VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]

B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Allied Subject : First Semester : Paper – I

DISCRETE MATHEMATICS
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Let R={(1,b),(3,d),(2,b)} and S={(b,4),(2,5),(d,a)} be a relation then R composition S=____.
   a) {(1,b),(3,d),(2,b)} b){(1,4),(3,a),(2,4)}
   c) {(4,b),(2,5),(3,a)} d){(1,d),(3,b),(2,c)}
2. If n[p(A)]= 64,then n(A) is
   a) 6 b) 8 c) 4 d) 5
3. *If* $\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ then, the values of x and y respectively, are
   a) 2, 0 b) 0, 2 c) 0, -2 d) 1, 1
4. Which one of the following is true for any two square matrices A and B of same order?
   a) $(AB)^T=A^T B^T$ b) $(A^TB^T)= A^TB^T$ c) $(AB)^T=BA$ d) $(AB)^T=B^TA^T$
5. Min-terms of two statements are formed by introducing the connective _____.
   a) Conjunction b) disjunction c) Conditional d) negation
6. If in the truth table the answer column has the truth values both TRUE and FALSE then it is said to be_____.
   a) tautology b) contradiction
   c) contingency d) equivalence relation

7. _____ is essentially used to prove that a property $P(n)$ holds for every natural number n, i.e. for n = 0, 1, 2, 3, and so on.

a) Mathimatical Induction b) Recursive

c) Recurrence d) Linear

8. _____is also a useful way for defining objects that have a repeated similar structural form.

a) Recursion b) Recursive c) Recurrence d) Function

9. Traveling salesman problem is example for _____ graph.

a) eulerian b) Hamiltonian c) tournament d) planar

10. In a graph if few edges have directions and few do not have directions then the graph is called_____.

a) multi graph b) directed graph

c) undirected graph d) mixed graph

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. *If* $A=\{2,4,6,8,10\}$ *and* $B=\{4,8,12\}$, then find $A\cup B$.

12. How many different words can be made out of the letters which form the word ALLAHABAD?

13. *If* $A=\begin{bmatrix}2+i & -2\\ 4-i & -2-i\end{bmatrix}$, then find $\bar{A}$.

14. State Cayley – Hamilton theorem.

15. Define tautology.

16. Give a recursive definition of $f(n)=n!$.

17. Define Hamiltonian Graph.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) *If* $A=\{1,2\}$ *and* $B=\{a,b,c\}$, then find $A\times B$ *and* $B\times A$.

(OR)

b) *Let* $f:Z\to Z$ be a function defined by $f(x)=2x+3$ *and* $g:Z\to Z$ be a function defined by $g(x)=3x+2$. Find $f\circ g$ *and* $g\circ f$.

19. a) *If* $A=\begin{bmatrix}-2 & 3 & -1\\ -1 & 2 & -1\\ -6 & 9 & 4\end{bmatrix}$ *and* $B=\begin{bmatrix}1 & 3 & -1\\ 2 & 2 & -1\\ 3 & 0 & -1\end{bmatrix}$, then find $2A+4B$.

(OR)

b) Find the rank of the matrix $A=\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9\end{bmatrix}$.

20. a) Construct the truth table for the statement formula $\sim p\wedge q$.

(OR)

b) Draw logical networks for $(a.\bar{b})+(\bar{a}.b)$.

21. a) Prove that $1+2+3+....+n=\frac{n(n+1)}{2}$ for all $n\in N$ by induction principle.

(OR)

b) Find the recurrence relation, satisfying $y_n=A(3)^n+B(-2)^n$.

22. a) Define isomorphic graphs with an example.

(OR)

b) What is the postfix form of $((a+b)\uparrow 3)+\left(\frac{(a-b)}{3}\right)$?

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. *Let* $A=\{1,2,3,4\}$, $B=\{1,4,9,16\}$ and the relation $R=\{(1,1),(2,4),(3,9),(4,16)\}$. Write the matrix of R and draw the relation graph.

24. Verify Cayley – Hamilton theorem for the matrix $A=\begin{bmatrix} 11 & -4 & -7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{bmatrix}$.

25. Show that $\sim(p\wedge(\sim q\wedge r))\vee(q\wedge r)\vee(p\wedge r)\Leftrightarrow r$.

26. Apply mathematical induction, prove that

$$1^3+2^3+3^3+.....+n^3=\frac{n^2(n+1)^2}{4};\ n\in N.$$

27. Define the following with an example:

i) Strongly Connected.

ii) Weakly Connected.

iii) Unilaterally Connected.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Allied Subject : Third Semester : Paper – I

OPERATIONS RESEARCH
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. OR was coined in the year in 1940 by _____.
   a) McClosky b) Thefthen c) both d) none
2. A physical model is an example of
   a) An iconic model b) An analogue model
   c) A verbal model d) A mathematical model
3. The first step in formulating a linear programming problem is
   a) Identify any upper or lower bound on the decision variables
   b) State the constraints as linear combination soft the decision variables
   c) Understand the problem
   d) Identify the decision variables
4. Non basic variable which is used to replace basic variable is variable which has
   a) most positive column b) most negative column
   c) most negative row d) most positive row
5. In the simplex method the variable enters the basis if _____.
   a) $Zj - Cj \geq 0$ b) $Zj - Cj \leq 0$ c) $Zj - Cj < 0$ d) $Zj - Cj = 0$
6. Which of the following is a valid objective function for a linear programming problem?
   a) Max = 5xy b) Min= 4x + 3y + 2z
   c) Max=$5x^2 + 6y^2$ d) Min $(x1 + x2)/x^3$

