

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--	--	--

BCS401

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2024

Analysis and Design of Algorithms

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	What is an algorithm? Explain the fundamentals of algorithmic problem solving.	10	L2	CO1
	b.	Develop an algorithm to search an element in an array using sequential search. Calculate the best case, worst case and average case efficiency of this algorithm.	10	L3	CO1
OR					
Q.2	a.	Explain asymptotic notations with example.	10	L2	CO1
	b.	Give the general plan for analyzing the efficiency of the recursive algorithm. Develop recursive algorithm for computing factorial of a positive number. Calculate the efficiency in terms of order of growth.	10	L3	CO1
Module – 2					
Q.3	a.	Explain Strassen's matrix multiplication approach with example and derive its time complexity.	10	L3	CO2
	b.	What is divide and conquer? Develop the quick sort algorithm and write its best case. Make use of this algorithm to sort the list of characters: E, X, A, M, P, L, E.	10	L2	CO2
OR					
Q.4	a.	Distinguish between decrease & conquer and divide & conquer algorithm design techniques with block diagram. Develop insertion sort algorithm to sort a list of integers and estimate the efficiency.	10	L3	CO2
	b.	Define topological sorting. List the two approaches of topological sorting and illustrate with examples.	10	L2	CO2
Module – 3					
Q.5	a.	Define AVL tree with an example. Give worst case efficiency of operations on AVL tree. Construct an AVL tree of the list of keys: 5, 6, 8, 3, 2, 4, 7 indicating each step of key insertion and rotation.	10	L3	CO3
	b.	Define Heap. Explain the bottom-up heap construction algorithm. Apply heap sort to sort the list of numbers 2, 9, 7, 6, 5, 8 in ascending order using array representation.	10	L3	CO3
OR					
Q.6	a.	Define 2-3 tree. Give the worst case efficiency of operations on 2-3 tree. Build 2-3 tree for the list of keys 9, 5, 8, 3, 2, 4, 7 by indicating each step of key insertion and node splits.	10	L3	CO3
	b.	Design Horspool algorithm for string matching. Apply this algorithm to find the pattern BARBER in the text: JIM_SAW_ME_IN_A_BARBERSHOP	10	L3	CO3
Module – 4					
Q.7	a.	Apply Dijkstra's algorithm to find the single source shortest path for given graph [Fig.Q7(a)] by considering 's' as source vertex. Illustrate each step.	10	L3	CO4

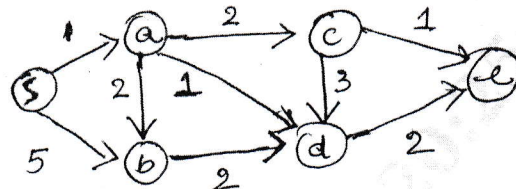


Fig.Q7(a)

b. Define transitive closure. Write Warshall's algorithm to compute transitive closure. Illustrate using the following directed graph.

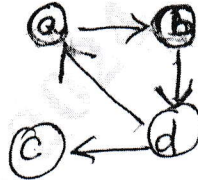


Fig.Q7(b)

OR

Q.8 a. Define minimum spanning tree. Write Kruskal's algorithm to find minimum spanning tree. Illustrate with the following undirected graph.

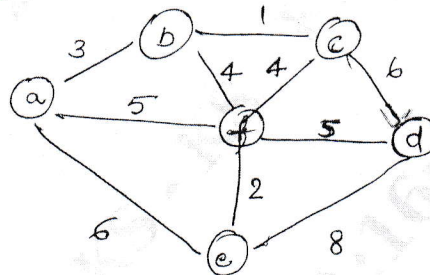


Fig.Q8(a)

b. Construct Huffman Tree and resulting code for the following:

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

- (i) Encode the text : ABACABAD
- (ii) Decode the text : 100010111001010

Module - 5

Q.9 a. Explain n-Queen's problem with example using backtracking approach.

b. Solve the following instance of the knapsack problem by the branch-and-bound algorithm. Construct state-space tree.

Item	Weight	Value
1	4	\$ 40
2	7	\$ 42
3	5	\$ 25
4	3	\$ 12

The knapsack's capacity W is 10.

