

SEMESTER 1(I Year)  
**PROGRAMMING IN C**

**TWO MARKS**

1. Define Header File?
2. Define Array?
3. Define Function?
4. What is Recursion?
5. Define Variable, Constant, Identifier?
6. What is Typecasting?
7. Define Structure?
8. Define Pointer?
9. What is C Tokens?
10. Define String?
11. What is Control Structure?
12. What is Iterative Statement?
13. Difference between do and while.
14. Difference between for and while.
15. Difference between if and switch.
16. Define Keywords.
17. Write rules for creating variables?
18. Differentiate Array and String.
19. What is String Processing?
20. What is the use of Strlen(), Strcmp()?
21. Explain seek(), tellg()?
22. Define Union.
23. Differentiate Union and Structure.
24. Define Self referential Structure.
25. Define Files.
26. How files are accessed?
27. What is a command line argument?
28. What is the use of # Pre-processor directive?
29. What is the use of Conditional operator?
30. Difference between Sequential and random access file.

**FIVE MARKS**

1. a. What do you understand by constant, variable and keywords?  
b. Discuss the scope of a variable.
2. Describe the main features of C language with examples.
3. Is C a low-level or high-level language? Explain your answer.
4. Explain the terms flowchart and algorithm with examples.
5. Discuss the basic structure of a 'C' program.
6. Name and describe the various data types available in C.
7. Can multiple assignments be written in C. In what order will the assignment be carried out.
8. Explain nested if –else with example.
9. What is the different decision control structure available in C. Explain with examples?
10. Discuss the conditional operator with the help of a program.
11. Discuss Precedence order and associativity of operators.
12. What is typecasting? When should a typecast be used?

13. What is the purpose of main( ) function? Can we have a program without main ( ).
14. What the term 'Nesting' refers to? Explain with the help of an example.
15. What are the various loop constructs available in C. Distinguish between while and do-while loops.
16. Why do we avoid the use of goto statements in programs?
17. Differentiate between break and continue with examples.
18. What are functions? What is the advantage of using function in a program?
19. In header files whether functions are declared or defined?
20. Explain call by value and call by reference with examples.
21. How can we swap two variables without using a temporary variable?
22. What do you understand by recursion? Explain with example.
23. Write a program in C to find the factorial of a number.
24. Write a program in C to find out the value of factorials from 1 to 10 using recursion.
25. What is an array? Explain the features of an array and their uses.
26. defining an array size in terms of symbolic constant rather than a fixed integer constant?
27. Explain the concepts of multidimensional arrays in 'C' Language.
28. Explain Function and its Types?
29. Explain User defined Data types?
30. Explain Structure within Structure?
31. Explain Command line Argument?
32. Explain Pointers with Examples?
33. Explain Storage classes and its Types?
34. Explain Array and its Types with Example?
35. Explain Variables and its types with Example?
36. Explain Self Referential Structure?
37. Difference between Structure and Union with Example.
38. Explain Passing through Arguments?
39. Explain String Function with Example?
40. Explain Structure of C program?
41. Difference between Sequential File and Random Access file.
42. Explain Union with Example?

### **TEN MARKS**

1. Explain Operators and its Types with suitable Examples?
2. Explain Control Structures with Example?
3. Explain Function with Example?
4. Discuss about Types of functions with neat example.
5. Describe the File Handling Function with Example?
6. Explain Array and its Types with suitable?
7. Discuss about String Processing with example.
8. Explain For, do while, while loops with Examples?
9. Explain Switch, Break, Continue statement with Example?
10. Explain Structure and its Types with Examples?
11. Explain about Pointer and pointer arithmetic with example.
12. Explain Command line arguments with example.

## MATHEMATICAL FOUNDATION I

### TWO MARKS

1. Define a Tautology and give example
2. Define conditional statement
3. Define biconditional operator
4. Show that  $(p \wedge q) \wedge \sim (p \vee q)$  is a contradiction
5. State any 2 laws of Algebra of proposition
6. Find the truth table for  $p \vee \sim q$
7. Show that the proposition  $p \rightarrow q$  and  $\sim p \vee q$  are logically equivalent
8. Write down the negation of (i) All square are rectangle  
(ii) Some even numbers are prime number
9. Write down the contrapositive of (i) If a triangle is equilateral, it is isosceles  
(ii) If a number is divisible by 9, then it is divisible by 3
10. Classify the following as proposition or not (i) Trichy is the capital of Tamilnadu  
(ii) Are you going to school
11. Write down the domain and range of the relation  $R = \{(x, \frac{1}{x}) / 0 < x < 4, x \text{ is an integer}\}$
12.  $f, g: \mathbb{R} \rightarrow \mathbb{R}$  are defined by  $f(x) = x+1$  and  $g(x) = 2x-3$ . Find  $\frac{f}{g}$  and  $\frac{g}{f}$
13. Define difference of sets and given an example
14. Define equivalence relation
15. Write any two types of function
16. Let  $A = \{1, 2, 3\}$ ,  $B = \{1, 3, 5\}$ ,  $C = \{2, 3, 4, 6\}$  | Find  $A - (B \cup C)$
17. Define partially ordered relation
18. Define symmetric relation
19. Define bijective relation
20. Define set
21. What are the types of binary operators
22. Find the value of  $\frac{{}^{11}C_8}{{}^{11}C_7}$
23. How many even numbers of 4 digit can be formed out of the digits 1, 2, 3, ... 9 if repetition of digit is not followed
24. Find  ${}^{10}P_3$

25. Define Distributive operation and Identity operation. Give example
26. Define Symmetric difference
27. If  $S = \{A, B, C, D\}$  where  $A = \emptyset$ ,  $B = \{a, b\}$ ,  $C = \{a, c\}$ ,  $D = \{a, b, c\}$ . Show that  $\cup$  is a binary operation on  $S$ .
28. Let  $S$  be a set and  $*$  be a binary operation on  $S$  satisfying the condition  $a*a=0$  for all  $a \in S$   
 $(a*b)*c = (b*c)*a$ . Show that  $*$  is both commutative and associative
29. Give an example of Boolean algebra and explain
30. Is subtraction, a binary operation operation in  $\mathbb{N}$  ? Explain
31. Find  $\lim_{x \rightarrow 0} \frac{\sin mx}{\sin nx}$
32. What are the maximum and minimum value of  $x + \frac{1}{x}$
33. Find the equation of tangent at  $(2, -12)$  on the curve  $y = 4x - 3x^2 - x^3$
34. Write down the necessary and sufficient condition for existence of an envelope for a family of curves  $f(x, y, \alpha)$
35. Find the  $n^{\text{th}}$  derivative of  $\sin 2x \cos 3x$
36. Write the formula for Radius of curvature
37. Evaluate  $\lim_{x \rightarrow 0} \frac{x^3 - 8}{x - 2}$
38. If  $u = (x-y)(y-z)(z-x)$  show that  $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$
39. Find the  $n^{\text{th}}$  derivative of  $y = \sin(ax+b)$
40. If  $x = 2at^2$  and  $y = 2at$  find  $\frac{dy}{dx}$
41. Show that the points  $A(1, 1)$ ,  $B(5, -9)$  and  $C(-1, 6)$  are collinear.
42. Find the equation of the tangent at the point  $(2, -5)$  on the circle  $x^2 + y^2 - 5x + y - 14 = 0$ .
43. Find the equation of the line which passes through the point of intersection of the lines  $5x - 6y = 1$  and  $3x + 2y + 5 = 0$  and is perpendicular to the line  $3x - 5y + 11 = 0$ .
44. Show that the circles  $x^2 + y^2 - 2x + 6y + 6 = 0$  and  $x^2 + y^2 - 5x + 6y + 15 = 0$  touch each other internally.
45. Find the values of  $\lambda$  so that the equation  $x^2 - \lambda xy + 2y^2 + 3x - 5y + z = 0$  represents a pair of straight lines.
46. Find the equation of the straight line the portion of which between the axes divided by the point  $(4, 3)$  in the ratio 2:3.
47. Find the length of the tangent from the point  $P(x_1, y_1)$  to the circle  $x^2 + y^2 + 2gx + 2fy + c = 0$ .
48. Prove that the lines  $3x - 4y + 5 = 0$ ,  $7x - 8y + 5 = 0$  and  $4x + 5y = 45$  are concurrent.
49. Find the equation of the hyperbola with focus  $(1, -2)$ , eccentricity 2 and directrix  $3x - 4y = 10$ .
50. Find the condition that the line  $y = mx + c$  may touch the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

#### FIVE MARKS

1. Find the truth table for  $\sim p \vee (q \wedge \sim r)$ .

2. Construct the truth table for the contra positive of  $(p \rightarrow q) \rightarrow r$ . Find the truth table of the proposition  $[q \leftrightarrow (r \rightarrow \sim p)][(\sim q \rightarrow p) \rightarrow r]$ .
3. Test the validity of the argument  $p \rightarrow \sim q, \sim r \rightarrow \sim q \vdash p \rightarrow \sim r$ .
4. Show that  $((\sim q) \wedge p) \wedge q$  is a contradiction.
5. Examine whether  $(p \wedge q) \rightarrow (p \vee q)$  is a tautology.
6. Find the truth table for  $p \wedge (q \vee r)$ .
7. Prove that the proposition  $p \vee \sim(p \wedge q)$  is a tautology.
8. Prove that the De-Morgan's law (i)  $\sim(p \wedge q) \equiv \sim p \vee \sim q$ . (ii)  $\sim(p \vee q) \equiv \sim p \wedge \sim q$ .
9. Prove that  $p \rightarrow (q \rightarrow r) \equiv (p \wedge \sim r) \rightarrow \sim q$ .
10. Construct the truth table for the proposition  $(p \wedge q) \wedge \sim(p \vee q)$  where  $\sim$  denote the negation.
11. Show that  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
12. If  $f$  and  $g$  are function defined by  $f(x) = 3x + 4$  and  $g(x) = x^2 + 2$ . Find  $(g \circ f)(x)$  and  $(f \circ g)(x)$ .
13. If  $af(x) + bf\left(\frac{1}{x}\right) = x + \frac{5}{x}, a \neq b$  find  $f(x)$ .
14. For any three sets  $A, B, C$  prove
  - (i)  $(A \cup B) - (A \cap B) = (A - B) \cup (B - A)$
  - (ii)  $A - (B \cup C) = (A - B) \cap (A - C)$ .
15. If  $f(x) = \frac{1}{1-x}$  find  $f \circ (f \circ f)$ .
16. If  $f: A \rightarrow B$  in a one-one and onto function. Prove that  $f \circ f^{-1} = I_B$  and  $f^{-1} \circ f = I_A$  where  $I_A$  and  $I_B$  are the identity function of the set  $A$  and  $B$  respectively.
17. Prove that  $A - (B \cap C) = (A - B) \cup (A - C)$ .
18. Find the inverse of the function  $f(x) = 1 - 2^{-x}$
19. Let  $A = \{1, 2, 3\}$  Define  $f: A \rightarrow A$  by  $f(1) = 2, f(2) = 1$  and  $f(3) = 3$  find  $f^2, f^3, f^4$  and  $f^{-1}$ .
20. Explain types of functions with example.
21. There are 4 bus lines between  $A$  and  $B$  and 3 bus lines between  $B$  and  $C$ .
  - (i) In how many ways can a man travel by bus lines from  $A$  to  $C$  by way of  $B$ ?
  - (ii) In how many ways can a man travel round trip by bus from  $A$  to  $C$  by way of  $B$  if he does not want to use a bus line more than once?
22. From 6 gentlemen and 4 ladies a committee of 5 is to be formed. In how many ways can this be done so as to include at least one lady?
23. Let  $S$  be a non empty set and  $*$  be a binary operation on  $S$  defined by  $x * y = x$ , for  $x, y \in S$ . Check whether  $*$  is commutative and associative.
24. Give example for the relation which is (i) Equivalence (ii) Transitive but neither symmetric nor reflexive (iii) Reflexive but neither transitive nor symmetric. Explain your answers.
25. Prove that  $nC_r = nC_{n-r}$ .
26. Define on  $Z$ ,  $a * b = a$ , for all  $a, b \in Z$ . Show that  $*$  is not associative.
27. A committee of three is to be chosen out of 5 Englishmen, 4 Frenchmen and 3 Indians the committee to contain one of each nationality.
  - (i) In how many ways can this be done?
  - (ii) In how many arrangements will a particular Indian be included?

28. Show that  $b=c$  iff  $a+b=a+c$  and  $a.b=a.c$ .
29. Find the number of arrangements of 5 boys and 5 girls in a row so that no two boys and no two girls sit together.
30. If  $nC_{10} = nC_6$  find  $nC_{11}$ .
31. Determine the maxima and minima of the function  $y = x^5 - 5x^4 + 5x^3 + 10$ .
32. If  $u = \log(x^3 + y^3 + z^3 - 3xyz)$  show that  $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \frac{3}{x+y+z}$ .
33. If  $f = \frac{1}{\sqrt{x^2+y^2+z^2}}$  Show that  $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} + \frac{\partial^2 f}{\partial z^2} = 0$ .
34. Find the equations of the tangent and normal to the curve  $y = 4x - 3x^2 - x^3$ .
35. Find the equation of tangent and normal at  $(2,-2)$  on the curve  $y^2 = \frac{x^3}{4-x}$ .
36. If  $z = e^x(x \cos y - y \sin y)$ , Show that  $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$ .
37. Find the angle between the curves  $y = x^2$  and  $y = (x - 2)^2$ .
38. Find the radius of curvature for the curve  $x = a \cos \Theta$ ,  $y = a \sin \Theta$ .
39. Find the angle between the curves  $y^2 = 4x$ .
40. Show that the radius of curvature at the point  $(x,y)$  on the curve  $y = c \cosh\left(\frac{x}{a}\right)$  is  $\frac{y^2}{a}$ .
41. Show that the points A(1,1), B(5,-9) and C(-1,6) are collinear.
42. Find the equation of the tangent at the point  $(2,-5)$  on the circle  $x^2 + y^2 - 5x + y - 14 = 0$ .
43. Find the equation of the line which passes through the point of intersection of the lines  $5x-6y=1$  and  $3x+2y+5=0$  and is perpendicular to the line  $3x-5y+11=0$ .
44. Show that the circles  $x^2 + y^2 - 2x + 6y + 6 = 0$  and  $x^2 + y^2 - 5x + 6y + 15 = 0$  touch each other internally.
45. Find the values of  $\lambda$  so that the equation  $x^2 - \lambda xy + 2y^2 + 3x - 5y + z = 0$  represents a pair of straight lines.
46. Find the equation of the straight line the portion of which between the axes divided by the point  $(4,3)$  in the ratio 2:3.
47. Find the length of the tangent from the point  $P(x_1, y_1)$  to the circle  $x^2 + y^2 + 2gx + 2fy + c = 0$ .
48. Prove that the lines  $3x-4y+5=0$ ,  $7x-8y+5=0$  and  $4x+5y=45$  are concurrent.
49. Find the equation of the hyperbola with focus  $(1,-2)$ , eccentricity 2 and directrix  $3x-4y=10$ .
50. Find the condition that the line  $y=mx+c$  may touch the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

### TEN MARKS

- Test the validity of the argument "If a man is a bachelor he is unhappy, If a man is unhappy he dies young, Therefore bachelor dies young".
- Prove by truth table  $p \rightarrow (q \vee r) \equiv (p \rightarrow q) \wedge (p \rightarrow r)$ .
- a) Show that  $\sim(p \vee q) \equiv (\sim p) \wedge (\sim q)$  & b) Check whether  $((\sim p) \vee q) \vee (p \wedge (\sim q))$  is a tautology.
- a) Write the inverse, converse and contrapositive for the following: i) If you do not practice you will never learn how to play your horn. ii) Being able to type is sufficient to learn word processing. & (b) test the validity of the argument: On my wife's

birthday I bring her flowers. Either it is my wife's birthday or I work late. I did not bring my wife flowers today. Therefore, I worked late.

