A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

JAGANNAICKPUR, KAKINADA.

DEPARTMENT OF COMPUTER SCIENCE

BOARD OF STUDIES OF COMPUTER SCIENCE

2024-2025

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science) – I Semester

Course 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Code: BSCM24101 **No. of Hours/Week: 5**

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Course Outcomes:

CO1: Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.

CO2: Understand the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.

CO3: Examine the interplay and connections between mathematics, physics, and chemistry in various applications.

CO4: Interpret the mathematical models and physical and chemical principles to explain and predict phenomena in different contexts.

CO5: Analyse the evolution of computer and internet technologies and assess their ethical implications, focusing on network security and data protection.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	-	-	-	2	1	3	2	3	2
CO2	2	1	3	2	1	1	2	3	1	1
CO3	1	1	2	3	3	1	1	1	2	3
CO4	2	2	3	2	2	2	1	2	1	2
CO5	1	2	1	1	1	2	2	1	1	1
Average	1.2	1.2	1.8	1.6	1.8	1.4	1.8	1.8	1.6	1.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT I: ESSENTIALS OF MATHEMATICS

Complex Numbers: Introduction of the new symbol i – General form of a complex number –Modulus-Amplitude form and conversions, Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS:

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance-Acoustic waves and electromagnetic waves - Electric and Magnetic fields and their interactions-Behaviour of atomic and nuclear particles - Wave-particle duality, the uncertainty principle-Theories and understanding of universe.

UNIT III: ESSENTIALS OF CHEMISTRY:

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY:

Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer evolution -Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. Ethical and social implications: Network and security concepts-Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

Additional Inputs: Probability, Chemical bonding, Octet rule, VB theory, MO theory, Drug development, Food adulteration, Computer Architecture

Note: Concepts from Additional inputs must be excluded from Examinations

Text books:

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
3. Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd. 4.Basic Statistics by B.L.Agarwal, New age international Publishers
4. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
5. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker

Reference Books:

1. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
2. Physics for Technology and Engineering" by John Bird
3. Chemistry in daily life by Kirpal Singh
4. Chemistry of bio molecules by S. P. Bhutan
5. Fundamentals of Computers by V. Raja Raman

ASD GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS), KAKINADA

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I B.Sc. (Computer Science) – I Semester

Course 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Time: 3 Hrs Max.Marks: 60 M

BLUEPRINT

- Question Paper has two parts mainly consisting Section A to E.
- Section A MCQ's 20 questions @ 1 mark each--20 marks
- Section B True or False 10 questions @ 1 mark each--10 marks
- Section C Fill in the blanks 10 questions @ 1 mark each--10 marks
- Section D Matching 1 question from each section with 4 bits. Each question carries 2 marks (5*2) --10 marks
- Section E One mark questions 10 questions@ 1 mark each--10 marks.

S.No	Unit/ Module	Section A (1 Mark)	Section B (1 Mark)	Section C (1 Mark)	Section D (1/2 Mark)	Section E (1 Mark)	Total (Marks)
1	**UNIT-I**	4	2	2	2	2	12
2	**UNIT-II**	4	2	2	2	2	12
3	**UNIT-III**	4	2	2	2	2	12
4	**UNIT-IV**	4	2	2	2	2	12
5	**UNIT-V**	4	2	2	2	2	12
		20	**10**	**10**	**10**	**10**	**60**

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I B.Sc. (Computer Science) – I Semester

Course 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

TIME: 3hrs Course Code : **BSCM24101** MAX MARKS:60M

SECTION–A

Answer all the Questions **20QX1M=20M**

1.	Find The value of i^{108} is [ ] (a) 0 (b) 1 (c) i (d) – i	**( )**	**CO1**	**BL1**
2	If z=1-i then principal value of arg(z) is (a) 4 (b) $\frac{-\pi}{4}$ (c) $\frac{\pi}{3}$ (d) None of these	**( )**	**CO1**	**BL3**
3	The conjugate of $\frac{1}{3+4i}$ is (a)3+4i (b) $\frac{3+4i}{25}$ (c) 3-4i (d)none of these	**( )**	**CO1**	**BL3**
4	Law of Inertia" was explained by ____ law. a) Newton's First law b) Newton's Second law c) Newton's Third law d) All	**( )**	**CO1**	**BL1**
5	Which of the following has minimum wavelength (a) Blue light b)Gamma rays c) Infrared rays d) Microwaves	**( )**	**CO2**	**BL4**
6	If the force applied to a body is doubled and the mass is cut in half. What would be the acceleration ratio? a) 1:2 b) 2:1 c) 1:4 d) 4:1	**( )**	**CO3**	**BL3**
7	Which unit is used to measure angle the S.I system? a) Radian b) Steradian c) Degree d) Minute	**( )**	**CO3**	**BL1**
8	The mass – Energy relation is given by a) E = mc2 b) F = ma c) P = mv d d) W = Fd	**( )**	**CO3**	**BL1**
9	. Who discovered neutron a) Einstein b) JJ Thomson c) Goldstein d) Chadwick	**( )**	**CO3**	**BL1**
10	What is a bond between amino acids called? a) Ionic bond b) Acidic bond c) Peptide bond d) Hydrogen bond	**( )**	**CO3**	**BL1**
11	What is the other name for group 18th elements? a) Noble gases b) Alkali metals c) Alkali earth metals d) Halogens	**( )**	**CO3**	**BL1**
12	Chemical name of washing soda is: a. Sodium chloride b. Sodium hydrogen carbonate c. Sodium carbonate d. Sodium hydroxide	**( )**	**CO3**	**BL1**
13	Which acid is present in sour milk? a. Citric Acid b. Acetic Acid c. Glycolic Acid d. Lactic Acid	**( )**	**CO3**	**BL1**
14	Which of the following is the general formula of Carbohydrates? a. (C4H2O)n b. (C6H2O)n c. (CH2O)n d. (C2H2O)n COOH	**( )**	**CO3**	**BL1**
15	One light second is equal to a) 30,000 kilometres b)300,000 kilometres c)180000 kilometres d) None	**( )**	**CO2**	**BL3**
16	. What year was the World Wide Web first introduced? a) 1989 b) 1991 c) 1995 d) 2000	**( )**	**CO5**	**BL1**
17	Which of the following is a type of malware designed to replicate itself? a) Trojan b) Virus c) Worm d) Spyware	**( )**	**CO5**	**BL2**
18	Which protocol is primarily responsible for assigning IP addresses? a) FTP b) HTTP c) DHCP d) SMTP	**( )**	**CO5**	**BL1 4**
19	. What is the primary purpose of a firewall? a) To speed up internet connections b) To manage domain names c) To protect networks from unauthorized access d) To provide internet access	**( )**	**CO5**	**BL4**
20	Which type of cryptography uses the same key for both encryption and decryption? a) Asymmetric b) Symmetric c) Hashing d) Digital signatures	**( )**	**CO5**	**BL4**

Section B

True or false questions **10Q X 1M= 10M**

21	The formula $(a+b)^2=a^2+b^2+2aXb$ is valid for non zero vector a and b.		**CO1**	**BL2**
22	. A vector in the direction of vector 5i-j+2k which has magnitude 8 units is 8(5i-j+2k).		**CO1**	**BL2**
23	The Mass of a body is equivalent to the ratio of the force action on it to the acceleration it generates		**CO2**	**BL3**
24	. For every action in nature there is an unequal and opposite reaction.		**CO2**	**BL2**
25	Watt is the unit of Energy		**CO2**	**BL2**
26	Honey contains Glucose		**CO3**	**BL2**
27	The Cleaning properties of common house hold product don't involve chemical reaction		**CO4**	**BL2**
28	Vitamin A is water soluble vitamin		**CO4**	**BL3**
29	Asymmetric encryption uses a single key for both encryption and decryption.		**CO5**	**BL3**
30	The primary function of an ISP is to provide internet access to users.		**CO5**	**BL4**

Section C

FILL IN THE BLANKS **10QX1M=10M**

31	. The value of $[\sin^2 20^0 + \sin^2 70^0 - \tan^2 45^0]$ is _____		**CO1**	**BL1**
32	The value of $\sec^4\theta - \tan^4\theta$ _____ if $\sec^2\theta + \tan^2\theta = 7/12$		**CO1**	**BL3**
33	First law of thermodynamic can be mathematically written as _____		**CO2**	**BL3**
34	_____ mechanic deals with the objects travel close to the speed of light		**CO2**	**BL2**
35	Kelvin statement of second law of Thermodynamics in equation form _____		**CO2**	**BL3**
36	. Major functions of Carbohydrates_____		**CO3**	**BL2**
37	IA GROUP Elements known as _____		**CO3**	**BL1**
38	Lanthanides period _____		**CO3**	**BL1**
39	The _____ system translates human-readable domain names into IP addresses.		**CO5**	**BL1**
40	.A _____ is a type of network that covers a small geographic area, typically within a building		**CO5**	**BL3**

Section D

41. Match the following **4Q X $\frac{1}{2}$M = 2M**

I	**Column A**	**Column B**			
i	Arithmetic mean	a) $\frac{1}{\frac{1}{n}\left[\frac{1}{x_1}+\frac{1}{x_2}+\cdots+\frac{1}{x_n}\right]}$		**CO4**	**BL2**
ii	Median	b) $l+\left(\frac{f-f_{-1}}{sf-f_1-f_{-1}}\right)$		**CO4**	**BL2**
iii	Mode	c) $l+\frac{\frac{1}{2}N-C}{f}.i$		**CO4**	**BL2**
iv	Harmonic mean	d) $a+\frac{\sum fd}{\sum f}$		**CO4**	**BL2**

42. Match the following **4Q X $\frac{1}{2}$M = 2M**

II	**Column A**	**Column B**			
i	Wind energy	a)) Non invasile imaging		**CO1**	**BL2**
ii	Solar energy	b) 16 digits		**CO1**	**BL2**
iii	Magnetic Resonance Imaging	c) Convert sunlight into electricity		**CO1**	**BL2**
iv	Hexa-Decimal number uses	d) Harness the kinetic energy of wind to produce electricity		**CO1**	**BL2**

43. Match the following

4Q X $\frac{1}{2}$M = 2M

III	Column A	Column B			
i	First law of thermodynamic is based on rules	a) Newton		**CO2**	**BL1**
ii	Joule x Sec	b) Newton second		**CO2**	**BL1**
iii	Force	c) Conservation of energy		**CO2**	**BL1**
iv	Impulse	d) Angular Momentum		**CO2**	**BL1**

44. Match the following **4Q X $\frac{1}{2}$M = 2M**

III	Column A	Column B		CO3	BL2
i	A semiconductor bonds	a) Large molecule composed of repeating subunits		**CO3**	**BL1**
ii	A pentavalent impurity	b) Five valence electrons		**CO3**	**BL3**
iii	A trivalent impurity	c) Three valence electrons		**CO3**	**BL1**
iv	Polymer	d) Covalent		**CO3**	**BL2**

45. Match the following **4Q X $\frac{1}{2}$M = 2M**

V	Column A	Column B			
i	LAN	a) Cipher text		**CO5**	**BL2**
ii	Cryptography	b) Software		**CO5**	**BL2**
iii	Anti-virus	c) replicates itself		**CO5**	**BL2**
iv	Worm	d) Local Area Network		**CO5**	**BL2**

Section E

One word/ One sentence answers **10 Q X 1M = 10M**

46	If cos A = 2/3 then what is the value of tan A		**CO1**	**BL4**
47	. Find the angle between the vectors a=i-j+k and b=i+j-k.?		**CO1**	**BL2**
48	Write the mathematical form of uncertainty principle.		**CO2**	**BL3**
49	Write the mathematical form of first law of thermodynamics		**CO2**	**BL3**
50	What is hole in a semiconductor		**CO2**	**BL2**
51	**.** What are vitamins		**CO3**	**BL1**
52	Write about food additives.		**CO3**	**BL1**
53	What is organic chemistry		**CO3**	**BL1**
54	What type of network connects multiple local area networks (LANs) over a large geographic area		**CO5**	**BL3**
55	List two types of Malware		**CO5**	**BL1**

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DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. (Computer Science) – I Semester

Course 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Code: BSCM24102 **No. of Hours/Week: 5**

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Course Outcomes:

Upon Successful completion of the course, the student will be able to

CO1: Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.

CO2: Use the different sources of renewable energy and their generation processes and advances in nano-materials and their properties, with a focus on quantum dots.

CO3: Practice non-pollutant methods to save the ecosystem and human health.

CO4: Apply mathematical models, physical and chemical principles in different contexts.

CO5: Distinguish between various number systems, signal types, and evaluate the role of networking devices in data communication over different transmission media.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	-	-	-	2	1	3	2	3	2
CO2	2	1	3	2	1	1	2	3	1	1
CO3	1	1	2	3	3	1	1	1	2	3
CO4	2	2	3	2	2	2	1	2	1	2
CO5	1	2	1	1	1	2	2	1	1	1
Average	1.2	1.2	1.8	1.6	1.8	1.4	1.8	1.8	1.6	1.8

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT I: ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms –Point of intersection of two straight lines Limits and Differentiation: Standard limits – Derivative of a function –Problems on product rule and quotient rule

Integration: Integration as a reverse process of differentiation – Basic methods of integration Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

UNIT II: ADVANCES IN PHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY:

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine, Application of biophysics: Biophysical Imaging, Biomechanics, Neurophysics,

Application of medical physics: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green Technology, Water treatment.

UNIT V: ADVANCED APPLICATIONS OF COMPUTER SCIENCE

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Demultiplexing,Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

Additional Inputs: Methods in Matrix, Nanomaterials in drug delivery, Metal organic frame works and their role in dye removal, Nanotechnology, Principles of Green Chemistry, Demultiplexing

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. Digital Logic Design by Morris Mano

Reference Books:

1. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
2. "Biophysics: An Introduction" by Rodney Cotterill
3. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
4. Data Communication & Networking by Bahrouz Forouzan

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Course 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Time: 3 Hrs Max.Marks: 60 M

BLUEPRINT

- Question Paper has two parts mainly consisting Section A to E.
- Section A MCQ's 20 questions @ 1 mark each--20 marks
- Section B True or False 10 questions @ 1 mark each--10 marks
- Section C Fill in the blanks 10 questions @ 1 mark each--10 marks
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S.No	Unit/ Module	Section A (1 Mark)	Section B (1 Mark)	Section C (1 Mark)	Section D (1/2 Mark)	Section E (1 Mark)	Total (Marks)
1	**UNIT-I**	4	2	2	2	2	12
2	**UNIT-II**	4	2	2	2	2	12
3	**UNIT-III**	4	2	2	2	2	12
4	**UNIT-IV**	4	2	2	2	2	12
5	**UNIT-V**	4	2	2	2	2	12
		20	**10**	**10**	**10**	**10**	**60**

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I B.Sc. (Computer Science) – I Semester

Course 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

TIME: 3hrs Course Code :**BSCM24102** MAX MARKS:60M

SECTION–A

Answer all the Questions **20QX1M=20M**

1. Find the equation of a line which passes through the point (x_1, y_1) and has slope 'M' is **( ) CO4 BL1**

a) y-y_1=m(x- x_1) b) $y_2 - y_1$ =m(x- x_1) c) $y - y_1$ =m(x- x_1) d) y=mc

2 If the slope of the line joing points A (x, 2) , B (6, -8) is $\frac{-5}{4}$ Find the value of x **( ) CO4 BL1**

a) -2 b) 3 c) 6 d) 0

3 What is the Intercept form of the Equation 3x + 4y -5 =0 ? **( ) CO4 BL1**

a) $\frac{x}{3}+\frac{y}{4}=1$ b) $\frac{x}{(5/3)}+\frac{y}{(5/4)}=1$ c) $\frac{x}{y}=0$ d) $\frac{x}{5}+\frac{y}{5}=12$

4 What is the value of $\lim_{x\to 1}\frac{x^3-1}{x-1}$ **( ) CO4 BL1**

a) 3 b) 9 c) 3 d) 0

5 What is the value of $\lim_{x\to 0}\frac{sinx}{x}$ is **( ) CO4 BL1**

a) 0 b) 1 c) 2 d) 3

6 The carbon nanotubes, graphene, and fullerenes are the _____ based nano particles? **( ) CO1 BL1**

a) Organic
b) Inorganic
c) Carbon based
d) None of the above

7 What is the primary focus of Biophysics [ ] **( ) CO2 BL1**

a) The study of living organisms' behavior
b) The study of the physical properties of living organisms
c) The study of the chemical reactions in living organisms
d) Study of the genetics of living organisms