OR

Q.10 a. Differentiate between Branch and Bound technique and Backtracking. Apply backtracking to solve the following instance of subset-sum problem $S = \{3, 5, 6, 7\}$ and $d = 15$. Construct a state space tree.

b. Explain greedy approximation algorithm to solve discrete knapsack problem.

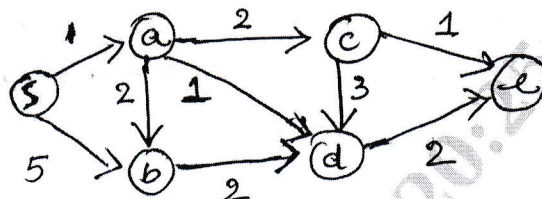


Fig.Q7(a)

- b. Define transitive closure. Write Warshall's algorithm to compute transitive closure. Illustrate using the following directed graph.

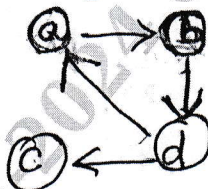


Fig.Q7(b)

OR

- Q.8 a. Define minimum spanning tree. Write Kruskal's algorithm to find minimum spanning tree. Illustrate with the following undirected graph.

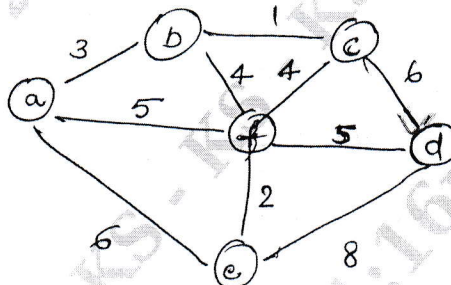


Fig.Q8(a)

- b. Construct Huffman Tree and resulting code for the following:

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

- (i) Encode the text : ABACABAD
(ii) Decode the text : 100010111001010

Module - 5

- Q.9 a. Explain n-Queen's problem with example using backtracking approach.
- b. Solve the following instance of the knapsack problem by the branch-and-bound algorithm. Construct state-space tree.

Item	Weight	Value
1	4	\$ 40
2	7	\$ 42
3	5	\$ 25
4	3	\$ 12

The knapsack's capacity W is 10.

OR

- Q.10 a. Differentiate between Branch and Bound technique and Backtracking. Apply backtracking to solve the following instance of subset-sum problem $S = \{3, 5, 6, 7\}$ and $d = 15$. Construct a state space tree.
- b. Explain greedy approximation algorithm to solve discrete knapsack problem.

CBCS SCHEME

USN

1	K	S	D	D	C	G	O	I	D
---	---	---	---	---	---	---	---	---	---

BCG402

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2024 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	What is computer graphics? Explain applications of computer graphics with examples.	10	L2	CO1
	b.	Explain in detail graphics pipeline architecture.	10	L2	CO1
OR					
Q.2	a.	With necessary steps explain Bresenham's line drawing algorithm. Consider the line from (6, 6) to (12, 8). Use the algorithm to rasterize the line.	10	L3	CO1
	b.	Explain the various graphics functions with example.	10	L2	CO1
Module – 2					
Q.3	a.	Explain 2D geometric transformations in detail.	10	L2	CO2
	b.	Develop OpenGL program to create and rotate a triangle about the origin and fixed point.	10	L3	CO2
OR					
Q.4	a.	Explain homogeneous co-ordinate representation.	10	L2	CO2
	b.	Develop OpenGL program to create and rotate cube.	10	L3	CO2
Module – 3					
Q.5	a.	Explain in detail various logical devices.	10	L2	CO3
	b.	Explain traditional animation technique in detail with example.	10	L2	CO3
OR					
Q.6	a.	Explain input modes in detail with neat diagram.	10	L2	CO3
	b.	Explain character animation and periodic motions in detail.	10	L2	CO3
Module – 4					
Q.7	a.	Explain Cohen-Sutherland algorithm with example and neat diagram.	10	L3	CO4
	b.	Explain in detail, The Phong Lighting model.	10	L2	CO4
OR					
Q.8	a.	Explain color models.	10	L2	CO4
	b.	Write a short note on, (i) Normalization and View port transformation. (ii) 2D point clipping.	06 04	L4	CO3
Module – 5					
Q.9	a.	Explain the concept of hidden surface removal.	10	L2	CO5
	b.	Explain perspective projection with neat diagram.	10	L2	CO5
OR					
Q.10	a.	Develop OpenGL program to draw a polygon and allow user to move the camera suitably to experiment with perspective viewing.	10	L3	CO5
	b.	Explain orthographic and axonometric projection. Bring out the differences.	10	L2	CO5