7. When the number of shipments in a feasible solution is less than the number of rows plus the number of columns minus one
   a) the solution is optimal
   b) there is degeneracy, and an artificial allocation must be created
   c) a dummy source must be created
   d) dummy destination must be created
8. MODI stands for:
   a) Modern distribution b) Mendel's distribution method
   c) Modified distribution method d) Model index method
9. In an assignment problem,
   a) One agent can do parts of several tasks
   b) One task can be done by several agents
   c) Each agent is assigned to its own best task
   d) None of the above
10. In Assignment problem if total supply < total demand we add _____.
   a) dummy row with cost 0 b) dummy column with cost 0
   c) dummy row with cost 1 d) dummy column with cost 1

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is Operation Research?
12. Define Slack Variable.
13. Define unbounded Solution.
14. Define basic feasible Solution.
15. What is the Condition of optimality?
16. Define Assignment problem.
17. Define Mathematical formulation of L.P.P.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Explain the principles of Modelling.

(OR)

b) What are the characteristics of Operations Research?

19. a) A firm manufactures two types of products A and B and sells them at a profit of ₹2 on type A and₹3 on type B. Each product is processed on two Machines M_1 & M_2. Type A requires 1 minute of processing time on M_1 and 2 minutes on M_2. Type B requires 1 minute on M_1 and 1 minute on M_2 Machine M1 is available for not morethan 6 hours 40 minutes while machine M_2 is available for 10 hours during any working day formulate the problem as L.P.P. so as to maximize the profit.

(OR)

b) Solve graphically the following L.P.P.

$$\textit{Minimize} \quad Z = 20x_1 + 10x_2$$

Subject to

$$x_1 + 2x_2 \le 40$$

$$3x_1 + x_2 \ge 30$$

$$4x_1 + 3x_2 \ge 60$$

$$x_1 \quad x_2 \ge 0$$

20. a) Use Simplex Method to Solve the L.P.P.

$$\textit{Max} \quad Z = 4x_1 + 10x_2$$

Subject to

$$2x_1 + x_2 \le 50$$

$$2x_1 + 5x_2 \le 100$$

$2x_1 + 3x_2 \le 90;$

$x_1 \quad x_2 \ge 0$

(OR)

b) Solve the following L.P.P.

$Max \quad Z = 3x_1 + 2x_2$

Subject to $\quad 2x_1 + x_2 \le 2$

$3x_1 + 4x_2 \ge 4$

$x_1 \quad x_2 \ge 0$

21. a) Consider the problem of assigning jobs to persons. The assignment costs are given below.

		Job				
		1	2	3	4	5
Person	A	8	4	2	6	1
	B	0	9	5	5	4
	C	3	8	9	2	6
	D	4	3	1	0	3
	E	9	5	8	9	5

Determine the optimum assignment schedule

(OR)

b) Solve the following assignment problem.

	A	B	C	D
I	1	4	6	3
II	9	7	10	9
III	4	5	11	7
IV	8	7	8	5

22. a) Find the Initial basic feasible solution for the following transportation problem using Least cost method.

					Supply
From	1	2	1	4	30
	3	3	2	1	50
	4	2	5	9	20
Demand	20	40	30	10	

(OR)

b) Find the Initial basic feasible solution for the following transportation problem using VAM method.

		D_1	D_2	D_3	D_4	Availability
Origin	S_1	11	13	17	14	250
	S_2	16	18	14	10	300
	S_3	21	24	13	10	400
Requirement		200	225	275	250	

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Explain briefly the phases of Operations Research.

24. Solve graphically the following L.P.P.

$$Max \quad Z = 3x_1 + 4x_2$$

Subject to $x_1 + x_2 \le 450$

$2x_1 + x_2 \le 600$

$x_1 \quad x_2 \ge 0$

25. Use Big-M-method to solve

$$\textit{Minimize} \quad Z = 4x_1 + 3x_2$$

Subject to $\quad 2x_1 + x_2 \geq 10$

$$-3x_1 + 2x_2 \leq 6$$

$$x_1 + x_2 \geq 6$$

$$\textit{and} \quad x_1 \;\; x_2 \geq 0$$

26. Solve the following Assignment problem and find the optimum solution.

	a	b	c	d	e
A	85	75	65	125	75
B	90	78	66	132	78
C	75	66	57	114	69
D	80	72	60	120	72
E	76	64	56	112	68

27. Solve the following transportation problem to minimize the total cost of transportation.

		Destination				
		1	2	3	4	Supply
Orgin	1	14	56	48	27	70
	2	82	35	21	81	47
	3	99	31	71	63	93
Demand		70	35	45	60	

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : First Semester : Paper – I

PROGRAMMING IN C
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Which of the following is incorrect variable type?
   a) float b) real c) int d) double
2. The declaration of C variable can be done _____.
   a) anywhere in the program b) in declaration part
   c) in executable part d) at the end of the program
3. By default the function returns _____.
   a) integer value b) float value c) char value d) double
4. str1+str2 _____.
   a) Combines two string b) adds value
   c) both d) none
5. Keyword 'void' before the function name means _____.
   a) function should not return any value
   b) function should return a value
   c) no arguments are passed
   d) some arguments are passed
6. The bitwise AND operator is used for
   a) Masking b) Comparison c) Division d) Shifting bit
7. The structure combines variables of _____.
   a) similar data types b) dissimilar data types
   c) unsigned data types d) signed data types

8. The redirection operator -> transfers any output to _____.

a) text file b) console c) binary file d) number file

9. A function declaration must be ended with a _____.

a) .Dot b) ? c) semicolon ; d) none

10. Command line arguments are used to accept argument from _____.

a) command prompt of operating system

b) through scanf( ) statement

c) both (a) and (b)

d) through printf() statement

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Give the syntax of scanf() function.