5. Prove that  $(p \rightarrow \sim q) \wedge (r \rightarrow p) \wedge q \rightarrow \sim r$  is a tautology.
6. Construct the truth table for i)  $\sim p \vee (q \wedge \sim r)$       ii)  $(p \vee \sim r) \wedge (q \vee \sim r)$   
iii)  $(p \vee \sim q) \wedge (\sim p \vee r)$ .
7. Write down the negation of each of the following proposition (a) If he studies he will pass the examination (b) He swims if and only if the water is warm (c) If Rama is rich then Ravi and Roy are happy (d) Magesh speaks English or Hindi if he speaks Tamil.
8. (a) Define Argument, Testing for validity of arguments. (b) Test the validity of the argument ' If I study then I will not fail in Mathematics, If I do not play Basket ball then I will study, But I failed in Mathematics. Therefore I played Basketball'.
9. Prove the De Morgan's laws a)  $\sim (p \wedge q) \equiv \sim p \vee \sim q$       (b)  $\sim (p \vee q) \equiv \sim p \wedge \sim q$ .
10. Prove that  $\sim (p \vee q) \vee (\sim p \wedge q)$  by using the laws of algebra of proposition.
11. Out of 800 boys in a school, 224 played cricket, 240 played hockey and 336 played basket ball; 80 played cricket and basketball and 40 played cricket and hockey; 24 played in all the three games. How many did not play any one of the game and how many played only one game?
12. Prove that a)  $A - (B \cap C) = (A - B) \cup (A - C)$ . b)  $A - (B \cup C) = (A - B) \cap (A - C)$ .
13. (a) Let  $f(x) = x+1$  and  $g(x) = \begin{cases} x - 1 & \text{if } x > 1 \\ 1 & \text{if } x = 1 \end{cases}$  Compute  $f \circ g$  and  $g \circ f$  and check whether they are onto. (b) If  $f : [0, \frac{\pi}{2}] \rightarrow \mathbb{R}$  is given by  $f(x) = \sin x$  and  $g : [0, \frac{\pi}{2}] \rightarrow \mathbb{R}$  is given by  $g(x) = \cos x$ , show that  $f+g$  is not one-to-one even though each of  $f$  and  $g$  is one-to-one.
14. Out of 880 boys in a school, 224 played cricket, 240 played hockey and 336 played basketball; of the total 64 played both basketball and hockey; 80 played cricket and basketball and 40 played cricket and hockey. 24 played all the three games. How many did not play any of the games and how many played only one game?
15. If  $R$  and  $S$  are equivalence relations in  $X$ . Prove that  $R \cap S$  is an equivalence relation in  $X$ .
16. Explain types of function with neat example.
17. Let  $A = \{1,2,3\}$ . Define  $f:A \rightarrow A$  by  $f(1) = 2$ ,  $f(2) = 1$ , and  $f(3) = 3$ , find  $f^2$ ,  $f^3$ ,  $f^4$  and  $f^{-1}$ .
18. Prove the De Morgan's law i)  $(A \cup B)' = A' \cap B'$       ii)  $(A \cap B)' = A' \cup B'$ .
19. Explain types of Relations with neat example.
20. Let  $f$  and  $g$  be functions defined by  $f(x) = 3x+4$  and  $g(x) = x^2 + 2$ . Find the formulae determining  $g \circ f$  and  $f \circ g$ .
21. A cricket team of 12 players is to be formed from 20 players including 6 bowlers and 3 wicket keepers. In how many ways can team be formed so that the team contains exactly 2 wicket keepers and atleast 4 bowlers?
22. Prove that  $nP_r = (n-1)P_r + r(n-1)P_{r-1}$ .
23. A man has 7 relatives, 4 of them are ladies and 3 gentlemen; his wife also has 7 relatives, 3 of them are ladies and 4 gentlemen. In how many ways can they invite a

dinner party of 3 ladies and 3 gentlemen so that there are 3 of man's relatives and 3 of wife's relatives?

24. A student is to answer 12 out of 15 questions in an examination. How many choices does the student have? (a) in all? (b) if he must answer the first two questions? (c) if he must answer the first or second question but not the both? (d) if he must answer exactly 3 of the first five questions? (e) if he must answer at least 3 of the first five questions?
25. (a) Find i)  ${}^{90}C_{88}$  and ii)  ${}^{15}P_4$ . & (b) Find the number of permutation of the letters of the word MISSISSIPPI.
26. In how many ways can the letters of the word NAGERKOIL be arranged? How many of them begin with NA? In how many of them the 4 vowels come together? How many of them begin with the 4 vowels.
27. The letters of the word NATURE are permuted and the words so formed are arranged as in a dictionary. Find the rank of the word NATURE.
28. In an examination paper, there are 7 questions in part A out of which any 4 are to be attempted and there are 6 questions in part B out of which 3 are to be attempted. In how many different ways can a candidate answer part A and part B in full?
29. If  $nC_r : nC_{r+1} = 1:2$  and  $nC_{r+1} : nC_{r+2} = 2:3$ , determine the values of n and r.
30. Find the number of ways in which 12 persons may be divided into 4 sets of 3 each, one to play lawn tennis, one to play cards one to play badminton and one to play table tennis.
31. If  $y = a \cos(\log x) + b \sin(\log x)$  prove that  $x^2 y_{n+2} + (2n+1)xy_{n+1} + (n^2+1)y_n = 0$ .
32. If  $y = \sin^{-1}x$ . Prove that  $(1-x^2)y_2 - xy_1 = 0$  and  $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2y_n = 0$ .
33. (a) If  $\sin y = x \sin (a+y)$  find  $\frac{dy}{dx}$  & (b) If  $u = x^3+y^3+z^3-3xyz$  find  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + z \frac{\partial u}{\partial z}$ .
34. Prove that the radius curvature at the point  $(a \cos^3 \Theta, a \sin^3 \Theta)$  on the curve  $x^{2/3} + y^{2/3} = a^{2/3}$  is  $3a \sin \Theta \cos \Theta$ .
35. Find the radius of curvature at  $x=y=\frac{3a}{2}$  to the curve  $x^3 + y^3 = 3axy$ .
36. Find the equation of tangent and normal at the point  $t=\frac{1}{2}$  on the curve  $x = \frac{2at^2}{1+t^2}$  ;  

$$y = \frac{2at^3}{1+t^3}$$
37. Find the radius of curvature at t on the curve is  $x=6t^2-3t^4, y=8t^3$  is  $6t(1+t^2)^2$ .
38. Find the maximum and minimum value of  $x^3 - 18x^2 + 96x + 4$ .
39. Find the angle between the curves  $y^2 = 4x$  and  $x^2 = 4y$ .
40. If  $u = \log (\tan x + \tan y + \tan z)$  prove that  $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z} = 2$ .
41. Find the equation of the circle passing through the points (1,1), (2,-1) and (3,2).
42. Find the centre, foci, eccentricity and latus rectum of the ellipse  
 $3x^2 + 4y^2 + 6x - 8y - 5 = 0$ .
43. Find the value of k so that  $2x^2 + 5xy + 2y^2 + 15x + 18y + k = 0$  may represent a pair of straight lines. Find the equation of bisectors of the angle between these lines.
44. Show that the area of the triangle formed by the lines  $ax^2 + 2hxy + by^2 = 0$ ,



$$lx + my + n = 0 \text{ is } \frac{n^2\sqrt{h^2 - ab}}{am^2 - 2hlm + bl^2}.$$

45. Find the equation of the circle whose centre lies on the line  $x = 2y$  and which passes through the points  $(-1,2)$  and  $(3,-2)$ .
46. Find the equation of the tangent at the point  $(2,-5)$  on the circle  $x^2+y^2-5x+y-14 = 0$ .
47. Find the value of  $\lambda$  so that the equation  $x^2 - \lambda xy - y^2 + 3x - 5y + 2 = 0$ .
48. a) Find the centre and radius of the circle  $x^2+y^2-14x+6y+9 = 0$ . (b) Find the length of the tangent from the point  $(2,3)$  to the circle  $x^2+y^2+8x+4y+8 = 0$ .
49. If the slopes of one of the lines of  $ax^2 + 2hxy + by^2 = 0$  is twice that of the other show that  $8h^2 = 9ab$ .
50. Show that the pair of lines  $ax^2 + 2hxy + by^2 = 0$  is perpendicular to the pair  $bx^2 - 2by + ay^2 = 0$ .

## SEMESTER II

### C++ DATA STRUCTURES

#### TWO MARKS

1. Define OOPs.
2. Define Objects.
3. What are the features of Object oriented programming.
4. Define Encapsulation and Data hiding.
5. Define Data Abstraction.
6. Define Data members.
7. Define Member functions.
8. Define Inheritance.
9. Define Polymorphism.
10. List and define the two types of Polymorphism.
11. Define Dynamic Binding.
12. Define Message Passing.
13. List some benefits of OOPS.
14. List out the applications of OOP.
15. What is the return type of `main ()`?
16. List out the four basic sections in a typical C++ program.

17. Define Token. What are the tokens used in C++?
18. Define identifier. What are the rules to be followed for identifiers?
19. State the use of void in C++.
20. Define an Enumeration data type.
21. Define reference variable. Give its syntax.
22. List out the new operators introduced in c++.
23. What is the use of Scope resolution operator?
24. List out the memory referencing operators.
25. Define Implicit Conversion.
26. What is call by reference?
27. What are inline functions?
28. State the advantages of Default Arguments.
29. Define Function overloading.
30. Define friend function.
31. Write the limitations/ disadvantages of C++
32. Define Constructor.
33. List some of the special characteristics of constructor.
34. Give the various types of constructors.
35. What are the ways in which a constructor can be called?
36. What is meant by dynamic initialization of objects.
37. Define Destructor.
38. List some of the rules for operator overloading.
39. What are the types of type conversions?
40. What are the conditions should a casting operator satisfy?
41. How the objects are initialized dynamically?

42. Define abstract class.
43. Define virtual base class
44. What are types of inheritance?
45. Give the syntax for inheritance.
46. Define single inheritance.
47. Define multi-level inheritance.
48. Define multiple inheritance.
49. What is an abstract class?
50. Define manipulators and also mention the manipulators that are used in C++.
51. What is the need for streams?
52. List some predefined streams.
53. What are the possible types that a file can be defined?
54. What are the two methods available for opening the files?
55. What is global namespace?
56. Write any four operations possible on string objects.
57. What are the advantages of using generic algorithm?
58. What is find()?
59. What are the ways that a string object can be created?
60. What is a pointer . Give eg.
61. Give the use of new and delete .
62. Write the use of functions malloc() and free()
63. Explain how to create dynamic objects
64. What is static binding.
65. What is dynamic binding .
66. What are the types of polymorphism.

67. Define 'this' pointer.
68. What is virtual function?
69. When a function is declared as virtual, C++ determines which function to
70. What is pure virtual function.
71. What is a data structure.
72. What does abstract data type means.
73. Explain about the types of linked lists.

**FIVE MARKS**

1. Explain the different types of polymorphism.
2. Explain Multilevel and hybrid Inheritance.
3. Describe Pure Virtual function with an example.
4. Write a C++ program using this pointer.
5. Write a C++ program for calculating the are of rectangle and circle using run time polymorphism (5)
6. Explain the basic concepts of Object oriented programming
7. Explain the use of constant pointers and pointers to constant with an example.
8. State the differences between class and struct and also illustrate with an example.
9. What are the difference between pointers to constants and constant to pointers?
10. Write a C++ program using inline function. \
11. Write a C++ program to illustrate the static function
12. Explain about call by reference and return by reference with program.
13. Explain Nested classes and local classes with an example
14. Write a program to evaluate the following function  

$$\sin(x) = x - x^3 / 3! + x^5 / 5! - x^7 / 7! + \dots$$
15. Explain the structure of C++ program
16. Explain in detail about formatted and unformatted console I/O operations.
17. . Write about declaring member function inside and outside a class
18. Explain the copy constructors with an example.
19. Whether Linked List is linear or Non-linear data structure?
20. Evaluate the following prefix expression " ++ 26 + - 1324"
21. How is it possible to insert different type of elements in stack?
22. Stack can be described as a pointer. Explain.
23. Which data structure is needed to convert infix notations to post fix notations.

**TEN MARKS**

1. Explain various types of Inheritance.
2. Write a C++ program using dynamic\_const.

3. Write a program in C++ to read two strings and perform the following string manipulation function .
4. (A) Find the long string Compare the two strings  
Concatenate them b) Explain in detail about dynamic objects. How are they created
5. Explain the basic concepts of Object oriented programming
6. Explain briefly about function overloading with a suitable example.
7. Explain Nested classes and local classes with an example
8. Write a program to explain the concept of array of objects.
9. Explain explicit Constructors, Parametrized Constructors, and multiple Constructors  
a. with suitable example.
10. How to achieve operator overloading through friend Function?
11. Write a program to add two complex numbers using operator overloading concept
12. Write a C++ program to find the area of various 2D shapes such as square, rectangle, triangle, circle and ellipse using function overloading.
13. Explain about Formatted and Unformatted IO with suitable Example
14. What is manipulator? Difference between manipulators and ios Function?
15. Explain the process of open,read,write and close files?
16. Explain the role of seekg(),seekp(),tellg(),tellp(),function in the process of random access in a binary file .
17. Write an algorithm to merge two sorted arrays into a third array. Do not sort the third array.
18. Convert the following infix expression to post fix notation  $((a+2)*(b+4)) - 1$  (Similar types can be asked) .

