COMPUTER SCIENCE
Specimen Question Paper

Maximum Marks: 80
Time allowed: One and a half hours
*(Candidates are allowed additional **15 minutes** for **only** reading the paper.)*
ALL QUESTIONS ARE COMPULSORY
The marks intended for questions are given in brackets [ ].
Each question/subpart of a question carries 1 mark.

1. The law which represents the Boolean equation A + B = B + A is: [1]
   (a) Associative Law
   (b) Distributive Law
   (c) Commutative Law
   (d) Absorption Law

2. The dual of the Boolean equation (X+Y) ·1 = X+Y is: [1]
   (a) X+Y + 0
   (b) X·Y + 0 = X·Y
   (c) (X·Y) + 1 = X·Y
   (d) (X+Y) + 0 = X·Y

3. If A=1, B=0, C=0 and D=1, then the maxterm will be: [1]
   (a) AB'C'D
   (b) A'BCD'
   (c) A+B'+C'+D
   (d) A'+B+C+D'

4. The compliment of the Boolean expression F(P,Q,R) = (P + Q + R) is: [1]
   (a) P'Q'R'
   (b) P' + Q' + R'
   (c) P + (Q'+R')
   (d) (P+Q) + R'

5. The propositional operator => represents: [1]
   (a) Conjunction
   (b) Implication
   (c) Disjunction
   (d) Negation

6. Encoders are used for: [1]
   (a) Adding two bits
   (b) Converting Decimal to Binary
   (c) Converting Binary to Decimal
   (d) Data transmission

7. NAND gate is formed by the combinations of: [1]
   (a) AND gate and OR gate
   (b) OR gate and NOT gate
   (c) NAND gate and NOT gate
   (d) AND gate and NOT gate

8. The combinational circuit which adds two binary bits is: [1]
   (a) Full Adder
   (b) Decoder
   (c) Half Adder
   (d) Multiplexer

9. The Quad group in a Karnaugh's map eliminates: [1]
   (a) One variable
   (b) Four variables
   (c) Three Variables
   (d) Two variables

10. The proposition (a <=> b) is represented by: [1]
    (a) a'b' + ab
    (b) (a'+b') · (a+b)
    (c) (a+b)'
    (d) (a·b)'

11. If the input in a decoder is A'BC'D, then the decimal equivalent output will be: [2]
    (a) 8
    (b) 10
    (c) 5
    (d) 6

12. A matrix MAT[10][15] is stored in the memory in Row Major Wise with each element requiring 2 bytes of storage. If the base address at MAT[1][2] is 2215, then the address of MAT[3][7] will be: [2]
    - (a) 2285
    - (b) 2315
    - (c) 2319
    - (d) None of the above

13. With reference to the given proposition $\sim P \Rightarrow Q$, answer the following questions:
    - (a) the converse of the proposition is: [1]
      - (i) $Q \Rightarrow \sim P$
      - (ii) $\sim Q \Rightarrow P$
      - (iii) $\sim Q \Rightarrow \sim P$
      - (iv) $\sim P \Rightarrow \sim Q$
    - (b) the contra-positive of the proposition is: [1]
      - (i) $\sim P \Rightarrow Q$
      - (ii) $Q \Rightarrow P$
      - (iii) $\sim Q \Rightarrow P$
      - (iv) $Q \Rightarrow \sim P$

14. The reduced expression for the Boolean expression $F(X,Y,Z) = \Sigma(0,1,2,3,4,5,6,7)$ is: [2]
    - (a) $XY' + X'Y$
    - (b) 1
    - (c) 0
    - (d) None of the above

15. What is the output of the code given below? [2]
    ```
    int i,j;
    for( i=1; i<=5;i++);
        for(j=i+1;j<1;j++);
            System.out.print(i + "+" + j) ;
    ```
    - (a) 67
    - (b) 1 + 2
    - (c) 6 + 7
    - (d) 12

16. What is the output of the statement given below? [2]
    ```
    System.out.print(Integer.parseInt("234")+'A');
    ```
    - (a) 234 + 65
    - (b) 234A
    - (c) 299
    - (d) ERROR

17. What is the output of the statement given below? [2]
    ```
    System.out.print('A'+'1'+'C');
    ```
    - (a) 65 + 1 + 66
    - (b) 10 + 1 + 67
    - (c) 181
    - (d) 65 + 49 + 67

18. The basic logic gate that represents the simplification of the Boolean expression **A.(A'+B). (A+B)** is: [2]
    - (a) OR gate
    - (b) NOT gate
    - (c) AND gate
    - (d) None of the above

19. What is the conditional statement to check for the Non-boundary elements in a double dimensional array of 'M' number of rows and 'N' number of columns? The row index is represented by 'r' and the column index is represented by 'c'. [2]
    - (a) (r>0 || r<M-1 && c>0 || c<N-1)
    - (b) (r>0 && r<M-1 || c>0 && c<N-1)
    - (c) (r>0 && r<M-1 && c>0 && c<N-1)
    - (d) (r>0 || r<M-1 || c>0 || c<N-1)

20. The proposition $\sim(a \wedge b) V (\sim a \Rightarrow b)$ is a: [2]
    - (a) Contradiction
    - (b) Contingency
    - (c) Tautology
    - (d) Implication

21. Reduce the given Boolean function $F(A,B,C,D) = \Sigma(0,2,4,8,9,10,12,13)$ by using 4-variable Karnaugh map and answer the following questions:
    - (a) What will be the least number of groups and their types formed for reduction? [1]
      - (i) 6 pairs
      - (ii) 2 quad and 2 pairs
      - (iii) 1 quad and 3 pairs
      - (iv) 3 quads
    - (b) The reduced expression of the Boolean function given above is: [2]
      - (i) $ACD' + B'D' + BD$
      - (ii) $(A+C'+D').(B'+D').(A+C')$
      - (iii) $C'D' + AC' + B'D'$
      - (iv) $(C+D'). (B'+D').(A+B+D)$

22. A school intends to select candidates for an Inter school competition as per the criteria given below:

    ● The student has participated in an earlier competition and is very creative

    Or

    ● The student is very creative and has excellent general awareness, but has not participated in any competition earlier

    Or

    ● The student has excellent general awareness and has won prize in an inter -house competition

    The inputs are:

Inputs	
A	Participated in a competition earlier
B	Is very creative
C	Won prize in an inter house competition
D	Has excellent general awareness

    (In all the above cases 1 indicates yes and 0 indicates no).

    Output: X [1 indicates yes and 0 indicates no for all cases].