8 Nanosensors are which type of sensors? [ ] **( ) CO3 BL1**

a) Chemical sensor, mechanical sensor
b) Physical sensor
c) Both a&b
d) None of the above

9 What is the main purpose of Photovoltaic cells in solar panels **( ) CO3 BL1**

a) Heat generation
b) Electricity generation
c) Water purification
d) Carbon capture

10 Which renewable energy source is harnessed from the earth's Internal heat? **( ) CO3 BL1**

a) Solar
b) Wind
c) Geothermal
d) Hydro

11 Which nonmaterial is often used in gas sensing applications due to its high surface area and reactivity? **( ) CO3 BL1**

a) Graphene
b) Silver
c) Diamond
d) Aluminum

12	Which of the following is a potential challenge in the development of nano sensors? a) Lower sensitivity compared to macro-scale sensors b) Difficulty in miniaturization c) Limited stability and durability d) Lack of research interest	**( )**	**CO2**	**BL1**
13	What is the primary advantage of using CADD in drug development? a) It eliminates the need for clinical trials b) It reduces the cost and time required for drug development c) It guarantees the success of a drug candidate d) It simplifies the chemical synthesis of drug	**( )**	**CO2**	**BL1**
14	What is the primary purpose of drug delivery systems? a) To make drugs more expensive b) To increase drug shelf life c) To enhance drug effectiveness and reduce side effects d) To make drugs taste better	**( )**	**CO3**	**BL1**
15	What is the primary goal of solid waste management? a) To increase waste generation b) To reduce waste generation c) To manage hazardous waste only d) To promote open dumping	**( )**	**CO3**	**BL1**
16	.Which number system uses a base of 2? a) Octal b) Decimal c) Binary d) Hexadecimal	**( )**	**CO5**	**BL1**
17	What is the main function of a modem? a) To connect multiple devices in a network b) To convert digital signals to analog and vice versa c) To route data between different networks d) To detect errors in data transmission	**( )**	**CO5**	**BL3**
18	Which of the following is a method of error detection? a) Multiplexing b) Parity Check c) Modulation d) Demodulation	**( )**	**CO5**	**BL1**
19	.Which device is used to connect multiple networks together? a) Sw b) Router c) Hub d) Bridge	**( )**	**CO5**	**BL3**
20	In which type of multiplexing does time division occur? a) Frequency Division Multiplexing (FDM) b) Time Division Multiplexing (TDM) c) Statistical Multiplexing d) Code Division Multiplexing (CDM)	**( )**	**CO5**	**BL4**

Section B

True or false questions **10Q X 1M= 10M**

21	The Intercept form of the Equation 3x + 4y -5 =0 is $\frac{x}{3}+\frac{y}{4}=1$.	**CO4**	**BL3**
22	The value of $\lim_{x\to 0}\frac{sinx}{x}$ =1	**CO4**	**BL1**
23	The efficiency of present day solar cells is of the order 15% to 20%	**CO3**	**BL1**
24	Radiation kills fast-growing cells in the area of treatment	**CO3**	**BL1**
25	Carbon nanotubes, quantum dots,etc are examples of nano sensors	**CO3**	**BL2**
26	Nano sensors can be used to monitor and control various environmental parameters.	**CO2**	**BL2**
27	Inhalation is not a suitable route for drug delivery.	**CO1**	**BL2**
28	Computer Aided drug design (CADD) Involved the use of computational methods to discover , design and optimize new potential drug	**CO2**	**BL3**
29	8 is used in Octal number system	**CO5**	**BL1**
30	The hexadecimal number system uses a base of 16.	**CO5**	**BL1**

Section C

FILL IN THE BLANKS **10QX1M=10M**

31	.Find the equation of a line which passes through the point (x_1, y_1) and has slope 'M' is	**CO4**	**BL1**
32	If the slope of the line joing points A (x, 2) , B (6, -8) is $\frac{-5}{4}$ Find the value of x is	**CO4**	**BL3**
33	Tidal energy is an Example for _____ energy	**CO3**	**BL1**
34	_____ are the particles used in quantum dots.	**CO2**	**BL2**
35	_____ is an application for Medical Physics.	**CO2**	**BL2**
36	Quantitative ----------relationships (QSAR) are used in CADD to predict the biological activity of compounds based on their chemical structure	**CO2**	**BL2**
37	Hydrogels are three-dimensional networks that can hold large amounts of _____ and are used in various drug delivery applications	**CO2**	**BL3**
38	The newspaper contains _____ toxic materials	**CO2**	**BL1**
39	A _____ is a device that regenerates and amplifies signals in a network.	**CO5**	**BL2**
40	_____ is a technique used to combine multiple signals into one for transmission over a single medium	**CO5**	**BL2**

Section D

41. Match the following **4Q X $\frac{1}{2}$M = 2M**

I	**Column A**	**Column B**		
i	Slope point equation	a) $\frac{x}{a}+\frac{y}{b}=1$	**CO4**	**BL2**
ii	Intercept form equation	b) y = 0	**CO4**	**BL2**
iii	Slope intercept equation	c)Y-$y_1 = x - x_1$	**CO4**	**BL2**

iv	Equation parallel to x axis is	d) y= mx+c	**CO4**	**BL2**

42. Match the following **4Q X $\frac{1}{2}$M = 2M**

II	**Column A**	**Column B**		
i	Wind energy	a)) Non invasile imaging	**CO1**	**BL2**
ii	Solar energy	b) 16 digits	**CO1**	**BL2**
iii	Magnetic Resonance Imaging	c) Convert sunlight into electricity	**CO1**	**BL2**
iv	Hexa-Decimal number uses	d) Harness the kinetic energy of wind to produce electricity	**CO1**	**BL2**

43. Match the following **4Q X $\frac{1}{2}$M = 2M**

	Column A	**Column B**	**CO2**	**BL1**
III				
i	Carbon dioxide	a) damage ozone layer	**CO2**	**BL1**
ii	Carbon monoxide	b) reduces oxygen carrying capacity of blood	**CO2**	**BL1**
iii	Floride in water	c)Cyclic Redundancy Check	**CO2**	**BL1**
iv	CRC	d) Fluorosis city	**CO2**	**BL1**

44. Match the following **4Q X $\frac{1}{2}$M = 2M**

IV	**Column A**	**Column B**		
i	CADD	a) Fluorosis	**CO3**	**BL1**
ii	Flouride in Water	b) Depletion of Ozone Layer	**CO2**	**BL1**
iii	Chlorofluoro Carbons	c) Quantum Dots	**CO3**	**BL1**
iv	Nanosensors	d) Computer Aided Drug Design& Development	**CO3**	**BL1**

45. Match the following **4Q X $\frac{1}{2}$M = 2M**

	Column A	**Column B**		
V				
i	Analog Signal	a) Converts signals for transmission	**CO5**	**BL2**
ii	Digital Signal	b) Compresses and decompresses data	**CO5**	**BL2**
iii	Modem	c) Continuous signal	**CO5**	**BL2**
iv	Codec	d) Discrete signal	**CO5**	**BL2**

Section E

One word/ One sentence answers **10 Q X 1M = 10M**

46	If all the diagonal elements are one and non diagonal elements are zero ,then a square matrix is called as?	**CO4**	**BL1**

47	. If $F(x) = x^3 - 20x + 8$, Find F(A),Where $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$	**CO4**	**BL2**
48	Give some Examples for renewable sources?	**CO2**	**BL2**
49	quantum computer in the form of?	**CO2**	**BL2**
50	What is the difference between MRI and C.T. Scan?	**CO3**	**BL2**
51	What is pharmacophore modeling in CADD?	**CO3**	**BL2**
52	. What is a common route for systemic drug delivery?	**CO4**	**BL1**
53	What is green technology?	**CO4**	**BL1**
54	Give the equivalent Hexa-Decimal number for $245_{(10)}$.	**CO5**	**BL3**
55	What is the technique used for detecting errors in transmitted data?	**CO5**	**BL1**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)

DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

Course 3: PROBLEM SOLVING IN C
(B.Sc. Computer Science - Major)

Course Code: CS24201 **No. of Hours/Week: 3**

Course Objective:
To equip students with the foundational skills in C programming, enabling them to design algorithms, implement control structures, and manage data using arrays, strings, and pointers effectively.

Course Outcomes
Upon successful completion of the course, a student will be able to:
CO1: Understand the working of a digital computer and Fundamental constructs of Programming
CO2: Analyze and develop a solution to a given problem with suitable control structures
CO3: Utilize arrays and strings in C for problem solving.
CO4: Demonstrate the use of functions and pointers in C, including function prototypes, recursion, and dynamic memory management
CO5: Implement structures and unions to manage complex data types in C and perform basic file Operations

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	1	1	3	2	2	2
CO2	3	2	2	2	2	2	3	2	3	3
CO3	3	-	-	1	2	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	1	2	1	3	3	3	3
Average	2.8	1	0.8	1.2	1.6	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I
Introduction to computer and programming: Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardware and software, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms
Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Operator Precedence, Type Casting, Structure of C program, Input /output statements in C-Formatted and Unformatted I/O

UNIT-II
Control statements: Decision making statements: if, if else, Nested if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop, Nested Loops. Jump Control statements: break, continue and goto.

UNIT-III

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation, Multi-Dimensional Arrays

Strings: Declaring & Initializing string variables; String handling functions, Character handling functions

UNIT-IV

Functions: Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion, Parameter Passing by address & by value. Local and Global variables. **Storage classes**: automatic, external, static and register.

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic. Pointers and arrays, pointers and functions.

Dynamic Memory Management: Introduction, Functions-malloc, calloc, realloc, free

UNIT-V

Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers.

Unions - Union definition; difference between Structures and Unions.

Files: File Operations, File Handling functions-fopen(), fclose(),fgetc(),fputc(),fscanf(),fprinf(),feof()

Additional Inputs:

C Pre-processor, Conditional Compilation, Header Files, Sparse Matrices

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The ‘C’ Programming language” - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us ‘C’ – BPB Publications.

Reference Books:

1. Introduction to C programming by REEMA THAREJA, OXFORD UNIVERSITY PRESS.
2. Schaum's Outline of Programming with C, by Byron Gottfried, 2nd Edition, (Indian Adapted Edition), TMH publications, New Delhi, 2006.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – I Year – II Semester

PROBLEM SOLVING IN C

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I Introduction to computer and programming**	1	1	20
2.	**Unit – I Fundamentals of C**	1	1	12
3.	**Unit – II Control Statements**	2	1	12
4.	**Unit – III Arrays**	1	1	12
5.	**Unit – III Strings**	1	0	08
6.	**Unit – IV Functions**	1	1	12
7.	**Unit – IV Pointers & Dynamic Memory Management**	1	1	12
8.	**Unit – V Structures**	1	1	12
9.	**Unit – V Files**	1	1	12
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA

MODEL QUESTION PAPER

B.Sc. - I YEAR II SEMESTER

PROBLEM SOLVING IN C

Time : 3hrs **Course Code: CS24201** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Outline the characteristics of an algorithm. **(CO1) (L2)**
2. Categorize different data types available in C. **(CO1) (L4)**
3. Illustrate switch statement with an example. **(CO2) (L2)**
4. Explain about One-Dimensional arrays with an example. **(CO3) (L2)**
5. Write about Pointer Arithmetic. **(CO4) (L3)**
6. Inspect the significance of recursive functions. **(CO4) (L4)**
7. Explain the difference between Structure and Union. **(CO5) (L4)**
8. Write a short note on nested structures. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Define computer. Draw the block diagram of computer and explain. **(CO1) (L4)**

   (or)

   (b) Elucidate different types of operators in C. **(CO1) (L4)**

10. (a) Compare and contrast different Decision-making statements. **(CO2) (L5)**

    (or)

    (b) Distinguish between different Looping statements in C. **(CO2) (L4)**

11. (a) List the types of arrays. Explain initialization, accessing the elements of a one-dimensional array with an example. **(CO3) (L5)**

    (or)

    (b) Explain various string handling & character functions. **(CO3) (L4)**

12. (a) Explain about Dynamic Memory Allocation in detail. **(CO4) (L3)**

    (or)

    (b) Explain various categories of Functions with examples. **(CO4) (L4)**

13. (a) What is a structure? Illustrate accessing the members of a structure with an example.**(CO5) (L2)**

    (or)

    (b) Explain about various File Handling functions. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

Course: PROBLEM SOLVING IN C

Course Code: CS24201P **No. of Hours/Week: 2**

Course Objective:
To develop programming skills using the fundamentals of C Language and to enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.

Course Outcomes:
At the end of the course the student will be able to

CO1: Implement programs using fundamental features of C Language.
CO2: Solve problems with the use of loops, decision making statements and functions.
CO3: Implement programs performing various Operations on Arrays.

List of Experiments

1. Write a program to calculate simple & compound interest
2. Find the biggest of three numbers using C.
3. Write a c program to find the sum of individual digits of a positive integer.
4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
5. Write a c program to check whether a number is Armstrong or not.
6. Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a c program that implements searching of given item in given list
8. Write a c program that uses functions to perform the following: Addition of two matrices. Multiplication of two matrices.
9. Write a program for concatenation of two strings.
10. Write a program for length of a string with and without String Handling functions
11. Write a program to demonstrate Call by Value and Call by Reference mechanism
12. Write a Program to find GCD of Two numbers using Recursion
13. Write a c program to perform various operations using pointers.
14. Write a c program to read data of 10 employees with a structure of 1.employee id 2.aadar no, 3.title, 4.joined date, 5.salary, 6.date of birth, 7.gender, 8.department.
15. Write a Program to demonstrate dynamic arrays using Dynamic Memory Management functions
16. Write a program to copy the contents of one file to other.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

Course 4: DIGITAL LOGIC DESIGN

Course Code: CS24202 **No. of Hours/Week: 3**

Course Objectives
To familiarize with the concepts of designing digital circuits.

Course Outcomes
Upon successful completion of the course, the students will be able to
CO1: Understand the conversion of numbers from one radix to another radix and perform arithmetic operations.
CO2: Simplify Boolean functions using Boolean algebra and k- maps
CO3: Design adders and subtractors circuits.
CO4: Design combinational logic circuits such as decoders, encoders, multiplexers and demultiplexers.
CO5: Use flip flops to design registers and counters.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	1	1	1	1	3	2	1	2
CO2	3	2	3	2	2	2	3	3	3	2
CO3	3	1	2	1	2	1	3	3	2	2
CO4	3	1	1	1	1	1	3	2	1	3
CO5	3	1	2	1	2	1	3	2	2	2
Average	3	1.2	1.8	1.2	1.6	1.2	3	2.4	1.8	2.2

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT – I
Number Systems: Binary, octal, decimal, hexadecimal number systems, conversion of numbers from one radix to another radix, r's, (r-1)'s complements, signed binary numbers, addition and subtraction of unsigned and signed numbers, weighted and unweighted codes.

UNIT – II
Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates,Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms,two level realization of logic functions using universal gates, minimizations of logic functions (POS and SOP) using Boolean theorems, K-map (up to four variables), don't care conditions.

UNIT – III
Combinational Logic Circuits – 1: Design of half adder, full adder, half subtractor, full subtractor, ripple adders and subtractors, ripple adder / subtractor.

UNIT – IV
Combinational Logic Circuits – 2: Design of decoders, encoders, priority encoder, multiplexers, De-multiplexers, higher order decoders, demultiplexers and multiplexers, realization of Boolean functions using decoders, multiplexers.

UNIT – V

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS- latch using NAND and NOR Gates, truth tables, RS, JK, T and D flip-flops, truth and excitation tables, Design of registers, shift registers, bidirectional shift registers, universal shift register, design of ripple counters

Additional Inputs: Johnson Counter, Ring Counter, conversion of flip- flops, flip-flops with asynchronous inputs (preset and clear), synchronous counters and variable modulus counters.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. M. Morris Mano, Michael D Ciletti, "Digital Design", 5th edition, PEA.