### Semester III(II Year)

### PROGRAMMING IN JAVA

#### TWO MARKS

1. What is meant by abstraction?
2. What is meant by Encapsulation?
3. What is mean by Polymorphism?
4. What are methods and how are they defined?
5. What are different types of access modifiers (Access specifiers)?
6. What is an Object and how do you allocate memory to it?
7. Explain the usage of Java packages.
8. What is method overloading and method overriding?
9. What gives java it's "write once and run anywhere" nature?
10. What is a constructor?
11. What is a destructor?
12. What is the difference between constructor and method?
13. What is **Static member classes**?
14. What is Garbage Collection and how to call it explicitly?
15. In Java, How to make an object completely encapsulated?  
What is static variable and static method?

16. What is finalize() method?
17. What is the difference between String and String Buffer?
18. What is the difference between Array and vector?
19. What is a package?
20. What is the difference between this() and super()?
21. Explain working of Java Virtual Machine (JVM)?
22. What is meant by Inheritance? What is the difference between superclass and subclass?
23. What is meant by Binding?
24. What is meant by Polymorphism? What is an Interface?  
What is reflection API? How are they implemented?
25. What is the difference between a static and a non-static inner class?
26. What is the difference between abstract class and interface?
27. Can you have an inner class inside a method and what variables can you access?
28. What is interface and its use? How is polymorphism achieved in java?
29. What modifiers may be used with top-level class?
30. What is a cloneable interface and how many methods does it contain?
31. What are the methods provided by the object class?
32. Define: Dynamic proxy.
33. What is object cloning?
34. What is the relationship between the Canvas class and the Graphics class?
35. How would you create a button with rounded edges?
36. What is the difference between the 'Font' and 'FontMetrics' class?
37. What is the difference between the paint() and repaint() methods?
38. Which containers use a border Layout as their default layout?
39. What is the difference between applications and applets?
40. Difference between Swing and Awt?
41. What is a layout manager and what are different types of layout managers available in java AWT?
42. How are the elements of different layouts organized?
43. Why would you use Swing Utilities.invokeLater or SwingUtilities.invokeLater?
44. What is an event and what are the models available for event handling?
45. What is the difference between scrollbar and scrollpane?
46. Why won't the JVM terminate when I close all the application windows?
47. What is the difference between a Choice and a List?
48. What is the purpose of the enableEvents() method?
49. What is the difference between the File and RandomAccessFile classes?
50. What is the lifecycle of an applet?
51. What is the difference between a MenuItem and a CheckboxMenuItem?
52. What class is the top of the AWT event hierarchy?
53. What is source and listener?
54. Explain how to render an HTML page using only Swing.
55. How would you detect a keypress in a JComboBox?
56. What is an I/O filter?
57. How can I create my own GUI components?
58. What is an exception?
59. What is error?
60. What are the advantages of using exception handling?
61. What are the types of Exceptions in Java

62. How does a try statement determine which catch clause should be used to handle an exception?
63. What is the purpose of the finally clause of a try-catch-finally statement?
64. What is the difference between checked and Unchecked Exceptions in Java?
65. What is the difference between exception and error?
66. What is the catch or declare rule for method declarations?
67. When is the finally clause of a try-catch-finally statement executed?
68. What if there is a break or return statement in try block followed by finally block?
69. How to create custom exceptions?
70. Can we have the try block without catch block?
71. What is the difference between swing and applet?
72. What is the difference between throw and throws clause?
73. Where does Exception stand in the Java tree hierarchy?
74. Explain the exception hierarchy in java.
75. Explain different way of using thread?
76. What are the different states of a thread ?
77. Why are there separate wait and sleep methods?
78. What is synchronization and why is it important?
79. How does multithreading take place on a computer with a single CPU?
80. What is the difference between process and thread?
81. What happens when you invoke a thread's interrupt method while it is sleeping or waiting?
82. How can we create a thread?
83. What are three ways in which a thread can enter the waiting state?
84. How can i tell what state a thread is in ?
85. What is synchronized keyword? In what situations you will Use it?
86. What is serialization?
87. What does the Serializable interface do?
88. When you will synchronize a piece of your code?
89. What is daemon thread and which method is used to create the daemon thread?
90. What is the difference between yielding and sleeping?
91. What is casting?
92. What classes of exceptions may be thrown by a throw statement?
100. A Thread is runnable, how does that work?
101. What is JDBC?
102. What is JDBC Driver?
103. What are the steps to connect to the database in java?
104. What are the JDBC API components?
105. What are the JDBC statements?
106. What is the return type of Class.forName() method?
107. What are the differences between Statement and PreparedStatement interface?
108. What are the benefits of PreparedStatement over Statement?
109. What are the differences between execute, executeQuery, and executeUpdate?
110. How can we execute stored procedures using CallableStatement?
111. What is the role of the JDBC DriverManager class?
112. What are the functions of the JDBC Connection interface?
113. What does the JDBC ResultSetMetaData interface?
114. How can we store the file in the Oracle database?
115. How can we retrieve the file in the Oracle database?
116. What are different types of JDBC Drivers?

117. What is JDBC Connection?  
118. What is the use of JDBC DriverManager class?  
119. What is JDBC Statement  
120. What is JDBC PreparedStatement?  
121. What is JDBC ResultSet?

### **FIVE MARKS**

1. Explain OOP Principles.
2. Explain the features of Java Language.
3. Compare and Contrast Java with C.
4. Compare and Contrast Java with C++.
5. Explain Constructors with examples.
6. Explain the methods available under String and String Buffer Class.
7. Explain the Date Class methods with examples.
8. Discuss in detail the access specifiers available in Java.
9. Explain the different visibility controls and also compare with each of them.
10. Explain the different methods in java.Util.Arrays class with example.
11. Explain Packages in detail.
12. Discuss the methods under Array Class.
13. Discuss some of the classes available under Lang package.
14. Illustrate with examples: static and final.
15. Explain method overriding with example program.
16. What is javaDoc? Explain the comments for classes, methods, fields and link.
17. Application Programs in Java.
18. Explain the concept of inheritance and its types.
19. Explain the concept of overriding with examples.
20. What is dynamic binding? Explain with example.
21. Explain the uses of reflection with examples.
22. Define an interface. Explain with example.
23. Explain the methods under "object" class and "class" class.
24. What is object cloning? Explain deep copy and shallow copy with examples.
25. Explain static nested class and inner class with examples.
26. With an example explain proxies.
27. Explain the classes under 2D shapes.
28. Explain event handling with examples.
29. Explain action event with an example.
30. What are the swing components. Explain.
31. Describe the AWT event hierarchy.
32. Explain the different states of a thread.
33. Explain thread synchronization with examples.
34. Explain the algorithm used for thread scheduling.
35. Describe multi threading.
36. Explain Deadlocks.
37. Explain the features of layout managers.
38. Write note on JDBC.
39. Explain two tier and three tier client server model.
40. Explain classes and interfaces in JDBC.
41. Write note on Database Metadata.
42. Write note on Resultset Metadata.



## TEN MARKS

1. Explain the basic concept of oops in detail.
2. Describe the concept of method overriding with example
3. Discuss about method of defining and accessing packages in java
4. Explain the concept of i/o stream classes in java in detail.
5. List out various decision making statement in java
6. Explain layout managers.
7. Explain the following i)client server ii)proxy server iii)DNS
8. Explain exception handling mechanism in java
9. Discuss stream classes available in java
10. Explain various types of controls in AWT?
11. Explain fundamental of applet
12. Write short notes on
  - a)Drawing line b)Drawing Rectangle c)Drawing Ovals
13. discuss on JButton
14. write five colour constants and their RGB values
15. write about menu with frames
16. write program to create a menu by using JFrame
17. Discuss about thread synchronization
18. Explain control statement in java
19. Explain sequential file with example
20. Explain menus with frames
21. Explain types of drivers in JDBC.
- 22.Explain Architecture in JDBC.
- 23.Explain steps in developing JDBC Applications.
24. Write a program to create a new database and table with JDBC.

## STATISTICAL METHODS AND THEIR APPLICATIONS-I

### TWO MARKS

1. Define statistics
2. Define primary data
3. Define secondary data
4. What are the various methods collecting primary data
5. State the meaning of questionnaire
6. Define census survey
7. Define sample
8. Define random sampling
9. Define stratified sampling
10. Define cluster sampling
11. Define quota sampling
12. Define statistical errors
13. Define sampling unit
14. What do you mean by sampling
15. Define classification

16. Define tabulation
17. What are the requisites of good table
18. What are the different type of diagram
19. Define histogram
20. Define graph
21. What are the general rule for graphing the data
22. What are the statistical average
23. Define mean
24. Define median
25. Define mode
26. Define harmonic mean
27. Define geometric mean
28. Define weighted mean
29. Define quartiles
30. Define range
31. What are the uses of mean deviation
32. Calculate the standard deviation from the given 14 ,22,9,15,20,17,12,11
33. Define co-efficient of variation
34. Write the formula for combined mean what are quartiles
35. Define skewness
36. Define kurtosis
37. Define moment
38. What are quartiles?
39. What are the different measures of skewness?
40. The median, mode, and coefficient of skewness for a certain distribution are respectively 17.4, 15.3 and 0.35 .calculate the coefficient of variation.
41. You are given mean =50, C.V=40%,Sk= -0.4.you are required to find standard deviation .mode and median.
42. For a distribution bowley's coefficient of skewness is -0.36.Q1=8.6 and median =12.3,what is its quartiles coefficient of dispersion ?
43. Compute quartile deviation and the coefficient of skewness from the following values. median=18.8, Q1=14.6,Q3=25.3.
44. The measure of skewness for certain distribution is -0.82.If the lower and the upper quartiles are 44.1 and 56.6 respectively .find the median.
45. In a moderately skewed frequency distribution, the mean is RS.15 and median isRs14 .the coefficient of variation is30%.find the pearsonian coefficient of skewness.
46. Define correlation.
47. Define regression.
48. What are the properties of the regression coefficient .
49. What are the properties of the central moment
50. Define scatter diagram.
51. Distinguish between discrete data and continuous data.
52. Define Spearman's rank correlation.
53. Differentiate Correlation and Regression.

54. What are the four types of Classification of data.
55. Write down the formula for individual observation of Standard Deviation.
56. If  $Q_1=30$  and  $Q_3=50$ . Find co efficient of Quartile deviation.
57. Define frequency polygon.
58. Define Kellys coefficient of Skewness.
59. Say True or False:  
There are no limits to the value of r.
60. Find the median of first fifty Natural numbers.
61. What are the methods for Studying Skewness?
62. Write the formula for finding rank correlation coefficient when ranks are repeated.
63. State types of bar diagram
64. State Bowley's co efficient of skewness
65. Write the formula of skewness.
66. Find the range for the given data:35,40,52,41,27,30,15,75
67. State the relationship between mean median mode.
68. What is positive correlation.
69. State merits of Quartile deviation.
70. Define co efficient of mean deviation.
71. What are regression lines

#### **FIVE MARKS**

1. Explain the limitation of statistics
2. Explain and illustrate the uses of statistics in commerce and business
3. Distinguish between primary data and secondary data
4. Discuss the various methods of collecting primary data
5. Explain the requirements of a good questionnaire
6. Describe clearly "Indirect personal interview" as a method of collecting statistical data
7. Distinguish between the census and sampling methods of collecting data and compare their merits
8. Explain the difference between a sample survey and a census survey
9. Explain the random sampling
10. Explain the quota sampling
11. Explain the cluster sampling
12. Distinguish between classification and tabulation
13. What are the merits and limitation of a diagrammatic representation of statistical data
14. Explain the histogram
15. Define graph what are the min advantages of graph
16. Calculate the mean from the following data

Marks	4	5	6	7	8	9
No of students	8	10	9	6	4	3

17. Calculate the arithmetic

mean from the following data

C.I	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
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F	6	5	15	10	5	4	3	2
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18. Find the missing frequency from the following data

marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	10	12	16	?	14	10	8

The mean is 16.82

19. Calculate the median from the following data

Value	Frequency
Less than 100	40
100-200	89
200-300	148
300-400	64
400 and above	39

20. Calculate the mode from the following data

Size	10	11	12	13	14	15	16	17	18
Frequency	10	12	15	19	20	8	4	3	2

21. Find the

mode from the following data

Value	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	5	7	12	18	16	10	5

22. If the mean and median of a moderately a symmetrical series are 26.8 and 27.8 respectively, what would be its most probable mode

23. Calculate geometric mean of the following data and given

Family	A	B	C	D	E
income	50	72	54	82	93

24. Find the geometric mean, mean and harmonic mean for the following data

Marks	0-10	10-20	20-30	30-40	40-50
No of students	5	7	15	25	8

25.

Calculate

the range and co-efficient of range

41,11,14,65,73,64,53,35,71,55

26 .From the following data compute quartile deviation.

Size	4-7	8-10	11-13	14-16	17-19
Frequency	14	24	38	20	4

27. Calculate inter quartile range for the data given below

C-I	0-10	10-20	20-30	30-40	40-50
Frequency	4	15	28	16	7

28. Calculate the standard deviation for the following data

Size	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

29. The numbers of members mean and S.D of the distribution are

number of members	280	350
Mean	45	54
S.D	6	4

Find the mean and S.D of the distribution formed by the two distribution taken together

30. Co efficient of the variation of two series of two series are 75% and 90% and their S.D are

15&18 respectively. Find the mean

31. What is a kurtosis? How does it differ from skewness?

32. Deference between dispersion and skewness

33. Explain karlpearson's coefficient of skewness

34. Calculate the coefficient of skewness from the following data

Wages	5	6	7	8	9	10	11	12
Workers	25	45	65	100	30	75	40	50

35. The sum of 20 obervations is 300 and its sum of square is 5000 and median is 15.then find its coefficient of skewness and coefficient of variation

36. Calculate first four moment s from the following data and find out

$\beta_1$  and  $\beta_2$

X	0	1	2	3	4	5	6	7	8
F	5	10	15	20	25	20	15	10	5

37.The first four central moments of a design are 0,2.5,0.7 and 18.75. Test the skewness and kurtosis of the distribution.

38. Calculate

i) The regression equation of X on Y and Y on X from the following data

ii) Estimate X when Y=20

X	10	12	13	17	18
Y	5	6	7	9	13

39. Distinguish between "correlation" and "regression" analysis

40. Given  $X=0.37Y$

$$Y=0.65x * \sigma_x = 12$$

Find  $\sigma_y$  and r

41.Coefficient of correlation between two variables X and Y is 0.48.Their co variance is

36. The variance of X is 16. Find the S.D of Y series.

42. Calculate karlpearsons coefficient of correlation from the data

X	2	4	6	8	10
Y	12	14	16	18	20

43. Calculate coefficient of correlation by concurrent deviation a method from the following data

X	30	40	50	50	20	10	60	70	40
Y	90	70	80	100	100	60	75	85	95

44. Calculate a suitable coefficient of correlation from the data

X	15	18	20	24	30	35	40	50
Y	85	93	95	105	120	130	150	160

45. Calculate Geometric mean from the following data

Roll No: 1    2    3    4    5    6

Marks: 5    15    25    35    45    55

46. Calculate Karl Person's co efficient of skewness for the following data

20,15,23, 40,27,25,23,25,20.