    Draw the truth table for the inputs and outputs given above and answer the following questions:

    (a) The POS expression for X(A,B,C,D) will be: [2]

       (i)   F(A,B,C,D) = Σ(3, 5, 7, 11, 12, 13, 14, 15)   (ii)   F(A,B,C,D) = π(3, 5, 7, 11, 12, 13, 14, 15)

       (iii)   F(A,B,C,D) = π(0, 1, 2, 4, 6, 8, 9, 10)   (iv)   F(A,B,C,D) = Σ(0, 1, 2, 4, 6, 8, 9, 10)

    (b) The maximum input combinations for the above truth table will be: [1]

       (i)   24   (ii)   16

       (iii)   8   (iv)   4

23. Reduce the given Boolean function F(A,B,C,D) = π(3,4,5, 6, 7, 11,13,15) by using 4-variable Karnaugh map and answer the following questions:

    (a) What will be the least number of groups and their types formed for reduction? [1]
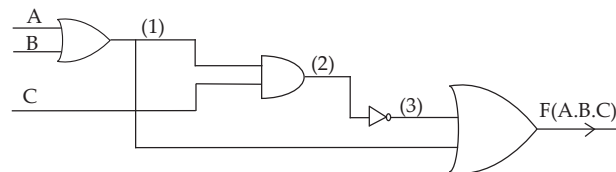
       (i)   6 pairs   (ii)   3 quads

       (iii)   1 quad and 3 pairs   (iv)   2 quad and 3 pairs

    (b) The reduced expression of the Boolean function given above is: [2]

       (i)   (B+C).(B+D).(A'+D)   (ii)   BC + BD + A'D

       (iii)   AB' + C'D' + B'D'   (iv)   (A+B').(C'+D').(B'+D')

24.

    From the logic diagram given above, where A,B and C are inputs and F is the output, answer the following questions:

    (a) The expression at (1) is: [1]

       (i)   A.B   (ii)   A' + B'

       (iii)   A + B'   (iv)   A + B

    (b) The expression at (3) is: [1]

       (i)   A+B.C'   (ii)   ((A+B)'.C)'

       (iii)   ((A+B).C)'   (iv)   (A+B).C

    (c) The final expression F(A,B,C) is: [1]

       (i)   F=((A+B)'.C)' + (A+B)   (ii)   F= (A+B)'.(C+A+B)

       (iii)   F=((A+B).C)' + (A+B)   (iv)   F= (AB + C)' +(A+B)

25. Given the Boolean expression F = (P + R) · (P·Q + Q·R′), identify:

    (a) The complement of the expression: [2]

    (i)   P′R′ + (P′+Q′).(Q′+R)   (ii)   (P′+R′) . (P′+Q′) + (Q+R′)

    (iii) P′R′ .(PQ′ + Q′R)   (iv)   (P+R)′ .(P′+Q).(Q′+R)

    (b) The law used: [1]

    (i)   Distributive Law   (ii)   De Morgan Law

    (iii) Associative Law   (iv)   Idempotent Law

26. With reference to the program code given below, answer the questions that follow:

    void fun(int n)

    { int i,f,;

    for(i=1,f=1;i<=n;i++,f*=i);

    System.out.print(f);

    }

    (a) What is the output of the method **fun()** when the value of n=4? [2]

    (i)   24   (ii)   72

    (iii) 120   (iv)   ERROR

    (b) What is the method **fun()** performing? [1]

    (i)   Checking for Prime Numbers   (ii)   Product of odd numbers

    (iii) Factors of a number   (iv)   Finding the factorial

27. With reference to the program code given below, answer the questions that follow:

    int test(int n)

        { if(n==1) return 0;

            for (int i=2;i<=(int)(Math.sqrt(n));i++)

            if(n%i==0)

            return 0;

            return 1;

        }

    (a) What will the method **test()** return when the value of n=9? [2]

    (i)   1   (ii)   true

    (iii) 0   (iv)   Error

    (b) What is the method **test()** performing? [1]

    (i)   Prime number/Composite number   (ii)   Armstrong number

    (iii) Palindrome number   (iv)   Perfect number

28. With reference to the program code given below, answer the questions that follow:

    void dimen(int n[ ][ ])

    { int p=0;

        for (int i=0;i<n.length;i++)

        for(int j=0;j<n[0].length;j++)

        { if(i==0 || i==n.length-1 || j==0 || j==n[0].length-1)

            p=p+n[i][j];

        }

        System.out.print(p);

    }

    (a) What will be the output of the method **dimen()** when the value of n[ ][ ] ={{2,3,7},{1,5,9},{10,-3,8}} ? [2]

    (i)   42   (ii)   33

    (iii) 5   (iv)   37

(b) What is the method **dimen( )** performing? [1]

    (i) Finding the product of the boundary elements

    (ii) Finding the sum of the non-boundary elements

    (iii) Finding the sum of the boundary elements

    (iv) Finding the sum of the matrix elements

29. With reference to the program code given below, answer the questions that follow:

```
void single(int x[])
{ int w=1;
  for(int y=0;y<x.length;y++)
    { if(x[y]%2==0 && x[y]>0)
       w=w*x[y];
    }
  System.out.print(w);
}
```

(a) What will be the output of the method **single()** when the value of x[] = {10,2,9,-6,5,6} ? [2]

    (i) 120   (ii) 45

    (iii) 720   (iv) 18

(b) What is the method **single( )** performing? [1]

    (i) Sum of the positive odd elements   (ii) Product of the even elements

    (iii) Product of the positive even elements   (iv) Sum of the positive even elements

30. With reference to the program code given below, answer the questions that follow:

```
int solve(int a, int b)
{ int i,l=0;
   for(i=1;i<=a*b;i++)
   { if(i%a==0&& i%b==0)
      { l=i; break;}
   }
  return l;
}
```

(a) What will be the output of the method **solve()** when the value of a=8 and b=12? [2]

    (i) 4   (ii) 96

    (iii) 0   (iv) 24

(b) What is the method **solve( )** performing? [1]

    (i) HCF of 'a' and 'b'   (ii) Prime Factors of 'a' and 'b'

    (iii) LCM of 'a' and 'b'   (iv) None of the above

31. The following program code checks if the positive integer 'N' is a palindrome number by returning true or false. There are some places in the code marked as **?1?, ?2?, ?3?, ?4?** and **?5?** which are to be replaced by a statement/expression so that the code works properly.

```
boolean Palindrome(int N)
{ int rev = ?1? ;
  int num = N;
  while (num>0)
  { int f = num/10;
    int s = ?2? ;
    int digit = num − ?3? ;
    rev = ?4? + digit;
```

```
        num /= ?5?;
    }
    if(rev == N)
        return true;
    else
        return false;
}
```

Answer the following question:

(a) What is the statement or expression at ?1? [1]

   (i)   −1   (ii)   0

   (iii) 10   (iv)   2

(b) What is the statement or expression at ?2? [1]

   (i)   s *10   (ii)   f /10

   (iii) rev   (iv)   f *10

(c) What is the statement or expression at ?3? [1]

   (i)   s   (ii)   rev

   (iii) f   (iv)   digit * 10

(d) What is the statement or expression at ?4? [1]

   (i)   s * 10   (ii)   rev *10

   (iii) f   (iv)   rev

(e) What is the statement or expression at ?5? [1]