CBCS SCHEME

USN 1 K S 2 2 A J 0 6 0

BCS403

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2024

Database Management Systems

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C																												
Q.1	a.	Define database. Elaborate component modules of DBMS and their interactions.	10	L2	CO1																												
	b.	Describe the three-schema architecture. Why do we need mappings among schema levels?	06	L2	CO1																												
	c.	Explain the difference between logical and physical data independence.	04	L2	CO1																												
OR																																	
Q.2	a.	Draw an ER diagram for an COMPANY database with employee, department, project as strong entities and dependent as weak entity. Specify the constraints, relationships and ratios in the ER diagram.	10	L3	CO3																												
	b.	Define the following terms with example for each using ER notations: Entity, attribute, composite attribute, multivalued attribute, participation role.	10	L3	CO3																												
Module – 2																																	
Q.3	a.	Discuss the update operations and dealing with constraint violations with suitable examples.	08	L2	CO2																												
	b.	Illustrate the relational algebra operators with examples for select and project operation.	06	L2	CO2																												
	c.	Discuss the characteristics of relations that make them different from ordinary table and files.	06	L2	CO2																												
OR																																	
Q.4	a.	Perform (i) Student U instructor (ii) Student \cap Instructor (iii) Student – Instructor (iv) Instructor – Student on the following tables: <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <caption>Student</caption> <tr><td>Fname</td><td>Lname</td></tr> <tr><td>Susan</td><td>Yao</td></tr> <tr><td>Ramesh</td><td>Shah</td></tr> <tr><td>Johnny</td><td>Kohler</td></tr> <tr><td>Barbara</td><td>Jones</td></tr> <tr><td>Amy</td><td>Ford</td></tr> <tr><td>Jimmy</td><td>Wang</td></tr> <tr><td>Ernest</td><td>Gilbert</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <caption>Instructor</caption> <tr><td>Fname</td><td>Lname</td></tr> <tr><td>John</td><td>Smith</td></tr> <tr><td>Ricardo</td><td>Browne</td></tr> <tr><td>Susan</td><td>Mao</td></tr> <tr><td>Francis</td><td>Johnson</td></tr> <tr><td>Ramesh</td><td>Shah</td></tr> </table> </div>	Fname	Lname	Susan	Yao	Ramesh	Shah	Johnny	Kohler	Barbara	Jones	Amy	Ford	Jimmy	Wang	Ernest	Gilbert	Fname	Lname	John	Smith	Ricardo	Browne	Susan	Mao	Francis	Johnson	Ramesh	Shah	04	L3	CO2
	Fname	Lname																															
Susan	Yao																																
Ramesh	Shah																																
Johnny	Kohler																																
Barbara	Jones																																
Amy	Ford																																
Jimmy	Wang																																
Ernest	Gilbert																																
Fname	Lname																																
John	Smith																																
Ricardo	Browne																																
Susan	Mao																																
Francis	Johnson																																
Ramesh	Shah																																
b.	Consider the following relational database schema and write the queries in relational algebra expressions: EMP(Eno, Ename, Salary, Address, Phone, DNo) DEPT(DNo, Dname, DLoc, MgrEno) DEPENDENT(Eno, Dep_Name, Drelation, Dage) (i) List all the employees who reside in 'Belagavi'. (ii) List all the employees who earn salary between 30000 and 40000 (iii) List all the employees who work for the 'Sales' department (iv) List all the employees who have at least one daughter (v) List the department names along with the names of the managers	10	L3	CO2																													