Reference Books

1. Kohavi, Jha, "Switching and Finite Automata Theory", 3rd edition, Cambridge.
2. Leach, Malvino, Saha, "Digital Principles and Applications", 7th edition, TMH.
3. Roth, "Fundamentals of Logic Design", 5th edition, Cengag

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – I Year – II Semester

DIGITAL LOGIC DESIGN

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I** **Number Systems**	2	2	24
2.	**Unit – II** **Logic Gates**	2	2	24
3.	**Unit – III** **Combinational Logic Circuits-1**	2	1	20
4.	**Unit – IV** **Combinational Logic Circuits-2**	2	1	20
5.	**Unit – V** **Sequential Logic Circuits**	2	2	24
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

KAKINADA

MODEL QUESTION PAPER

B.Sc. (Computer Science) - I YEAR II SEMESTER

DIGITAL LOGIC DESIGN

Time : 3hrs **Course Code: CS24202** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Convert $1243_{(10)}$ to its equivalent Hexa-Decimal number. **(CO1) (L3)**
2. Give a short note on Weighted and un-weighted codes. **(CO1) (L2)**
3. Write about basic logic Gates. **(CO2) (L2)**
4. Give the truth tables for XOR and XNOR Gates.**(CO2) (L1)**
5. Explain about Half adder. **(CO3) (L2)**
6. Explain about Encoders. **(CO4) (L4)**
7. Write a short note on RS Flip-Flop. **(CO5) (L2)**
8. Explain about Shift Registers. **(CO5) (L4)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Express the following numbers in decimal: **(CO1) (L4)**
   (i) $(10110.0101)_2$
   (ii) $(16.5)_{16}$
   (or)
   (b) What is Complement? Explain r's and (r-1)'s Complement. **(CO1) (L3)**

10. (a) Explain about realization of logic functions using Universal Gates. **(CO2) (L4)**
    (or)
    (b) Simplify the Boolean function using K-map in products of sums form: **(CO2) (L4)**
    $F(w,x,y,z)=\Sigma(2,3,10,11,12,13,14,15)$.

11. (a) Explain Full adder with the logic circuit diagram. **(CO3) (L4)**
    (or)
    (b) Give the circuit diagram for Half Subtractor. Explain. **(CO3) (L4)**

12. (a) Explain the working of 2X4 and 3X8 Decoder. **(CO4) (L4)**
    (or)
    (b) Explain about Multiplexer with reference circuit diagram. **(CO4) (L3)**

13. (a) Explain the principle of JK Flip-flop with the logic diagram and truth table. **(CO5) (L4)**
    (or)
    (b) Explain the operation of 4-bit universal shift register. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester
Course 4: DIGITAL LOGIC DESIGN

Course Code:CS24202P **No. of Hours/Week: 2**

Course Objective:
To provide students with hands-on experience in designing, implementing, and testing digital circuits and systems using fundamental logic gates

Course Outcomes:
At the end of the course the student will be able to

CO1: Understand and verify the truth tables of basic logic gates using TTL ICs.
CO2: Design digital circuits for Boolean functions, adders, subtractors, multiplexers, decoders, and counters
CO3: Verify the stable tables of various flip-flops

List of Experiments

The laboratory work can be done by using physical gates and necessary equipment or simulators. Simulators: https://sourceforge.net/projects/gatesim/ or https://circuitverse.org/ or any free open-source simulator.

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean functions using logic gates in both SOP and POS forms.
3. Realization of basic gates using universal gates.
4. Design and implementation of half and full adder circuits using logic gates.
5. Design and implementation of half and full subtractor circuits using logic gates.
6. Verification of stable tables of RS, JK, T and D flip-flops using NAND gates.
7. Verification of stable tables of RS, JK, T and D flip-flops using NOR gates.
8. Implementation and verification of Decoder and encoder using logic gates.
9. Implementation of 4X1 MUX and DeMUX using logic gates.
10. Implementation of 8X1 MUX using suitable lower order MUX.
11. Implementation of 7-segment decoder circuit.
12. Implementation of 4-bit parallel adder.
13. Design and verification of 4-bit synchronous counter.
14. Design and verification of 4-bit asynchronous counter

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
Skill Course
Common for B.Sc./B.Com/B.A-SEMESTER II
DIGITAL LITERACY

Course Code: DL24201SC **No. of Hours/Week: 2**

Course Objective:

- To understand various components of computers
- To work confidently with GUI base operating system
- To understand internet and its functionalities.
- To get familiar with Sending and receiving emails

Course Outcomes:

At the end of the course, the student will be able to

CO1: Perform operations on the computer and files
CO2: Access the Internet and finding information of interest
CO3: Register for an E-mail account and operating it
CO4: Make bill payments and use other applications of Internet
CO5: Create, edit and format documents using a word processor

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	2	1	-	1	1	2	1	2	2
CO2	2	2	3	1	2	1	1	2	3	3
CO3	1	3	3	2	2	1	2	2	1	2
CO4	2	3	3	2	2	2	3	2	2	2
CO5	3	3	3	2	2	1	3	2	3	3
Average	1.8	2.6	2.6	1.4	1.8	1.2	2.2	1.8	2.2	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Operate the elements of a computer and performing operations on the computer Operate the elements of a computer including power cord, power switch, network connecting cable, USB ports, Mouse operations, Keyboard operations, interface icons, GUI elements, Editing options, perform operations including switching on the computer, logging in, locating a file, opening a file, printing a document, storing a file with proper extension, creating a folder/ sub folder in a volume on hard disk and desktop, shifting files from one folder to another, shutting off the computer.

UNIT-II

Access the Internet to browse information and E-mail operation Access the Internet, use a search engine, find information on the topic of interest, register for a web-based E-mail account, access E-mail with attachments, reply to an e-mail, forward an e-mail and delete an e-mail message

UNIT-III

Make bill payments, other applications using Internet and word processing Make utility bill payments, booking bus/train tickets, bank transactions, personal transactions, job search through employment portals, mobile/DTH recharge, word processing basics, creating, editing and formatting of text, saving and printing of word document.

Additional Inputs: Online banking system

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Appreciation of Digital Literacy Handbook published by Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India.

Web Resources:

1. https://youtu.be/b2X_j5Bz-VM
2. https://youtu.be/jln3-P6L2ro
3. https://youtu.be/cfDisqUMIvw
4. https://youtu.be/3h_PyURcdrc
5. https://youtu.be/EqN0LBcydBg

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

SKILL COURSE
DIGITAL LITERACY

BLUE PRINT

S.No	Unit	Essay Questions 10 marks	Short Questions 5 marks	Marks Allotted
1	**Unit – I**	2	2	35
2	**Unit – II**	2	2	35
3	**Unit – III**	2	2	30
Total Marks				100

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
MODEL QUESTION PAPER

DIGITAL LITERACY

Common for B.Sc./B.Com/B.A

Semester-II

Time: 2 Hrs **Course Code: DL24201SC** **Max. Marks: 40**

SECTION-A

I. Answer any FOUR of the following questions. **4 x 4 = 16**

1. Write the procedure to switch-on the Computer. **(CO1) (L1)**
2. How to locate a file in the system? **(CO1) (L1)**
3. Write the procedure of shifting files from one folder to another. **(CO2) (L2)**
4. Write about Search Engine. **(CO2) (L2)**
5. Give the procedure for accessing E-Mail with attachments. **(CO3) (L3)**
6. Write the process of booking Bus/Train tickets.**(CO4) (L3)**

SECTION-B

II. Answer the following questions. **3 x 8 = 24**

7. Explain about different operations performed on a Computer.**(CO1) (L4)**

(or)

8. Write the procedure to Shutdown the computer. **(CO1) (L1)**

9. What is E-mail? Explain advantages and disadvantages of E-mail. **(CO3) (L4)**

(or)

10. Explain the procedure for searching the content in the Internet. **(CO2) (L2)**

11. How to search for jobs through various Job/Employment portals? Explain. **(CO4) (L2)**

(or)

12. Write about creating, editing, formatting and saving Word document. **(CO5) (L3)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 5: OBJECT ORIENTED PROGRAMMING USING JAVA

Course Code: CS23301 **No. of Hours/Week: 3**

Course Objective:

To introduce the fundamental concepts of Object-Oriented programming and to design &implement object-oriented programming concepts in Java.

Course Outcomes:

Upon successful completion of the course, a student will be able to:
CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
CO3: Create packages and implement interfaces, exception handling to enhance program reliability
CO4: Develop multithreaded applications and utilize stream-based I/O for file handling in Java
CO5: Construct GUI screens with event handling.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants,scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism**: Dynamic binding, method

overriding, abstract classes and methods.

UNIT-III

Interface: Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception subclasses.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization.

UNIT-V

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.

Additional Inputs: constructor overloading, Access specifiers

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object Oriented Programming with Java, updated edition,T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall,2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Concepts and Java Programming ,** **Java Programming**	2	2	24
2	**Unit – II** **Arrays** **Classes and Objects** **Inheritance**	2	2	24
3	**Unit – III** **Interface** **Packages** **Exception Handling**	2	2	24
4	**Unit – IV** **Multithreading** **Stream based I/O**	2	1	20
5	**Unit – V** **GUI Programming with Swing** **Event Handling**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER

B.Sc. – II Year III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA

Time : 3hrs **Course Code: CS23301** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4 = 20**

1. Why do we need to use OOPS concept? **(CO1) (L2)**
2. Write about type conversion and type casting. **(CO1) (L2)**
3. Write about the Arrays in Java. **(CO2) (L1)**
4. Explain the significance of "this" keyword with an example. **(CO2) (L2)**
5. Explain about the Packages in Java. **(CO3) (L2)**
6. List types of Exceptions. Explain any two. **(CO3) (L2)**
7. What is the difference between Process and Thread? **(CO4) (L3)**
8. Write a short notes on Adapter Classes. **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8 = 40**

9. (a) Explain Object Oriented Programming Concepts. **(CO1) (L2)**

(or)

(b) Explain about Operators in Java. **(CO1) (L4)**

10. (a) Explain the process of creating a class and object with a simple program. **(CO2) (L3)**

(or)

(b) Explain the various forms of Inheritance with illustration. **(CO2) (L4)**

11. (a) Discuss about Interfaces with example. **(CO3) (L4)**

(or)

(b) Explain about the Exception handling with a simple program. **(CO3 (L4)**

12. (a) Explain about the Life Cycle of Threads. **(CO4) (L4)**

(or)

(b) Explain about FileInputStream and FileOutputStream **(CO4) (L4)**

13. (a) Write about the MVC Architecture Swing in Java. **(CO5) (L2)**

(or)

(b) Elucidate Event Handling in Java with a suitable example. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Course Code: CS23301P **No. of Hours/Week: 2**

Course Objective:
To introduce various Object-Oriented Concepts through which the students will be enabled to implement classes, inheritance, interface, package and multithreading concepts.

Course Outcomes:
At the end of the course the student will be able to

CO1: Apply OOP concepts to solve real time problems.
CO2: Make use of class, inheritance, interface and packages to develop solutions for complex problems.
CO3: Build java applications using Exception handling and Threads.

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
   i. Single ii. Multi-Level iii. Hierarchical iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception "In Sufficient Funds" when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays "good morning", for every one second, "hello" for every 2 seconds and "welcome" for every 3 seconds by using extending Thread class.
11. Write a Java program that creates three threads. First thread displays "OOPS", the second thread displays "Through" and the third thread Displays "JAVA" by using Runnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button "add" is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE
    Form Fields are: Name, RNO, Mail id, Gender, Branch, Address.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 6: DATA STRUCTURES USING C

Course Code: CS23302 **No. of Hours/Week: 4**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance ofvarious data structures in developing and implementing efficient algorithms.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Analyze algorithms and Understand various Data Structures including arrays for data storage and processing.
CO2: Realize Linked List Data Structure for various operations
CO3: Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
CO4: Implement and compare various searching & sorting techniques.
CO5: Understand the Non-Linear Data Structures such as Binary Trees and Graphs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	2	1	3	2	2	2
CO2	3	2	2	1	2	2	3	2	3	3
CO3	3	-	-	1	-	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	0.8	1	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Basic Concepts: Algorithm Analysis-Space Complexity, Time Complexity, Asymptotic Notation

Introduction to Data structures: Definition**,** Types of Data structure, Abstract Data Types (ADT), Difference between Abstract Data Types, Data Types, and Data Structures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

UNIT-II

Linked List: Concept of Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linked list, Insertion and deletion

into linked list (At first Node, Specified Position, Last node), Application of linked lists

UNIT-III

Stacks: Introduction to stack ADT, Representation of stacks with array and Linked List, Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparison between recursion and Iteration

Queues: Introduction to Queue ADT, Representation of Queues with array and Linked List, Implementation of Queues, Application of Queues, Types of Queues- Circular Queues, De-queues, Priority Queue

UNIT-IV

Searching: Linear or Sequential Search, Binary Search and Indexed Sequential Search
Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort

UNIT-V

Binary Trees: Concept of Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree.

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), and Applications of Graphs.

Additional Inputs: Spanning Trees, properties of spanning trees, Minimum Spanning trees

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt LtdDelhi India
2. A.K. Sharma ,Data Structure Using C, Pearson Education India.
3. "Data Structures Using C" Balagurusamy E. TMH

Reference Books

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications.
2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley Dreamtech Publication.
3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mcgraw-hill Education (India)Pvt.Ltd.
4. Michael T.Goodrich,RobertoTamassia, David M.Mount "Data Structures and Algorithms in C++", Wiley India.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year IV Semester

DATA STRUCTURES USING C

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Basic Concepts in DS using C** **Introduction to Data Structures** **Arrays**	2	2	24
2	**Unit – II** **Linked Lists** **Implementation of Linked list ADT**	2	2	24
3	**Unit – III** **Stacks** **Queues**	2	1	20
4	**Unit – IV** **Searching** **Sorting**	2	1	20
5	**Unit – V** **Binary Trees** **Graphs**	2	2	24
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER
B.Sc. II YEAR - IV SEMESTER
DATA STRUCTURES USING C

Time : 3hrs **Course Code: CS23302** **Max Marks : 60**

SECTION - A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain about Recursion. **(CO1) (L2)**
2. Discuss briefly about Asymptotic Notation. **(CO1) (L4)**
3. What is an ADT? Discuss about Array ADT. **(CO2) (L2)**
4. Discuss briefly about types of Circular linked lists. **(CO2) (L4)**
5. What are the applications of Stack? Explain. **(CO3) (L2)**
6. Explain about Circular Queue. **(CO3) (L2)**
7. Discuss briefly about insertion in Binary Search Trees. **(CO5) (L4)**
8. Write short notes on Linear Search. **(CO4) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Define Data Structures. Elucidate different types of Data Structures. (**CO1) (L4)**

(Or)

(b) How to declare, initialize and access the elements of a 2 Dimensional Array? **(CO1) (L4)** Explain with example.

10. (a) Write a program to illustrate insertion and deletions in a single linked list. **(CO2) (L6)**

(Or)

(b) What is a Linked List? Distinguish between different types of Linked lists. **(CO2) (L4)**

11. (a) Illustrate the operations on Stack with an example. **(CO3) (L3)**

(Or)

(b) Discuss Queue and its implementation using Arrays. **(CO3) (L4)**

12. (a) Discuss Quick Sort with an example. **(CO4) (L4)**

(Or)

(b) Explain about Binary search with an example. **(CO4) (L4)**

13. (a) Explain about various Graph Traversals. **(CO5) (L4)**

(Or)

(b) Define Binary Search Tree. List and explain operations on BST. **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – IV Semester

Course 6: DATA STRUCTURES USING C LAB

Course Code: CS23302P **No. of Hours/Week: 2**

Course Objective:

To implement data structures for problem solving and to implement and analyze the searching algorithms in the context of specific engineering problems.