12. What is the use of Switch Statement?

13. Write the Single dimensional array declaration statement.

14. Write down the General Form of a Function in C.

15. List out the different categories of Function.

16. Define Union.

17. Define Pointer.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Give the Basic structure of C Program and Explain its Parts.

(OR)

b) Bring out the difference between while and do-while loops in C.

19. a) Illuminate with example Single Dimensional Array.

(OR)

b) Explain with example about Two-dimensional Arrays.

20. a) Analyze with example Arguments but no Return values category of Functions.

(OR)

b) What is recursion function? What advantage is there in its use? Give Example.

21. a) Explain Structure definition with example.

(OR)

b) How structure assign values to member? Explain.

22. a) Write short notes on Pointers and Arrays with example.

(OR)

b) Illustrate Pointers and Functions with example.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Write in detail about the various Operators available in C with examples.

24. Demonstrate strcat() function with example.

25. Discuss Arguments with return values in Function with example.

26. Discuss with example about initialisation of structures in C.

27. Write in detail about defining, opening and closing a File with pointers with suitable examples.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : First Semester : Paper – II

DIGITAL ELECTRONICS
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Any set of digits or alphabets are generally referred as _____.
   a) Characters b) Symbols c) Bits d) Bytes
2. The expression of a NAND gate is_____
   a) A.B b) A'B+AB' c) (A.B)' d) (A+B)'
3. Canonical form is a unique way of representing _____.
   a) SOP b) Minterm
   c) Boolean Expressions d) A page
4. How many truth table entries are necessary for a four-input circuit?
   a) 4 b) 8 c) 12 d) 16
5. If the number of n selected input lines is equal to 2^m then it requires _____ select lines.
   a) 2 b) m c) n d) None of the Mentioned
6. The decimal number system represent the decimal number in the form of
   a) Hexadecimal b) Binary coded c) Octal d) Decimal
7. Forrealisation of JK flip-flop from SR flip-flop, if J=0 & K=0 then the input is
   a) S=0, R=0 b) S=0, R=X c) S=X, R=0 d) S=X, R=X
8. Which of the following flip-flops is free from race around problem?
   a) T flip-flop b) SR flip-flop
   c) Master-Slave Flip-flop d) None of the Mentioned

9. A register is defined as

a) The group of latches for storing one bit of information

b) The group of latches for storing n-bit of information

c) The group of flip-flops suitable for storing one bit of information

d) The group of flip-flops suitable for storing binary information

10. MOD-16 counter requires _____ number of states.

a) 8 b) 4 c) 16 d) 32

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Convert the decimal number 115 to binary number system.

12. What is meant by minterm and maxterm?

13. What is decoder?

14. Subtract the binary number 0110 from1111.

15. What is a flip-flop?

16. Give some applications of clocked R-S flip-flop.

17. Give the classifications of shift registers.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) How the Ex-OR gate is constructed using basic gates? Explain.

(OR)

b) Write a note on Excess – 3 codes.

19. a) Simplify $Y = (A+B)(A+B+\overline{C})+\overline{AB}.$

(OR)

b) Simplify the following Boolean expression using the K map :

$Y(A,B,C,D) = \sum(0,2,5,7,8,10,13,15).$

20. a) Draw and explain the operation of 8 to 1 multiplexer.

(OR)

b) Write a note on "Primary checker/ Generator".

21. a) Describe the construction, working of D-flip-flop, give its truth table.

(OR)

b) Explain the operation of J-K flip-flop, give its truth table.

22. a) Explain with block diagram, the action of serial in, serial out shift register.

(OR)

b) Describe the functions of ring counter.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Show that both NAND gate and NOR gate are Universal gates.

24. Simplify the given Boolean function by using

a) Sum of products form b) Product of sums form

$F = \sum m(0.1,2,5,8,9,10)$

25. Draw and explain the operation of a 1 to 16 Demultiplexer.

26. Explain how 555 Timer can be used as an Astable Multivibrator. Deduce an expression for the frequency of the output wave.

27. Explain the functioning of 4-bit ripple counter.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – I

COMPUTER ORGANISATION
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. A _____ digit is called a bit.
   a) decimal b) binary c) octal d) hexadecimal
2. The directive used to perform initialization before the execution of the code is _____.
   a) Reserve b) Store c) Data word d) EQU
3. Special input terminal for setting the flip-flop is called _____.
   a) clear b) set c) preset d) reset
4. The _____ input in the register determines the action to be taken with each clock pulse.
   a) buffer b) register c) load d) zero
5. A _____ interrupt is a system that establishes a priority over sources to determine which condition to service first.
   a) software b) hardware c) priority d) device
6. The addressing mode which makes use of in-direction pointers is _____.
   a) Indirect addressing mode b) Index addressing mode
   c) Relative addressing mode d) Offset addressing mode
7. The name of the operation that complements bits in A register where there are corresponding 1's in B register is _____.
   a) selective set b) selective complement
   c) selective clear d) mask

8. The mode in which the effective address is equal to the address part of instruction is _____.
   a) indirect addressing mode b) direct addressing mode
   c) register addressing mode d) relative addressing mode
9. The fastest data access is provided using _____.
   a) Caches b) DRAM's c) SRAM's d) Registers
10. The binary address issued to data or instructions are called as _____.
   a) Physical address b) Location
   c) Relocatable address d) Logical address

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. What is an Assembler?
12. Define Operating System.
13. Write a short note on stack.
14. What is ALU?
15. Expand: ASCII.
16. Define Memory unit.
17. What is Multiprogramming?