47. Calculate the Spearman's Rank correlation coefficient for the following data

X	80	91	99	71	61	81	70	59
Y	123	135	154	110	105	134	121	106

48. Calculate co efficient of correlation for the following pairs of values of x and y

X	17	19	21	26	20	28	26	27
Y	23	27	25	26	27	25	30	33

49. Find Bowley's coefficient of Skewness for the following frequency distribution:

No of Children per family : 0    1    2    3    4    5    6

No of families :                    7    10    16    25    18    11    8

50. Calculate the quartile deviation from the following data :

Age in Years:            20    30    40    50    60    70    80

No of members:        3        61    132    153    140    51    3

51. The Wheat production (in Kg) of 20 acres is given as : 1120, 1240, 1320, 1040, 1080, 1200, 1440, 1360, 1680, 1730, 1785, 1342, 1960, 1880, 1755, 1720, 1600, 1470, 1750, and 1885. Find the quartile deviation and coefficient of quartile deviation.

52. Write down the nature of skewness and its Characteristics.

53. Below is given the IQ scores of 120 students of a class. Calculate the skewness based on median

IQ score:                    50-60    60-70    70-80    80-90    90-100    100-110    110-120    120-130  
130-140

No of students:            5        8        10        18        25        21        19        10

4

54. Compute the coefficient of Rank correlation between sales and advertisement expressed in thousands of dollars from the following data

Sales:                    90    85    68    75    82    80    95    70

Advertisement:        7    6    2    3    4    5    8    1

55. Calculate the mean deviation from the arithmetic mean in respect to the marks obtained by nine students given 7,4,10,9,15,12,7,9,7.

56. Calculate the first four moments of the following distribution about the mean and hence find

$\beta_1$  and  $\beta_2$ .

X:	0	1	2	3	4	5	6	7	8
F:	1	8	28	56	70	56	28	8	1

57. Draw a histogram for the frequency distribution

Mark (X):	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
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No of students :	9	11	10	44	45	54	37	26	8	5
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58. Distinguish between Skewness and kurtosis

59. Mention the qualities of a good average.

60. Define the Co efficient of variation and its uses

61. Explain Scatter diagram.

62. To calculate a Spearman rank order correlation on data without any ties we will use the

following data:

English: 56 75 45 71 62 64 58 80 76 61

Maths: 66 70 40 60 65 56 59 77 67 63

63. Obtain the equations of regression lines from the following data:

$$n = 20, \sum x = 80, \sum y = 40, \sum x^2 = 1680, \sum y^2 = 320, \sum xy = 480$$

64. Find the mean, median and mode for the following Data and verify the empirical relation

among them.

Class interval : 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90

Frequency: 3 7 13 17 18 10 8 5 6

65. Calculate combined standard deviation for the following data

	X	Y	Z
No of observation	25	35	15
Average	30	40	33
Standard deviation	6	12	8

66. Explain simple bar diagram and subdivided bar diagram with one example each.

67. Determine the equation of a straight line which best fits the data.

X: 10 12 13 16 17 20 25

Y: 10 22 24 27 29 33 37

68. Calculate the coefficient of correlation and obtain the lines of regression for the following:

X: 1 2 3 4 5 6 7 8 9

Y: 9 8 10 12 11 13 14 16 15

Obtain an estimate of Y which would correspond to the average  $X = 6.2$

69. Given :  $N=50$ , Mean of  $Y = 44$   
 Variance of  $X$  is  $9/16$  of the variance of  $Y$   
 Regression Equation of  $X$  on  $Y = 3Y-5X= -180$   
 Find (1) the mean of  $X$   
 (2) Coefficient of correlation between  $X$  and  $Y$ .

70. From the following regression equation find the mean values of  $X$  and  $Y$  series. Given the variance of  $X = 9$ .

$$8X - 19Y = -66$$

$$40X - 18Y = 214$$

- Find (1) Average values of  $X$  and  $Y$   
 (2) Correlation coefficient between the two variable  
 (3) Standard Deviation of  $Y$

### 10 Marks

1. Explain the scope of statistics
2. What are the uses and limitations of statistics
3. Explain the terms: Random sampling, stratified random sampling, purpose of sampling
4. Distinguish between classification and tabulation mention the requisites of good statistical table
5. Explain the different types of diagram
6. Explain frequency polygon and the frequency curve
7. Prepare the histogram and a frequency polygon from the following data

C.I	0-6	6-12	12-18	18-24	24-30	30-36
F	4	8	15	20	12	6

8. For a certain frequency table which is only partly reproduced here .the mean was found to be 1.46.

No.of.accidents	0	1	2	3	4	5
frequency	46	?	?	25	10	5

Calculate the missing frequencies.

9. Calculate the mean .the median and mode from the following data.

Age	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95
No.of.people	7	13	20	15	30	33	28	14

9. Calculate the arithmetic mean, geometric mean, and harmonic mean from the following data are given,

Variable	3	4	5	6	7	8	9	10	11
frequency	2	5	9	14	15	8	6	3	1

10. Calculate the median and mode.

No. of day absent	No, of students
-------------------	-----------------



Less than 5	29
Less than 10	224
Less than 15	465
Less than 20	582
Less than 25	634
Less than 30	644
Less than 35	650

11. Calculate the inter quartile range for the data given below

Class	0-10	10-20	20-30	30-40	40-50
frequency	4	15	28	16	7

12. Calculate the mean deviation from the mean the following data.

Size of item	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Frequency	3	7	22	60	85	32	8

13. Compute the S.D and M.D from the mean for the distribution given below

A	101	27	0	36	82	45	7	13	65	14
B	97	12	40	96	13	8	85	8	56	15

14. Explain the difference between “skewness” and kurtosis

15. From the following distribution calculate

- (i) The first four methods about the mean
- (ii) Skewness based on moments
- (iii) Kurtosis

Income Rs	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

16. Explain different types of classification.

17. Find the regression coefficient of X on Y and Y on X for the following data.

X	3	2	-1	6	4	-2	5
Y	5	13	12	-1	2	20	0

18. Explain the methods of calculating spearman’s rank correlation coefficient.

19. What is regression? How is this concept useful of business forecasting?

20. What are the properties of the regression coefficient?

21. What is meant by correlation? What are the properties of the coefficient of correlation?

22. From the data given below calculate rank correlation.

A	24	29	19	14	30	19	27	30	20	28	11
B	37	35	11	16	26	23	27	19	20	16	21

23. Determine the equation of a straight line which best fits the data.

X	10	12	13	16	17	20	25
Y	10	22	24	27	29	33	37

24. Calculate two regression equation X on Y and Y on X from the data given below , taking

deviation from actual means X and Y.

Price	10	12	13	12	16	15
Amount demand	40	38	43	45	37	43

25. Calculate Karl Pearson's coefficient of correlation from the following data.

- A) Sum of deviations of X=5
- b) Sum of deviations of Y=4
- c) Sum of squares of deviations of X=40
- d) Sum of squares of y=50
- e) Sum of product of deviations of X and Y =32
- f) No of pairs of observations =10

26. Two random variables have the following regression equations

$$3X+2Y-26=0$$

$$6X+Y-31=0$$

Find the mean values and the coefficient of correlation between X and Y. if the variance of X=25, find the standard deviation of Y from the data given above.

27. In a correlation study the following values are obtained.

	X	y
Mean	65	67
Standard deviate	2.5	3.5
Coefficient of correlation	0.8	

Find the two regression equations that are associated with the values.

28. What is meant by a measure of dispersion? State the different methods of measuring it.

29. From the information given below calculate karlpearson's coefficient of skewness and also quartile of skewness .

Measure	Place A	Place B
Mean	256.5	240.8
Median	201	201.6
S.D	215.4	181.1
Third quartile	260	242
First quartile	157	164.2

30. The following table shows the ages (X) and Blood Pressure (Y) of 8 persons

X: 52 63 45 36 72 65 47 25

Y: 62 53 51 25 79 43 60 33

Obtain the regression equation of Y on X and find the expected blood pressure of a person who is 49 years old.

31. Discuss about pictographs and cartograms

32. Explain Concurrent Deviation method.

33. Find the missing frequency. If arithmetic mean is 28 of the data given below find the median of the series later:

Profit per shop:	0-10	10-20	20-30	30-40	40-50	50-60
No of shops:	12	18	27	?	17	6

34. The frequency distribution of weight in grams of Mangoes of a given variety is given below.

Calculate the arithmetic mean, median and mode

Weights (in gms):	410-419	420-429	430-439	440-449	450-459	460-469	470-479
No of mangoes:	14	20	42	54	45	18	7

35. Calculate the quartile deviation and coefficient of quartile deviation from the data given below

Maximum Load (short tons)	Number of cables
9.3-9.7	2
9.8-10.2	5
10.3-10.7	12
10.8-11.2	17
11.3-11.7	14
11.08-12.2	6
12.3-12.7	3
12.8-13.2	1

36. In a class of 50 students 10 have failed and their averages marks is 205. The total marks secured

by the entire class were 281. Find the average marks of those who have passed.

37. Find out the coefficient of mean deviation in the following series

Age in years:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No of persons:	20	25	32	40	42	35	10	8

38. For a group of 50 male workers, the mean and the standard deviation of their wages are Rs 63 and Rs 9 respectively. For a group 40 female workers these are Rs 54 and Rs 6 respectively. Find the standard deviation for the combined group of 90 workers.

39. In two factories A and B, engaged in the same industrial area the average weekly wages (in

rupees) and the standard deviations are as follows :

Factory	Average	Standard deviation	No of workers
A	34.5	5	476
B	28.5	4.5	524

A) Which factory A or B pays out a larger amount as weekly wages?

B) Which factory A or B has greater variability in individual wages?

40. Particulars regarding income of the two villages are below:

	Village A	Village B
No of people	600	500
Average income	175	186
Variance of income	100	81

- In which village is the variation in income greater?
- What is the total income of the both the villages put together?
- What is the average income of the people of the both the villages put together?
- What is the combined Standard deviation?

41. A sample of size 15 has mean 3.5 and S.D 3.0. Another sample of size 22 has mean 4.7 and S.D is

4.0. if the two samples are plotted together, find the mean and S.D of the combined mean.

42. Obtain the equations of Regression lines from the following data

$$n=20, \sum x = 50, \sum y = 25, \sum x^2 = 1250, \sum y^2 = 300, \sum xy = 400$$

43. Calculate Kelly's coefficient of skewness for the given data

Salary:	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No of employees:	25	40	50	90	80	75	35	60

44. Calculate Bowleys Coefficient of Skewness from the following data.

Mid value:	75	100	125	150	175	200	225	250
Frequency:	35	40	48	100	125	80	50	22

45. Calculate the first 4 moment about the mean and also the value of  $\beta_1$  and  $\beta_2$

Marks:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No of Students:	8	12	20	30	15	10	5

46. The following data relate to the expenditure of the family A,B,C per month.

Items of expenditure	Family A	Family B	Family C
Food	40	60	160
Rent	20	40	150
Clothing	20	30	100
Education	10	40	80
Savings	5	10	30
others	5	20	80

Represent the data by pie diagram

47. Explain the various diagrammatic and graphical representation of data.

48. Calculate the Geometric mean from the following data and also state the merits and demerits of

Geometric mean

Marks:	0-10	10-20	20-30	30-40	40-50
No of students:	8	12	18	8	6

49. The score of two player A and B in a innings :

Player A	46	42	11	40	43	41	45
Player b	40	38	36	35	39	37	41

Find out coefficient of variation, which player more consistent in scoring?

50. Calculate mean deviation from the following data :

Marks ( less than )	No of students	Marks (less than)	No of students
80	100	40	32
70	90	30	20
60	80	20	13
50	60	10	5

51. Present the following data by a rectangular diagram.

	Commodities A	Commodities B
Price / Unit of commodity	10	12
Quantity Sold	20	24
Cost of raw material used	100	120
Other cost	60	96
Profit	40	70

52. Find Mean, Median and Mode for the following data and verify the empirical relation among them.

Class Interval :	1-10	11-20	21-30	31-40	40-50	51-60	61-70	71-80	81-90
Frequency:	3	7	13	17	18	10	8	5	6

53. The following data relate to the expenditure of the family A, B, C per month.

Items of Expenditure	Family A	Family B	Family C
Food	40	60	160
Rent	20	40	150
Clothing	20	30	100
Education	10	40	80
Litigation	5	10	30
Others	5	20	80

54. State the steps involved for computation of median with continuous series ?

55. Discuss about Pictographs and Cartographs .

56. Write down the properties of regression lines.

57. Find Bowley's coefficient of Skewness from the following data :

Income:	0-200	200-400	400-600	600-800	800-1000	1000-1200
No of Persons:	25	40	85	75	20	16

58. Explain in detail with sample diagram a) Quartile b) Deciles.

59. From the data given below find

a) The two regression Equations

b) The correlation coefficient

X : 65 66 67 67 68 69 70 72

Y : 67 68 65 68 72 72 69 71

60. The following data give the ages and blood pressure of 10 women:

Age (X):	56	42	36	47	49	42	60	72	63	55
Blood Pressure:	147	125	118	128	140	145	155	160	149	150

### DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

#### TWO MARKS :(SECTION A)

1. what is micro computer?
2. what are the functions of cpu?
3. give one example for indexing addressing modes.
4. what is decoder?
5. what is time delay?
6. what is subroutine?
7. what is the function of PWR TEN?
8. when table look-up technique is used?
9. what is vector interrupt?
10. define cycle stealing?
11. what is the function of an assembler?
12. what is meant by a bus?
13. Name the instruction used for enabling the interrupt.
14. write the instruction format.
15. what is a counter?
16. Mention any two applications of microprocessor.
17. write an assembly language program in 8085 to find the two's complement of a number.
18. what is the function of a flag register?
19. expand DMA
20. write the syntax of IN and OUT instructions.
21. define the term microprocessor
22. what is the function of a program counter?
23. what is the use of DAA instruction?
24. write the format of an instruction.
25. what is subroutine?
26. name any two applications of microprocessors.
27. write an assembly language program in 8085 to find the one's complement of a number.
28. Name the flags in program status word (PSW).
29. write the interrupts available in 8085.
30. what is the function of an interface?
31. write the number (123) base 10 in binary and BCD
32. explain the various basic logic gates with their truth table.
33. show that  $AB'C + A'BC + ABC' + ABC = AB + BC + CA$
34. simplify using k-map  $F(A, B, C) = \text{summation}(1, 2, 3, 5, 7)$
35. explain the working of a clocked RS flip flop using NAND gates.
36. draw the circuit of a 4-bit ripple counter using JK flip flop and explain its working.
37. discuss the working of a multiplexer in detail.
38. what is a status register? how is it designed?