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Course Outcomes:

At the end of the course the student will be able to

CO1: Implement linear and non-linear data structure operations using C programs

CO2: Solve problems implementing appropriate data structures

CO3: Implement sorting and searching algorithms using relevant data structures

List of Experiments

1. Write a program to read 'N' numbers of elements into an array and also perform thefollowing operation on an array
    a. Add an element at the beginning of an array
    b. Insert an element at given index of array
    c. Update an element using a values and index
    d. Delete an existing element
2. Write Program to implement Single Linked List with insertion, deletion and traversaloperations
3. Write Program to implement Circular doubly Linked List with insertion, deletion and traversal operations
4. Write Programs to implement the Stack operations using an array
5. Write a program using stacks to convert a given infix expression to postfix
6. Write Programs to implement the Stack operations using Liked List.
7. Write Programs to implement the Queue operations using an array.
8. Write Programs to implement the Queue operations using Liked List.
9. Write a program for Binary Search Tree Traversals
10. Write a program to search an item in a given list using the following Searching Algorithms
    a) Linear Search b) Binary Search.
11. Write a program for implementation of the following Sorting Algorithms
    a. Bubble Sort b) Insertion Sort c) Quick Sort

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 7: COMPUTER ORGANIZATION

Course Code:CS23303 **No. of Hours/Week: 3**

Course Objectives

To familiarize with organizational aspects of memory, processor and I/O.

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Describe register transfer language and perform basic micro-operations

CO2: Distinguish between various instruction formats and identify the significance of micro-programmed and hard-wired control units.

CO3: Analyze the performance of hierarchical organization of memory.

CO4: Summarize different data transfer techniques.

CO5: Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	1	1	1	3	2	2	3
CO2	3	2	1	2	1	2	3	3	2	3
CO3	3	2	-	2	2	2	3	3	2	3
CO4	3	1	1	1	1	2	3	3	3	3
CO5	2	1	1	1	1	3	3	2	3	3
Average	2.8	1.4	0.6	1.4	1.2	2	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT – I

Register Transfer Language and Micro Operations: Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, instruction cycle, Register reference instructions, Memory – reference instructions, input – output and interrupt.

UNIT – II

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats, addressing modes, Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

UNIT – III

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

UNIT – IV

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer- programmed I/O, priority interrupt, direct memory access, Input – Output Processor (IOP).

UNIT – V

Computer Arithmetic and Parallel Processing: Data representation- fixed point, floating point,addition and subtraction, multiplication and division algorithms.

Parallel Processing-Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

Additional Inputs: Stack Organization

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. M. Moris Mano, "Computer Systems Architecture", 3rd edition, Pearson/ PHI.

Reference Books:

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, "Computer Organization", 5th edition, McGrawHill.
2. William Stallings, "Computer Organization and Architecture", 8th edition, Pearson/PHI.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

COMPUTER ORGANIZATION

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Register Transfer language and Micro Operations**	1	1	12
2	**Unit – I** **Basic Computer Organization and Design**	1	1	12
3	**Unit – II** **CPU and Micro Programmed Control**	2	2	24
4	**Unit – III** **Memory Organization**	2	1	20
5	**Unit – IV** **Input- Output Organization**	2	1	20
6	**Unit – V** **Compute Arithmetic and Parallel Processing**	2	2	24
Total Marks				112

A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN(A), KAKINADA

MODEL QUESTION PAPER

B.Sc. II YEAR - III SEMESTER

C 7 – COMPUTER ORGANIZATION

Time : 3hrs **Course Code: CS23303** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. What is a micro operation? Give examples. **(CO1) (L2)**
2. What is an instruction code? Explain. **(CO1) (L1)**
3. Compare and contrast different instruction formats. **(CO2) (L2)**
4. Write a short note on control memory. **(CO2) (L1)**
5. Give a brief account on various types of memory. **(CO3) (L4)**
6. Elucidate Priority interrupt. **(CO4) (L2)**
7. Discuss briefly about Instruction pipelining. **(CO5) (L2)**
8. Write about fixed point representation. **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Explain Register Reference Instructions with an example. **(CO1) (L4)**

(or)

(b) What is an Instruction cycle? Explain different phases involved in instruction cycle with a flowchart. **(CO1) (L4)**

10. (a) Define addressing mode. Analyze different types of Addressing modes with examples. **(CO2) (L4)**

(or)

(b) Elucidate Micro-programmed control unit in detail. **(CO2) (L3)**

11. (a) Explain the organization of Associative memory with a neat sketch. **(CO3) (L4)**

(or)

(b) Discuss Cache Memory and its mapping techniques. **(CO3) (L4)**

12. (a) Compare and contrast various types of Asynchronous Data transfer **(CO4) (L5)**

(or)

(b) Explain Direct Memory Access. **(CO4) (L4)**

13. (a) Discuss Flynn's taxonomy of parallel processing. **(CO5) (L4)**

(or)

(b) Elaborate Booth's Multiplication algorithm. **(CO5) (L5)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course7: COMPUTER ORGANIZATION LAB

Course Code: CS23303P **No. of Hours/Week: 2**

Course Objectives

To develop an understanding of how computing technology presents new ways to address problems.

Course Outcomes:

At the end of the course, the student will be able to

CO1: Implement various Arithmetic operations on binary numbers

CO2: Develop skills in writing assembly language code using different instruction formats and addressing modes

CO3: Implement various micro-operations

Lab Experiments

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimalnumber vice versa.
2. Implement a C program to perform Binary Addition & Subtraction.
3. Implement a C program to perform Multiplication of two binary numbers.
4. Implement arithmetic micro-operations using logic gates.
5. Implement logic and shift micro-operations using logic gates.
6. Implement a C program to perform Multiplication of two binary numbers (signed) using Booth's Algorithms.
7. Implement a C program to perform division of two binary numbers (Unsigned) usingrestoring division algorithm.
8. Implement a C program to perform division of two binary numbers (Unsigned) using non-restoring division algorithm.
9. Write assembly language code for A+B*(C-D) using various instruction formats in MASM orany open-source assembler.
10. Write assembly language code for A+B*C using various addressing modes in MASM or anyopen-source assembler.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 8: OPERATING SYSTEMS

Course Code: CS23304 **No. of Hours/Week: 3**

Course Objective:

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Demonstrate knowledge and comprehension of operating system functions.
CO2: Analyze different process scheduling algorithms and apply them to manage processes and threads effectively
CO3: Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.
CO4: Compare and contrast different memory allocation strategies and evaluate their effectiveness.
CO5: Evaluate disk scheduling algorithms while implementing OS security measures.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	-	-	1	1	-	2	1	2	3
CO2	3	2	1	-	2	-	3	2	3	3
CO3	3	2	2	2	3	2	3	3	3	3
CO4	2	2	1	1	2	2	3	2	2	2
CO5	3	3	2	1	2	2	3	2	3	3
Average	2.6	1.8	1.2	1	2	1.2	2.8	2	2.6	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time System.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; **Process Scheduling**- Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixedand -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V

File and I/O Management, OS security: Directory Structure, File Operations, File AllocationMethods, Device Management, Pipes, Buffer, Shared Memory, Disk Scheduling algorithms.

Additional Inputs:

Inter process Communication in Linux, Multithreading: Benefits, Multithreading Models

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and GregGagne(7th Edition) Wiley India Edition.

Reference Books

1. Operating Systems: Internals and Design Principles by Stallings (Pearson)
2. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. – II YEAR III SEMESTER

OPERATING SYSTEMS

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I Operating System Introduction**	**2**	**2**	**24**
2.	**Unit – II Processor and User Models**	**2**	**2**	**24**
3.	**Unit – III Process Scheduling**	**2**	**2**	**24**
4.	**Unit – IV Memory Management**	**2**	**1**	**20**
5.	**Unit – V File, I/O Management and OS Security**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER

B.Sc. II YEAR - III SEMESTER

OPERATING SYSTEMS

Time : 3hrs **Course Code:CS23304** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Give the functions of Multitasking Operating Systems. **(CO1) (L1)**
2. Discuss briefly the objectives of Operating Systems. **(CO1) (L4)**
3. Explain about System Call. **(CO2) (L2)**
4. What is the Scheduling Criteria for Process Scheduling Algorithms? **(CO2) (L2)**
5. Discuss about the necessary conditions for a Deadlock. **(CO3) (L4)**
6. Write about Process Synchronization. **(CO3) (L2)**
7. Compare and Contrast Physical and Logical address space. **(CO4) (L3)**
8. Explain about Pipes. **(CO5) (L2)**

SECTION-B

II. Answer ALL the following questions. **5x8=40**

9. (a) Explain the functions of the operating system. **(CO1) (L4)**

   (or)

   (b) List the types of Operating Systems. Explain. **(CO1) (L2)**

10. (a) Explain about FCFS and SJF Process Scheduling Algorithm with an example. **(CO2) (L4)**

    (or)

    (b) Explain Process Control block and Process state with a neat sketch. **(CO2) (L4)**

11. (a) Explain the deadlock detection techniques. **(CO3) (L4)**

    (or)

    (b) What is critical section? Elaborate the significance of Semaphores in Process synchronization. **(CO3) (L5)**

12. (a) Explain about Memory Allocation Strategies. (**CO4) (L4)**

    (or)

    (b) What is Virtual Memory? Dissect the benefits of virtual memory technique. **(CO4) (L4)**

13. (a) Explain the Indexed File allocation method with an example. **(CO5) (L4)**

    (or)

    (b) Explain about Disk Scheduling Algorithms. **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 8: OPERATING SYSTEMS LAB USING C

Course Code:CS23304P **No. of Hours/Week: 2**

Course Objective:

To impart knowledge on Operating System design Principles and demonstrate Process Scheduling and Page Replacement Algorithms.

Course Outcomes:

At the end of the course the student will be able to

1. Implement Process Scheduling and Page Replacement Algorithms.
2. Implement Various File Organization schemes
3. Implement Deadlock Avoidance and prevention algorithms

List of Experiments

1. Illustrate the LINUX commands
   a) pwd
   b) mkdir
   c) rmdir
   d) grep
   e) chmod
   f) ls
   g) rm
   h) cp
2. Write a program to calculate average waiting time and turn around time of each processusing the following CPU Scheduling algorithm for the given process schedules.
   a) FCFS b) SJF
   c) Priority d) Round Robin
3. Simulate MVT and MFT memory management techniques
4. Write a program for Bankers Algorithm for Dead Lock Avoidance
5. Implement Bankers Algorithm Dead Lock Prevention.
6. Write a program to simulate Producer-Consumer problem.
7. Simulate all Page replacement algorithms.
   a) FIFO b) LRU
   c) LFU d) Optimal
8. Simulate Paging Techniques of memory management
9. Simulate the following disk scheduling algorithms

a) FCFS b) SSTF c) SCAN d) CSCAN

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

II YEAR - III SEMESTER
SKILL COURSE
INFORMATION & COMMUNICATION TECHNOLOGY
(Common to B.Sc./B.A./B.Com.)

Course Code: ICT23303-SC **No. of Hours/Week:2**

Course Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course Outcomes:

After completion of the course, student will be able to;

CO1: Understand the literature of social networks and their properties.

CO2: Develop skills to use various social networking sites like twitter, flickr, etc.,

CO3: Apply skills to use Email, online forums, docs, spreadsheets, etc. through G-Suite, for communication,collaboration and research.

CO4: Learn few GOI digital initiatives in higher education.

CO5: Get acquainted with internet threats and security mechanisms.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	2	1	1	3	2	3	2
CO2	3	2	3	2	1	1	2	2	3	2
CO3	2	2	3	2	2	1	2	1	2	2
CO4	2	3	3	2	2	1	3	2	3	3
CO5	2	1	3	2	2	1	2	1	3	3
Average	2.2	2	3	2	1.6	1	2.4	1.6	2.8	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e- acharya, e-Yantra and NPTEL).

Text Books:

1. Internet technology and Web design, ISRD group, TMH.

Reference Books :

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e –by Raymond Greenlaw and Ellen Hepp, Publishers : TMH
2. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

II YEAR III SEMESTER

SKILL COURSE

INFORMATION & COMMUNICATION TECHNOLOGY

(Common to B.Sc./B.A./B.Com.)

BLUE PRINT

S.No.	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Fundamentals of Internet**	2	2	24
2	**Unit – II** **E-mail and G-Suite**	2	2	24
3	**Unit – III** **Overview of Internet Security**	2	2	24
Total Marks				72

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II YEAR III SEMESTER

SKILL COURSE

MODEL QUESTION PAPER

INFORMATION & COMMUNICATION TECHNOLOGY

(Common to B.Sc./B.A./B.Com.)

Time: 2 Hrs **Course Code:ICT23303-SC** **Max. Marks: 40**

SECTION-A

I. Answer any FOUR of the following questions. **4 x 4 = 16**

1. Write about the fundamentals of Internet. **(CO1) (L2)**
2. How to search for information through Internet? **(CO2) (L1)**
3. What are the advantages of E-mail? **(CO3) (L2)**
4. Write about Domain Names. **(CO3) (L1)**
5. What is Firewall? **(CO5) (L1)**
6. Explain about E-Sodh-Sindhu and NPTEL. **(CO4) (L2)**

SECTION-B

II. Answer the following questions. **3 x 8 = 24**

7. (a) Explain about various social networks. **(CO2) (L4)**

   (or)

   (b) What is Internet? Summarize the applications of Internet. **(CO1) (L4)**

8. (a) What is E-mail? Explain advantages and disadvantages of E-mail. **(CO3) (L4)**

   (or)

   (b) How to use Google documents, spreadsheets and Google forms? Interpret their usage.**(CO3) (L5)**

9. (a) Explain briefly about E-mail threats. **(CO5) (L5)**

   (or)

   (b) List the GOI digital initiatives in higher education. Explain. **(CO4) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS

Course Code:CS23401 **No. of Hours/Week: 3**

Course Objectives

To familiarize with concepts of database design

Course Outcomes:

On successful completion of the course, students will be able to

CO1: Differentiate between database systems and file based systems

CO2: Design a database using ER model

CO3: Make use of relational model in database design

CO4: Utilize SQL commands for creating and manipulating data stored in databases.

CO5: Write PL/SQL programs to work with databases.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT - II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

UNIT - III

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

Structured Query Language: Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Additional Inputs:

Transaction Management and Concurrency Control: What is transaction, ACID Properties, Concurrency control

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.
2. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications.

Reference Books

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Major)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Overview of Database Management System**	2	2	24
2	**Unit – II Entity-Relationship Model**	2	2	24
3	**Unit – III Relational Model**	2	2	24
4	**Unit – IV Structured Query Language**	2	1	20
5	**Unit – V PL/SQL**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER

B.Sc. - II YEAR IV SEMESTER
DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Major)

Time : 3hrs **Course Code: CS23401** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. Discuss briefly the components of DBMS. **(CO1) (L4)**
2. Summarize the drawbacks of File System. **(CO1) (L2)**
3. Elucidate EER. **(CO2) (L2)**
4. Classify Relationships based on entity sets participation. **(CO2) (L2)**
5. Explain about Aggregate Functions. **(CO4) (L2)**
6. Write a short note on CODD rules. **(CO3) (L2)**
7. Give a brief account on Procedures in PL/SQL. **(CO5) (L1)**
8. Explain set operations in Relation Algebra. **(CO4) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Define DBMS. Explain the advantages of DBMS. **(CO1) (L4)**

   (Or)

   (b) Elucidate Database System Architecture with a neat sketch. (**CO1) (L4)**

10. (a) Interpret the building blocks of an entity relationship diagram with illustration. **(CO2) (L6)**

    (Or)

    (b) Discuss IS A relationship and attribute inheritance. **(CO2) (L5)**

11. (a) Discuss relational algebra, operations and advantages of relational algebra. **(CO3) (L4)**

    (Or)

    (b) Distinguish between INF and 2NF in detail. **(CO3) (L4)**

12. (a) Categorize DDL Commands based on their purpose with illustrations. **(CO4) (L5)**

    (Or)

    (b) Compare and contrast various DML Commands. **(CO4) (L5)**

13. (a) Discuss control structures used in PL/SQL. **(CO5) (L4)**

    (Or)

    (b) Illustrate the use of triggers in detail with an example. **(CO5) (L3)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS LAB
(B.Sc. Computer Science Major)

Course Code:CS23401P **No. of Hours/Week: 2**

Course Objective:
To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:
At the end of the course the student will be able to

CO1: Design database and ER diagrams for the real world scenarios.