   (i)   1   (ii)   100

   (iii) 10   (iv)   rev

32. The following program code sorts a single dimensional array in ascending order using **Insertion Sort technique**. There are some places in the code marked as **?1?, ?2?, ?3?, ?4?** and **?5?** which are to be replaced by a statement/expression so that the code works properly.

```
void insertionSort(int array[])
{ int n = ?1?;
    for (int j = 1; j < n; j++)
    {
        int key = ?2?;
        int i = j-1;
        while ( (i > -1) && ( array [i] > ?3? ) )
        {
            array [i+1] = ?4?;
            i--;
        }
        ?5? = key;
    }
}
```

Answer the following question:

(a) What is the statement or expression at ?1? [1]

   (i)   array.length()   (ii)   array.length

   (iii) length   (iv)   −1

(b) What is the statement or expression at ?2? [1]

   (i)   j   (ii)   array[j+1]

   (iii) array[j]   (iv)   0

(c) What is the statement or expression at ?3?   [1]

   (i)   key   (ii)   array[j]

   (iii) i+1   (iv)   n

(d) What is the statement or expression at ?4?   [1]

   (i)   j+1   (ii)   key

   (iii) array[j]   (iv)   array[i]

(e) What is the statement or expression at ?5?   [1]

   (i)   array[i+1]   (ii)   i+1

   (iii) j   (iv)   array[i]

Answers

1. (c) Commutative Law

Explanation: According to Commutative law , (A+B) = (B+A)

2. (b) X·Y + 0 = X·Y

Explanation: According to the principle of Duality, the dual form of a Boolean expression can be found by replacing each AND (•) to OR(+) , each OR (+) with AND (•). Also replacing each zero(0) with one(1) and one(1) with zero (0).

3. (d) A′+B+C+D′

Explanation: As per the Maxterm, 1 means variable in the complement form and 0 means variable in the normal form.

4. (a) P′Q′R′

Explanation: Here we can use the DeMorgan's law. In short, we can replace OR(+) to AND (•) and replace AND (•) to OR(+). Also convert the normal variable to the complement form and complement form to normal.

5. (b) Implication

Explanation: '→' represents the implication

6. (b) Converting Decimal to Binary

Explanation: Encoders can be used to convert decimal to binary format (In the syllabus we discuss about the decimal to binary encoder).

7. (d) AND gate and NOT gate

Explanation: NAND means negation of AND , so it is the combination of NOT gate and AND gate.

8. (c) Half Adder

Explanation: Half adders are used for adding two binary bits whereas full adders used for adding three binary bits.

9. (d) Two variables

Explanation: Quad group eliminates two variables , octet eliminates three variables and pair removes one variable.

10. (a) a′b′ + ab

Explanation: If you form the SOP (sum of products) of the equivalent connective , then it is **a'.b' + a.b**

11. (c) 5

Explanation: A′.B.C′.D is equal to 0101 which is equal to 5.

12. (a) 2285

Explanation: The formula we use here is row major wise .

Address of MAT[I][J] = B + W * ((I – LR) * N + (J – LC)) From the question, B = 2215 , W= 2 , I = 3, J = 7, LR = 1, LC= 2, N is the number of columns= 15.

Calculation :

= 2215 + 2x(15x(3-1) + (7-2))

= 2215 +2x35

= 2215 + 70

= 2285

13. (a) (i)   Q => ~P

   Explanation: The given proposition is ~P→Q so converse is Q→ ~P

   (b) (iii) ~Q => P

   Explanation: The contrapositive of the proposition is ~Q→P.

14. (b) 1

   Explanation: If we draw the Karnaugh Map of the given expression, we get an octet, reducing an octet means eliminating 3 elements. So 1 is the answer as it is the SOP.

15. (c) 6 + 7

   Explanation: The value of i is 6 and j loop will execute only where j= i+1 (7).

16. (c) 299

   Explanation: Integer.parseInt("234")+ 'A' = 234 + 65 (ASCII value of A) = 299.

17. (c) 181

   Explanation: ASCII value of 'A' = 65 ASCII value of '1'= 49 ASCII value of 'C' = 67. So sum of all these ASCII values is 65+ 49+ 67=181.

18. (c) AND gate

   Explanation: A.(A'+B).(A+B) = (A.A' + A.B).(A+B)

                                 = (0 + A.B).(A+ B)

                                 = A.B.A + A.B.B = A. B

19. (b) (r>0 && r<M-1 || c>0 && c<N-1)

   Explanation: To access the non boundary elements the condition for rows is r > 0 & r< M-1 and the condition for columns is c>0 &c < N-1.

20. (c) Tautology

   Explanation: The expression is :

   ~(a ∧ b) V (~a => b)

a	b	a^b	~(a^b)	~a	~a => b	~(a ∧ b) V (~a => b)
0	0	0	1	1	0	1
0	1	0	1	1	1	1
1	0	0	1	0	1	1
1	1	1	0	0	1	1

   So , ~(a ∧ b) V (~a => b) will give always True , which means it is a tautology.

21. (a) (iv) 3 quads

   (b) (iii) C'.D' + A.C' + B'.D'

   Explanation: F (A, B, C, D) = ss(0, 2, 4, 8, 9, 10, 12, 13)

Quad 1 (0, 4, 12, 8) = $\overline{C}\cdot\overline{D}$

Quad 2 (8, 9, 12, 13) = $A\cdot\overline{C}$

Quad 3 (0, 2, 8, 10) = $\overline{B}\cdot\overline{D}$

22. (a) (iii) $F(A,B,C,D) = \pi(0, 1, 2, 4, 6, 8, 9, 10)$

Explanation: The POS expression for X(A,B,C,D).

(b) (ii) 16

Explanation: as there are 4 inputs, there will be 2^4 (16) input combinations.

A	B	C	D	X(output)
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

$X(A,B,C,D) = \pi(0,1,2,4,6,8,9,10)$

23. (a) (ii) 3 quads

(b) (iv) (A+B').(C'+D').(B'+D')

Explanation:

There will be 3 quads

Quad 1 (3, 7, 5, 11)

Quad 2 (4, 5, 7, 6)

Quad 3 (5, 7, 13, 15)

24. (a) (iv) A+B

(b) (iii) ((A+B).C)'

(c) (iii) F=((A+B).C)' + (A+B)

25. (a) (i)   P′R′ + (P′+Q′).(Q′+R)

   Explanation: Applying the DeMorgan's law

   F = (P + R) · (P·Q + Q·R′)

   = ((P+R). (P.Q+Q.R′))′

   = ((P+R)′ + (P.Q +Q.R′)′) (De-morgan's law)

   = P′.R′ + (P.Q)′.(Q.R′)′

   = P′.R′ + (P′+Q′)(Q′+R)

   (b) (ii)   De Morgan Law

26. (a) (iii)   120

   Explanation: n = 4 , f = f*i. The final value of i is 5 and f= 24 (4 factorial). The value of f will be updated as f= 24 *5= 120.

   (b) (iv)   Finding the factorial

27. (a) (iii)   0

   Explanation: When n= 9, the iterative values of 'i' are, 2 and 3, so it returns 0

   (b) (i)   Prime number/Composite number

   Explanation: as it will return 1 for prime number and 0 for composite number.

28. (a) (iv)   37

   Explanation: 37 it is the sum of the boundary elements of the 2 dimensional array.