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) Discuss about the Assembly Language.

(OR)

b) Write a short note on Compiler.

19. a) Explain Memory Stack.

(OR)

b) Explain parallel processing.

20. a) Write a short note on Array Multiplier.

(OR)

b) Discuss about the Decimal Arithmetic operations.

21. a) Explain Input/output interface.

(OR)

b) Explain IBM 370 I/O channel.

22. a) Explain Auxiliary memory.

(OR)

b) Write a short note on Address and memory space.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Explain Functional units of a Computer System.
24. Explain the Different types of Addressing modes.
25. Discuss about the floating point Arithmetic Operations.
26. Explain DMA.
27. Explain Direct and set-Associate mapping method.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – II

OBJECT ORIENTED PROGRAMMING WITH C++
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The _____ access specifies allows functions or data to be accessible to other parts of the program.
   a) private b) protected c) public d) inherited
2. ___ is a unary operator that returns the memory address of its operand.
   a) &. b) ++ c) _ _ d) ||
3. _____ have the return type void.
   a) all functions b) constructors
   c) destructors d) none of the mentioned
4. The technique of building new classes from existing classes is called _____.
   a) inheritance b) overloading c) constructor d) polymorphism
5. The value 132.54 can represented using which data type?
   a) double b) void c) int d) bool
6. Looping in a program means _____.
   a) jumping to the specified branch of program
   b) repeat the specified lines of code
   c) execute only once
   d) jump to random location of the program
7. The expression 5/2 in c++ is evaluated to _____.
   a) 2 b) 3 c) 2.5 d) 0

8. _____ is a default access specifier for members of class in C++.
   a) protected b) public c) private d) default
9. Every statement in C++ program should end with a _____.
   a) comma (,) b) full stop (.) c) semicolon (;) d) colon (:)
10. C++ begins its execution with _____.
   a) header file b) main c) class d) declaration

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is Object Oriented Programming?
12. What do you mean by tokens?
13. What is the a Class? Give Example.
14. What do you meant by nesting of member functions?
15. What is Parameterized Constructor?
16. Give the different types of Inheritance.
17. State the use of 'this pointer'.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) What is OOP Paradigm? Give Examples.

(OR)

b) Explain cin and cout statements in c++ with syntax and relavant diagrams with suitable examples.

19. a) Distinguish. Between call by reference and return by reference with examples.

(OR)

b) Explain the usage of classes and objects with examples.

20. a) Neatly Explain Constructor and Destructor with suitable example.

(OR)

b) Discuss with examples 'Operator Overloading' with examples.

21. a) Write about Single Inheritance in C++ with example.

(OR)

b) Discuss Multilevel Inheritance with examples.

22. a) Explain Pure Virtual Function in detail with example.

(OR)

b) Illustrate Formatted Console I/O Operations with example.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Write a C++ Program using Switch Statement to do the Four basic arithmetic operation between Two numbers.
24. Demonstrate Function Overloading with examples.
25. Discuss Copy Constructors Syntax with example.
26. Explain Virtual Base Class using a C++ program.
27. Discuss with example about UnFormatted I/O Operations.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – III

DATA STRUCTURE
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. In a stack, if a user tries to remove an element from empty stack it is called _____.
   a) Underflow b) Empty c) Overflow d) Garbage
2. Which of the following is an example of dynamic programming approach?
   a) Fibonacci Series b) Tower of Hanoi
   c) Dijkstra Shortest Path d) All of the above
3. The linked list data represents _____ element.
   a) Value b) Address c) Memory d) all the above
4. Stack can be represented by means of _____.
   a) Tree b) Graph c) One-way List d) None
5. The children node of same parent is called_____.
   a) binary tree b) tree c) sibling d) list
6. _____ is the situation where data-structure is empty.
   a) Overflow b) Underflow c) Null d) Empty
7. Each node in a singly linked list has _____ fields
   a) 2 b) 3 c) 4 d) 5
8. Accessing and processing each array elements is called _____.
   a) sorting b) traversing c) searching d) merging

9. If every node u in G is adjacent to every other node v in G, A graph is said to be _____.

a) isolate b) complete

c) finite d) Strongly connected

10. The efficient searching algorithm for a sorted array is _____.

a) Binary search b) Linear search

c) Indexed search d) Repeated search

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is priority queue?
12. Define linked structure.
13. Define Binary search tree.
14. Explain polish notation.
15. What is Spanning tree.
16. Define graph traversal.
17. What is radix sort?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Discuss in detail about delimiter matching algorithm.

(OR)

b) Explain priority queues in standard Template library.

19. a) Discuss about circular list with example.

(OR)

b) Explain skip list in detail.

20. a) Discuss about searching in binary search tree.

(OR)

b) Explain the concept of heaps with example.

21. a) Discuss in detail about cycle detection.

(OR)

b) Explain Depth First Search with algorithm.

22. a) Discuss in detail about insertion sort.