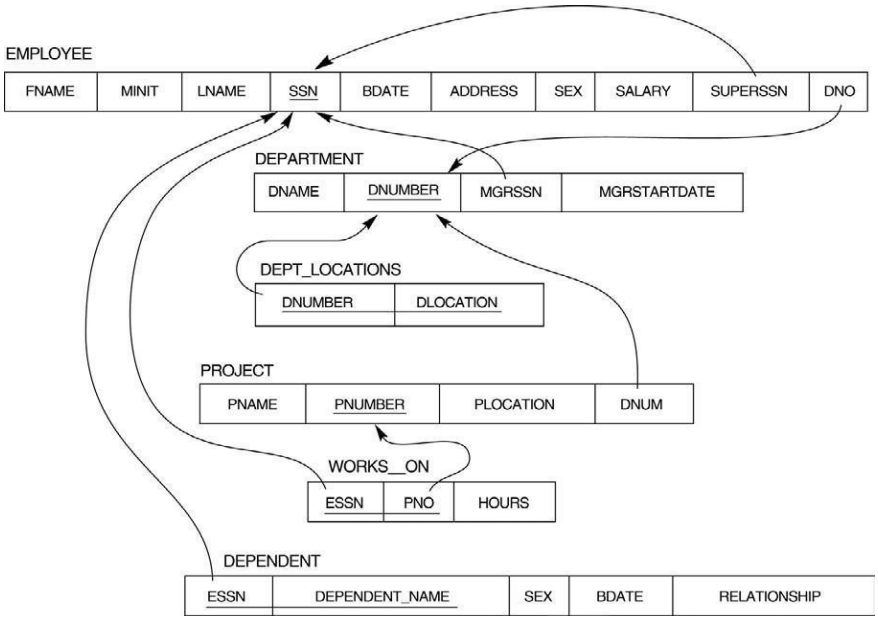
CO2: Understand ER concepts and ER mapping to relational model.

CO3: Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

Lab Experiments

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant Primary Key, Foreign Key and other constraints
2. Populate the tables with data
3. Display all the details of all employees working in the company.
4. Display ssn, lname, fname, address of employees who work in department no 7.
5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in ‘Bellaire’
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan’ either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee'sdepartment, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, andthe average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the ‘Marketing’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose ssn is ‘123456789’.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 10: OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Major)

Course Code: CS23402 **No. of Hours/Week: 3**

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approachin analyzing, designing an application, system, or business by applying the object- oriented paradigm and visual modeling.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modelling Language (UML) basics, in the development of software solutions.

CO2: Analyse and specify software requirements, develop use cases and scenarios, apply object- oriented analysis and design (OOAD) principles

CO3: Implement software construction principles using object-oriented programming languages and apply testing methodologies

CO4: Analyse and Evaluate Software Maintenance and Evolution Strategies

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	2	3	2	2	3
CO3	2	2	3	1	1	1	2	1	2	3
CO4	3	2	3	2	1	1	3	3	2	2
CO5	3	2	3	1	1	1	3	3	2	2
Average	2.8	2	3	1.6	1	1.2	2.8	2.2	2	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), Unified Modelling Language (UML) basics, Introduction to software development process and softwaredevelopment life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques(class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering.

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service- oriented architecture (SOA), Agile software development and Scrum methodologies.

Text Books

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rdEdition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998,Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G.Booch, Addison Wesley

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Major)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Object-Oriented Programming**	2	2	24
2	**Unit – II Requirements Analysis and Design**	2	2	24
3	**Unit – III Software Construction and Testing**	2	2	24
4	**Unit – IV Software Maintenance and Evolution**	2	1	20
5	**Unit – V Advanced Topics in Object-Oriented Software Engineering**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

OBJECT ORIENTED SOFTWARE ENGINEERING

(B.Sc. Computer Science Major)

Time : 3hrs **Course Code: CS23402** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain polymorphism in OOP. **(CO1) (L2)**
2. Explain the importance of UML in the software development process. **(CO1) (L2)**
3. What is a use case, and how is it utilized in the requirements analysis process? **(CO2) (L2)**
4. Distinguish between a class diagram and a sequence diagram in UML. **(CO2) (L4)**
5. Describe the main advantages of using an object-oriented Design in Software development. **(CO3) (L2)**
6. Compare and contrast corrective and adaptive maintenance with examples. **(CO3) (L5)**
7. Explain the advantages of Service-Oriented Architecture (SOA). **(CO4) (L2)**
8. What are the key roles and ceremonies in the Scrum framework? **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Discuss the Principles and Advantages of Object-Oriented Programming (OOP). **(CO1) (L4)**

   (or)

   (b) Briefly describe the stages of the Software Development Life Cycle (SDLC). **(CO1) (L2)**

10. (a) Explain the need for requirements analysis and specification in the software development process. **(CO2) (L4)**

    (or)

    (b) Elaborate the principles and practices of Object-Oriented Analysis and Design (OOAD). **(CO2) (L4)**

11. (a) Discuss the evolution of software construction, emphasizing its significance in modern software development. **(CO3) (L4)**

    (or)

    (b) Explain about different types of Software Testing. **(CO3) (L4)**

12. (a) Describe the significance of software maintenance in the software development lifecycle. **(CO4) (L2)**

    (or)

    (b) Analyse the concept of refactoring and its role in improving code quality. **(CO4) (L4)**

13. (a) Discuss the concept of Model-Driven Engineering (MDE) and its application in modern software development. **(CO5) (L4)**

    (or)

    (b) Summarize the key principles of Agile Software Development **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING LAB
(B.Sc. Computer Science Major)

Course Code:CS23402P **No. of Hours/Week: 2**

Course Objective:

To develop projects using Object Oriented analysis, design and testing techniques.

Course Outcomes:

At the end of the course, the student will be able to

CO1: Understand the software engineering methodologies involved in the phases for project development.
CO2: Gain knowledge about open source tools used for implementing software engineering methods.
CO3: Apply UML concepts in software development.

Suggested Software Tools: Star UML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan(Gantt chart).
2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagramwith generalization, specialization and aggregation of specified problem statement
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagramand draw it
4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 anddraw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them usingUML Interaction diagrams.
9. Draw the state chart diagram.

10. Identify the user interface, domain objects, and technical services. Draw the partial layered,logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 11: DATA COMMUNICATION AND COMPUTER NETWORKS

Course Code: CS23403 **No. of Hours/Week: 3**

Course Objectives

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply network applications, hardware, software, and reference models for network communication.

CO2: Design and analyse data link layer protocols, multiple access protocols, and wireless LAN technologies.

CO3: Evaluate network layer design, routing algorithms, and congestion control

CO4: Analyse transport service, transport protocols, and evaluate UDP and TCP in the internet.

CO5: Understand application layer protocols, including DNS, HTTP, and SMTP, and their roles in network communications.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	1	3	3	2	2
CO3	2	2	3	1	1	1	2	3	1	2
CO4	3	2	3	2	2	1	3	2	3	2
CO5	3	2	3	1	1	1	3	2	3	2
Average	2.8	2	3	1.6	1.2	1	2.8	2.4	2.2	2

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT-II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer on the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

UNIT-III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT-IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT-V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web:architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Text Books

1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, NewDelhi, India

Reference Books

1. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, McGraw-Hill, India.
2. Kurose, Ross (2010), Computer Networking: A top down approach, PearsonEducation, India.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

DATA COMMUNICATION AND COMPUTER NETWORKS

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Introduction** **The Physical Layer**	2	2	24
2	**Unit – II** **The Data Link Layer** **The Medium Access Sublayer**	2	2	24
3	**Unit – III** **Network Layer**	2	1	20
4	**Unit – IV** **The Transport Layer**	2	1	20
5	**Unit – V** **The Application Layer** **Application Layer Protocols**	2	2	24
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER
MODEL QUESTION PAPER
DATA COMMUNICATION AND COMPUTER NETWORKS

Time: 3hrs **Course Code: CS23403** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain about different types of networks. **(CO1) (L2)**
2. Discuss the functions of Physical Layer. **(CO1) (L4)**
3. Explain about HDLC. **(CO2) (L2)**
4. What is meant by channel allocation problem? Explain. **(CO2) (L1)**
5. What is Congestion control? How it is addressed by the Network layer? **(CO3) (L3)**
6. Write a short note on IPV4 Header. **(CO3) (L2)**
7. Give a brief account on Simple Transport Protocol. **(CO4) (L2)**
8. Elucidate World Wide Web. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Describe ISO-OSI Reference Model in detail with a neat sketch. **(CO1) (L4)**

(Or)

(b) Compare and contrast different types of guided transmission media in detail. **(CO1) (L5)**

10. (a) What are the different mechanisms used for error correction and error detection? Elaborate. **(CO2) (L4)**

(Or)

(b) Illustrate the mechanism of Sliding Window Protocols. **(CO2) (L2)**

11. (a) Explain about design issues in Network layer. **(CO3) (L4)**

(Or)

(b) Write about any two Routing algorithms in detail. **(CO3) (L4)**

12. (a) Explain about Transmission Control Protocol. **(CO4) (L4)**

(Or)

(b) Discuss the significance of elements in transport layer Protocols. **(CO4) (L5)**

13. (a) What is DNS? Explain. **(CO5) (L4)**

(Or)

(b) Discuss Simple Mail Transfer Protocol (SMTP) in detail. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 11: DATA COMMUNICATION AND COMPUTER NETWORKS LAB

Course Code: CS23403P **No. of Hours/Week: 2**

Course Objectives:

To provide exposure to Data Communication and its implementation strategies

Course Outcomes:

At the end of the course, the student will be able to

CO1: Identify different types of networks.

CO2: Simulate Routing and establish networks.

List of Experiments:

1. Understanding various network tools in Windows and Linux
2. Study different types of Network devices and Cables
3. Building a Local Area Network
4. Concept of Network IP Address
5. Introduction to Network Simulator – Packet Tracer (PT)
6. Configuration of a Router using Packet Tracer
7. Implementation of a Network using Packet Tracer
8. Implementation of Static Routing using Packet Tracer
9. Implementation of RIP using Packet Tracer
10. Implementation of OSPF using Packet Tracer
11. Implement DNS using packet tracer
12. Implementation of a VLAN using Packet Tracer

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

SKILL COURSE
CYBER SECURITY
(Common to B.Sc./B.A./B.Com.)

Course Code: CBS23401-SC **No.of Hours/ Week: 2**

Course Objective:
To understand and identify various Cyber Threats and implement certain measures to overcome them.

Course Outcomes:
Upon successful completion of the course, the students will be able to

CO1: Develop an understanding of cybercrimes and various legal perspectives involved.
CO2: Develop a security model to handle mobile, wireless devices and related security issues of an organization.
CO3: Use the cybercrime tools and methods in solving real world problems

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	2	3	2	2	2	2	2
CO2	3	2	2	2	3	1	3	1	2	2
CO3	3	2	1	2	2	2	3	2	3	2
Average	3	2	1.6	2	2.6	1.6	2.6	1.6	2.3	2

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I:
Introduction to Cybercrime: Introduction, Cybercrime: Definition and origins of the word, Cybercrime and Information Security, who are cyber criminals? classifications of cybercrimes, cybercrime: the legal perspectives, an Indian perspective, cybercrime and the Indian IT Act 2000, a Global perspective on Cybercrimes.

UNIT-II:
Cybercrime-Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless ComputingEra, Authentication Service Security, Attacks on Mobile/Cell Phones.
Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT-III:
Tools and Methods Used in Cybercrime: Password Cracking, key loggers and Spywares, virus and

worms, Trojan Horses and Backdoors, Steganography, attacks on wireless networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft).

Text Books:

1. Mark Rhodes, Ousley, Information Security, 1st Edition ,MGH, 2013.

Reference Books:

1. Nina Godbole and SunitBelpure ¯ Cyber Security Understanding Cyber Crimes,Computer Forensics and Legal Perspectives , 1st Edition Publication Wiley, 2011.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Skill Course: CYBER SECURITY
(Common to B.Sc./B.A./B.Com.)

BLUE PRINT

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Introduction to Cybercrime**	2	2	24
2	**Unit – II** **Cybercrime-Mobile and Wireless Devices** **Mobile Devices**	2	2	24
3	**Unit – III** **Tools and Methods Used in Cybercrime**	2	2	24
Total Marks				**72**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

MODEL QUESTION PAPER

Skill Course: CYBER SECURITY
(Common to B.Sc./B.A./B.Com.)

Time : 2hrs **Course Code: CBS23401-SC** **Max Marks : 40**

SECTION-A

I. Answer any FOUR of the following questions. **4 X 4=16**

1. Who can be called as cyber criminals? **(CO1) (L1)**
2. Give a short note on Indian IT Act 2000. **(CO1) (L1)**
3. Write about wireless devices. **(CO2) (L2)**
4. What are the security implications? **(CO2) (21)**
5. Define Spyware. **(CO3) (L1)**
6. Describe the features of Trojan Horses. **(CO3) (L2)**

SECTION-B

II. Answer the following questions. **3 X 8=24**

7. (a) Explain about cybercrime and information security. **(CO1) (L4)**

(or)

(b) What is cybercrime? Explain important sections of Indian IT ACT 2000? **(CO1) (L2)**

8. (a) Explain about credit card frauds in wireless computing Era. **(CO2) (L4)**

(or)

(b) What are the Organizational Security Policies in Laptops? Explain. **(CO2) (L5)**

9. (a) What are the various malwares used in cybercrime? Explain. **(CO3) (L4)**

(or)

(b) Compare and contrast various cyber-attack on wireless networks. **(CO3) (L5)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: CS225307-6A **No. of Hours/Week: 4**

Course Objective:

To provide knowledge about Web architecture and services and inculcate the competency of building a Website.

Course Outcomes:

At the end of the course the student will be able to

CO1: Understand the fundamentals of HTML, including its structure, elements, attributes, and responsive design techniques.

CO2: Create and manage HTML forms with various input types and integrate CSS for styling and layout customization.

CO3: Implement client-side validation and dynamic web features using JavaScript and DHTML for enhanced user interaction.

CO4: Learn how to install word press and gain the knowledge of installing various plugins to use in their websites

CO5: Customize WordPress sites using parent and child themes, manage user roles, and extend functionality with plugins.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	2	1	1	3
CO2	3	2	3	3	2	3
CO3	3	2	3	2	2	3
CO4	3	2	3	1	2	3
CO5	3	3	3	2	1	3
Average	2.8	2.4	2.8	1.8	1.6	3

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, styles, colours, HTML formatting, Quotations, Comments, images, tables, lists, blocks and classes, HTML CSS, HTML frames, file paths, layout, symbols, HTML responsive.

UNIT - II

HTML forms: HTML form elements, input types, input attributes, HTML5, HTML graphics, HTML media – video, audio, plug INS, you tube.

HTML API'S: Geo location, Drag/drop, local storage, HTML SSE.

CSS: CSS home, introduction, syntax, colours, back ground, borders, margins, padding, height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinators, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters, CSS responsive.

UNIT – III

Client side Validation: Introduction to JavaScript - What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript - Data and objects in JavaScript, regular expressions, exception handling. DHTML with JavaScript - Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

UNIT – IV

Word press: Introduction to word press, servers like wamp, bitnami etc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.

UNIT – V

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site

Additional Inputs: Changing the appearance of site using css, protecting word press website from hackers.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).

Reference Books:

1. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
2. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
3. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
4. Word press for Beginners, Dr.Andy Williams.
5. Professional word press, Brad Williams, David damstra, Hanstern.
6. Web resources:
   a. http://www.codecademy.com/tracks/web
   b. http://www.w3schools.com
   c. https://www.w3schools.in/wordpress-tutorial/
   d. http://www.homeandlearn.co.uk

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE
B.Sc. – III YEAR V SEMESTER

6A - WEB INTERFACE DESIGNING TECHNOLOGIES

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I** **HTML**	**2**	**2**	**24**
2.	**Unit – II** **HTML forms, APIs & CSS**	**2**	**2**	**24**
3.	**Unit – III** **Client side Validation**	**2**	**2**	**24**
4.	**Unit – IV** **Word press**	**2**	**1**	**20**
5.	**Unit – V** **Working with themes**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

MODEL QUESTION PAPER

III B.Sc. - V SEMESTER

6A-WEB INTERFACE DESIGNING TECHNOLOGIES

Time : 3hrs **Course Code: CS225307-6A** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. Illustrate the Structure of HTML program with an example. **(CO1) (L2)**
2. Discuss briefly about various types of lists. **(CO1) (L2)**
3. What is CSS? Explain with example**.(CO2) (L2)**
4. Write about various input form elements and their attributes. **(CO2) (L3)**
5. List the data types available in Javascript. Explain. **(CO3) (L2)**
6. Interpret Exception handling mechanism in Javascript. **(CO3) (L4)**
7. Give a brief account on configuring Word Press. **(CO4) (L2)**
8. Write about User roles and profiles in Word Press. **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Discuss about Text Formatting Tags in HTML. **(CO1) (L4)**

(Or)

(b) What are the elements of table tag? How to create a table in HTML? Elaborate the process with an example. **(CO1) (L6)**

10. (a) What are the different mechanisms that are used to add style sheet properties to a document? Explain. **(CO2) (L3)**

(Or)

(b) Create a student registration from with different form elements. **(CO2) (L6)**

11. (a) Explain about Operators in Javascript. **(CO3) (L2)**

(Or)

(b) Write about Arrays and Functions in Javascript. **(CO3) (L2)**

12. (a) Elucidate the features of WordPress**. (CO4) (L2)**

(Or)

(b) Identify the components on the home screen of WordPress. Explain their usage. **(CO4)(L3)**

13. (a) Explain the process of customizing the Website using WordPress. **(CO5) (L3)**

(Or)

(b) List and evaluate various themes used in designing a website using WordPress. **(CO5) (L5)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester
Course: WEB INTERFACE DESIGNING TECHNOLOGIES LAB

Course Code: CS225307P-6A **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web architecture, web services, client side and server side scripting technologies and to provide skills to design interactive and dynamic web sites.