   (b) (iii)   Finding the sum of the boundary elements

29. (a) (i)   120

   Explanation: The method single() checks two conditions inside the for loop. One is the condition of even number and other is checking the condition of greater than zero or not. The answer is 120. The initial value of w= 1, as the loop executes , it becomes 10,20 (10 × 2)and finally 120(20 × 6)

   (b) (iii)   Product of the positive even elements

   Explanation: It calculates the product of the positive even numbers.

30. (a) (iv)   24

   Explanation: 24. Here a= 8 and b= 12. So the for loop executes from 0 to 96 (8 × 12). It satisfies the condition i%a ==0 and i%b==0 only when iterative value of 'i ' is 24.

   (b) (iii)   LCM of 'a' and 'b'

   Explanation: method solve() calculates the LCM of a and b.

31. (a) (ii)   0

   Explanation: i.e int rev=0 (here we initialise the value of rev)

   (b) (iv)   f *10

   Explanation: So, int s= f*10;

   (c) (i)   s

   Explanation: so int digit= num- s

   (d) (ii)   rev *10

   Explanation: so rev= rev*10 + digit;

   (e) (iii)   10

   Explanation: so num/= 10 (num= num/10, for eliminating the last digit from num and eventually num becomes zero.)

32. (a) (ii)   array.length

   (b) (iii)   array[j]

   Explanation: int key = array [j]

   (c) (i)   key

   Explanation: array[i]> key

   (d) (iv)   array[i]

   Explanation: array [i+1] = array [i]

   (e) (i)   array[i+1]

   Explanation: array [i+1] = key

❑❑

Chapter 1

Boolean Algebra

Multiple choice questions

1. What are universal gates?

  (a) AND   (b) OR

  (c) NAND   (d) None of these

2. The other name of Boolean algebra is

  (a) Algebra

  (b) Linear algebra

  (c) Arithmetic algebra

  (d) Switching algebra

3. If we want to perform product of max terms, the Boolean function must be brought into

  (a) NAND terms   (b) OR terms

  (c) NOT terms   (d) NAND terms

4. Which of the following is the expression for absorption law

  (a) $A + AB = A$

  (b) $A + AB = B$

  (c) $AB + AA'$ is equal to A

  (d) $A + B$ is equal to $B + A$

5. $X*Y = Y*X$ is the

  (a) Commutative law   (b) Inverse property

  (c) Associative law   (d) Identity element

6. Boolean algebra is a set of

  (a) Three values   (b) Two values

  (c) Four values   (d) Five values

7. To evaluate Boolean expressions, the first operator precedence is

  (a) Parentheses   (b) AND

  (c) OR   (d) NOT

8. $(A + B + C)'$ is equal to

  (a) $A'B'C'$ (b) $A'+ B'+ C'$

  (c) ABC (d) $A + B + C$

9. What is the function $A'B'C'$ using theorem and laws ?

  (a) $(A') + B + C$ (b) $(A + B)'+ C$

  (c) $A + B + C$ (d) $A'+B' +C'$

10. How can a Boolean function be converted from algebraic expression to a product of max terms.

  (a) Using Graphical Representation

  (b) Using Truth table

  (c) Using Canonical Conversion Method

  (d) Both b and c

11. What is the De Morgan's theorem ?

  (a) $(AB)'$ is equal to $A' + B.'$

  (b) $(A + B)'$ is equal to $A' *B$

  (c) $A'+ B'$ is equal to $A'B'$

  (d) $A' + B'= A'B'$

12. which is the reduced form of $A + BC$

  (a) $A'B + AB'C$

  (b) $AB + BC$

  (c) $(A + B) (A + C)$

  (d) $(A + C)B$

13. Which of the following is correct for x.x according to Boolean Algebra theorems

  (a) x   (b) 1

  (c) 0   (d) x'

14. What is the symbol of AND operation?

  (a) (+)   (b) (.)

  (c) (-)   (d) (/)

15. In Boolean Algebra, 0 is a

  (a) Commutative property

  (b) Additive identity

  (c) Associated identity

  (d) Identity element

16. Which algebraic structure with two Mathematic operations are used in Boolean algebra

  (a) Addition and subtraction

  (b) Subtraction and multiplication

  (c) Addition and multiplication

  (d) Addition and division

17. What do we call the logical sum of two or more logical product terms ?

(a) Sum of Product SOP

(b) Product of Sum POS

(c) OR operation

(d) NAND operation

18. Which of the following property is correct for X + 0 = 0 + X = X ?

(a) Commutative property

(b) Inversion property

(c) Associative property

(d) Identity element

19. Identify the correct identity element w r t addition

(a) X - 1 (b) x + 1

(c) X - 0 (d) x + 0

20. What do you understand by Sum of Product?

(a) Sum of Minterms

(b) Sum of Maxterms

(c) Both a and b

(d) Max terms

21. What is the other name of OR relation ?

(a) Logical multiplication

(b) Logical addition

(c) Logical Subtraction

(d) None of these

22. What is the other name of AND relation?

(a) Logical multiplication

(b) Logical addition

(c) Logical Subtraction

(d) None of these

23. When grouping cells within a K-map, the cells must be combined in groups of

(a) 2 (b) 1,2,4,8 etc

(c) 4 (d) 3

24. NAND and NOR gates are also called Universal gates because

(a) It can be found in almost all digital circuits.

(b) It can be used to build all other types of gates.

(c) These are used in all countries of the world.

(d) These were the first gates to be integrated.

25. State the Commutative Law of addition for two variables

(a) A + B = A.B (b) A + B = B + A

(c) AB = A + B (d) None of these

26. (A + B)(A′ *B′) = ?

(a) 1 (b) 0

(c) AB (d) AB′

27. (x*y)*z=x*(y*z) is the

(a) Commutative property

(b) Inverse property

(c) Identity element

(d) Associative property

28. According to Boolean Law, A + 1 = ?

(a) 1 (b) A

(c) 0 (d) A′

29. Which is equal to X.X′.

(a) 0 (b) 1

(c) X (d) X′

30. What do we call an Exclusive OR

(a) Prime function (b) Undefined function

(c) Even function (d) Odd function

31. X + XY =

(a) Y (b) 1

(c) 0 (d) X

32. Solve Y = AB′ + (A′ + B)C

(a) AB + AC (b) AB′ + C

(d) A′B + AC′ (d) AB + A

33. NAND is the complement of

(a) AND (b) OR

(c) NOT (d) XOR

34. What is the complement of NOR ?

(a) AND (b) OR

(c) NOT (d) XOR

35. Which of the following logic sense is involved in the inverter circuit ?

(a) Division (b) Addition

(c) Boolean variable (d) Subtraction

36. Simplify the following expressions:

F(A, B, C) = Σ(2, 3, 5, 4)

(a) What will be the smallest number of groups and their types formed for reduction?