(OR)

b) Discuss decision trees in detail.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Discuss about operation on queues with array implementation.
24. Explain in detail about singly linked list.
25. Explain in detail about tree traversal.
26. Explain Dijkstra's algorithm with example.
27. Explain in detail about merge sort.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Fifth Semester : Paper – I

COMPUTER NETWORKS
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. _____ is one of the Underwater Networking Application.
   a) Nutrition b) Pollution Monitoring
   c) Tourism d) Teaching
2. Terminators are used in _____ topology.
   a) bus b) ring c) star d) irregular
3. The commonly used protocol for webpage transfer is _____.
   a) HTML b) HTTP c) WML d) WTTP
4. Which of the following is used for modulation and demodulation?
   a) Modem b) Protocols c) Gateway d) Multiplexer
5. To connect a computer with a device in the same room user will likely to use _____.
   a) coaxial cable b) ground station
   c) dedicated line d) fibre optic cable
6. In a synchronous modem, the receive equalizer is known as _____ analyzer.
   a) adaptive b) statistical c) impairment d) compromise
7. A device that converts digital signals into analog signals is _____.
   a) a packet b) gateway c) modem d) repeater
8. _____ specifies a star topology featuring a central hub and unshielded twisted-pair wire asthe medium.
   a) 10 Base 2 b) 10 Base 5 c) 10 Base T d) 10 Base 8

9. RF signal is meant for

a) Relay Frequency b) Radio Frequency

c) Relative Frequency d) Range Frequency

10. Identify the following IP address: 192.5.0.0 _____.

a) host ip address b) limited broadcast address

c) direct broadcast address d) network address

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define E-mail.
12. What is broadcasting network?
13. Define Mulimode Fiber.
14. What is Half-duplex?
15. What is Hamming distance?
16. Define Subnet.
17. What are Hyperlinks?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Write a short note on Wireless network.

(OR)

b) Discuss about the design issue for the layer.

19. a) Explain about the Light wave Transmission.

(OR)

b) Describe about the Coaxial cable.

20. a) Write a short note on Framing.

(OR)

b) Explain about the Simplex stop and wait protocol.

21. a) Briefly explain about the Multicasting routing.

(OR)

b) Explain about the TCP Protocol.

22. a) Discuss about the DNS Namespace.

(OR)

b) What is Uniform Resource locators? Explain with details.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Describe in detail about the OSI Reference Model.
24. Explain about the Microwave transmission.
25. Explain in detail about the Error correcting code.
26. Discuss about the UDP.
27. What is Electronic mail? Explain in detail.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Fifth Semester : Paper – II

JAVA PROGRAMMING
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Which of the following primitive data type deals with small integer numbers?
   a) Boolean b) String c) int d) float
2. String in Java is a _____.
   a) class b) object c) variable d) character array
3. _____ is passed to a method by use of call-by-reference.
   a) variables b) objects c) methods d) operators
4. Methods having same name, same type signature are called _____ methods.
   a) overriding b) overloading c) overwriting d) overreading
5. One interface can inherit another by use of the keyword _____.
   a) public b) extends c) method name d) class name
6. _____ are automatically called when an object is destroyed.
   a) collect Garbage () b) Destructor ()
   c) finalize () d) final ()
7. _____ is at the top of the exception class hierarchy.
   a) try b) throwable c) exception class d) catch
8. When we implement the Runnable interface, we must define the method
   a) run() b) start() c) init() d) main()

9. Graphics object can only be drawn on _____.

a) view b) windows c) applet d) zoom

10. When you read your e-mail, you are viewing _____ data.

a) active b) passive

c) active and passive d) active or passive

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. Write short notes on Java Character Set.

12. Define String Buffer Class.

13. What is a package?

14. Explain about the method overriding?

15. List out the different states of Thread in Java.

16. What is an Exception?

17. Define datagram.

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) Write about the different types of operators in Java.

(OR)

b) Discuss about the various data types in Java.

19. a) Define objects. How to create an objects?

(OR)

b) Explain about the method overloading with example program.

20. a) How to implement interface with example program?

(OR)

b) Write short notes on abstract classes.

21. a) Explain about the multithreading concept with example program.

(OR)

b) Discuss about the exception handling mechanism in Java.

22. a) Briefly explain about the TCP / IP client sockets.

(OR)

b) Explain about the Life Cycle of an Applet.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Discuss about the various control statements with example.

24. Write about the Constructors in java.

25. Explain about the package with example program.

26. Explain the following : i) Thread Priority

ii) Synchronization

27. Briefly explain about the URL.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – III : Elective Subject : Fifth Semester : Paper – I

SOFTWARE ENGINEERING
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Every software engineering organization should describe a unique set of _____ activities.
   a) design b) framework c) methodology d) development
2. When the model is analyzed, try to minimize _____.
   a) cohesion b) coupling c) functions d) complexity
3. The Data flow diagram shows:
   a) the flow of data b) the processes
   c) the areas where they are stored d) all of the
4. A design _____ describes a design structure that solves a particular design problem.
   a) algorithm b) pattern c) guide d) entity
5. Waterfall model is a _____ model.
   a) linear b) iterative c) rapid d) iterative
6. Basis path testing comes under _____ testing.
   a) white-box b) black-box c) integration d) validation
7. The condition testing focuses on testing each _____ in the program.
   a) path b) condition c) value d) data
8. Testing is conducted by _____ of the software.
   a) developer b) customer c) analyst d) all the above

9. A representative sample of tests that will exercise all software _____ is considered in regression testing.

a) modules b) components c) functions d) clusters

10. One of the data manipulation activities is _____.

a) drawing creation b) symbol creation

c) graphs d) charts

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is Software Engineering?

12. Define Hardware.

13. What is the use of COCOMO?

14. What is the use of Software Requirements Specification?

15. Define Architectural Design.

16. Write the Goal of Software Design.

17. What is Software Testing?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Write about the Size Factors of Software Engineering.

(OR)

b) How the Software Engineers have planned the development Process?

19. a) What are the Cost Estimation Techniques in Software? Explain each of them.