- 39.convert the following octal number to decimal (a)46 (B)125 (c)765 ( d)12.6
- 40.explain the basic laws of boolean algebra with truth table
- 41.what is role condition?explain JK flip flop with a circuit diagram.
- 42.explain full adder and half subtractive with a diagram.
- 43.explain the functions of a accumulator.
- 44.Use two's complement to perform M-N ( subtract N from M) with the given binary numbers.
- (A)M=1010100 N=1000100
- (B)M=1000100 N=1010100
45. Draw the logic gates and construct the truth table of NOT,AND,AND OR gates.
- 46.simplify the following boolean functions to a minimum number of literals.(a) $X+X'Y$   
(b)  $X(X'+Y)$
- 47.show that NAND gate is a universal gate.
- 48.explain the working of JK flip flop and give the truth table.
- 49.explain shift register.
- 50.explain the working of demultiplexer.
- 51.explain the uses of general purpose register.
- 52.convert the following hexadecimal number to decimal equivalents.
- (A) AB6 (b) 3A6
- 53.draw a logic diagram composed of AND,OR and NOT gates for following algebraic expression.  $F=Xy'+X'Y$
- 54.simplify  $Y=(A+B)(A+B')( A'+ C)$ .
- 55.explain the working of a RS flip flop and give the truth table.
- 56.explain the working of synchronous counter.
- 57.Draw a full subtractor circuit and explain with the help of its truth table.
- 58.explain the ROM organization.
- 59.Draw an accumulator register with processor and explain it.
- 60.convert ( 9A.A)base 16=(X)base 10
- 61.define the term digital computer.
- 62.state associative law
- 63.simplify  $XY+X'Y+XY'+S'Y'$ .
- 64.what is the function of a truth table?
- 65.what is a pair?
- 66.what is a flip flop?
- 67.write the types of RAM.
- 68.define the term microprocessor.
- 69.write the function of a program counter.
- 70.what is analog computer?
- 71.convert the following (45.6)base 8=(?)base 10
- 72.what is duality principle?
- 73.define BCD code.
- 74.define don't care conditions.
- 75.Define minterm.
- 76.define full adder.

77.what is multiplexer?

78.define register.

79.what is mod counter?

### **FIVE MARKS(SECTION-B)**

1.state the advantages of assembly language.

2.briefly explain about address multiplexing.

3.explain the addressing modes of 8085 with suitable example.

4.write short notes on dynamic debugging.

5.explain hexadecimal counter.

6.explain the time delay using a register pair.

7.write an assembly language program in 8085 to perform BCD instructions.

8.write an assembly language program in 8085 to perform 8 bit division.

9.write a brief note on multiple interrupts.

10.write a brief note on programmable interface 8255.

11. Explain the time delay using a register pair.

12. Write an assembly language program in 8085 to perform BCD addition.

13.write an assembly language program in 8085 to perform 8 bit subtraction.

14.write the syntax of SIM instruction and explain.

15.differentiate between memory mapped I/O and I/O mapped I/O.

16.draw the pin diagram of 8085 microprocessor.

17.write short notes on instruction set.

18.write a program to find the bigger of two numbers.

19.what is data transfer instruction?give an example.

20.discuss pulse timings for flash lights in detail.

21.write short notes on call and return instructions.

22.what is multibyte addition?give an example.

23.write short notes on seven segment LED code.

24.list out the various functions of I/O devices.

25.discuss memory mapped I/O in detail.

26.explain the organization of micro computer.

27.briefly explain about address multiplexing.

28.explain the looping and counting programming techniques

29.write short notes on static debugging.

30.write a brief note on subroutines.

31.what do you mean by overlapping in a K- map? Explain.

32.explain half adder.

33.construct decoder and explain.

34.state the application of microprocessor.explain

35.what is bus? Explain the different types of buses?

36.using ten's complement,subtract

(i)72532-3250 ( ii)3250-72532.

37.convert the following numbers to decimal equivalents.

(i)(11010.11) base 2

(ii)(B65F) base 16



38. simplify the boolean function  $F(w,x,y,z)=\text{summation}(0,1,2,4,5,6,8,9,12,13,14)$ .
37. design BCD counter and explain it's working.
38. Draw a decimal to binary encoder circuit and it's working.
39. Describe the design of ALU in detail.
40. convert the following octal numbers to decimal equivalents.  
(i) 1213 (ii) 21
41. simplify using K- map method.  
 $F(A,B,C,D)=\text{summation}(0,1,2,4,5,8,9)$ .
42. what is ripple counter? Draw the equivalent circuit of 4 bit binary ripple counter and explain it's working.
43. what is the need for binary number system? Explain.
44. perform the one's complement subtraction.  $(1101.10)_{\text{base}2} - (1001.10)_{\text{base}2}$
45. explain the product of sum (POS) method with an example.
46. Realize EX-OR gate using NOT, AND and OR gates.
47. explain two variables K- map with an example.
48. explain the NOR as universal gate.
49. explain the digital computers, what is the number system used in digital computer? Give examples.
50. simplify the function  $F(A,B,C)=A'B'C+AB'C+ABC'+ABC$  and draw the circuit using NAND gates only.
51. show that  $A'BC+AB'C+ABC'+ABC+AB+BA+CA$ .
52. what do you understand about don't care condition? How it is useful in K-map simplification?
53. simplify using K- map  $F(A,B,C,D)=\text{summation}(0,1,3,5,7,9,11,12,13,14,15)$ .
54. construct the circuit of full adder using NAND gates only.
55. Explain the 3 to 8 decoder with suitable circuit and truth table.
56. Explain the RS flip flop.
57. Explain the ring counter with suitable circuit.
58. Draw the gate equivalent circuit of  $4 \times 1$  multiplexer and explain it's working.
59. Describe the design of status register.

### **TEN MARKS (SECTION-C)**

1. Explain the architecture 8085 with a neat diagram.
2. Explain the data transfer instructions of 8085 with suitable example.
3. Discuss about conditional call and return instructions with example.
4. Write an assembly language program in 8085 to perform HEX to BCD conversion.
5. Explain the process of interfacing microprocessor with an input device.
6. Draw the pin diagram of 8085 and explain the functions of each pin in detail.
7. Explain the arithmetic and logic instruction of 8085 with suitable examples.
8. Discuss about conditional call and return instructions with examples.
9. Write an assembly language program in 8085 to perform multibyte addition.
10. Explain the process of interfacing microprocessor with ROM.
11. Discuss various memory classification in detail.
12. Explain various addressing modes of 8085 microprocessor.

13. Describe counters and time delays with suitable example.
14. Explain BCD multiplication and BCD division with an example.
15. Discuss 8085 interrupts in details.
16. Describe in detail the different types of codes.
17. State the postulates and theorems of Boolean algebra and explain.
18. Simplify using Karnaugh map,  $(A, B, C, D) = \sum (0, 1, 4, 5, 10, 11, 14, 15)$ . Draw truth table and circuit.
19. Explain the working of a shift register with a neat circuit and table.
20. Explain the architecture of microprocessor with a neat diagram.
21. Define the term logic gates. Explain the different types of logic gates with their symbols and truth tables.
22. State and prove (i) De Morgan's theorem (ii) Distributive law
23. Simplify  $F(A, B, C, D) = ABC + ABD + A'BC + CD + BD'$ .
24. Simplify using Quine McCluskey method.  $F(A, B, C, D) = \sum (0, 5, 7, 8, 13, 15)$ .
25. Differentiate between combinational and sequential circuit.
26. Explain the applications of multiplexer.
27. Describe the up and down counter with suitable circuit.

#### **SEMESTER 4**

Subject: Database System DBMS Question Bank

1. What is database?
2. What is DBMS?
3. What is a Database system?
4. What is the role of Database Administrator ?
5. Disadvantage in File Processing System?
6. Describe the three levels of data abstraction?
7. Define the "integrity rules"
8. What is extension and intension?
9. What is Data Independence?
10. What do you mean by Data processing ?
11. Which part of the RDBMS takes care of the data dictionary? How
12. What do you mean by instance & schema ? Explain the difference between these.
13. What is the difference between Procedural DML and Non-Procedural DML ?
14. What is a view? How it is related to data independence?
15. What is Data Model?
16. What is E-R model?
17. What do you mean by Hierarchical model ?
18. What is an Entity?
19. What is an Entity type?
20. What is an Entity set? LOKNAYAK JAI PRAKASH INSTITUTE OF TECHNOLOGY CHAPRA, BIHAR
21. What is a composite attribute? Give examples.
22. What is a single valued attribute? Give examples.
23. What is a multi-valued attribute? Give examples.

24. What do you mean by cardinality? What are different kinds of cardinalities ?
25. What is an Extension of entity type?
26. What is the difference between the strong entity set and weak entity set ?
27. Define subtype and supertype entities ?
28. Give example of following relationships : a. Many-to-One b. One-to-One c. One-to-Many d. Many-to-Many
29. What is an attribute?
30. What is a Relation Schema and a Relation?
31. What is degree of a Relation?
32. What is Relationship, Relationship set, and Relationship type?
33. What is degree of Relationship type?
34. What is SDL (Storage Definition Language)?
35. What is Data Storage - Definition Language?
36. What is DDL, DCL, and DML (Data Manipulation Language)?
37. What is VDL (View Definition Language)?
38. Consider the following tables: Employee (Emp\_no, Name, Emp\_city) Company (Emp\_no, Company\_name, Salary) i. Write a SQL query to display Employee name and company name. ii. Write a SQL query to display employee name, employee city ,company name and salary of all the employees whose salary >10000 iii. Write a query to display all the employees working in 'XYZ' company.
39. What is Relational Algebra?
40. What are the unary operations in Relational Algebra?
41. Explain various operators used in relational algebra.
42. What do you mean by atomicity and aggregation?
43. Differentiate between Cartesian product and natural join operations used in relational algebra.
44. What are the primitive operations common to all record management systems
45. What is a primary key ?
46. Define foreign key ? How does it play a role in the join operation ?
47. What are various Data types in SQL ?
48. What do you mean by SQL ?What are the characteristics of SQL ?
49. Explain Triggers and its types with examples.
50. Distinguish between static and dynamic SQL.
51. What is meant by static SQL? How it differs from dynamic SQL?
52. How are the nulls represented in database system?
53. What are aggregate functions?
54. What is the purpose of group by clause in the SELECT statement?
55. What are views? How they are created?
56. What do you mean by integrity constraints ?
57. Which subdivision of SQL is used to put values in tables and which one to create tables ?
58. Differentiate between SQL commands DROP TABLE and DROP VIEW.
59. What is the difference between WHERE and Having Clause ?
60. Discuss the various type of join operations ? Why are these join required.

61. How are exceptions handled in PL/SQL? Give some of the internal exceptions' name
62. What are stored-procedures? And what are the advantages of using them.
63. What are cursors give different types of cursors.
64. What is normalization?
65. What are Armstrong rules? How do we say that they are complete and/or sound
66. Explain the codd's rules for relational database design.
67. Explain Functional dependency and Trivial functional dependency with examples.
68. Explain the term Distributed DBMS and Client-Server DBMS
69. Define the relational data model.
70. What is Functional Dependency?
71. What do you mean by redundancy ?How this can be avoided ?
72. When is a functional dependency F said to be minimal?
73. What is Multivalued dependency?
74. What is Lossless join property?
75. What is Fully Functional dependency?
76. What is lossy decomposition?
77. What is transitive dependency?
78. What is 1NF, 2NF, 3NF and BCNF (Boyce-Codd Normal Form)?
79. Explain Closure of Set of Functional dependency and Closure of Attribute sets
80. Explain Canonical cover and Extraneous Attributes with examples.
81. What do you understand by dependency preservation?
82. What is the need of the normalization? Explain the first three steps involed in the normalization.
83. What are the different phases of transaction?
84. What are the ACID properties of a transaction? a. What do you mean by isolation? Why is it important? Give an example. b. What do you mean by consistency? Why is it important? Give an example. c. What do you mean by atomicity? Why is it important? Give an example. d. What do you mean by durability? Why is it important? Give an example.
85. List out the states of a transaction.
86. Discuss the immediate update recovery technique is both single and multiuser environment.
87. Explain the purpose of checkpoint mechanism. How often should checkpoints be performed
88. List and explain various types of specialized locking techniques used in DBMS
89. Why is concurrency control needed? Explain lost update, Inconsistent retrievals and Uncommitted dependency anomalies.
90. What is a deadlock ? How can a deadlock occur ? explain.
91. Briefly explain one deadlock prevention algorithm.
92. What if time stamping is used ? Explain briefly
93. What is two-phase locking and how does it guarantee serializability ?
94. Discuss the concurrency control mechanism in detail using suitable example.

95. Differentiate between Two phase locking and Rigorous two-phase locking.
96. How can deadlocks be avoided when using 2PL?
97. How Share and exclusive locks differ ? Explain.
98. How precedence graph can be used to detect deadlock ?
99. What is a system log ? What is the purpose of the system log in system recovery ?
100. What do you understand by distributed databases? Give the various advantages and disadvantages of distributed database management system.
101. What is database recovery? Why backups are important?
102. What are transaction logs?
103. What do you mean by rollback?
104. What is the difference between volatile and non volatile storage?
105. What are redo and undo logs?
106. What is a timestamp? State its advantages.
107. What is shadow paging? State its advantages.
108. What are the methods used to prevent the system from dead lock?
109. What is database recovery? Why backups are important?
110. Explain shadow paging recovery scheme in detail.
111. What is database? What is DBMS? Its functions and applications.
112. Disadvantage of File Processing System? Advantages of DBMS over File System?
113. Describe the three levels of data abstraction? Also explain the role of DBA?
114. What is Data Independence? What is a view? How it is related to data independence?
115. Explain SQL and all the Database Languages.
116. Describe Transaction Management with its state diagram and properties.
117. Classify database Management System with brief description about all.
118. Explain the three schemas Architecture with suitable diagram.
119. Discuss the overall Database structure with suitable diagram.
120. Define the terms: a) Data redundancy b) Data Consistency c) Data Integrity d) Data Isolation e) Instance & schema.

## **SEMESTER 5**

### **MOBILE APPLICATIONS DEVELOPMENT**

#### **TWO MARKS**

10. What is Mobile Application ?
11. What is Android ?
12. What is OHA ?
13. What is XML ?
14. Define IDE.
15. Define Native Applications.
16. Define Dalvik VM.
17. What is Emulator ?
18. List the Versions of Android.
19. Define Web Application.
20. How to make call in Emulator ?
21. How do you send Message from Emulator.