	c.	Consider the two tables T_1 and T_2 shown below: <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="text-align: center;"> <caption>T_1</caption> <thead> <tr><th>P</th><th>Q</th><th>R</th></tr> </thead> <tbody> <tr><td>10</td><td>a</td><td>5</td></tr> <tr><td>15</td><td>b</td><td>8</td></tr> <tr><td>25</td><td>a</td><td>6</td></tr> </tbody> </table> <table border="1" style="text-align: center;"> <caption>T_2</caption> <thead> <tr><th>A</th><th>B</th><th>C</th></tr> </thead> <tbody> <tr><td>10</td><td>b</td><td>6</td></tr> <tr><td>25</td><td>c</td><td>3</td></tr> <tr><td>10</td><td>b</td><td>5</td></tr> </tbody> </table> </div> <p>Show the results of the following operations:</p> <p>(i) $T_1 \bowtie_{T_1.P=T_2.A} T_2$</p> <p>(ii) $T_1 \bowtie_{T_1.Q=T_2.B} T_2$</p> <p>(iii) $T_1 \bowtie_{(T_1.P=T_2.A \text{ AND } T_1.R=T_2.C)} T_2$</p>	P	Q	R	10	a	5	15	b	8	25	a	6	A	B	C	10	b	6	25	c	3	10	b	5	06	L3	CO2
P	Q	R																											
10	a	5																											
15	b	8																											
25	a	6																											
A	B	C																											
10	b	6																											
25	c	3																											
10	b	5																											
Module – 3																													
Q.5	a.	Discuss the informal design guidelines for relation schema design.	08	L2	CO4																								
	b.	Define 1NF, 2NF, and 3NF with examples.	06	L2	CO4																								
	c.	Write the syntax for INSERT, UPDATE and DELETE statements in SQL and explain with suitable examples.	06	L2	CO3																								
OR																													
Q.6	a.	Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with examples.	10	L2	CO3																								
	b.	Illustrate the following with suitable examples: (i) Datatypes in SQL (ii) Substring Pattern Matching in SQL.	10	L2	CO3																								
Module – 4																													
Q.7	a.	Consider the following relations: Student(<u>Snum</u> , Sname, Branch, level, age) Class(<u>Cname</u> , meet_at, room, fid) Enrolled(<u>Snum</u> , <u>Cname</u>) Faculty(<u>fid</u> , fname, deptid) Write the following queries in SQL. No duplicates should be printed in any of the answers. (i) Find the names of all Juniors (level = JR) who are enrolled in a class taught by I. Teach. (ii) Find the names of all classes that either meet in room R128 or have five or more students enrolled. (iii) For all levels except JR, print the level and the average age of students for that level. (iv) For each faculty member that has taught classes only in room R128, print the faculty member's name and the total number of classes she or he has taught. (v) Find the names of students not enrolled in any class.	10	L3	CO3																								
	b.	What do understand by correlated Nested Queries in SQL? Explain with suitable example.	04	L2	CO3																								
	c.	Discuss the ACID properties of a database transaction.	06	L2	CO4																								
OR																													
Q.8	a.	What are the views in SQL? Explain with examples.	04	L3	CO5																								
	b.	In SQL, write the usage of GROUP BY and HAVING clauses with suitable examples.	06	L2	CO3																								
	c.	Discuss the types of problems that may encounter with transactions that run concurrently.	10	L2	CO5																								

Module – 5					
Q.9	a.	What is the two phase locking protocol? How does it Guarantee serializability.	06	L2	CO5
	b.	Describe the wait-die and wound-wait protocols for deadlock prevention.	08	L2	CO5
	c.	List and explain the four major categories of NOSQL system.	06	L2	CO3
OR					
Q.10	a.	What is Multiple Granularity locking? How is it implemented using intension locks? Explain.	10	L2	CO5
	b.	Discuss the following MongoDB CRUD operations with their formats: (i) Insert (ii) Delete (iii) Read	06	L2	CO4
	c.	Briefly discuss about Neo4j data model.	04	L2	CO4

* * * * *

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BCS405A

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2024 Discrete Mathematical Structures