(OR)

b) Explain Staff Level Estimation.

20. a) Explain about the Software Requirements Specification.

(OR)

b) Explain Formal Specification Techniques.

21. a) What are the Fundamental Design Concept in Software? Explain.

(OR)

b) Write and Explain the Design Techniques.

22. a) Explain in detail about Source Code Metrics.

(OR)

b) Discuss about i) Walkthroughs ii) Inspections

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Discuss in detail about Quality and Productivity Factors.

24. Illustrate about Software Cost Factors.

25. Explain about Languages and Processors for Requirements Specification.

26. Discuss about Design Notations in Software.

27. Explain i) Unit Testing and Debugging ii) System Testing

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B.A. / B.Sc. Degree (Semester) Examinations, November 2018
Part – IV : Non-Major Subject : First Semester : Paper – I

INTRODUCTION TO INFORMATION TECHNOLOGY
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The URL means
   a) use resource locator b) undefined resource locator
   c) uniform resource locator d) user defined locator
2. When was the first e-mail sent?
   a) 1963 b) 1969 c) 1971 d) 1974
3. Which statement is valid?
   a) 1KB = 1024 bytes b) 1 MB =2048 bytes
   c) 1 MB = 1000 kilobytes d) 1 KB = 1000 bytes
4. The computers can store large amount of _____.
   a) data and information b) numbers and text
   c) personal information d) public information
5. A dot matrix printer uses to _____ form letters.
   a) bars b) codes c) pins d) daisy wheels
6. Input unit is used for
   a) printing of data b) storage of data
   c) supply of data d) calculation
7. Magnetic disk contains
   a) metallic b) plastic c) magnetic particle d) thermo plastic

8. The ribbon is used in _____.

a) Laser Printer b) Plotter

c) Ink-jet printer d) Dot Matrix printer

9. CD-ROM stands for

a) Compactable Read Only Memory

b) Compact Data Read Only Memory

c) Compactable Disk Read Only Memory

d) Compact Disk Read Only Memory

10. Storage capacity of floppy disk are

a) 44 MB b) 10 MB c) 5 MB d) 2 MB

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. What is CPU?
12. What is RAM?
13. What is hardware?
14. What is internet?
15. Convert 38 to binary.
16. Convert 10101 to decimal.
17. List out the different types of printer?

SECTION – C

Answer ALL Questions : (3 × 9 = 27)

18. a) what is the use of IT in business? Explain.

(OR)

b) How is IT used in Education?

19. a) Write a short note on Microprocessor?

(OR)

b) Explain about different types of printers?

20. a) Explain the functional part of computer?

(OR)

b) Discuss about the Memory devices.

SECTION – D

Answer any TWO Questions : (2 × 14 = 28)

21. Discuss in detailed about the usage of IT in different field.
22. Discuss briefly about the Keyboard descriptions in a computer system?
23. How to Browsing the web?
24. Explain the different types of Operating Systems?

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – IV : Skill Based Subject : Third Semester : Paper – I

SYSTEM SOFTWARE
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. In a two pass assembler the object code generation is done during the?
   a) Second pass b) First pass c) Three pass d) None
2. The translator used by second generation languages is?
   a) Assembler b) interpreter c) Compiler d) Linker
3. Dynamic memory allocation is implementing using _____.
   a) queue and stacks b) Trees c) stack and heaps d) Graphs
4. Which is not a function of loader?
   a) allocation b) translation c) relocation d) loading
5. Symbolic names can be associated with
   a) Information b) data or instruction
   c) operand d) mnemonic operation
6. A program in execution is called
   a) Process b) Instruction c) Procedure d) Function
7. The expansion of nested macro calls follows
   a) FIFO rule b) LIFO rule c) LILO rule d) Priority rule
8. Resolution of externally defined symbols is performed by
   a) Linker b) Loader c) Compiler d) Editor
9. Which of the following is the fastest logic?
   a) TTL b) ECL c) CMOS d) LSI
10. An example of intermediate language is?
    a) SNOBOL b) PASCAL c) COBOL d) UNCOL

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is System Software?
12. Expand SIC & RISC?
13. What is loader?
14. Define compiler?
15. Define Operating System.
16. What is meant by Kernel?
17. Differentiate call by value from call by reference.

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Briefly discuss VAX architecture. **(OR)**
    b) Describe about one pass & Multi pass assembler.
19. a) Briefly discuss about static & dynamic memory allocation. **(OR)**
    b) Briefly discuss Descent parsing with suitable example.
20. a) Explain about compiler and compilers. **(OR)**
    b) Briefly discuss about UNIX operating system with diagram.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Discuss about SIC/XE machine architecture.
22. Explain about Instruction format and addressing mode.
23. Explain briefly about the sun os C compiler.
24. Explain the classification of OS and its type.