Course Outcomes:

At the end of the course the student will be able to

CO1: Create a basic website with the help of HTML and CSS.
CO2: Acquire the skill of installing word press and various plugins of Word press.
CO3: Create a static website with the help of Word press.
CO4: Create an interface for a dynamic website.
CO5: Apply various themes for their websites using Word press.

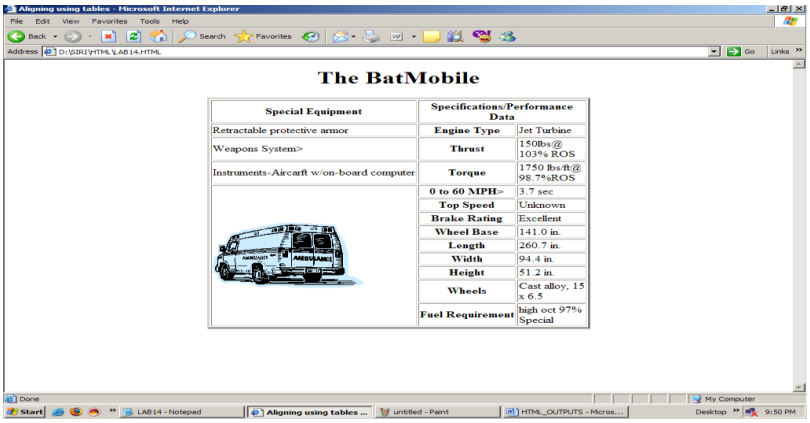
List of Experiments

HTML and CSS:

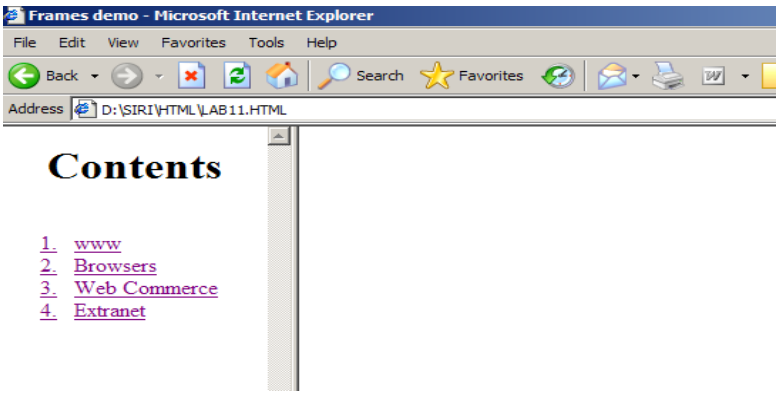
1. Create an HTML document with the following formatting options:
   (a)Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag
2. Create an HTML document which consists of:
   (a) Ordered List (b) Unordered List (c) Nested List (d) Image
3. Create a Table with four rows and five columns. Place an image in one column.
4. **Using "table" tag, align the images as follows:**

5. Create a menu form using html.
6. Style the menu buttons using css.

7. Create a form using HTML which has the following types of controls:
   (a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
8. Embed a calendar object in your web page.
9. Create an applet that accepts two numbers and perform all the arithmetic operations on them.
10. Create nested table to store your curriculum.
11. Create a form that accepts the information from the subscriber of a mailing system.
12. Design the page as follows:



13. Create a help file as follows:



14. Create a webpage containing your bio data (assume the form and fields).
15. Write a html program including style sheets.
16. Write a html program to layers of information in web page.
17. Create a static webpage.

Word press:

18. Installation and configuration of word press.
19. Create a site and add a theme to it.
20 Create a child theme
21. Create five pages on COVID – 19 and link them to the home page. .
22. Create a simple post with featured image.
23. Add an external video link with size 640 X 360.
24. Create a user and assign a role to him.
25. Create a login page to word press using custom links
26. Create a website for your college.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: CS225308-7A **No. of Hours/Week: 4**
Paper : VII-A

Course Objective:
To provide knowledge about development of Web Applications

Course Outcomes:
At the end of the course the student will be able to

CO1: Understand PHP syntax, including variables, data types, operators, and write simple programs in PHP.
CO2: Create and manipulate arrays and objects in PHP.
CO3: Develop web forms in PHP, manage form input, implement cookies, and utilize session management for user state persistence.
CO4: Perform file and directory operations in PHP, including file inclusion, reading, writing, and executing system commands.
CO5: Connect PHP with MySQL to manage data, and develop applications.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	3	1	1	3
CO2	3	2	2	2	3	3
CO3	3	2	2	2	2	3
CO4	3	2	2	2	1	3
CO5	3	3	3	1	2	3
Average	2.8	2.2	2.4	1.6	1.8	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I:
The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

UNIT-II:
Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

UNIT-III:
Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

UNIT-IV:
Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen(), Running Commands with exec(), Running Commands with system() or passthru().

UNIT-V:
Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Creating an Online Address Book: Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

Additional Inputs: Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill

Reference Books:

1. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
3. Web resources:
    a. http://www.codecademy.com/tracks/php
    b. http://www.w3schools.com/PHP
    c. http://www.tutorialpoint.com

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
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B.Sc. – III YEAR V SEMESTER

7A - WEB APPLICATIONS DEVELOPMENT USING PHP& MYSQL

Blue Print

S.No	Unit	Essay Questions 10 marks	Short Questions 5 marks	Marks Allotted
1.	**Unit – I The Building blocks of PHP**	**2**	**2**	**24**
2.	**Unit – II Working with Arrays**	**2**	**2**	**24**
3.	**Unit – III Working with Forms**	**2**	**2**	**24**
4.	**Unit – IV Working with Files and Directories**	**2**	**1**	**20**
5.	**Unit – V Interacting with MySQL using PHP**	**2**	**1**	**20**
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

MODEL QUESTION PAPER

III B.Sc. - V SEMESTER

VII A- WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Time : 3hrs **Course Code: CS225308-7A** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 x 4=20**

1. What is a variable? How to declare a variable in PHP? **(CO1) (L1)**
2. Differentiate between while and do-while. **(CO1) (L4)**
3. Give a brief account on Date and Time functions. **(CO2) (L2)**
4. Write about formatting strings in PHP. **(CO2) (L2)**
5. Write about Session Variables. **(CO3) (L4)**
6. Interpret the steps involved in Form submission. **(CO3) (L5)**
7. Explain about validating files. **(CO4) (L3)**
8. Write about MySQLi Functions. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5 x 8=40**

9. (a) List the data types in PHP. Explain. **(CO1) (L2)**

(Or)

(b) Elaborate on the operators used in PHP. **(CO1) (L2)**

10. (a) What is an Array? Explain initialization of arrays with examples. **(CO2) (L3)**

(Or)

(b) Describe the process of creation of Objects in PHP. **(CO2) (L4)**

11. (a) Elucidate the process of creating forms in PHP. **(CO3) (L4)**

(Or)

(b) Discuss about Working with Cookies in PHP. **(CO3) (L5)**

12. (a) Explain about reading from a file and appending to file. **(CO4) (L2)**

(Or)

(b) Explain how to modify existing images. **(CO4) (L3)**

13. (a) Explain about connecting to MySQL with PHP. **(CO5) (L3)**

(Or)

(b) Explain about Record Addition and Record Deletion mechanisms. **(CO2) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL LAB

Course Code: CS225308P-7A **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on web applications using PHP and MYSQL Lab.

Course Outcomes:

At the end of the course the student will be able to

CO1: Write, debug and implement the Programs by applying concepts and error handling techniques of PHP.
CO2: Create an interactive and dynamic website.
CO3: Create a website with reports generated from a database.
CO4: Write programs to create an interactive website for e-commerce sites like online shopping, etc.

List of Experiments

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
9. Write PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add new Rows in a Table.
12. Write a PHP application to modify the Rows in a Table.
13. Write a PHP application to delete the Rows from a Table.
14. Write a PHP application to fetch the Rows in a Table.
15. Develop an PHP application to implement the following Operations
    i. Registration of Users.
    ii. Insert the details of the Users.
    iii. Modify the Details.
    iv. Transaction Maintenance.
        a) No of times Logged in

b) Time Spent on each login.
c) Restrict the user for three trials only.
d) Delete the user if he spent more than 100 Hrs of transaction.

16. Write a PHP script to connect MySQL server from your website.
17. Write a program to read customer information like cust-no, cust-name, item-purchased, and mob-no, from customer table and display all these information in table format on output screen.
18. Write a program to edit name of customer to “Kiran” with cust-no =1, and to delete record with cust-no=3.
19. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format in your website.
20. Create a dynamic web site using PHP and MySQL.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: INTERNET OF THINGS

Course Code: **No. of Hours/Week: 4**

Paper : VI-B

Course Objective:

To provide knowledge on IoT, its concepts and architecture

Course Outcomes:

At the end of the course the student will be able to

CO1: Appreciate the technology for IoT

CO2: Understand various concepts, terminologies and architecture of IoT systems.

CO3: Understand various applications of IoT

CO4: Learn how to use various sensors and actuators for design of IoT.

CO5: Learn how to connect various things to Internet and inculcate skills to develop simple IOT Devices.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	-	-	-	-	-	2	1	1	2
CO2	3	3	2	-	-	2	2	2	2	3
CO3	3	3	3	-	2	2	3	3	3	3
CO4	3	2	1	-	-	2	2	2	2	3
CO5	3	3	2	-	2	2	3	3	3	3
Average	2.8	2.2	1.6	-	0.8	1.6	2.4	2.6	2.2	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

Unit - I

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M.

Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

Unit - II

Sensors Networks : Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

Unit - III

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet And Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, LoRA, RPL, REST

Unit - IV

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, Writing Arduino Software, Arduino Libraries, Basics of Embedded C programming for Arduino, Interfacing LED, push button and buzzer with Arduino, Interfacing Arduino with LCD.

Sensor & Actuators with Arduino: Overview of Sensors working, Analog and Digital Sensors, Interfacing of Temperature, Humidity, Motion, Light and Gas Sensors with Arduino, Interfacing of Actuators with Arduino, Interfacing of Relay Switch and Servo Motor with Arduino.

Unit - V

Developing IOT's: Implementation of IoT with Arduino, Connecting and using various IoT Cloud Based Platforms such as Blynk, Thingspeak, AWS IoT, Google Cloud IoT Core etc. Privacy and Security Issues in IoT.

Additional Inputs: AMPQ, CoAP, MQTT. Edge connectivity and protocols, Cloud Computing, Fog Computing.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1st Edition, VPT, 2014

Reference Books:

1. Daniel Minoli, — "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications
2. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press
3. Open source software / learning websites
    a. https://github.com/connectIOT/iottoolkit
    b. https://www.arduino.cc/
    c. https://onlinecourses.nptel.ac.in/noc17_cs22/course
    d. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html
    e. Contiki (Open source IoT operating system)
    f. Ardudroid (open source IoT project)
    g. https://blynk.io (Mobile app)
    h. IoT Toolkit (smart object API gateway service reference implementation)

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: INTERNET OF THINGS LAB

Course Code: **No. of Hours/Week: 2**

Course Objective:

To inculcate knowledge on using Arduino and IoT devices.

Course Outcomes:

At the end of the course the student will be able to

CO1: Acquire the skills to design a small IoT device.

CO2: Connect various sensors, actuators, etc to Arduino board.

CO3: Connect the things to Internet

CO4: Design a small mobile app to control the sensors.

CO5: Deploy a simple IoT device.

List of Experiments

1. Understanding Arduino UNO Board and Components
2. Installing and work with Arduino IDE
3. Blinking LED sketch with Arduino
4. Simulation of 4-Way Traffic Light with Arduino
5. Using Pulse Width Modulation
6. LED Fade Sketch and Button Sketch
7. Analog Input Sketch (Bar Graph with LEDs and Potentiometre)
8. Digital Read Serial Sketch (Working with DHT/IR/Gas or Any other Sensor)
9. Working with Adafruit Libraries in Arduino
10. Spinning a DC Motor and Motor Speed Control Sketch
11. Working with Shields
12. Design APP using Blink App or Things peak API and connect it LED bulb.
13. Design APP Using Blynk App and Connect to Temperature, magnetic Sensors.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. (M.P.Cs) – V Semester

Course: APPLICATION DEVELOPMENT USING PYTHON

Course Code: **No. of Hours/Week: 4**
Paper : VII-B

Course Objective: To develop applications using Python

Course Outcomes:
Students after successful completion of the course will be able to:

CO1: Interpret the concepts of Object-Oriented Programming as used in Python.

CO2: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

CO3: Demonstrate proficiency in handling Strings and File Systems.

CO4: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.

CO5: Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	-	-	1	3	2	2	2
CO2	3	2	2	-	-	2	3	2	3	3
CO3	3	-	-	-	-	1	3	3	3	3
CO4	3	1	1	-	-	1	3	3	3	3
CO5	2	-	-	-	-	1	3	3	3	3
Average	2.8	1	0.8	-	-	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types **Numbers** - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules
Sequences - Strings, Lists, and Tuples, Mapping and Set Types

UNIT-II

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related **Modules Exceptions**: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules
Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT-III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded **Programming:** Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT-IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

UNIT-V

Database Programming: Introduction, Python Database Application Programmer's Interface (DBAPI), Object Relational Managers (ORMs), Related Modules

Additional Inputs: Web Programming: Introduction, Wed Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application, Advanced CGI, Web (HTTP) Servers

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.
2. Think Python, Allen Downey, Green Tea Press.

Reference Books:

1. Introduction to Python, Kenneth A. Lambert, Cengage.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
3. Learning Python, Mark Lutz, O' Really.
4. Web sources suggested by the teacher concerned and the college librarian including reading material.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. (M.P.Cs) – V Semester

Course: APPLICATION DEVELOPMENT USING PYTHON LAB

Course Code: **No. of Hours/Week: 2**
Paper : VII-B

Course Objective:

To develop various applications using Python

Course Outcomes:

On successful completion of this practical course, student shall be able to:

CO1: Implement simple programs in Python
CO2:Implement programs related to various data structures like lists, dictionaries, etc.
CO3:Implement programs related to files. 16
CO4:Implement applications related to databases, Web services and IOT.