(i) 2 pairs (ii) 1 pair

(iii) 4 pairs (iv) 3 pairs

(b) The reduced appearance of the Boolean function given above is:

(i) AB + AB (ii) AB + BA

(iii) A + B (iv) A

37. Given the Boolean expression A′B + CD′ identify:

(a) Complement of the expression is

(i) (A′ + B)(C′ + D) (ii) (A + B′)(C′ + D)

(iii) (A′ + B)(C′ + D) (iv) (A + B′)(C + D′)

(b) The law used:

    (i) Distributive Law

    (ii) De Morgan Law

    (iii) Associative Law

    (iv) Idempotent Law

Fill in the blanks

38. Logical addition is done by _____operator.

  (a) OR   (b) AND

  (c) NOT   (d) NOR

39. According to De Morgan's Theorem, the complement of a sum of variables is equal to the_____ of the variables.

  (a) Sum of complement

  (b) Complement of product

  (c) Product of complement

  (d) A sum term

40. A mathematical system invented by _____ _____ for formulating logical statement with symbol is called Boolean algebra

  (a) George Boole   (b) John Mauchly

  (c) J Presper Eckert   (d) Robert Noyce

41. Binary values 0 and 1 used in Boolean algebra called_____ .

  (a) Boolean values   (b) Boolean constants

  (c) Boolean digits   (d) Boolean elements

42. The _____ is inverse of a variable and is indicated by a bar over the variable.

  (a) Inversion   (b) Complement

  (c) Sum   (d) Product

43. If two or more sum terms are multiplied by Boolean multiplication, the final expression is a _____ form.

  (a) Product of sum   (b) Sum of product

  (c) Complement   (d) Constant

44. _____. gives all the values of logical variables and the possible results of given combinations of values.

  (a) Truth table   (b) Operators

  (c) Expression   (d) Complement

45. OR, AND and NOT are the _____ operations.

  (a) Relational   (b) Logical

  (c) Arithmetic   (d) Literal

46. Associative law of addition is _____ .

  (a) $A + B = B + A$

(b) $A + (B + C) = (A + B) + C$

(c) $A + (B + C) = (A + B)(A + C)$

(d) $A + B + C = A + B + C$

47. Name the correct law for $X(Y + Z) = XY + XZ$.

  (a) Commutative law

  (b) Associative law

  (c) Absorption law

  (d) Distributive law

48. What do you mean by Minterms ?

  (a) Product of binary variables

  (b) Sum of binary variables

  (c) Difference of binary variables

  (d) Complement of binary variables

49. What is Maxterms ?

  (a) Product of binary variables

  (b) Sum of binary variables

  (c) Difference of binary variables

  (d) Complement of binary variables

Match the following

50. Match the columns:

Group A		Group B	
1.	an octect	(i)	1
2.	a quad	(ii)	3
3.	a pair	(iii)	2
4.	$(x')'$	(iv)	A
5.	$A(A + B)$	(v)	x

(a) 1-(ii), 2-(iii), 3-(i), 4-(v), 5-(iv)

(b) 2-(ii), 1-(iii), 3-(v), 4-(i), 5-(iv)

(c) 3-(ii), 4-(iii), 5-(v), 1-(i), 2-(iv)

(d) 4-(ii), 5-(iii), 1-(v), 2-(i), 3-(iv)

51. Match the columns:

Group A		Group B	
1.	Simplification law	(i)	SOP and POS
2.	canonical forms of Boolean Expressions	(ii)	M.(~M + N) = M.N
3.	universal logic gates	(iii)	X-NOR
4.	logic gate that provides high output	(iv)	NAND and NOR

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

52. Match the columns:

Group A		Group B	
1. Addition of variables	(i)	C	
2. C + CD	(ii)	maxterms	
3. OR operation	(iii)	A + AB = A	
4. Absorption law	(iv)	Associative properties	

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

53. Match the columns:

Group A		Group B	
1. A + 1 =	(i)	A	
2. involution of A	(ii)	1	
3. A(A + B) =	(iii)	(AB)′ = A′ + B′	
4. DeMorgan's theorem	(iv)	A	

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(iii), 2-(iv), 3-(i), 4-(ii)

Answers

Multiple choice questions

1. (c) NAND

Explanation: The NAND gate is a universal gate since it can implement the AND, OR and NOT functions.

2. (d) Switching algebra

3. (b) OR terms

Explanation: Maxterms. , a sum term in which each of the n variables appears once.

4. (a) A + AB = A

Explanation: Absorption law states that (i) X + XY = X and (ii) X(X + Y) = X.

5. (a) Commutative law

Explanation: X • Y = Y • X Commutative Law.

6. (b) Two values

Explanation: Boolean algebra is the algebra of two-valued logics.

7. (a) Parentheses

Explanation: Expressions inside brackets are always evaluated first.

8. (a) A′B′C′

Explanation: 1. (A′B′)′ = A + B

2. (AB)′ = A′ + B′

3. (A + B) = A′B′

Thus (A + B + C)′ = A′B′C′

9. (d) A′ + B′ + C′

Explanation: 1. (A′B′)′ = A + B

2. (AB)′ = A′ + B′

3. (A + B) = A′B′

Thus A′B′C′ = (A + B + C)′

10. (d) Both b and c

Explanation: A truth table is a mathematical table used in logic—specifically in connection with Boolean algebra, boolean functions, and propositional calculus.

Conversion of POS form to standard POS form or Canonical coversion method

11. (a) (AB)′ is equal to A′ + B′

Explanation: (A.B)′ = A′ + B′

(A + B)′ = A′.B′

12. (c) (A + B) (A + C)

Explanation: A + (B.C) = (A + B).(A + C) (AND Distributive Law

13. (a) X

Explanation: (i) X • X = X (ii) X + X = X Idempotent Law

14. (a) (AB)′ is equal to A′ + B.′

15. (b) Additive identity

Explanation: 0 is additive identity as The first Boolean identity is that the sum of anything and zero is the same as the original "anything."

16. (c) Addition and multiplication

17. (b) Product of Sum POS

Explanation: The logical sum of two or more logical product terms, is called SOP (i.e. sum of product). The logical product of two or more logical sum terms is called POS (i.e. product of sums).

18. (a) Commutative property

Explanation: Commutative Law states that the interchanging of the order of operands in a

Boolean equation does not change its result. For example:

OR operator → A + B = B + A

AND operator → A * B = B * A)

19. (d) x + 0

Explanation: A + 0 = A   A·1 = A - identity element.

20. (a) Sum of Minterms

21. (b) Logical addition

Explanation: The logical OR symbol is used in Boolean algebra to indicate an inclusive disjunction between two statements. An inclusive disjunction is true if either, or both, of its components are true.

22. (a) Logical multiplication

23. (b) 1,2,4,8 etc

Explanation: When grouping cells within a K-map, the cells can be combined in groups of 2, 4, 8, etc.

24. (b) It can be used to build all other types of gates.

Explanation: The NOR gate and NAND gate are universal gates. This means that you can create any logical Boolean expression using only NOR gates or only NAND gates.

25. (b) A + B = B + A

Explanation: Commutative Law states that the interchanging of the order of operands in a Boolean equation does not change its result. For example:

OR operator → A + B = B + A. AND operator → A * B = B * A.