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B.Sc. Comp. Sci. Degree (Semester) Examinations, November 2018
Part – IV : Skill Based Subject : Fifth Semester : Paper – I

COMPETITIVE EXAMINATION FOR IT
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(75 × 1 = 75)**

1. _____ controls the way in which the computer system functions and provides a means by which users can interact with the computer.
   a) The operating system b) The motherboard
   c) The platform d) Application software
2. Computers use the _____ language to process data.
   a) Relational b) megabyte c) binary c) Processing
3. In the binary language each letter of the alphabet, each number and each special character is made up of a unique combination of:
   a) 8 bits b) 8-characters c) 8-byte d) 8 KB
4. What is a search engine?
   a) A program that monitors your surfing behavior on the Internet
   b) A website where you can type in key words and search for them in millions of web pages
   c) Website where you can click on hundreds of categorized web addresses
   d) Application software
5. _____ is data that has been organized or presented in a meaningful way.
   a) process b) information c) storage d) software
6. Forecast: : Future: : Regret : ?
   a) Present b) A tone c) past d) sins
7. Restaurant:: meal :: vending machine : ?
   a) Change b) snack c) candy d) lobby
8. Coffee :: cup:: soup : ?
   a) Chicken b) apptizer c) bowl d) Plate
9. Doctor: Patient: : Politician : ?
   a) Voter b) chair c) money d) public

10. Man: Biography : : Nation : ?
    a) History b) Geography c) People d) leader
11. FULL is the antonyms of _____.
    a) Hollow b) Light c) Thin d) Empty
12. DRY is the antonyms of _____.
    a) Cold b) Wet c) Slim d) Clouly
13. UNLIKE is the antonyms of_____.
    a) SIMILAR b) EQUAL c) INSEPARABLE d) TWIN
14. In a certain code language, WINDOW is coded as 452364, SHADE as 17839. Then HIDDEN is coded as?
    a) 763392 b) 753394 c) 765595 d) 756696
15. If ACTION is coded as ZXGRLM, then HEALTH will be coded as
    a) SVZOGS b) TVZOGT c) RUZPGR d) QVGOZQ
16. If OUT is coded as 152120, IN will be coded as
    a) 1015 b)1813 c) 819 d) 914

find odd man out (17-20)

17. a) skull b) heart c) liver d) lung
18. a) nile b) suez c) amazons d) ganges
19. a) april b) june c) september d) may
20. 3, 5, 11, 14, 17, 21
    a) 21 b) 11 c) 14 d) 21
21. Average of all prime numbers Between 30 to 50
    a) 37 b) 37.8 c) 39 d) 39.8
22. Reeya obtained 65, 67, 76, 82 and 85 out of 100 in different subjects, what will be the average
    a) 70 b) 75 c) 80 d) 85
23. Find the sum of first 30 natural numbers
    a) 470 b) 468 c) 465 d) 463
24. Find the average of all numbers between 6 and 34 which are divisible by 5
    a) 15 b) 20 c) 25 d) 30
25. Average age of 7 family members is 75 years. But average age of 6 of them is 74 years 6 months. What is the age of the 7^{th} family member?
    a) 75.5 b) 78 c) 68 d) 80

26. Average age of 5 people in a family is 55 years. However it is seen that 3 of the 5 people also have an average age of 55 years. What will be the average age of remaining two people of the family?
    a) 82.5 years b) 27.5 years c) 55 years d) 110 years
27. The average of fifty numbers is 28. If two numbers, namely 25 and 35 are discarded, the average of the remaining numbers is nearly,
    a) 29.27 b) 27.92 c) 27.29 d) 29.72
28. The average of three numbers is 77. The first number is twice the second and the second number is twice the third. Find the first number.
    a) 33 b) 66 c) 77 d) 132
29. 3 boxes have some average weight. When one box which weighs 89 kg is replaced by another box, the average weight increases by 5 kg. How much the new box weighs?
    a) 109 kg b) 94 kg c) 104 kg d) 84 kg
30. Find the average of first 97 natural numbers.
    a) 47 b) 37 c) 48 d) 49
31. A's salary is 50% more than B's. How much percent is B's salary less than A's?
    a) $33\left(\frac{1}{4}\right)\%$ b) $33\left(\frac{1}{3}\right)\%$ c) $33\left(\frac{1}{2}\right)\%$ d) 33%
32. In a country 55% population is female. 80% of the male population is literate. How much of females are literate if total literacy is 58%?
    a) 45% b) 55% c) 40% d) 22%
33. 5% of 5% of Rs.100 is
    a) Rs.0.25 b) Rs.0.50 c) Rs.10 d) Rs.25
34. Half percent, written as a decimal, is
    a) 0.2 b) 0.02 c) 0.005 d) 0.05
35. What will be the fraction of 4%
    a) $\frac{1}{20}$ b) $\frac{1}{50}$ c) $\frac{1}{75}$ d) $\frac{1}{25}$
36. A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:
    a) 588 apples b) 600 apples c) 672 apples d) 700 apples
37. *If* $a:b:c=3:4:7$, then the ratio $(a+b+c):c$ is equal to
    a) $2:1$ b) $14:3$ c) $7:2$ d) $1:2$

38. Two numbers are in ratio 4:5 and their LCM is 180. The smaller number is
    a) 9 b) 15 c) 36 d) 45
39. The H.C.F. of two numbers is 23 and the other two factors of their L.C.M. are 13 and 14. The larger of the two numbers is:
    a) 276 b) 299 c) 322 d) 345
40. Greatest Common Divisor of two numbers is 8 while their Least Common Multiple is 144. Find the other number if one number is 16.
    a) 108 b) 96 c) 72 d) 36
41. The greatest number of four digits which is divisible by 15, 25, 40, 75 is
    a) 600 b) 9,000 c) 9,600 d) 9,400
42. What is HCF of $\frac{36}{75}, \frac{48}{150}, \frac{72}{135}$?
    a) $\frac{12}{1350}$ b) $\frac{150}{36}$ c) $\frac{1350}{36}$ d) $\frac{72}{225}$
43. Rajesh had to arrange his books in uniform groups. He makes groups of 4 books each. But 3 books are left. He tries it with groups of 5 books each. But still 3 books are left. 3 books are still left when he tried with groups of 9 or 10 books each. How many books does he have?
    a) 90 b) 180 c) 900 d) 183
44. HCF and LCM of two numbers is 8 and 96. Sum of those numbers is 56. Then what is sum of their reciprocals?
    a) $\frac{1}{56}$ b) $\frac{7}{96}$ c) $\frac{1}{96}$ d) $\frac{1}{8}$
45. The L.C.M. of two number is 60. The numbers are in the ratio $4:5$. Find the sum of numbers.
    a) 27 b) 33 c) 38 d) 45
46. Find the fourth proportion to 2, 3, 6
    a) 18 b) 12 c) 9 d) 4
47. The ratio of two numbers is $4:5$ and their H.C.F is 4. Find their L.C.M.
    a) 96 b) 80 c) 73 d) 48
48. 3 bells beep at an interval of 12, 20, and 35 minutes. If they beep together at 10 a.m., then they will again beep together at:
    a) 12 p.m. b) 1 p.m. c) 4 p.m. d) 5 p.m.
49. Find the lowest common multiple of 24, 36 and 40.
    a) 120 b) 240 c) 360 d) 480
50. A ratio equivalent to 3 : 7 is:
    a) 3 : 9; b) 6 : 10; c) 9 : 21; d) 18 : 49