List of Experiments

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
   Grade A: Percentage >=80
   Grade B: Percentage>=70 and <80
   Grade C: Percentage>=60 and <70
   Grade D: Percentage>=40 and <60
   Grade E: Percentage<40
3. Write a python program to display the first n terms of Fibonacci series.
4. Write a python program to calculate the sum and product of two compatible matrices.
5. Write a function that takes a character and returns True if it is a vowel and False otherwise.
6. Write a menu-driven program to create mathematical 3D objects I. curve II. sphere III. cone IV. arrow V. ring VI. Cylinder.
7. Write a python program to read n integers and display them as a histogram.
8. Write a python program to display sine, cosine, polynomial and exponential curves.
9. Write a python program to plot a graph of people with pulse rate p vs. height h. The values of P and H are to be entered by the user.
10. Write a python program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula m=60/ (t+2), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.
11. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows: P (t) = (15000(1+t))/ (15+ e)
12. Where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
13. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:

I. velocity wrt time (v=u+at)

II. distance wrt time (s=u*t+0.5*a*t*t) 17

III. distance wrt velocity (s=(v*v-u*u)/2*a)

14. Write a program that takes two lists and returns True if they have at least one common member.
15. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements.
16. Write a program to implement exception handling.
17. Try to configure the widget with various options like: bg=”green”, family=”times”, size=20.
18. Write a Python program to read last 5 lines of a file.
19. Design a simple database application that stores the records and retrieve the same
20. Design a database application to search the specified record from the database.
21. Design a database application to that allows the user to add, delete and modify the records.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc.(M.P.Cs) – V Semester
Course: DATA SCIENCE

Course Code: **No. of Hours/Week: 4**
Paper : VI-C

Course Objective:

To develop knowledge on various concepts in Data Science

Course Outcomes:

CO1: Develop relevant programming abilities.
CO2: Demonstrate proficiency with statistical analysis of data.
CO3: Develop the ability to build and assess data-based models.
CO4: Demonstrate skill in data management
CO5: Apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction: The Ascendance of Data, What is Data Science? , Finding key Connectors, Data Scientists You May Know, Salaries and Experience, Paid Accounts, Topics of Interest, Onward.
Python: Getting Python, The Zen of Python, Whitespace Formatting, Modules, Arithmetic, Functions, Strings, Exceptions, Lists, Tuples, Dictionaries, Sets, Control Flow, Truthiness, Sorting, List Comprehensions, Generators and Iterators, Randomness, Object – Orienting Programming, Functional Tools, enumerate, zip and Argument Unpacking, args and kwargs, Welcome to Data Sciencester!
Visualizing Data: matplotlib, Bar charts, Line charts, Scatterplots.
Linear Algebra: Vectors, Matrices

UNIT-II

Statistics: Describing a Single Set of Data, Correlation, Simpson's Paradox, some Other Correlation Caveats, Correlation and Causation.

Probability: Dependence and Independence, Conditional Probability, Bayes's Theorem, Random Variables, Continuous Distributions, The Normal Distribution, The Central Limit Theorem.
Hypothesis and Inference: Statistical Hypothesis Testing, Example: Flipping a Coin, Confidence Intervals, P-hacking, Example: Running an A/B Test, Bayesian Inference.
Gradient Descent: The Idea behind Gradient Descent, Estimating the Gradient, Using the Gradient, Choosing the Right Step Size, Putting It All Together, Stochastic Gradient Descent.

UNIT-III

Getting Data: stdin and stdout, Reading Files – The Basics of Text Files, Delimited Files, Scraping the Web - HTML and the parsing Thereof, Example: O'Reilly Books About Data, Using APIs – JSON (and XML), Using an Unauthenticated API, Finding APIs.
Working with Data: Exploring Your Data, Exploring One-Dimensional Data, Two Dimensions Many Dimensions, Cleaning and Munging, Manipulating Data, Rescaling, Dimensionality Reduction.
Machine Learning: Modeling, What Is Machine Learning? Over fitting and under fitting, Correctness, The Bias-Variance Trade-off, Feature Extraction and Selection

UNIT-IV

K-Nearest Neighbors: The Model, Example: Favorite Languages, The Curse of Dimensionality.
Naive Bayes: A Really Dumb Spam Filter, A More Sophisticated Spam Filter, Implementation, Testing Our Model.
Simple Linear Regression: The Model, Using Gradient Descent, Maximum Likelihood Estimation.

UNIT-V

Logistic Regression: The Problem, The Logistic Function, Applying the Model, Goodness of Fit Support Vector Machines.
Decision Trees: What Is a Decision Tree? Entropy, The Entropy of a Partition, Creating a Decision Tree, Putting It All Together, Random Forests.
Neural Networks: Perceptron, Feed-Forward Neural Networks And Back propagation, Example: Defeating a CAPTCHA.
Clustering: The Idea, The Model, Example: Meetups , Choosing k, Example: Clustering Colors, Bottom-up Hierarchical Clustering.

Additional Inputs: Multiple Regression: The Model, Further Assumptions of the Least Squares Model, Fitting the Model, Interpreting the Model, Goodness of Fit.

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Data Science from Scratch by Joel Grus O'Reilly Media
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython", O'Reilly, 2nd Edition, 2018.

Reference Books:

1. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", O'Reilly, 2017.
2. Web resources: a. https://www.edx.org/course/analyzing-data-with-python b.http://math.ecnu.edu.cn/~lfzhou/seminar/[Joel_Grus]_Data_Science_from_Scr atch_First_Princ.pdf
3. Other web sources suggested by the teacher concerned and the college librarian including reading material.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc.(M.P.Cs) – V Semester

Course: DATA SCIENCE LAB

Course Code: **No. of Hours/Week: 2**
Paper : VII-B

Course Objective:

To implement solutions to various problems in Data Science using Python

Course Outcomes:

On successful completion of this practical course, student shall be able to:

1. Implement simple programs in Python
2. Implement programs related to various data structures like lists, dictionaries, etc.
3. Implement programs related to files. 16
4. Implement applications related to databases, Web services and IOT.

V. Learning Outcomes:

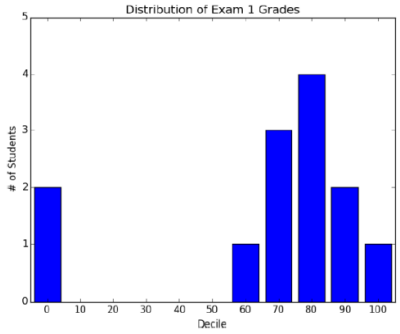
On successful completion of this practical course, student shall be able to:

1. Apply data science solutions to real world problems.
2. Implement the programs to get the required data, process it and present the outputs using Python language.
3. Execute statistical analyses with Open source Python software.

List of Experiments

1. Write a Python program to create a line chart for values of year and GDP as given below

2. Write a Python program to create a bar chart to display number of students secured different grading as given below 21.



3. Write a Python program to create a time series chart by taking one year month wise stock data in a CSV file
4. Write a Python program to plot distribution curve
5. Import a CSV file and perform various Statistical and Comparison operations on rows/columns. Write a python program to plot a graph of people with pulse rate p vs. height h. The values of P and H are to be entered by the user.
2. Import rainfall data of some location with the help of packages available in R Studio and plot a chart of your choice.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: PYTHON FOR DATA SCIENCE

Course Code: **No. of Hours/Week: 4**
Paper : VII-C

Course Objective:
To inculcate knowledge on Data Science and solving problems in Data Science using Python

Course Outcomes:
At the end of the course the student will be able to
CO1: Identify the need for data science and solve basic problems using Python built-in data types and their methods.
CO2: Design an application with user-defined modules and packages using OOP concept
CO3: Employ efficient storage and data operations using NumPy arrays.
CO4: Apply powerful data manipulations using Pandas.
CO5: Do data pre-processing and visualization using Pandas.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	-	-	-	3	2	2	3
CO2	3	3	3	-	1	-	3	3	2	3
CO3	3	2	1	-	-	-	3	3	2	3
CO4	3	3	1	-	1	-	3	3	3	3
CO5	2	2	2	-	1	-	3	2	3	3
Average	2.8	2.4	1.8	-	0.6	-	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT - I
Introduction to Data Science - Why Python? - Essential Python libraries - Python Introduction- Features, Identifiers, Reserved words, Indentation, Comments, Built-in Data types and their Methods: Strings, List, Tuples, Dictionary, Set - Type Conversion- Operators.
Decision Making- Looping- Loop Control statement- Math and Random number functions. User defined functions - function arguments & its types.

UNIT –II
User defined Modules and Packages in Python- Files: File manipulations, File and Directory related methods - Python Exception Handling.
OOPs Concepts -Class and Objects, Constructors – Data hiding- Data Abstraction- Inheritance.

UNIT –III

NumPy Basics: Arrays and Vectorized Computation- The NumPy ndarray- Creating ndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays- Basic Indexing and Slicing - Boolean Indexing-Transposing Arrays and Swapping Axes.

Universal Functions: Fast Element-Wise Array Functions- Mathematical and Statistical Methods-Sorting-Unique and Other Set Logic.

UNIT –IV

Introduction to pandas Data Structures: Series, Data Frame and Essential Functionality: Dropping Entries-Indexing, Selection, and Filtering- Function Application and Mapping- Sorting and Ranking.

UNIT –V

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: Removing Duplicates, Transforming Data Using a Function or Mapping, Replacing Values, Detecting and Filtering Outliers- String Manipulation: Vectorized String Functions in pandas. Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or Point Plots.

Additional Inputs: Summarizing and Computing Descriptive Statistics- Unique Values, Value Counts, and Membership. Reading and Writing Data in Text Format

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Y. Daniel Liang, “Introduction to Programming using Python”, Pearson, 2012.
2. Wes McKinney, “Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython”, O’Reilly, 2nd Edition, 2018.

Reference Books:

1. Jake VanderPlas, “Python Data Science Handbook: Essential Tools for Working with Data”, O’Reilly, 2017.
3. Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2006.
4. Mark Lutz, “Learning Python”, O’Reilly, 4th Edition, 2009.
5. Web resources:
    a. https://www.edx.org/course/python-basics-for-data-science
    b. https://www.edx.org/course/analyzing-data-with-python
    c. https://www.coursera.org/learn/python-plotting?specialization=data-science-python
    d. https://www.programmer-books.com/introducing-data-science-pdf/
    e. https://www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester
Course: PYTHON FOR DATA SCIENCE LAB

Course Code: **No. of Hours/Week: 2**

Course Objective:

To provide knowledge on implementing programs in Python.

Course Outcomes:

At the end of the course the student will be able to

CO1: Implement simple programs in Python.

CO2: Implement programs related to various structures like arrays, lists, Data frames, etc.

CO3: Implement programs related to files.

CO4: Implement applications related to data science

List of Experiments

1. Perform Creation, indexing, slicing, concatenation and repetition operations on Python built-in data types: Strings, List, Tuples, Dictionary, Set
2. Apply Python built-in data types: Strings, List, Tuples, Dictionary, Set and their methods to solve any given problem.
3. Handle numerical operations using math and random number functions
4. Create user-defined functions with different types of function arguments.
5. Create packages and import modules from packages.
6. Perform File manipulations- open, close, read, write, append and copy from one file to another.
7. Write a program for Handle Exceptions using Python Built-in Exceptions
8. Write a program to implement OOP concepts like Data hiding and Data Abstraction.
9. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects and Random Functions.
10. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining and Splitting.
11. Computation on NumPy arrays using Universal Functions and Mathematical methods.
12. Load an image file and do crop and flip operation using NumPy Indexing.
13. Create Pandas Series and Data Frame from various inputs.
14. Import any CSV file to Pandas Data Frame and perform the following:
    (a) Visualize the first and last 10 records
    (b) Get the shape, index and column details
    (c) Select/Delete the records (rows)/columns based on conditions.
    (d) Perform ranking and sorting operations.
    (e) Do required statistical operations on the given columns.
    (f) Find the count and uniqueness of the given categorical values.
    (g) Rename single/multiple columns
15. Import any CSV file to Pandas Data Frame and perform the following:
    (a) Handle missing data by detecting and dropping/ filling missing values.
    (b) Transform data using apply () and map() method.
    (c) Detect and filter outliers.
    (d) Perform Vectorized String operations on Pandas Series.
    (e) Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and Scatter Plots.

DEPARTMENT OF COMPUTER SCIENCE

MINOR SYLLABUS

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA

B.Sc. (Computer Science) – Minor Syllabus Under CBCS – 2024-2025

Course Structure

Semester	Paper	Subject	Hrs./Week	Credits	CIA	EX	Total
FIRST YEAR							
SEM - II	1	Problem Solving in C	3	3	40	60	100
		Problem Solving in C Lab	2	1	-	50	50
SECOND YEAR							
SEM - III	2	Object Oriented Programming using Java	3	3	40	60	100
		Object Oriented Programming using Java Lab	2	1	-	50	50
SEM - IV	3	Database Management System	3	3	40	60	100
		Database Management System Lab	2	1	-	50	50
	4	Object Oriented Software Engineering	3	3	40	60	100
		Object Oriented Software Engineering Lab	2	1	-	50	50

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

PROBLEM SOLVING IN C
(B.Sc. Computer Science Minor)

Course Code: M-CS24201 **No. of Hours/Week: 3**

Course Objective:
To equip students with the foundational skills in C programming, enabling them to design algorithms, implement control structures, and manage data using arrays, strings, and pointers effectively.

Course Outcomes
Upon successful completion of the course, a student will be able to:
CO1: Understand the working of a digital computer and Fundamental constructs of Programming
CO2: Analyze and develop a solution to a given problem with suitable control structures
CO3: Utilize arrays and strings in C for problem solving.
CO4: Demonstrate the use of functions and pointers in C, including function prototypes, recursion, and dynamic memory management
CO5: Implement structures and unions to manage complex data types in C and perform basic file operations

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	1	1	3	2	2	2
CO2	3	2	2	2	2	2	3	2	3	3
CO3	3	-	-	1	2	1	3	3	3	3
CO4	3	1	1	1	1	1	3	3	3	3
CO5	2	-	-	1	2	1	3	3	3	3
Average	2.8	1	0.8	1.2	1.6	1.2	3	2.6	2.8	2.8

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I
Introduction to computer and programming: Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardware and software, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms
Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Operator Precedence, Type Casting, Structure of C program, Input /output statements in C-Formatted and Unformatted I/O

UNIT-II
Control statements: Decision making statements: if, if else, Nested if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop, Nested Loops. Jump Control statements: break, continue and goto.

UNIT-III

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation, Multi-Dimensional Arrays

Strings: Declaring & Initializing string variables; String handling functions, Character handling functions

UNIT-IV

Functions: Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion, Parameter Passing by address & by value. Local and Global variables. **Storage classes**: automatic, external, static and register.

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic. Pointers and arrays, pointers and functions.

Dynamic Memory Management: Introduction, Functions-malloc, calloc, realloc, free

UNIT-V

Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers.

Unions - Union definition; difference between Structures and Unions.

Files: File Operations, File Handling functions-fopen(), fclose(),fgetc(),fputc(),fscanf(),fprinf(),feof()

Additional Inputs:

C Pre-processor, Conditional Compilation, Header Files, Sparse Matrices

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us 'C' – BPB Publications.

Reference Books:

1. Introduction to C programming by REEMA THAREJA, OXFORD UNIVERSITY PRESS.
2. Schaum's Outline of Programming with C, by Byron Gottfried, 2nd Edition, (Indian Adapted Edition), TMH publications, New Delhi, 2006.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – I Year – II Semester

PROBLEM SOLVING IN C

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1.	**Unit – I Introduction to computer and programming**	1	1	20
2.	**Unit – I Fundamentals of C**	1	1	12
3.	**Unit – II Control Statements**	2	1	12
4.	**Unit – III Arrays**	1	1	12
5.	**Unit – III Strings**	1	0	08
6.	**Unit – IV Functions**	1	1	12
7.	**Unit – IV Pointers & Dynamic Memory Management**	1	1	12
8.	**Unit – V Structures**	1	1	12
9.	**Unit – V Files**	1	1	12
Total Marks				112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A), KAKINADA

MODEL QUESTION PAPER

B.Sc. - I YEAR II SEMESTER (Minor)

PROBLEM SOLVING IN C

Time : 3hrs **Course Code: M-CS24201** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Outline the characteristics of an algorithm. **(CO1) (L2)**
2. Categorize different data types available in C. **(CO1) (L4)**
3. Illustrate switch statement with an example. **(CO2) (L2)**
4. Explain about One-Dimensional arrays with an example. **(CO3) (L2)**
5. Write about Pointer Arithmetic. **(CO4) (L3)**
6. Inspect the significance of recursive functions. **(CO4) (L4)**
7. Explain the difference between Structure and Union. **(CO5) (L4)**
8. Write a short note on nested structures. **(CO5) (L2)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Define computer. Draw the block diagram of computer and explain. **(CO1) (L4)**

   (or)

   (b) Elucidate different types of operators in C. **(CO1) (L4)**

10. (a) Compare and contrast different Decision-making statements. **(CO2) (L5)**

    (or)

    (b) Distinguish between different Looping statements in C. **(CO2) (L4)**

11. (a) List the types of arrays. Explain initialization, accessing the elements of a one-dimensional array with an example. **(CO3) (L5)**

    (or)

    (b) Explain various string handling & character functions. **(CO3) (L4)**

12. (a) Explain about Dynamic Memory Allocation in detail. **(CO4) (L3)**

    (or)

    (b) Explain various categories of Functions with examples. **(CO4) (L4)**

13. (a) What is a structure? Illustrate accessing the members of a structure with an example.**(CO5) (L2)**

    (or)

    (b) Explain about various File Handling functions. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester

Course: PROBLEM SOLVING IN C
(B.Sc. Computer Science Minor)

Course Code:M-CS24201P **No. of Hours/Week: 2**

Course Objective:
To develop programming skills using the fundamentals of C Language and to enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.