22. Write some Features of IDE.
23. What is the difference between Code Editor and IDE.
24. Give the Properties of IDE.
25. Write any two Advantages of IDE.
26. What is AndroidSDK ?
27. Define Android SDK.
28. Define Database.
29. Define Android Device.
30. Define Mobile Operating System.
31. What is Java ?
32. What is Eclipse ?
33. What is Virtualization ?
34. What is Android File System ?
35. Define Activity Stack.
36. What are Launch Modes ?
37. Define Android Activities.
38. What is Intent ?
39. List the use of Intent.
40. Define Intent Filters.
41. What is Intent PutExtra ?
42. What is Intent GetExtra ?
43. Write the Types of Intent.
44. What is Emulator ?
45. Expand DDMS and API.
46. Define Android Studio.
47. What is Simple Services ?
48. What is Foreground ?
49. What is Background ?
50. Explain Bound Service.
51. Define Broadcast Receiver.
52. What is meant by Content Provider ?
53. Define Content Resolver.
54. What is Database Schema ?
55. Define SQL Database.
56. Define Data Analysis.
57. What is an Adapter in Android ?
58. What is Intent GetExtra ?
59. Write the Types of Intent.
60. What is Emulator ?
61. .Expand DDMS and API.
62. Define Android Studio.
63. What is Layout ?
64. List the major Attributes of Layout.
65. Define Style along with Example.
66. Define Linear Layout.
67. Define Relative Layout.
68. What is meant by Table Layout ?
69. Define Grid View.
70. What is Frame Layout ?
71. Define Menu.

72. List Various Types of Menus.
73. What is Option Menu ?
74. What is Context Menu ?
75. Define PopUp Menu.
76. What is List View.
77. Define Notification.
78. What are the Steps to create and send Notification.
79. What is the use of Button ?
80. What are the various Types of Button.
81. What is the use of Text Field ?
82. What is the use of Check Box ?
83. What are the uses of Alert Dialog ?
84. What is Spinner ?
85. Define Progress Bar.
86. What is Pin Ball Game ?
87. What is Android Alarm Clock ?
88. Define Calendar App.
89. Define Converter App.
90. Define Phonebook App.
91. What is meant by Phonebook Adapter ?
92. Define Doodlz App.
93. What is Tip Calculator App ?
94. Define Weather Viewer App.
95. What is Adapter Layout App ?

## **5 MARKS**

1. List features of the Android Operating System.
2. Define Android Virtual Devices (AVD).
3. Write the directory path where images are stored while developing Android Applications.
4. List all attributes to develop a simple button.
5. Write the syntax for Intent-Filter tag.
6. Define services in Android operating system..
7. Explore the Steps to install and configure Android Studio and SDK .
8. During an activity life cycle which methods invoked only once?
9. What is the use of setContentView() method?
10. Where will you declare your activity so the system can access it?
11. Where can you define the icon for your Activity?
12. What do you mean by resource?
13. Which object is passed to onCreate () method?
14. To create an Activity which class must be inherit
15. Describe the significance of SQLite database in Android.
16. Discuss Developer console with its purpose.
17. What is Simple Services ? Explain.
18. Discuss on Broadcast Receiver in detail.
19. Explain in detail about Content Providers.
20. What is Content Resolver ? Explain.
21. How to work with Databases ? Explain.
22. Narrate some Database Applications.

23. Write brief note on Data Analysis.
24. Write a program to display a circular progress bar.
25. What is Layout ? Explain
26. Discuss on Linear Layout.
27. Briefly Explain Relative Layout.
28. Explain briefly Table Layout.
29. Discuss on Frame Layout.
30. Write brief note on Menus.
31. Explain the Types of Menus in detail.
32. Explain in detail about Android Option Menu.
33. Explain in detail about Android Context Menu.
34. Discuss on Android Popup Menu.
35. Elaborate on Listview.
36. Discuss on PinBall Game.
37. What is Calendar App ? Explain.
38. How do we use Converter App ? Explain.
39. Discuss on Phonebook App.

### **10 Marks**

1. Activity Life Cycle.
2. Android Stack
3. Explain in detail about user interface and its types?
4. 4.What are the core components under the Android application architecture?
5. Explain any two in detail.
6. What does an Android APK file contains?
7. To monitor debugging process which tool is useful?
8. Explain other tool of Android in detail.
9. Write a note on Dalvik Virtual Machine component of Android Runtime.
10. Explain more features of Android version which contains NFC.
11. .List all the versions of android.
12. Which file is considered as managing file in Android application?
13. Explain each node of that file in detail.
14. Write a note on Android device available in market.
15. Explain various resources which can be specified in Android application project. Give an appropriate example for each.
16. Which are the four essential states of an activity?
17. During an activity life cycle which methods invoked only once?
18. What is a the use of setContentView() method?
19. Where will you declare your activity so the system can access it?
20. Which object is passed to onCreate () method?
21. To create an Activity which class must be inherits in our sub class?
22. Describe the significance of SQLite database in Anroid.
23. Discuss Developer console with its purpose.
24. What is Simple Services ? Explain.
25. Dicuss on Broadcast Receiver in detail.



26. Explain in detail about Content Providers.
27. What is Content Resolver ? Explain.
28. How to work with Databases ? Explain.
29. Narrate some Database Applications.
30. Write brief note on Data Analysis.
31. Write a Sample program using XML.
32. What is the use of Adapter ? Explain.
33. Discuss on Notification.
34. Write brief note on Buttons.
35. What is Android Text Fields ? Explain.
36. What is Android Check Box ? Explain.
37. Explain in detail about Android Alert Dialog.
38. Discuss on PinBall Game.
39. What is Calendar App ? Explain.
40. How do we use Converter App ? Explain.
41. Discuss on Phonebook App.
42. Explain about Tip Calculator App.
43. What is Weather Viewer App ? Explain.
44. Explain about Adapter Layout File.

## **OPERATING SYSTEM**

### **2 MARKS**

1. What is an operating system?
2. What does an operating system do?
3. Where are operating systems found?
4. What is a general purpose operating system?
5. What is simple operating system for a security control system?
6. What s Input and Output devices?
7. What is a single-user operating system?
8. What is a multi-user operating system?
9. What are the operating system utilities?
10. List out the operating system interfaces
11. What are the advantages of multi-user operating system?
12. What is a multi-tasking operating system?
13. What are the various parts of operating system?
14. What is real-time executive?
15. What is a computer program?
16. How does operating system run more than one program at once?
17. What is co-operative and pre-emptive switching?
18. Define dispatching
19. What is system overhead?
20. What is context switching?
21. Define scheduling?
22. What are the other ways of scheduling process?
23. What is a process?
24. Write about process states

25. What is a process control block?
26. How does the process inter-communicate?
27. Define synchronize
28. What is a thread?
29. What is a shell?
30. Write examples of deadlock
31. Define paging system
32. What are the types of access methods?
33. Define seek optimization
34. Define UNIX file system
35. What is the UNIX I/O system?
36. Define spooling
37. What do you mean by non-pre-emptive scheduling?
38. Define throughput
39. What are the advantages of dynamic loading?
40. How can external fragmentation problem be solved?
41. Define rotational latency
42. Define inode
43. What is the system call?
44. What is communication?
45. Write notes on GUI
46. Define preemptive scheduling.
47. Define multilevel queue scheduling algorithm
48. Define thrashing
49. What is protection?
50. Define access controls
51. Mention all the page replacement algorithms
52. Mention the problems that are associated with contiguous allocation
53. What do you mean by free-space list?
54. What is compile time binding?
55. Define virtual memory
56. What is meant by executable file?
57. What is meant by shell?
58. Define file
59. What is meant by graceful degradation?
60. Define message passing
61. What is the use of datagram sockets in UNIX?
62. Define CPU scheduling
63. What is paging?
64. Define demand paging
65. What is the use of internal file structure?
66. List out the types of file system
67. What is a page table?
68. What is the work of a command interpreter?

69. What is overlay?
70. What are the types of operating systems?

**(5 Marks)**

1. Explain about the operating system operation
2. Explain about process management
3. Explain the characteristics of deadlock
4. Write about virtual memory management
5. Explain about demand paging
6. Explain about free-space management
7. Describe the allocation methods
8. Explain any two disk scheduling algorithms
9. Explain distributed UNIX system
10. Describe system programs
11. Write short note on command-interpreter systems
12. Explain simple batch systems
13. Give a short account on indirect communication
14. Explain the necessary conditions that cause deadlock
15. Write note on Thrashing
16. Explain optimal page replacement algorithm
17. Explain two level directory structure
18. Give brief account on free space management
19. Explain the concept of swapping in UNIX
20. Explain the implications of inode
21. Explain the security in operating system
22. Write note on simple structure of operating system
23. Write about synchronization
24. Write about segmentation
25. Explain the ways to handle deadlocks
26. Write about page replacement algorithms
27. Define scan scheduling
28. Explain about file attributes
29. Explain the KERNAL of UNIX
30. Write about the history of UNIX
31. Explain the two major methods of keeping tracks of blocks
32. With an example, explain about tree-structured directories
33. Explain the different components of UNIX systems
34. Write note on virtual file system in UNIX
35. Discuss the components of OS with block diagram
36. Explain about round robin scheduling algorithm
37. Is it possible to have a deadlock involving a single process? Justify your answer.
38. Explain about multiple partition allocation
39. What is the need for page replacement algorithm?
40. Explain about the various file operations

41. Explain linked allocation methods
42. Explain UNIX directory structure
43. How IPC is performed in UNIX. Explain
44. Define spooling and explain it
45. Explain the state of process with the help of state diagram
46. Write note on buffering
47. Explain the implementation of segment table
48. Explain the block buffer cache
49. Discuss on SSTF scheduling
50. Write note on Concurrency controls

**(10 Marks)**

1. Explain the various types of system calls
2. Describe the ways for deadlock avoidance
3. Write any five CPU scheduling algorithms
4. Differentiate between internal and external fragmentation with example
5. Explain any two replacement algorithms
6. Discuss in detail about inter process communication
7. Explain about memory management of UNIX systems
8. Give a detailed account on operating system services
9. Explain in detail about deadlock prevention
10. Describe indexed allocation in detail
11. Describe the file system of UNIX
12. Explain about distributed systems
13. What is deadlock? Explain the various strategies for deadlock
14. Explain the various operations performed on a file
15. Discuss in detail about process scheduling
16. Explain the free space management technique
17. Describe the use of priority scheduling algorithm with example
18. Describe the CPU scheduling algorithms used for a UNIX system
19. Explain about random file access in distributed file system
20. Describe about virtual memory

**DATA COMMUNICATION NETWORKS**

**2 MARKS**

1. Define networks.

2. Define Computer communication.
3. What are the types of networks?
4. Define protocol and its standards.
5. What are the various components of data communication?
6. List out the common protocols.
7. Define topology.
8. What are the basic types of topology?
9. What is data communication?
10. List out the various types of network topology.
11. Define switching.
12. What is packet switching?
13. What is OST model?
14. List the layers in OSI model.
15. What is peer to peer process?
16. What are the responsibilities of network layer?
17. Define Analog & Digital signal.
18. What is frequency & phase?
19. Differentiate analog & digital data.
20. Define bandwidth.
21. Define synchronization.
22. What are the types of connections?
23. What is signals and modulation?
24. What is transmission media?
25. What are the categories of noise?
26. What are the possible encoding techniques?
27. Define encoding.
28. What are the categories available in polar encoding?
29. Define AMI.
30. What is serial and parallel transmission?
31. Define Multiplexing?
32. What are the types of multiplexing?
33. What are the categories in TDM?
34. What is statistical TDM?
35. Define synchronous TDM.
36. What is circuit switching?
37. Differentiate packet and circuit switching.
38. Define periodic and aperiodic signals.
39. Give two examples for analog signals.
40. Define modem.
41. Name the two categories of transmission media.
42. How do a guided media differ from unguided media?
43. What is error detection and correction?
44. What are the types of errors?
45. Define VRC & LRC.

46. What is the purpose of hamming code?
47. Define internet & intranet.
48. List out the types of Packet switching.
49. What are the main components of PPP?
50. What is frame relay?
51. What is the purpose of FCS?
52. What is ISDN?
53. Define ATM.
54. Define WWW.
55. What is piggybacking?
56. Define firewalls.
57. How TCP differs from UDP?
58. What is twisted pair?
59. How frame differs from packet?
60. What is datagram?
61. Define Congestion control.
62. What is the use of choke packet?

#### **5 MARKS**

1. Discuss about data communication model.
2. Explain communication tasks.
3. Discuss about types of networks.
4. Discuss about topology.
5. Explain TCP/IP reference model.
6. Explain protocol architectures.
7. What are the internet terminologies? Explain.
8. What are the reasons for using digital signaling techniques?
9. Write about Noise.
10. Explain digital data, analog signals.
11. Explain the types of modulation with example.
12. Write about QAM.
13. Explain in detail about parallel transmission.
14. Discuss about flow control.
15. Write short note on multiplexing?
16. Explain FDM.
17. Discuss about circuit switching.
18. What are the packet switching principles - explain.
19. Write short note on congestion control.
20. Explain Frame relay congestion control.

#### **10 MARKS**

1. List out and explain OSI model.
2. Discuss about the types of protocols.
3. Explain about multimedia.
4. Explain about transmission media.
5. Discuss about Transmission impairments.

6. Explain in detail about digital data, analog signals
7. Write short note on: analog data to digital & analog signals.
8. Explain about serial transmission.
9. Write about synchronous and asynchronous transmission.
10. Explain about error control.
11. Discuss about TDM.
12. Explain routing in circuit switched networks.
13. Explain routing in packet switching networks.
14. Discuss about frame relay protocol architecture.
15. Compare circuit and packet switching networks.

## **DATA MINING**

### **2 MARKS**

1. Define data?
2. What is information?
3. What is knowledge?
4. Define Data mining
5. List out any two uses of data mining
6. List out any two applications of data mining
7. Define Prediction
8. What are Association rules?
9. What is spatial database?
10. Define data warehouse
11. What is OOD?
12. Define relational database
13. Define temporal database
14. What is outlier analysis?
15. Define discrimination
16. Define prediction
17. What is clustering?
18. Define regression
19. List out any three classification of data mining systems
20. What is data integration?
21. Define coupling
22. Define loose coupling
23. Define semi tight coupling
24. Define tight coupling
25. Define data warehousing
26. List any two characteristics of data warehousing
27. Differentiate between operational data and data warehousing
28. What is noisy?