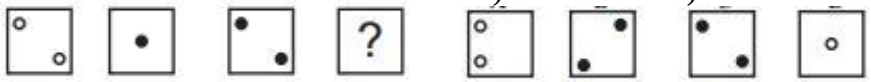
51. The ratio 35 : 84 in simplest form is:
    a) 5 : 7; b) 7 : 12; c) 5 : 12; d) none of these
52. In a class there are 20 boys and 15 girls. The ratio of boys to girls is:
    a) 4 : 3; b) 3 : 4; c) 4 : 5; d) none of these
53. The ratio of 1.5 m to 10 cm is:
    a) 1 : 15; b) 15 : 10; c) 10 : 15; d) 15 : 1
54. 7 : 12 is equivalent to:
    a) 28 : 40; b) 42 : 71; c) 72 : 42; d) 42 : 72
55. The binary number is hexadecimal number C3 is
    a) 1111 b) 110011 c) 111100 d) 11000011
56. What is the binary equivalent of 747_{10}
    a) 1011101011 b) 1000101011 c) 1100101101 d) none
57. Convert the following 942 to hexadecimal
    a) 3AE b) 2AF c) 3CE d) 3AF
58. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?
    a) 120 meters b) 150 meters c) 125 meters d) 130 meters
59. The length of the bridge, which a train 130 metres long and travelling at 45 km/hr can cross in 30 seconds, is:
    a) 200 m b) 225 m c) 245 m d) 250
60. A man sitting in a train which is traveling at 50 kmph observes that a goods train, traveling in opposite direction, takes 9 seconds to pass him. If the goods train is 280 m long, find its speed.
    a) 60 b) 62 c) 64 d) 65
61. AZ, GT, MN, ?, YB
    a) KF b) RX c) SH d) TS
62. AZ, CX, FU, ?
    a) IR b) IV c) JQ d) KP
63. Pointing to a girl in the photograph, Amar said, "Her mother`s brother is the only son of my mother's father." How is the girl`s mother related to Amar?
    a) Mother b) Sister c) Aunt d) Grandmother
64. A shopkeeper sells an article for Rs. 200 with a loss of Rs. 20 %. Find the cost price of the article.
    a) 220 b) 250 c) 280 d) 260

65. I have Rs 7500/- which I deposit in a bank at a simple quarterly interest of 8%. How much will the amount yield me in two and a half years?
a) Rs.8,600 b) Rs.9,000 c) Rs.9,050 d) Rs.9,300

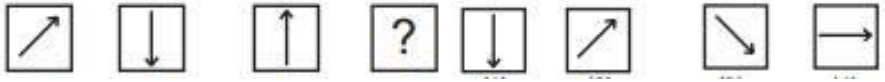
66. S.P. of 10 candles is same as C.P. of 12 candles. Find the gain percent.
a) 11 % b) 15 % c) 20 % d) 25 %

67. A man buys an article for Rs. 27.50 and sells it for Rs 28.60. Find his gain percent
a) 1% b) 2% c) 3% d) 4%

68. A TV is purchased at Rs. 5000 and sold at Rs. 4000, find the lost percent.
a) 10% b) 20 c) 25 d) 30

69. 

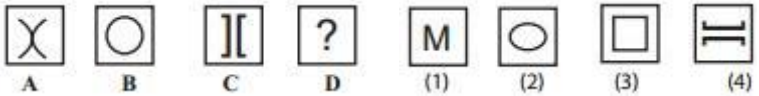
a) 1 b) 2 c) 3 d) 4

70. 

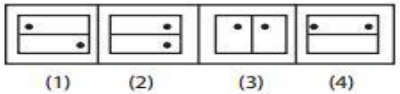
a) 1 b) 2 c) 3 d) 4

71. 

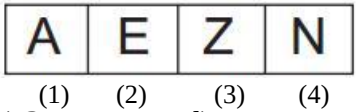
a) 1 b) 2 c) 3 d) 4

72. 

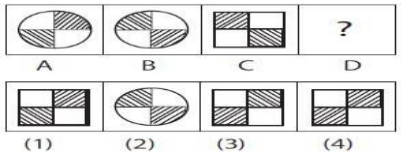
a) 1 b) 2 c) 3 d) 4

73. Choose the figure which is different : 

a) 1 b) 2 c) 3 d) 4

74. Choose the figure which is different : 

a) 1 b) 2 c) 3 d) 4

75. Choose the figure which is different : 

a) 1 b) 2 c) 3 d) 4

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