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define tautology. Prove that for any propositions p, q, r the compound proposition. $[(p \wedge \neg q) \rightarrow r] \rightarrow [p \rightarrow (q \vee r)]$ is a tautology	06	L2	CO1
	b.	Test whether the following is a valid argument: If Ram studies then he will pass 12 th . If Ram passes 12 th then his father gifts him a bike. If Ram doesn't play video game then he will pass 12 th . Ram did not get a bike. <hr style="width: 50%; margin-left: 0;"/> ∴ Ram played video game.	07	L3	CO1
	c.	Give direct proofs of the statements: i) If k and l are odd then k + l is even. ii) If k and l are odd then kl is odd.	07	L2	CO1
OR					
Q.2	a.	Define (i) Proposition (ii) Open statement (iii) Quantifiers	06	L2	CO1
	b.	Using the laws of logic, prove the following logical equivalence: $[(\neg p \vee \neg q) \wedge (F_0 \vee p) \wedge p] \Leftrightarrow p \wedge \neg q$	07	L2	CO1
	c.	Write the following statement in symbolic form and find its negation: “If all triangles are right angled then no triangle is equilateral”.	07	L2	CO1
Module – 2					
Q.3	a.	Prove by using mathematical induction. $1^2 + 2^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$	06	L2	CO1
	b.	How many words can be made with or without meaning from the letters of the word “STATISTICS”? In how many of these a and c are adjacent? In how many vowels are together?	07	L3	CO2
	c.	Find the coefficient of x^3y^8 in the expansion of $(2x - y)^{11}$.	07	L2	CO2
OR					
Q.4	a.	Obtain the recursive definition for the sequence in each of the following cases: (i) $a_n = 5n$ (ii) $a_n = 3n + 7$ (iii) $a_n = n^2$ (iv) $a_n = 2 - (-1)^n$	06	L2	CO2
	b.	A woman has 11 close relations and wishes to invite 5 of them to dinner. In how many ways can she invite them if (i) there is no restriction on her choice. (ii) 2 persons will not attend separately (iii) 2 persons will not attend together.	07	L3	CO2
	c.	In how many ways can we distribute 7 apples and 5 oranges among 3 children such that each child gets atleast one apple and one orange?	07	L3	CO2

Module – 3					
Q.5	a.	State pigeon hole principle. Using pigeon hole principle find the minimum number of persons chosen so that atleast 5 of them will have their birthday in the same month.	06	L3	CO3
	b.	Let $A = \{a, b, c, d\}$ and $B = \{1, 2, 3, 4, 5\}$. Find the number of 1-1 functions and onto functions from (i) A to B (ii) B to A	07	L2	CO3
	c.	Let $A = \{1, 2, 3, 4, 5\}$. Define a relation R on $A \times A$ by $(x_1, y_1) R (x_2, y_2)$ iff $x_1 + y_1 = x_2 + y_2$. (i) Verify that R is an equivalence relation (ii) Determine the equivalence class of $[(2, 4)]$	07	L2	CO3
OR					
Q.6	a.	Consider the functions f and g from R to R defined by $f(x) = 2x + 5$ and $g(x) = \frac{1}{2}(x - 5)$. Prove that g is inverse of f.	06	L2	CO3
	b.	Let $A = \{1, 2, 3, 4\}$ and R be the relation on A defined by xRy if and only if $x < y$. Write down R as a set of ordered pairs. Write the relation matrix and draw the digraph. List out the in degrees and out degrees of every vertex.	07	L2	CO3
	c.	Let $A = \{1, 2, 3, 6, 9, 12, 18\}$ and define R on A by xRy iff 'x divides y'. Prove that (A, R) is a POSET. Draw the Hasse diagram for (A, R).	07	L2	CO3
Module – 4					
Q.7	a.	How many integers between 1 and 300 (inclusive) are divisible by (i) atleast one of 5, 6 or 8. (ii) None of 5, 6 and 8.	06	L3	CO4
	b.	At a restaurant 10 men handover their umbrellas to the receptionist, In how many ways can their umbrellas be returned so that (i) no man receives his own umbrella. (ii) atleast one gets his own umbrella. (iii) atleast two gets their own umbrellas.	07	L3	CO4
	c.	The number of virus affected files in a system is 1000 (to start with) and this increases by 250% every 2 hours. Use a recurrence relation to determine the number of virus affected files in the system after 12 hours.	07	L3	CO4
OR					
Q.8	a.	In how many ways one can arrange the letters of the word "CORRESPONDENTS" so that there are (i) no pair (ii) atleast 2 pairs of consecutive identical letters.	06	L3	CO4
	b.	4 persons P_1, P_2, P_3, P_4 who arrive late for a dinner party find that only one chair at each of five tables T_1, T_2, T_3, T_4 and T_5 is vacant. P_1 will not sit at T_1 or T_2 . P_2 will not sit at T_2 . P_3 will not sit at T_3 or T_4 . P_4 will not sit at T_4 or T_5 . Find the number of ways they can occupy the vacant chairs.	07	L3	CO4
	c.	Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for $n \geq 2$ with $a_0 = 5, a_1 = 12$.	07	L2	CO4
Module – 5					
Q.9	a.	If * is an operation on Z defined by $xy = x + y + 1$, prove that (Z, *) is an abelian group.	06	L2	CO5
	b.	Explain Klein-4 group with example.	07	L2	CO5
	c.	State and prove Lagrange's theorem.	07	L2	CO5
OR					
Q.10	a.	Prove that intersection of two subgroups of a group G is also a subgroup of G.	06	L2	CO5
	b.	Prove that $(Z_4, +)$ is a cyclic group. Find all its generators.	07	L2	CO5
	c.	Let $G = S_4$ for $\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \end{pmatrix}$ Find the subgroup $H = \langle \alpha \rangle$ determine the left cosets of H in G.	07	L3	CO5