29. Define DQML
30. List out the various pre-processing technique
31. Why pre-process the data?
32. Define outlier analysis
33. Define regression
34. What is concept description?
35. What is data generalization?
36. Define data cube
37. What is quantitative rule?
38. Define association rule
39. What is APRIORI?
40. Define binning
41. What are subjective and objective measures?
42. Define classification
43. What is prediction?
44. List the issues regarding classification and prediction
45. Define CART
46. Define ID3
47. What is back propagation?
48. Define over fitting
49. What are Bayesian classifiers?
50. What is Naive Bayesian classification?
51. Define CPT
52. What is cluster analysis?
53. What is good cluster analysis?
54. List out any two requirements of clustering in DM
55. Define nominal variable
56. Define ordinal variable
57. Define ratio-scaled variable
58. What is partitioning method?
59. Define grid based method
60. Define hierarchical method
61. Define density based method
62. What is BIRCH?
63. What is ROCK?
64. What id DBSCAN?
65. Define OLAP
66. Define star schema
67. Define snowflake schema
68. Difference between star and snowflake schema
69. Define data mart
70. What is virtual warehouse?
71. List out any two regarding the design of a data warehouse
72. Define top down approach in data warehousing



73. Define bottom down approach in data warehousing
74. Define OLAM
75. List out any three data warehouse applications

### **5 Marks**

1. Explain about data mining in detail
2. Explain any two applications of data mining in detail
3. Write a note on data mining issue in detail
4. Explain about data mining metrics
5. Discuss about social implications of data mining
6. Write note on spatial database
7. Explain about Temporal database
8. Discuss about text and multimedia database
9. Explain heterogeneous database in detail
10. Write note on object oriented database
11. Explain about relational database
12. Explain about data mining functionalities
13. Discuss about pattern interestingness
14. Explain about classification of data mining system
15. Briefly explain about data mining primitive tasks
16. Explain about typical architecture of data mining system with neat diagram
17. Explain the characteristics of data warehousing
18. Discuss the future of data warehousing
19. Explain the applications of data warehousing
20. Discuss in detail about advantages of data warehousing
21. Bring out the difference between OLTP and data warehousing
22. Why separate data warehouse? Explain
23. Explain data pre-processing with a suitable example
24. Explain data cleaning as process in detail
25. Discuss about data integration
26. Explain about data transformation
27. Briefly explain about DQML
28. Explain about data reduction strategies
29. Discuss about major tasks in data pre-processing
30. Explain the methods of handling missing data
31. Explain about descriptive data summarization
32. Discuss about mining class comparison
33. Explain data generalization and summarization based characterisation
34. Define association rule mining and explain how apriori algorithm works with example
35. Explain the process involved in apriori algorithm with the help of the pseudo code
36. Define association rule and explain the FP growth algorithms in association techniques
37. Explain mining association rules in large databases
38. Explain about mining associations rules from transactional databases

39. Explain about mining association rules from data warehouses
40. Discuss about constraint based association mining in detail
41. Explain about the issues regarding classification and prediction
42. Write note on back propagation
43. Explain Bayesian classification
44. Discuss about naive Bayesian classification
45. Explain about rule based induction
46. Discuss about lazy learners
47. Write short note on genetic algorithms
48. Discuss fuzzy set approach
49. Discuss about cluster analysis
50. Briefly explain about types of data in cluster analysis
51. Explain about categorization of cluster methods
52. Explain about the hierarchical method
53. Explain about grid based methods
54. Discuss in detail about OPTICS
55. Explain about data warehouse schema
56. Difference between OLTP and OLAP
57. Discuss about need for OLAP
58. Explain about multi dimensional model
59. Discuss about categorization of OLAP tools
60. Explain about architecture of data warehouse in detail
61. Explain in detail about data warehouse design process
62. Explain OLAP engine in detail
63. Discuss data warehouse back end tools and utilities
64. Explain about data warehouse implementation
65. Explain about data cube operation in detail
66. Discuss about efficient computation of data cube
67. Explain in detail about architecture of OLAM with neat diagram

### **10 Marks**

1. Write a detailed note on data mining task primitives
2. Explain the data transformation process in detail with example
3. Describe star schema of a data warehouse with example
4. Explain in detail about mining quantitative association rules with example
5. Discuss the application of data mining in telecommunication industry
6. Explain in brief about data mining issue in detail
7. Give the statistical base algorithm
8. Explain any two hierarchical algorithms
9. Explain the association rules with examples
10. Explain any two applications of data warehouse
11. Explain data mining metrics
12. What is decision tree? Explain
13. Describe partitioning algorithm

14. Write a brief note on the various aspects of data mart and data modelling
15. Give any two tools for data warehousing
16. Explain data pre-processing with example
17. Explain apriori algorithm for frequent patterns from large volume of data
18. Explain advanced concepts of data mining
19. Discuss on data reduction
20. Explain cube aggregation and data compression
21. Discuss about density based methods
22. Explain about K-nearest neighbour classifiers with example
23. Explain back propagation algorithm
24. Explain data generalization and summarization
25. Explain missing and noisy data

## **SOFTWARE ENGINEERING**

### **2 MARKS**

1. Define Software Engineering.
2. What is meant by Software engineering paradigm?
3. What are the Advantages of incremental model?
4. Write any two characteristics of software as a product.
5. Which process model leads to software reuse? Why?
6. Give at least two reasons for prototyping is problematic.
7. Mention the Advantage and Disadvantage of waterfall model.
8. Distinguish between process and methods.
9. Define software process. State the important features of a process.
10. Distinguish between verification & validation.
11. Define System Modeling.
12. State the System Engineering Hierarchy.
13. Mention some of the factors to be considered during System Modeling.
14. Define Verification & Validation.
15. What are the phases encompassed in the RAD model?
16. List the task regions in the spiral model.
17. What is requirement engineering?
18. What is meant by feasibility study?
19. What is meant by requirement validation?
20. What is meant by Requirement management?
21. What is meant by software prototyping?
22. Differentiate data flow diagram and state transition diagram.

23. Define cardinality and Modality of a relation.
24. Compare evolutionary and throw away prototyping?
25. Define the term product and process in software engineering?
26. List out the elements of analysis model?
27. Why modularity is important in data dictionary?
28. Specify at least four questionnaire which supports to select the prototyping approach.
29. Distinguish between expected requirements and excited requirements.
30. What is meant by software prototyping?
31. What are the non-functional requirements of software?
32. What is data dictionary? How is it used in software engineering?
33. Define Behavioral Modeling.
34. Define Data dictionary.
35. Define Process Specification.
36. What does data dictionary contains?
37. What is meant by Throw away Prototyping?
38. What is the major distinction between user requirements and system requirements?
39. What is DFD?
40. What are the common characteristics of design methods?
41. What are the different levels of abstraction?
42. What are the elements of design model?
43. How the Architecture Design can be represented?
44. Define design process.
45. List the principles of a software design.
46. What is the benefit of modular design?
47. What is a cohesive module?
48. What is coupling?
49. What are the common activities in design process?
50. What are the various elements of data design?
51. List the guidelines for data design.
52. Name the commonly used architectural styles.
53. What is Transform mapping?
54. What is meant by fan-in, fan-out?
55. Define software testing?
56. Define Smoke Testing?

57. What are the objectives of testing?
58. Define White Box Testing.
59. What are the two levels of testing?
60. What are the various testing activities?
61. Write short note on black box testing.
62. What is equivalence partitioning?
63. What is Regression Testing?
64. What is a boundary value analysis?
65. What are the reasons behind to perform white box testing?
66. What is cyclomatic complexity?
67. How to compute the cyclomatic complexity?
68. Distinguish between verification and validation.
69. What are the approaches of integration testing?
70. What are the benefits of smoke testing?
71. Distinguish between alpha and beta testing.
72. What are the various types of system testing?
73. State the objectives and guidelines for debugging.
74. What do you mean by test case management?
75. What is the need for cyclomatic complexity?
76. What is meant by software project management?
77. What is meant by software management?
78. Define debugging.
79. What are the common approaches in debugging?
80. Write about the types of project plan.
81. Write short note on the various estimation techniques.
82. What is the Objective of Formal Technical Reviews?
83. What is COCOMO model?
84. What is the purpose of timeline chart?
85. Why software change occurs?
86. Write about software change strategies.
87. Define CASE Tools.
88. What is software maintenance?
89. Define maintenance.

90. What are the types of software maintenance?

**5 Marks**

1. What are the major differences between system engineering and software engineering?  
State explains the stages that distinguish the two.
2. Explain Water fall Model. What are the problems that are sometimes encountered when the waterfall model
3. Which is more important-the product or process? Justify your answer.
4. With suitable illustration explain SPIRAL model .
5. Explain the Evolutionary and Incremental Model
6. Write a short notes an System engineering and Computer based System
7. How do you differentiate software engineering from system engineering?
8. Explain incremental process model
9. Explain the spiral model.
10. What are the necessities of Life cycle model? Elaborate on the various issues of Software lifecycle
11. Differentiate product engineering and business engineering overview
12. Explain the process model that combines the element of waterfall and iterative fashion.
13. What is the use of context diagram? Draw a Level-1 DFD
14. Explain about requirement management?
15. What is requirement engineering? State its process and explain requirements elicitation problem
16. Explain functional and behavioral modeling.
17. What is prototyping approach? Explain.
18. Explain about the cardinality and modality with suitable example.
19. Compare functional and behavioral models
20. Explain in detail about all modeling technique in software requirements.
21. Explain about rapid prototyping techniques.
22. Write a detailed note on scenario based modeling.
23. With an example explain about DFD.
24. Write short notes on data modeling?
25. explain the elements of the analysis model
26. Define the concept of cohesion and coupling. State the difference.
27. What are different types of architectural styles exist for software and explain any one software architecture.

28. What is transform mapping? Explain the process with an illustration. What is its strength and weakness?
29. Explain about the various design concepts considered during design?
30. Write short notes on user interface design process?
31. What are the different types of architectural styles exist for software and explain any onesoftware architecture in detail.
32. Explain data architectural and procedural design for a software.
33. Justify “Design is not coding and coding is not design”.
34. Explain in detail about the characteristics and criteria for a good design.
35. Describe the golden rules for interface design.
36. What is the design document?
37. Discuss in detail the basic structure of analysis model.
38. Explain the testing objectives and its principles.
39. Explain the basis path testing in detail.
40. What is the need for software maintenance and maintenance report.
41. What are the attributes of the good test? Explain the test case design.
42. Integration testing.
  
43. Explain the cyclometric complexity in detail
44. What is black box testing? Explain
45. What is the necessity of unit testing? Write down all unit test considerations.
46. Explain about system testing.
47. Why is it so important to include boundary values in your black-box test data?  
Explain
48. Discuss the differences between black box and white box testing . [8]
49. Explain the different integration testing approaches.
50. What do you mean by system testing? Explain in detail
51. Explain boundary value analysis.
52. Justify the importance of testing process
53. Discuss in detail about alpha and beta testing.
54. What do you mean by integration testing? Explain their outcomes.
55. Explain the integration testing process and system testing process and discuss their outcomes:
56. . What do you mean by boundary value analysis? Give two

examples.

57. What is performance testing? Describe.
58. What are the various testing strategies to software testing? Discuss them briefly.
59. Describe the testing objectives and its principles.
60. Explain the basis path testing in detail.
61. What is need for software maintenance and maintenance report.
62. What are the attributes of a good test. Explain the test case design.
63. Explain the various types of black-box testing methods.
64. What is the necessity of unit testing? Write down all unit test considerations.
  
65. Write a note on regression testing.
66. Explain in detail the COCOMO model.
67. Explain in detail about the maintenance process
68. Discuss in detail about software evolution.
69. Justify the statement "Software maintenance is costlier".
70. Discuss the concept of software maintenance process.
71. Explain the scheduling of software project.
72. Explain task network. Construct a schematic task network for concept development project.
73. Explain the Constructive Cost model.
74. Explain the various methods encountered in cost estimation

**10 marks**

1. Explain the changing nature of Software.
2. Explain Evolutionary process model.
3. With suitable illustration explain SPIRAL model .
4. Explain software prototyping? What are the various prototyping methods and tools?
5. What is requirement engineering? State its process and explain requirements elicitation problem.
6. Explain in detail about all modeling techniques in software requirements.
7. Explain the fundamental software design concepts in detail.
8. Discuss in detail the basic structure of analysis model.
9. What is transform mapping? Explain the process with an illustration



10. Explain about the various design concepts considered during design?
11. Write short notes on user interface design process
12. Discuss in detail about the design process in software development process.
  
13. Explain the different integration testing approaches.
14. Explain boundary value analysis.
15. What are the various testing strategies to software testing? Discuss them briefly.
16. Explain the various types of black-box testing methods.
17. What are the different activities in project planning
18. Discuss the concept of software maintenance process
19. Explain about Formal Technical Review.

## **OPEN SOURCE SOFTWARE**

### **2 MARKS**

1. What is CSS?
2. Explain heading tag in HTML.
3. What are daemons in linux?
4. What is process?
5. What is MYSQL?
6. What is the function of loading a database?
7. Write advantages of Javascript.
8. How we can declare user define function in javascript?
9. What is meant by expression?
10. What is meant by formal parameter?
11. How to create a hyperlink in HTML?
12. What is display property in CSS?
13. Mention any two advantage of linux.
14. What is the use echo command?
15. Write any two advantage of javascript.
16. Define array.
17. Write the syntax of USE command in MYSQL.
18. How to load a database?
19. Mention any two characteristics of PHP.
20. Define session.
21. What is meant by HTML?
22. What is TAG? Give example.

23. Why linux is considered as an open-source system?
24. What is Linux kernel?
25. How we can set cookie expire time?
26. Write the function of `mysql_fetch_row()`.
27. What is javascript?
28. How we can add javascript to HTML page?
29. What is variable in PHP?
30. Explain `echo()` function.
31. Explain `<HR>` tag with example.
32. What is hypertext?
33. Who is first developer of linux?
34. What is kernel?
35. What is the use of comment statement in javascript?
36. What is event in javascript?
37. What is meant by table in mysql?
38. What is the use of `SHOW TABLES` command?
39. What is purpose of `$_GET[]` method?
40. What is the meant by function in PHP?
41. Explain `<A>` tag with example.
42. What is HTML?
43. What is Terminal in linux?
44. What is the use of pipe “|” operator in linux?
45. List the logical operators in javascript.
46. Write the purpose of `abs()` function in javascript.
47. What is meant by record in mysql?
48. Write the command to display the structure of a table in mysql.
49. What is purpose of `$_POST[]` method?
50. What is meant by session in PHP?

### **5 MARKS**

1. Explain the features of HTML.
2. Explain formatting tags in HTML
3. Explain any five VI editor commands.
4. What is a process in linux? Explain about `PS` and `KILL` command.
5. Explain `IF..ELSE` statement in Javascript.
6. Difference model and modeless dialog box.
7. Explain the data types used in mysql.
8. Explain about Altering the table with example.
9. What is PHP? write its advantages.
10. Explain data handling functions in PHP.
11. Write short notes on lists.
12. Explain the `css` box model.
13. Discuss the two kinds of partition in linux.
14. Elucidate the concepts of process management.
15. Write short notes on javascript variable.