26. (b) 0

Explanation: (a + b)(a′ b′)

= (a′b′)(a+b)

= a′b′a+a′b′b

= 0*b′+a′*0

= 0+0 (Theorem 3)

= 0

27. (d) Associative property

28. (a) 1

Explanation: A + 1 = 1 - Annulment

29. (a) 0

Explanation: X • X′ = 0   X + X′ = 1 Complement Law.

30. (d) Odd function

Explanation: XOR gate (sometimes EOR, or EXOR and pronounced as Exclusive OR) is a digital logic gate that gives a true (1 or HIGH) output when the number of true inputs is odd.

31. (d) X

Explanation: X + X•Y = X•(1 + Y) = X•1 = X

32. (b) AB′ + C

Explanation: Y = AB′ + (A′ + B)C = AB′ + (AB′)′C = (AB′ + C)(AB′ + (AB′)′) = (AB′ + C).1 = (AB′ + C).

33. (a) AND

Explanation: NAND gate is actually a combination of two logic gates: AND gate followed by NOT gate. So its output is complement of the output of an AND gate.

34. (b) OR

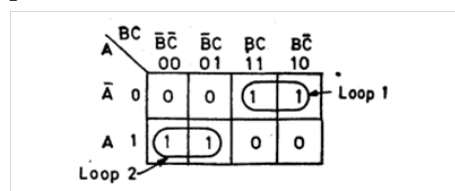**Explanation:** The NOR gate represents the complement of the OR operation.

35. (c) Boolean variable

Explanation: Boolean variables can either be True or False and are stored as 16-bit (2-byte) values.

36. (a) (i) 2 pairs

(b) (i) AB + AB

Explanation:

37. (a) (ii) (A + B′)(C′ + D)

(b) (ii) De Morgan Law

Fill in the blanks

38. (a) OR

Explanation: Boolean addition is equivalent to the OR logic function.

39. (c) Product of complement

Explanation: De-Morgan's Theorems 1. The complement of a product of variables is equal to the sum of the complements of the variables.

40. (a) George Boole

41. (b) Boolean constants

Explanation: A Boolean constant can have two values, TRUE and FALSE, where TRUE is equivalent to 1 and FALSE is equivalent to 0.

42. (a) Inversion

Explanation: The complement is the inverse of a variable and is indicated by a bar over variable.

43. (b) Sum of product

Explanation: The Product of Sum expression is equivalent to the logical OR-AND function which gives the AND Product of two or more OR Sums to produce an output.

44. (a) Truth table

Explanation: a table that shows the truth-value of a compound statement for every truth-value of its component statements also : a similar table (as for a computer logic circuit) showing the value of the output for each value of each input.

45. (a) Relational

Explanation: The logical operators *AND and *OR specify the relationship between operands in a logical expression. The logical operator *NOT is used to negate logical variables or constants.

46. (b) A + (B + C) = (A + B) + C

Explanation: Associative Law – This law allows the removal of brackets from an expression and regrouping of the variables.

A + (B + C) = (A + B) + C = A + B + C)

47. (b) Associative law

Explanation: Distributive Law – This law permits the multiplying or factoring out of an expression.

A(B + C) = A.B + A.C

48. (d) Complement of binary variables

Explanation: Each minterm = 1 for only one combination of values of the variables, = 0 otherwise.

49. (a) Product of binary variables

Explanation: A maxterm is a Boolean expression resulting in a 0 for the output of a single cell expression, and 1s for all other cells in the Karnaugh map, or truth table.

Match the following

50. (a) 1-(ii), 2-(iii), 3-(i), 4-(v), 5-(iv)

51. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

52. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

53. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

❑❑

Chapter 2

Computer Hardware

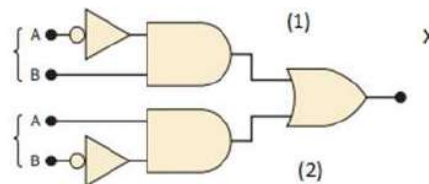## Multiple choice questions

1. What are basic gates from the following?
   (a) NOT
   (b) NAND
   (c) AND
   (d) NOT, AND & OR

2. When two inputs are _____, an XNOR produces an output.
   (a) High
   (b) Low
   (c) Different
   (d) Same

3. Choose the correct logic Gates that provide output as 0 when both inputs are the same (either 0 or 1)
   (a) XNOR
   (b) XOR
   (c) NOR
   (d) NAND

4. Identify the universal gates from the following.
   (a) NAND and NOR gates
   (b) NOT and XOR gates
   (c) AND and NOT gates
   (d) OR and XOR gates

5. In how many groups we can categorise the logical gates
   (a) 1 group
   (b) 2 group
   (c) 3 group
   (d) 4 group

6. Which Gate is represented by the output of the logic circuit given below

   (a) OR
   (b) NOR
   (c) AND
   (d) NAND
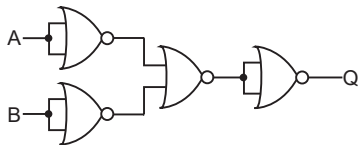
7. Identify the arithmetic gates from the following ?
   (a) NOT
   (b) NAND and NOR
   (c) X-OR & X-NOR
   (d) NOT, AND & OR

8. Among the following which are the forms of complex logic gates ?
   (a) OR-AND invert (OAI)
   (b) AND-OR invert (AOI)
   (c) Both AOI and OAI
   (d) None of these

9. What is the standard form of DCVS logic?
   (a) Differential cascade Voltage Switch
   (b) Differential cascade Voltage Static
   (c) Differential Complex Voltage Switch
   (d) None of above

10. What are the advantages of static complementary gates?
    (a) Reliable
    (b) Not easy to use
    (c) Not reliable
    (d) Reliable and easy to use

11. How many terminals do Mos transistors have?
    (a) 1
    (b) 2
    (c) 3
    (d) 4

12. What is the alternative form of canonical form?
    (a) Sum of products
    (b) Product of Sums
    (c) Both
    (d) None of above

13. What is the sum of product canonical forms also & known as ?
    (a) Minterm expansion
    (b) Disjunctive Normal form
    (c) Both
    (d) None of these

14. State the other name of the product of sums canonical forms?
    (a) Maxterm expansion
    (b) Conjunctive Normal form
    (c) Both
    (d) None of these

15. Identify the identity law?
    (a) $a + 0 = 0 + a = a$
    (b) $1 + a = a + 1 = 1$
    (c) $ab = ba$
    (d) $a + (b + c) = (a + b) + c$