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--	--

BBOC407

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2024 Biology for Engineers (CSE)

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Discuss the various components of Eukaryotic cells.	10	L3	CO1
	b.	Identify the applications of stem cells.	5	L2	CO1
	c.	Explain the functions of vitamins.	5	L2	CO1
OR					
Q.2	a.	Compare Prokaryotic and Eukaryotic cells.	10	L3	CO1
	b.	Explain the properties of Carbohydrates.	5	L2	CO1
	c.	Explain the functions of Lipids.	5	L2	CO1
Module – 2					
Q.3	a.	Highlighting the properties of cellulose, justify cellulose as an effective water filter.	10	L3	CO1
	b.	Explain the working and development of DNA vaccines by taking suitable example.	10	L2	CO1
OR					
Q.4	a.	What are Bioplastics? Justify the use of PHA as Bioplastic mentioning its properties and applications.	10	L3	CO1
	b.	Discuss the following : (i) Meat analogs of protein. (ii) Lipids as cleaning agents.	10	L2	CO1
Module – 3					
Q.5	a.	What is Electro Encephalogram (EEG)? Discuss the types of Brain activity detected with EEG. Write any three applications.	10	L3	CO2
	b.	What are Pace Makers? Explain basic design and construction of Pace Makers.	10	L2	CO2
OR					
Q.6	a.	Justify Lungs as purification system.	10	L3	CO2
	b.	Explain architecture of Rod and Core cells with suitable diagram.	10	L2	CO2
Module – 4					
Q.7	a.	What is ultrasonography? Explain the uses and working principle.	10	L2	CO3
	b.	What is lotus leaf effect? Explain the mechanism and applications of super Hydrophobic effect.	10	L2	CO3
OR					
Q.8	a.	The structure and design of Kingfisher beak lead to the design of Bullet trains. Explain.	10	L2	CO3
	b.	Explain the working and applications of Bionic Leaf Technology.	10	L2	CO3

Module – 5					
Q.9	a.	Explain the use of Electrical tongue in food science.	10	L2	CO4
	b.	Explain the advantages and limitations of Artificial Intelligence for disease diagnosis.	10	L2	CO4
OR					
Q.10	a.	Explain Bioengineering solutions for muscular dystrophy and Osteroporosis.	10	L2	CO4
	b.	Explain most commonly used Bioprinting Techniques.	10	L2	CO4