16. Describe the arithmetic and relational operators in javascript.
17. Explain the “show” database and “create” database commands.
18. Give short notes on table joins.
19. Illustrate the PHP variables.
20. Explain the cookies.
21. How to customize a form.
22. Compare textbox with label.
23. Explain any two indeterminate loops.
24. Mention any four built-in functions for mathematical operations.
25. Write an algorithm for sorting the numbers in ascending order.
26. Write the structure for defining the events.
27. Mention the types of dialog boxes.
28. Write about optimization.
29. Mention the statements for basic file operations.
30. Write a program to write data to a text file.
31. Explain the structure of HTML.
32. Explain FRAMES tags in HTML.
33. Explain grep command and its parameters with an example.
34. Write a shell to display nos. From 1...10 using while loop.
35. What is loop? Difference while loop and do-while loop in javascript.
36. Write a javascript to get a name from the HTML form and display it using alert window.
37. Write the features of MYSQL.
38. Explain about joins in MYSQL with example.
39. What is PHP? Write its advantages.
40. Explain function definition and function call in PHP.
41. Explain the display properties.
42. What is <IMG> tag? What are the attributes that can be used with <IMG> tag?
43. Explain following functions with syntax purpose and example.
  - (i) Mysql connect().
  - (ii) Mysql select db().
44. Write steps to establish connection from PHP to Mysql with simple code.
45. Explain logical operators in javascript.
46. Explain while loop in javascript with example.
47. How we can set cookie expire time? Explain with examples.
48. List and explain advantages of mysql.
49. How variables are declared in PHP? Explain.
50. Explain branching statement in PHP.
51. How special characters are represented in HTML? Explain.
52. Explain any four text formatting tags in HTML.
53. List and explain advantages and disadvantages of mysql.
54. List and explain mysql datatypes.
55. Explain conditional operators in javascript.
56. Explain for loop in javascript with example.
57. Explain session its advantages and disadvantages.

58. List and explain possible data types available in PHP.
59. How to starting and destroying a session? Explain.
60. How to customize a form?
61. Compare textbox with label.
62. Explain any two indeterminate loops.
63. Mention any four built in function for mathematical operations.
64. Write an algorithm for sorting the numbers in ascending order.
65. Write the structure for defining the events.
66. Mention the types of dialog boxes.
67. Write about optimization.
68. Mention the statements for basic file operations.
69. Write a program to write data to a text file.

### **10 MARKS**

1. Mention any four events which can be triggered by command button.
2. Write a program to calculate average of marks with functions for finding sum of marks.
3. Develop an application with two forms each with four controls.
4. Develop a project with MDI form and any two menu options.
5. Give common properties and methods of DriveListBox.
6. Explain TABLE, TH, TR, FONT, SELECT tags with an example.
7. Discuss about LINUX architecture.
8. Explain string handling functions in javascript.
9. Explain SELECT, INSERT, UPDATE and DELETE commands in Mysql.
10. Write a code with PHP and MYSQL to insert a student record into the database.
11. Explain in detail about the style sheets in CSS.
12. Discuss the file system concept in linux.
13. Write a detailed note on javascript functions.
14. Explain the sheet, insert, update and delete statement in MYSQL with example.
15. Describe the various types of operators on PHP.
16. Explain HTML forms with an example.
17. Explain the directory structure of linux.
18. Write a javascript code for simple form validation with the fields name, e-mail, zipcode and country.
19. Explain mysql string handling functions with example.
20. Write a code for PHP and MYSQL to search a student record from the database and display it vertically on the browser.
21. Explain features of HTML.
22. How to manage process in LINUX ? Explain.
23. Write a javascript for blinking text on the screen.

24. Explain the statements (a) select (b) insert (c) update and (d) delete.
25. What are three different kind of arrays in PHP? Explain.
26. What is meant by FORM? What are essential steps while designing the idle form?
27. Write a javascript to manipulate array.
28. List and explain mysql datatypes.
29. What are decision making statements in PHP? Explain.
30. List the properties of color box.

### **ASP.NET**

1. What are the limitations of Asp that led to the development of Asp.net
2. What are the different filetypes available with Asp.Net
3. What is the use of bin directory?
4. Comment on Application updates and Page updates
5. What are component updates
6. What are the steps for creating virtual directory
7. Explain the various stages in an ASP.NET request
8. Explain Web Form Inheritance
9. Write the syntax for converting a vb code to dll
10. Write a short note on
11. What are the three ways to code web forms
12. Write a short note on Global.asax application file
13. What are the basic events available with Global.asax
14. Write a short note on Asp.classes
15. Write a short note on asp.net configuration
16. What is an applet
17. What are the problems with Response.write
18. Write a note on server controls
19. What are Html server controls?
20. What do you understand by view class?
21. Explain the html server control classes
22. What are the important properties of html server controls
23. Explain the different parameters available for event handlers
24. Explain the html control inheritance
25. Explain html control events
26. Explain Htmlcontrol base class properties

27. Explain htmlcontainercontrol properties
28. Explain htmlinputcontrol properties
29. Explain the basic page properties
30. Write a note on the controls collection
31. Explain the HttpRequest class properties
32. Explain the HttpResponse Members
33. Explain the methods of the serverutility class
34. What are the features of web controls
35. Explain the basic web control classes
36. Give the syntax for defining web control tags
37. Explain with the help of diagram the web control hierarchy
38. Explain the webcontrol properties
39. What are List controls and Mutiple select List controls
40. What are enumerated values
41. How can we set fonts, colors, Units in web controls
42. Explain the web control events
43. Explain the postback processing sequence
44. Explain web control events
45. Explain the page processing sequence

## **Mobile Computing**

1. Define Mobile computing.
2. List the advantages of mobile computing.
3. Distinguish between mobile computing and wireless networking.
4. List the wireless networking standards used in Mobile computing.
5. Distinguish between infrastructure-based network and infrastructure less network.
6. Define Mobile Communication.
7. Analyze the challenges in Wireless Communication.
8. Classify the types of wireless networks
9. Illustrate Ad hoc Networks with pictorial representation.
10. Give the uses of Ad-Hoc networks?
11. Mention the applications of Mobile computing.
12. Point out the Characteristics of Mobile computing
13. Describe the function of presentation, application and data tier of mobile environment.
14. What is the role of a MAC protocol?
15. Identify the issues of Wireless MAC Protocol.
16. Classify the types of MAC Protocol.
17. Explain hidden terminal problems in infrastructure-less network.

18. When does the exposed terminal problem arise? Compose a role which is played by Radio/Infrared signals play in Mobile Computing?
19. Summarize the reasons as to why the MAC protocol designed for infrastructure based wireless may not work satisfactory in infrastructure
20. Formulate a reason why Collision Detection based protocol is not suitable for wireless networks?
21. What is MACA protocol? In which environment is it suitable?

## **PART II**

1. (i) What is Mobile Computing? Explain its applications in the real world scenario. (8) (ii) Differentiate between mobile computing and wireless networking. (8)
2. (i) Explain the characteristics of Mobile Computing. (8) (ii) Explain the structure of Mobile Computing Application. (8)
3. (i) Describe the architecture of Mobile Computing Environment (8) (ii) Define the functions of the presentation tier, application tier and data tier of Mobile Computing Environment. (8)
4. (i) Name one MAC protocol that is used in mobile ad hoc networks. Briefly explain its working. (8) (ii) Name 1 MAC protocol that is used in sensor networks. Briefly explain its working. (8)
5. (i) Illustrate the taxonomy of MAC protocols. (10) (ii) Discuss about one popular protocol from each of these categories. (6)
6. (i) Summarize the issues in the Wireless MAC Protocols. (8) (ii) Identify the situations under which protocols from one category would be preferable over the other categories. (8)
7. (i) Describe the various Fixed assignment schemes. (8) (ii) Discuss the various Reservation Based schemes. (8)
8. Describe in detail about TDMA, FDMA, and CDMA and tabulate the differences among them. (16)
9. (i) Discuss the basic scheme of the CDMA protocol. (8) (ii) What is the role of a pseudorandom generator in the working of the CDMA protocol? (8)
10. (i) What are the principle responsibilities of the MAC Protocol? (8) (ii) How does MAC protocol for wireless networks differ from those in wired network? (8)
11. (i) Illustrate the working of a contention-based MAC protocol with suitable examples. (8) (ii) Explain the various random assignment schemes that are used in MAC protocol. (8)
12. (i) What is MACA protocol? In which environment is it suitable. Briefly explain its working. (8) (ii) How does MACA protocol solve the hidden/exposed terminal problem? (8)
13. (i) Explain why MAC scheme in wired network fail in wireless networks. (8) (ii) How does the multiple access with collision avoidance (MACA) scheme work? (8)
14. (i) Prepare a brief account of scheduled based MAC protocol. (8) (ii) Name any one scheduled based MAC protocol and explain in detail. (8)

## **PART III**

1. Differentiate between Traditional IP and Mobile IP?
2. What is encapsulation in mobile IP?
3. List the advantages and disadvantages of mobile IP?
4. What do you mean by the term binding of mobile node?
5. Compare tunneling and reverse tunneling.
6. What do you mean by agent advertisement?
7. Compare Agent solicitation and Agent discovery
8. Formulate a plan to create mobile IP along with basic requirements?

9. Illustrate the schematic model of Mobile IP with the neat sketch.
10. What is DHCP?
11. Point out the Advantages and Disadvantages of Mobile TCP
12. Show the pictorial representation of indirect TCP model.
13. State the functions of SMTP and SMNP protocols
14. Describe the structure of TCP segment
15. Define Adaptive transmission control mechanism
16. Develop a solution to reduce the congestion in a mobile network.
17. Why does congestion occur in a network?
18. Define slow start in mobile computing.
19. Illustrate about snooping TCP with suitable examples.
20. Summarize the features of Freeze-TCP
1. Write Short notes on: (16) (i) Home Address (ii) Mobile Node (iii) Foreign Agent (iv) Foreign Network (v) Home Network
2. Describe the following terms in detail: (16) (i) Corresponding Node (ii) Care of Address (iii) Agent Discovery (iv) Tunneling and Encapsulation.
3. (i) Explain the operation of mobile IP with the help of a suitable schematic diagram and by suitable examples.(8) (ii) Explain the agent advertisement procedure of mobile IP(8)
4. (i) Explain why the traditional IP cannot be used in a mobile network. (8) (ii) What are the main differences between the traditional IP and the mobile IP? How does mobile IP support mobile hubs? (8)
5. (i) Explain the limitations of IPv4 and how are they overcome by IPv6. (8) (ii) Describe the evolution of Mobile IP. (8)
6. Give a brief account of route optimization in Mobile IP. (16)
7. (i) With the diagram explain DHCP and its protocol architecture. (8) (ii) Describe IP-in-IP, Minimal IP and GRE encapsulation methods. (8)
8. (i) Compare the architecture of TCP/IP protocol suite with the ISO/OSI architecture.(8) (ii) Explain the adaptation of TCP window in detail. (8)
9. (i) With the neat diagram explain the Architecture of TCP/IP. (8) (ii) Explain the various improvements in TCP performance with diagram. (8)
10. (i) Define I-TCP and explain with the help of a suitable schematic diagram. (8) (ii) What is the snooping TCP approach in mobile wireless networks? Discuss its advantages. (8)
11. (i) What is slow start in TCP operation? Explain its working. (8) (ii) How does slow start help improve the performance of TCP? (8)
12. (i) Briefly discuss the M-TCP approach of extending TCP to work efficiently in mobile wireless networks. (8) (ii) How does M-TCP maintain end to end semantics? (8)
13. (i) Why does congestion occur in a network? Explain how does TCP detect and handle congestion. (8) (ii) Explain the working of freeze-TCP. (8)
14. Discuss the popular TCP Congestion Control Algorithms. (16)

#### **PART IV**

1. Give some popular Routing Protocols.
2. Give the applications of MANET.
3. Is 3G cellular wireless technology superior to 2G technology? Justify your answer.
4. Show the characteristics of 4G and 5G Cellular Networks.
5. List the 3 important features of GSM security.
6. Define MSC and BSC
7. Define Call Routing
8. Define OMC.



9. List the Services of GSM.
10. Describe the function of HLR and VLR.
11. What are the subsystems of GSM?
12. Point out the major functions in NSS.
13. Analyse the need for EIR.
14. Define GPRS.
15. Give the Functions of GGSN?
16. Classify the categories of GPRS services.
17. GPRS is advantageous than GSM. Justify the statement.
18. Generalize the limitations of GPRS.
19. What are the main elements of UMTS?
20. How UMTS networks are different from 2G network?
21. Can UMTS networks easily work with the existing GSM/GPRS networks? Justify your answer.
22. networks? Justify your answer.
23. Create different ways to develop anonymity

## **PART V**

1. Illustrate about cellular Mobile Communication with the neat sketch. (16)
2. Briefly explain how the mobile cellular communication has evolved over different generations of technology. (16)
3. (i) Compare 1G and 2G cellular wireless communication technologies. (8) (ii) What do you understand by 2.5G? How is it different from 2G and 3G technologies? (8)
4. (i) Describe the important functional difference between 1G, 2G and 3G cellular networks. (10) (ii) Is 3G cellular wireless technology superior to 2G technology? Justify your answer. (6)
5. Explain the transport technologies used across Generations of Cellular Networks. (16)
6. (i) Describe GSM architecture and its services in detail. (8) (ii) Explain GSM Authentication and Security. (8)
7. Identify at least four similarities and four dissimilarities between a GSM network and UMTS network. (16)
8. Illustrate how a GSM network provides security to the customers. (16)
9. (i) Describe the GPRS procedure in detail. (8) (ii) State its Advantages and Disadvantages. (8)
10. (i) Explain GPRS protocol architecture in detail. (8) (ii) Explain in detail about UMTS architecture. (8)
11. What do you mean by Virtual Home Environment (VHE)? Explain how VHE is realized in 3G networks?
12. (i) Discuss the services of GPRS. (8) (ii) What are the advantages of GPRS over GSM? (8)
13. What is UMTS? Describe the functions of HLR and VLR in call routing & roaming?
14. Do mobile phones affect the human body negative? Explain your answer.(16)

## **PART V**

1. What is ad hoc network?
2. Analyse the need for Ad Hoc networks.
3. List the characteristics of MANETs.
4. Identify the issues that are addressed by routing protocol in MANET?
5. What is hybrid routing protocol?

6. List the advantages in DSR.
7. What do you mean by dynamic topology of MANET?
8. Interpret count to infinity problem.
9. Give some popular Routing Protocols.
10. Give the applications of MANET.
11. Classify the MANET routing algorithms.
12. Classify the types of communication in a MANET?
13. Relate the MANET routing strategies with routing strategies of traditional networks.
14. Why traditional routing strategies cannot be deployed in a MANET?
15. Summarize about security issues in MANET.
16. Compare DSDV and DSR
17. Give examples of typical Applications of Unicast and Multicast communication
18. Can cellular network and wireless LAN be considered as adnetworks? Justify
19. Define VANET.
20. Compare MANET Vs VANET.