16. Choose an example of dominance law?

(a) $a + 0 = 0 + a = a$

(b) $1 + a = a + 1 = 1$

(c) $ab = ba$

(d) $a + (b + c) = (a + b) + c$

17. Which of the following is an example of distributive law?

(a) $a + 0 = 0 + a = a$

(b) $1 + a = a + 1 = 1$

(c) $a + bc = (a + b)(a + c)$

(d) $a + (b + c) = (a + b) + c$

18. Why do we use combinational Logic?

(a) Compute outputs

(b) Compute new states

(c) Both

(d) None of above

19. Which methods are used to represent negative integer numbers?

(a) 1's complement   (b) Sign magnitude

(c) 2's complement   (d) All of above

20. How many types of number systems are there?

(a) 1   (b) 2

(c) 3   (d) 4

21. For which number system the base is 16?

(a) Binary   (b) Hexadecimal

(c) Decimal   (d) Octal

22. How many characters are there in the American standard code for Information Interchange?

(a) 64   (b) 25

(c) 128   (d) None of above

23. Which number system has base 8?

(a) Binary   (b) Hexadecimal

(c) Decimal   (d) Octal

24. How many types of IC packages are there?

(a) 1   (b) 2

(c) 3   (d) 4

25. Number of categories of ICs.

(a) 1   (b) 2

(c) 3   (d) 4

26. How many gates do vast scale integration contain?

(a) 100 gates

(b) 10,000 to 100,000 gates

(c) 10000 gates

(d) None of above

27. From the logic diagram given above, where A and B are inputs and X is the output, answer the following questions:

(a) The expression at (1) is:

(i) A'B   (ii) AB

(iii) A   (iv) B

(b) The expression at (2) is:

(i) AB'   (ii) AB

(iii) A   (iv) B

(c) The Final expression is:

(i) A'B + AB'   (ii) A + AB

(iii) AB + B   (iv) AB + A

28. From the logic diagram given above, where A, B and C are inputs and X is the output, answer the following questions:
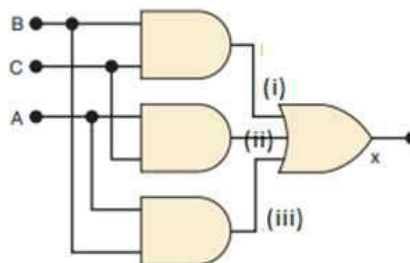
(a) The expression at (1) is:

(i) BC   (ii) AB

(iii) A   (iv) B

(b) The expression at (2) is:

(i) AC   (ii) AB

(iii) A   (iv) B

(c) The expression at (3) is:

(i) AB   (ii) AC

(iii) A   (iv) B

(d) The Final expression is:

(i) BC + AC + AB   (ii) A + AB

(iii) AB + B   (iv) AB + A

Fill in the blanks

29. The one's complement of Binary Number 1010 is _____ .

(a) 0101   (b) 1010

(c) 0110   (d) 1110

30. The 2's complement of Binary Number 1010 is
_____ .

(a) 0101   (b) 1010

(c) 0110   (d) 1110

31. Adders are used to calculate_____ .

(a) Addresses   (b) Table indices

(c) Increment and decrement operators

(d) All of above

32. Total number of inputs in a half adder is
_____

(a) 2   (b) 3

(c) 4   (d) 1

33. In _____ operation carry is obtained.

(a) Subtraction

(b) Addition

(c) Multiplication

(d) Both addition and subtraction

34. If A and B are the inputs of a half adder, the sum
is given by _____

(a) A AND B   (b) A OR B

(c) A XOR B   (d) A EX-NOR B

35. If A and B are the inputs of a half adder, the carry
is given by _____

(a) A AND B   (b) A OR B

(c) A XOR B   (d) A EX-NOR B

36. Devices which converts an input device state
into a binary representation of one's and zero's is
called as_____

(a) Encoder   (b) Decoder

(c) Multiplexer   (d) Data Selector

37. A circuit that changes a code into a set of signals is
called _____.

(a) Encoder   (b) Decoder

(c) Multiplexer   (d) Data Selector

38. Multiplexer is

(a) Decoder that decodes several inputs and gives
an output

(b) A device that converts many signals into one

(c) Takes one input and gives many outputs

(d) A type of encoder that decodes several inputs
and gives an output

39. _____ combinational circuit is used to select
a single input from multiple inputs & direct the
binary information to output line?

(a) Data Selector

(b) Data distributor

(c) Both data selector and data distributor

(d) DeMultiplexer

40. With digital multiplexer with the proficiency of
large number of _____ it is possible for an
enable input to undergo an expansion of MUX
ICs

(a) Inputs   (b) Outputs

(c) Selection lines   (d) Enable lines

Match the following

41. Match the columns:

Group A		Group B	
1. adder	(i)	Encoding	
2. Half adder	(ii)	3 inputs and 2 outputs	
3. Full adder	(iii)	design circuits	
4. record music in the recorder	(iv)	add two binary numbers	

(a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

(b) 2-(iv), 3-(iii), 4-(ii), 1-(i)

(c) 3-(iv), 4-(iii), 1-(ii), 2-(i)

(d) 4-(iv), 1-(iii), 2-(ii), 3-(i)

42. Match the columns:

Group A		Group B	
1. OR gates in Decimal to BCD encoder	(i)	yes	
2. OR gates in Octal to Binary encoder	(ii)	2^8	
3. Combinations with 8-bit encoder	(iii)	3	
4. Encoder be called a multiplexer	(iv)	4	

(a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

(b) 2-(iv), 3-(iii), 4-(ii), 1-(i)

(c) 3-(iv), 4-(iii), 1-(ii), 2-(i)

(d) 4-(iv), 1-(iii), 2-(ii), 3-(i)

43. Match the columns:

Group A		Group B	
1. Binary number 10101	(i)	1010	
2. Inverter	(ii)	NAND	
3. Digital circuits	(iii)	NOT gate	
4. Decimal number 10	(iv)	21	

(a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

(b) 2-(iv), 3-(iii), 4-(ii), 1-(i)

(c) 3-(iv), 4-(iii), 1-(ii), 2-(i)

(d) 4-(iv), 1-(iii), 2-(ii), 3-(i)

44. Match the columns:

Group A		Group B	
1. One multiplexer can replace	(i)	Strobe	
2. select lines required for 8-line-to-1-line multiplexer	(ii)	2	
3. NOT gates required for a 4-to-1 multiplexer?	(iii)	3	
4. enable input, also known as	(iv)	Several SSI logic gates or combinational logic circuits	

(a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

(b) 2-(iv), 3-(iii), 4-(ii), 1-(i)

(c) 3-(iv), 4-(iii), 1-(ii), 2-(i)

(d) 4-(iv), 1-(iii), 2-(ii), 3-(i)

45. Match the columns:

Group A		Group B	
1. Simplest line decoder	(i)	Encoding	
2. Encoder that secure online email addresses	(ii)	Rotary Encoder	
3. Encoder that converts rotary positions to electronic signals	(iii)	Email encoder	
4. Converting received messages to codewords	(iv)	1-2 line decoder	

(a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

(b) 2-(iv), 3-(iii), 4-(ii), 1-(i)

(c) 3-(iv), 4-(iii), 1-(ii), 2-(i)

(d) 4-(iv), 1-(iii), 2-(ii), 3-(i)