7. Which of the following is not a usability principle?
 - a) Learn ability
 - b) Efficiency
 - c) Memorability
 - d) Cost-effectiveness
8. In concern to design UI stands for _____.
 - a) User involvement
 - b) User interface
 - c) User interaction
 - d) User inspection
9. The difference between UI and UX is/are:
 - a) UI focuses on virtual elements, while UX focuses on functionality and user satisfaction
 - b) UI and UX are interchangeable terms
 - c) UI focuses on functionality, while UX focuses on elements
 - d) UI focus on functionality, while UX focuses on user satisfaction
10. Emotional impact is user experience design refers to:
 - a) The psychological effects of color choices on users
 - b) How user feel when they interact with a product or service
 - c) The technical performance of the website or app
 - d) The number of features available to users.
11. Design concept includes _____.
 - a) Usability
 - b) Accessibility
 - c) Both (a) and (b)
 - d) None of these
12. _____ is a human centered approach to problems solving that emphasizes empathy, creativity and collaboration.
 - a) Design
 - b) Design thinking
 - c) User perspectives
 - d) User collaboration
13. Generation of new idea is _____.
 - a) Critiquing
 - b) Designing
 - c) Idea creation
 - d) Sketching
14. Interaction perspective is _____.
 - a) How the system work
 - b) How the user operate the system
 - c) How the system communicate
 - d) How a system interface
15. The long term design documentation is _____.
 - a) Sketching
 - b) Design
 - c) Drawing
 - d) ideation
16. Critiquing is about _____.
 - a) Review and judgment
 - b) Joy and enjoyment
 - c) Idea creation
 - d) Theme or ideas
17. Rapid creation of freehand drawing is _____.
 - a) Drawing
 - b) Sketching
 - c) Designing
 - d) Intellectual drawing
18. Story board is a sequence of _____.
 - a) Frame clips
 - b) Visual frames
 - c) Sketches
 - d) Graphics frames
19. Ideation is an _____.
 - a) Active
 - b) Fast moving
 - c) Collaboration
 - d) All of these

20. Use mental model is a description of _____
 a) How the system work
 b) Explanation of someone's thought
 c) Something works in the real world
 d) None of these
21. The purpose of wire framing in UI/UX design is to _____
 a) to create a final polished design
 b) to communicate layout and functionality
 c) to select color schemes
 d) to add animations
22. UX measure is _____
 a) Usage of your interaction design
 b) Usage of conceptual design
 c) Usage of design thinking
 d) Usage of ideations
23. Measuring instrument is a description of _____
 a) Providing values for the particular UX measure
 b) Providing values for the UX targets
 c) Providing values for the UX metrics
 d) Providing values for UX goals.
24. Detailed design includes _____
 a) Visual frames
 b) Visual clips
 c) Visual comps
 d) Visual wire frames
25. Bread and butter tool of interaction design is _____
 a) Sketching
 b) Wireframes
 c) Detailed design
 d) None of these
26. In which software tool is used in wireframe _____
 a) Adobe XD
 b) Keil
 c) Xlinx
 d) None of these
27. Subjective of the UX design is _____
 a) UX metrics
 b) UX goals
 c) UX measure
 d) UX target
28. Quantitative statement is _____
 a) UX metrics
 b) UX goals
 c) UX measure
 d) UX target
29. Wire frames are _____ frames
 a) Low fidelity wire frames
 b) High fidelity wireframes
 c) Median fidelity wireframes
 d) None of these
30. The drawing aspects of wireframes are user of _____ boxes
 a) Square boxes
 b) Parallelogram boxes
 c) Rectangular boxes
 d) None of these
31. A sense is a design representation is _____
 a) Interaction design
 b) Wire frame
 c) Prototype
 d) Design thinking
32. The ideas of prototyping is _____
 a) Timeless and universal
 b) Build and real thing
 c) Choice and approach
 d) all of these