Course Outcomes:
At the end of the course the student will be able to

1. Implement programs using fundamental features of C Language.
2. Solve problems with the use of loops, decision making statements and functions.
3. Implement programs performing various Operations on Arrays.

List of Experiments

1. Write a program to calculate simple & compound interest
2. Find the biggest of three numbers using C.
3. Write a c program to find the sum of individual digits of a positive integer.
4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
5. Write a c program to check whether a number is Armstrong or not.
6. Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a c program that implements searching of given item in given list
8. Write a c program that uses functions to perform the following: Addition of two matrices. Multiplication of two matrices.
9. Write a program for concatenation of two strings.
10. Write a program for length of a string with and without String Handling functions
11. Write a program to demonstrate Call by Value and Call by Reference mechanism
12. Write a Program to find GCD of Two numbers using Recursion
13. Write a c program to perform various operations using pointers.
14. Write a c program to read data of 10 employees with a structure of 1.employee id 2.aadar no, 3.title, 4.joined date, 5.salary, 6.date of birth, 7.gender, 8.department.
15. Write a Program to demonstrate dynamic arrays using Dynamic Memory Management functions
16. Write a program to copy the contents of one file to other.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

Course 5: OBJECT ORIENTED PROGRAMMING USING JAVA
(B.Sc. Computer Science Minor)

Course Code: M-CS23301 **No. of Hours/Week: 3**

Course Objective:

To introduce the fundamental concepts of Object-Oriented programming and to design &implement object-oriented programming concepts in Java.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
CO3: Create packages and implement interfaces, exception handling to enhance program reliability
CO4: Develop multithreaded applications and utilize stream-based I/O for file handling in Java
CO5: Construct GUI screens with event handling.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants,scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism**: Dynamic binding, method overriding, abstract classes and methods.

UNIT-III

Interface: Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception subclasses.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization.

UNIT-V

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.

Additional Inputs: constructor overloading, Access specifiers

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object Oriented Programming with Java, updated edition,T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall,2018.
2. Paul Deitel, Harvey Deitel, "Java SE 8 for programmers", 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. – II Year III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA

(B.Sc. Computer Science Minor)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Concepts and Java Programming ,** **Java Programming**	2	2	24
2	**Unit – II** **Arrays** **Classes and Objects** **Inheritance**	2	2	24
3	**Unit – III** **Interface** **Packages** **Exception Handling**	2	2	24
4	**Unit – IV** **Multithreading** **Stream based I/O**	2	1	20
5	**Unit – V** **GUI Programming with Swing** **Event Handling**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

MODEL QUESTION PAPER
B.Sc. – II Year III Semester
OBJECT ORIENTED PROGRAMMING USING JAVA
(B.Sc. Computer Science Minor)

Time : 3hrs **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4 = 20**

1. Why do we need to use OOPS concept? **(CO1) (L2)**
2. Write about type conversion and type casting. **(CO1) (L2)**
3. Write about the Arrays in Java. **(CO2) (L1)**
4. Explain the significance of "this" keyword with an example. **(CO2) (L2)**
5. Explain about the Packages in Java. **(CO3) (L2)**
6. List types of Exceptions. Explain any two. **(CO3) (L2)**
7. What is the difference between Process and Thread? **(CO4) (L3)**
8. Write a short notes on Adapter Classes. **(CO5) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8 = 40**

9. (a) Explain Object Oriented Programming Concepts. **(CO1) (L2)**
   (or)
   (b) Explain about Operators in Java. **(CO1) (L4)**

10. (a) Explain the process of creating a class and object with a simple program. **(CO2) (L3)**
    (or)
    (b) Explain the various forms of Inheritance with illustration. **(CO2) (L4)**

11. (a) Discuss about Interfaces with example. **(CO3) (L4)**
    (or)
    (b) Explain about the Exception handling with a simple program. **(CO3 (L4)**

12. (a) Explain about the Life Cycle of Threads. **(CO4) (L4)**
    (or)
    (b) Explain about FileInputStream and FileOutputStream **(CO4) (L4)**

13. (a) Write about the MVC Architecture Swing in Java. **(CO5) (L2)**
    (or)
    (b) Elucidate Event Handling in Java with a suitable example. **(CO5) (L4)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester

OBJECT ORIENTED PROGRAMMING USING JAVA LAB
(B.Sc. Computer Science Minor)

Course Code: M- CS23301P **No. of Hours/Week: 2**

Course Objective:

To introduce various Object-Oriented Concepts through which the students will be enabled to implement classes, inheritance, interface, package and multithreading concepts.

Course Outcomes:

At the end of the course the student will be able to

1. Apply OOP concepts to solve real time problems.
2. Make use of class, inheritance, interface and packages to develop solutions for complex problems.
3. Build java applications using Exception handling and Threads.

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
   a. Single ii. Multi-Level iii. Hierarchical iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception “In Sufficient Funds” when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays “good morning”, for every one second, “hello” for every 2 seconds and “welcome” for every 3 seconds by using extending Threadclass.
11. Write a Java program that creates three threads. First thread displays “OOPS”, the second thread

displays “Through” and the third thread Displays “JAVA” by using Runnable interface.

12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button “add” is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE

    Form Fields are: Name, RNO, Mail id, Gender, Branch, Address.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Minor)

Course Code: M-CS23401 **No. of Hours/Week: 3**

Course Objectives

To familiarize with concepts of database design

Course Outcomes: On successful completion of the course, students will be able to
CO1: Differentiate between database systems and file based systems
CO2: Design a database using ER model
CO3: Make use of relational model in database design
CO4: Utilize SQL commands for creating and manipulating data stored in databases.
CO5: Write PL/SQL programs to work with databases.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	3	2	2	3
CO2	3	3	3	2	1	1	3	3	2	3
CO3	3	2	3	2	-	2	3	3	2	3
CO4	3	3	3	1	1	1	3	3	3	3
CO5	2	2	2	1	1	2	3	2	3	3
Average	2.8	2.4	2.6	1.4	0.6	1.4	3	2.6	2.4	3

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT- I

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT - II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

UNIT - III

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

Structured Query Language: Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, DataManipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements,Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Additional Inputs:

Transaction Management and Concurrency Control: What is transaction, ACID Properties, Concurrency control

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.
2. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications.

Reference Books

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Minor)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I** **Overview of Database Management System**	2	2	24
2	**Unit – II** **Entity-Relationship Model**	2	2	24
3	**Unit – III** **Relational Model**	2	2	24
4	**Unit – IV** **Structured Query Language**	2	1	20
5	**Unit – V** **PL/SQL**	2	1	20
			Total Marks	112

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
MODEL QUESTION PAPER
B.Sc. II YEAR IV SEMESTER

DATABASE MANAGEMENT SYSTEMS
(B.Sc. Computer Science Minor)

Time : 3hrs **Course Code:M-CS23401** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5 X 4=20**

1. Discuss briefly the components of DBMS. **(CO1) (L4)**
2. Summarize the drawbacks of File System. **(CO1) (L2)**
3. Elucidate EER. **(CO2) (L2)**
4. Classify Relationships based on entity sets participation. **(CO2) (L2)**
5. Explain about Aggregate Functions. **(CO4) (L2)**
6. Write a short note on CODD rules. **(CO3) (L2)**
7. Give a brief account on Procedures in PL/SQL. **(CO5) (L1)**
8. Explain set operations in Relation Algebra. **(CO4) (L3)**

SECTION-B

II. Answer the following questions. **5 X 8=40**

9. (a) Define DBMS. Explain the advantages of DBMS. **(CO1) (L4)**

   (Or)

   (b) Elucidate Database System Architecture with a neat sketch. (**CO1) (L4)**

10. (a) Interpret the building blocks of an entity relationship diagram with illustration. **(CO2) (L6)**

    (Or)

    (b) Discuss IS A relationship and attribute inheritance. **(CO2) (L5)**

11. (a) Discuss relational algebra, operations and advantages of relational algebra. **(CO3) (L4)**

    (Or)

    (b) Distinguish between INF and 2NF in detail. **(CO3) (L4)**

12. (a) Categorize DDL Commands based on their purpose with illustrations. **(CO4) (L5)**

    (Or)

    (b) Compare and contrast various DML Commands. **(CO4) (L5)**

13. (a) Discuss control structures used in PL/SQL. **(CO5) (L4)**

    (Or)

    (b) Illustrate the use of triggers in detail with an example. **(CO5) (L3)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

Course 9: DATABASE MANAGEMENT SYSTEMS LAB
(B.Sc. Computer Science Minor)

Course Code: M-CS23401 **No. of Hours/Week: 2**

Course Objective:

To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:

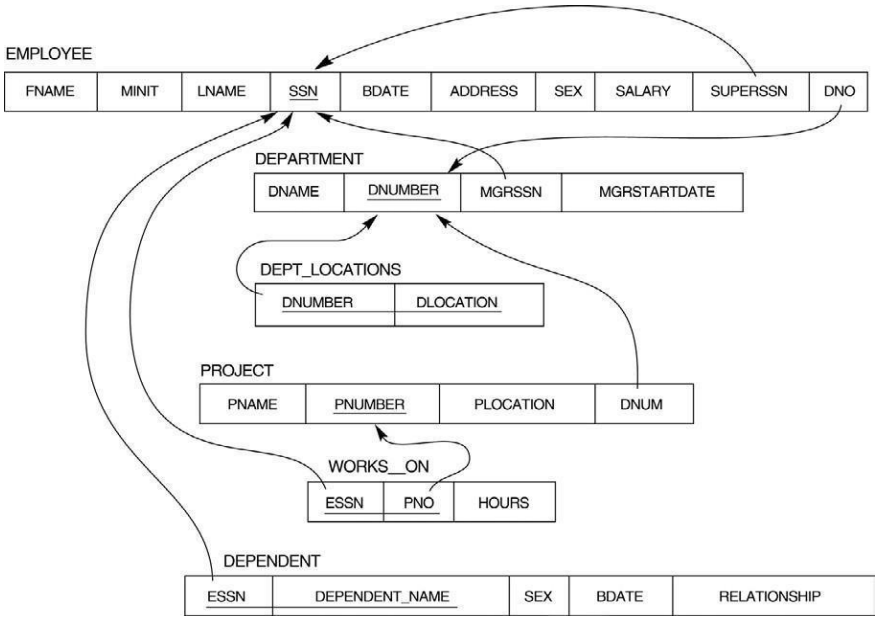
At the end of the course the student will be able to

1. Design database and ER diagrams for the real world scenarios
2. Understand ER concepts and ER mapping to relational model
3. Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

Lab Experiments

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant Primary Key, Foreign Key and other constraints
2. Populate the tables with data
3. Display all the details of all employees working in the company.
4. Display ssn, lname, fname, address of employees who work in department no 7.
5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in ‘Bellaire’
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last nameis 'Narayan’ either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employeefirst name.
20. Select the names of employees whose salary does not match with salary of any employeein department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire,

Houston, or Stafford.

22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary,and the average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the ‘Marketing’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose ssn is ‘123456789’.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR - IV SEMESTER

Course 10: OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Minor)

Course Code: M-CS23402 **No. of Hours/Week: 3**

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approach in analyzing, designing an application, system, or business by applying the object- oriented paradigm and visual modeling.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modelling Language (UML) basics, in the development of software solutions.

CO2: Analyse and specify software requirements, develop use cases and scenarios, apply object- oriented analysis and design (OOAD) principles

CO3: Implement software construction principles using object-oriented programming languages and apply testing methodologies

CO4: Analyse and Evaluate Software Maintenance and Evolution Strategies

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	3	2	1	1	3	2	2	2
CO2	3	2	3	2	1	2	3	2	2	3
CO3	2	2	3	1	1	1	2	1	2	3
CO4	3	2	3	2	1	1	3	3	2	2
CO5	3	2	3	1	1	1	3	3	2	2
Average	2.8	2	3	1.6	1	1.2	2.8	2.2	2	2.4

The COs are mapped to POs based on the relevance on a scale of 0-3
(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-'/0:No Correlation)

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), UnifiedModelling Language (UML) basics, Introduction to software development process and softwaredevelopment life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques (class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering.

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service- oriented architecture (SOA), Agile software development and Scrum methodologies.

Text Books

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rdEdition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998, Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G.Booch, Addison Wesley

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. II YEAR IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING
(B.Sc. Computer Science Minor)

Blue Print

S.No	Unit	Essay Questions 8 marks	Short Questions 4 marks	Marks Allotted
1	**Unit – I Object-Oriented Programming**	2	2	24
2	**Unit – II Requirements Analysis and Design**	2	2	24
3	**Unit – III Software Construction and Testing**	2	2	24
4	**Unit – IV Software Maintenance and Evolution**	2	1	20
5	**Unit – V Advanced Topics in Object-Oriented Software Engineering**	2	1	20
			Total Marks	**112**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR IV SEMESTER

MODEL QUESTION PAPER

OBJECT ORIENTED SOFTWARE ENGINEERING

(B.Sc. Computer Science Minor)

Time : 3hrs **Course Code: M-CS23402** **Max Marks : 60**

SECTION-A

I. Answer any FIVE of the following questions. **5x4=20**

1. Explain polymorphism in OOP. **(CO1) (L2)**
2. Explain the importance of UML in the software development process. **(CO1) (L2)**
3. What is a use case, and how is it utilized in the requirements analysis process? **(CO2) (L2)**
4. Distinguish between a class diagram and a sequence diagram in UML. **(CO2) (L4)**
5. Describe the main advantages of using an object-oriented Design in Software development. **(CO3) (L2)**
6. Compare and contrast corrective and adaptive maintenance with examples. **(CO3) (L5)**
7. Explain the advantages of Service-Oriented Architecture (SOA). **(CO4) (L2)**
8. What are the key roles and ceremonies in the Scrum framework? **(CO5) (L1)**

SECTION-B

II. Answer the following questions. **5x8=40**

9. (a) Discuss the Principles and Advantages of Object-Oriented Programming (OOP). **(CO1) (L4)**

   (or)

   (b) Briefly describe the stages of the Software Development Life Cycle (SDLC). **(CO1) (L2)**

10. (a) Explain the need for requirements analysis and specification in the software development process.**(CO2) (L4)**

    (or)

    (b) Elaborate the principles and practices of Object-Oriented Analysis and Design (OOAD). **(CO2) (L4)**

11. (a) Discuss the evolution of software construction, emphasizing its significance in modern software development. **(CO3) (L4)**

    (or)

    (b) Explain about different types of Software Testing. **(CO3) (L4)**

12. (a) Describe the significance of software maintenance in the software development lifecycle. **(CO4) (L2)**

    (or)

    (b) Analyse the concept of refactoring and its role in improving code quality. **(CO4) (L4)**

13. (a) Discuss the concept of Model-Driven Engineering (MDE) and its application in modern software development. **(CO5) (L4)**

    (or)

    (b) Summarize the key principles of Agile Software Development **(CO5) (L2)**

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE

B.Sc. II YEAR - IV SEMESTER

OBJECT ORIENTED SOFTWARE ENGINEERING LAB
(B.Sc. Computer Science Minor)

Course Code: M-CS23402 **No. of Hours/Week: 2**

Course Objective:

To develop projects using Object Oriented analysis, design and testing techniques.

Course Outcomes:

At the end of the course, the student will be able

1. To understand the software engineering methodologies involved in the phases for project development.
2. To gain knowledge about open source tools used for implementing software engineering methods.
3. To apply UML concepts in software development.

Suggested Software Tools: StarUML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagram with generalization, specialization and aggregation of specified problem statement
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagram and draw it
4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 and draw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.

9. Draw the state chart diagram.
10. Identify the user interface, domain objects, and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.