33. Which prototype is demonstrating the product concept and for conveying an early product overview?
a) Vertical prototype
b) Upper prototype
c) Horizontal prototype
d) None of these
34. In which prototype combines the advantages of both horizontal and vertical, offering a good compress for system evaluation?
a) 'R' prototype
b) 'Y' prototype
c) 'T' prototype
d) 'D' prototype
35. A vertical prototype is associated with _____
a) User actions, in depth
b) Customer actions, in depth
c) Stake holder actions in depth
d) All of these
36. Prototype that are not faithful representations of the details of look, feel and behavior is _____
a) Vertical prototype
b) Local prototype
c) Horizontal prototype
d) Low fidelity prototype
37. In which prototype are more detailed representation of designs _____
a) High fidelity prototype
b) Local prototype
c) Horizontal prototype
d) Low fidelity prototype
38. Which one of the fidelity is not independent _____
a) Interactivity of prototype
b) Local prototype
c) Horizontal prototype
d) Low fidelity prototype
39. Paper prototype can act as _____
a) Coding blocker
b) View blocker
c) Prototype blocker
d) All of these
40. A 'T' prototype combines _____
a) Both paper and local prototype
b) Both horizontal and local prototype
c) Both low fidelity and high fidelity
d) None of these
41. Some of the guidelines and much of practical user performance depend on
a) The concepts of over satisfaction
b) The concepts of UX guidelines
c) The concepts of human working memory
d) All of these
42. Sensory memory is of _____
a) Small brief duration
b) Large brief duration
c) Very brief duration
d) None of these
43. The selected UX design guidelines are generally organized by the _____
a) UAF structure
b) API structure
c) GUI structure
d) All of these
44. Design examples of UX guidelines from everyday things such as
a) Hair dryers
b) Automobiles
c) Public doorways
d) All of these

45. Planning guidelines are the support _____
a) Users b) Servants c) Public d) None of these
46. User actions to determine _____
a) When tasks or steps to do b) What tasks or steps to do
c) How tasks or step to do d) Why tasks or steps to do
47. Translation guidelines are to support _____
a) Users b) Customers c) Peoples d) None of these
48. Including human memory support in the task structure _____
a) Design simplicity b) Flexibility
c) Efficiency d) Concurrency
49. Physical actions guidelines support users is doing physical actions including _____
a) Typing
b) Clicking
c) Dragging in a GUI, scrolling on a web page
d) All of these
50. The outcomes part of the interaction cycle is about supporting _____
a) Users through complete and correct "backend" functionality
b) User's interaction cycle functionality
c) Dragging in a GUI, scrolling on a web page functionality
d) All of these

* * * * *

- 36 Comprehensive human goal is right understanding prosperity, trust (fearlessness) and
 a) Co-existence b) Happiness c) Abhay d) None
- 37 There is justice in relationship when there is
 a) Mutual fulfillment b) Self regulation c) Freedom d) None
- 38 The extension of family is
 a) Self b) Body c) Society d) Nature
- 39 The feeling of relatedness to all human beings is called
 a) Love b) Affection c) Gratitude d) Respect
- 40 Acceptance of excellence in others is called
 a) Reverence b) Glory c) Gratitude d) Guidance
- 41 Harmony should be maintained in
 a) Between body and life
 b) Between self and society
 c) Between life and environment
 d) All of these
- 42 I being the
 a) does, seer and Enjoyer b) doer
 c) seer d) enjoy
- 43 Which of the following is NOT response of the self?
 a) Knowing b) Assuming
 c) Recognizing d) Preconditioning
- 44 Activities of self (I) are
 a) Happiness b) Prosperity
 c) Desire, thought and expectation d) None
- 45 The requirement of body is right utilization and nurturing
 a) Desire b) Protection c) Thought d) Expectation
- 46 The _____ is an instrument of _____
 a) I, Body b) Body, I c) Both a and b d) None
- 47 The activity of desire, thought and expecting together is called as
 a) Body b) Health c) Imagination d) Future
- 48 Imaging is _____ with time
 a) Continuous b) Discontinuous c) Random d) Different
- 49 Where there is harmony among the parts of the body it is known as
 a) Swasthya b) Sanyam c) Prosperity d) None
- 50 Knowing means having the
 a) Assumption
 b) Right understanding
 c) Right feeling
 d) None