Expression based questions

46. $X = B + A\overline{B} + AB = ?$

(a) $A + B$ (b) $\overline{A}B$

(c) AB (d) $\overline{A} + \overline{B}$

47. Complement form of $A(B + C)(\overline{C} + \overline{D}) = ?$

(a) $A + \overline{BC} + DC = 1$ (b) $A + BC + CD$

(c) $A + BC$ (d) $\overline{A} + \overline{BC} + CD$

48. $\overline{A} + \overline{AB} = ?$

(a) $A + B$ (b) $A + \overline{B}$

(c) $\overline{A} + \overline{B}$ (d) $\overline{B} + A$

49. $(A + B).(A + \overline{B}) = ?$

(a) B (b) A

(c) $A + B$ (d) AB

50. The NAND gate output will be low if the 2 inputs are

(a) 00   (b) 01

(c) 10   (d) 11

51. Binary equivalent of Decimal number 368

(a) 101110000   (b) 110110000

(c) 111010000   (d) 111100000

52. The number of control lines for an 8 – and - 1 multiplexer is

(a) 2   (b) 3

(c) 4   (d) 5

53. $\overline{A}.B + A.\overline{B} + A.B = ?$

(a) $A + B$ (b) $\overline{A}.B$

(c) $A.B$ (d) $\overline{A} + \overline{B}$

54. $(x + y)(x + z) = ?$

(a) $x + yz$ (b) X

(c) $x + x(y + z)$ (d) $x(1 + yz)$

55. Decimal equivalent of Binary number 11010 is

(a) 26   (b) 36

(c) 16   (d) 23

Answers

Multiple choice questions

1. (d) NOT, AND & OR

Explanation: Basic gates are called the AND gate, the OR gate, and the NOT gate.

2. (d) Same

Explanation: The XNOR gate is the complement of the XOR gate. It is a hybrid gate. it is the combination of the XOR gate and NOT gate. The output level of the XNOR gate is high only when both of its inputs are the same, either 0 or 1.

3. (b) XOR

Explanation: XOR compares two input bits and generates one output bit.

4. (a) NAND and NOR gates

Explanation: A universal gate is a logic gate which can implement any Boolean function without the need to use any other type of logic

gate. The NOR gate and NAND gate are universal gates.

5. (c) 3 group

Explanation: All digital systems can be constructed by only three basic logic gates. These basic gates are called the AND gate, the OR gate, and the NOT gate.

6. (d) NAND

Explanation: NAND, is a NOT AND that yields true if any condition is false, and false if all conditions are true.

7. (c) X-OR & X-NOR

Explanation: The XOR output is asserted whenever an odd number of inputs are asserted, and the XNOR is asserted whenever an even number of inputs are asserted.

8. (c) Both AOI and OAI

Explanation: AOI gates are two-level compound (or complex) logic functions constructed from the combination of one or more AND gates followed by a NOR gate.The complement of AOI Logic is OR-AND-Invert (OAI) logic where the OR gates precede a NAND gate.

9. (a) Differential cascade Voltage Switch

Explanation: Differential cascade voltage switch (DCVS) logic is a CMOS circuit technique that has potential advantages over conventional NAND/NOR logic in terms of circuit delay, layout density, power dissipation, and logic flexibility.

10. (d) Reliable and easy to use

11. (c) 3

Explanation: A MOS TRANSISTOR has three terminals. Gate; Drain; Source.

12. (c) Both

Explanation: Canonical Form – In Boolean algebra,Boolean function can be expressed as Canonical Disjunctive Normal Form known as minterm and some are expressed as Canonical Conjunctive Normal Form known as maxterm . ... Boolean functions expressed as a sum of minterms or product of maxterms.

13. (c) Both

14. (c) Both

15. (a) $a + 0 = 0 + a = a$

Explanation: The Identity Law is one of the Boolean Laws; it has two expressions: 1 AND A = A And. 0 OR A = A

16. (b) $1 + a = a + 1 = 1$

Explanation: Domination Laws: The complement is used in the operations to form these laws. The idea behind these laws is that if the first number is 1 then the negation of 1 is 0.

17. (c) $a + bc = (a + b)(a + c)$

Explanation: Distributive Law states that the multiplication of two variables and adding the result with a variable will result in the same value as multiplication of addition of the variable with individual variables. For example: A + BC = (A + B) (A + C).

18. (c) Both

Explanation: combinational logic is a type of digital logic which is implemented by Boolean circuits, where the output is a pure function of the present input only.

19. (d) All of above

20. (d) 4

Explanation: four main types are :

Binary number system (Base - 2)

Octal number system (Base - 8)

Decimal number system (Base - 10)

Hexadecimal number system (Base - 16)

21. (b) Hexadecimal

Explanation: Hexadecimal Number System is one the type of Number Representation techniques, in which there value of base is 16.

22. (c) 128

Explanation: ASCII is a 7-bit code, meaning that 128 characters (2^7) are defined.

23. (d) Octal

Explanation: The octal numeral system, or oct for short, is the base-8 number system, and uses the digits 0 to 7.

24. (b) 2

25. (b) 2

26. (b) 10,000 to 100,000 gates

Explanation: Vast scale integration contains over 10,000 transistors.

27. (a) (i) A'B

(b) (i) AB'

(c) (i) A'B + AB'

28. (a) (i) BC

(b) (i) AC

(c) (i) AB

(d) (i) BC + AC + AB

Fill in the blanks

29. (a) 0101

Explanation: Flip all the bits in the signed binary one›s complement representation (reverse the digits) - replace the bits set on 1 with 0s and the bits on 0 with 1s:

!(1010) = 0101

30. (c) 0110

Explanation: To get 2›s complement of binary number is 1›s complement of given number plus 1 to the least significant bit (LSB).

31. (d) All of above

Explanation: An adder is a digital logic circuit in electronics that is extensively used for the addition of numbers.

32. (a) 2

33. (b) Addition

34. (c) A XOR B

Explanation: The half adder circuit has two inputs: A and B, which add two input digits and generates a carry and a sum.

35. (a) A AND B

36. (a) Encoder

Explanation: An encoder is a sensor that detects rotation angle or linear displacement. Encoders are used in devices that need to operate in high speed and with high accuracy.

37. (b) Decoder

Explanation: Decoder is a combinational circuit that has 'n' input lines and maximum of 2n output lines.

38. (b) A device that converts many signals into one

Explanation: A multiplexer (MUX) is a device that can receive multiple input signals and synthesize a single output signal in a recoverable manner for each input signal.

39. (b) Data distributor

Explanation: A digital multiplexer is a combinational circuit that selects one digital information from several sources and transmits the selected information on a single output line depending on the status of the select lines. That is why it is also known as a data selector.

40. (a) Inputs

Match the following

41. (a) 1-(iv), 2-(iii), 3-(ii), 4-(i)
42. (a) 1-(iv), 2-(iii), 3-(ii), 4-(i)
43. (a) 1-(iv), 2-(iii), 3-(ii), 4-(i)
44. (a) 1-(iv), 2-(iii), 3-(ii), 4-(i)
45. (a) 1-(iv), 2-(iii), 3-(ii), 4-(i)

Expression based questions

46. (a) $A + B$

47. (d) $\overline{A} + \overline{BC} + CD$

48. (c) $\overline{A} + \overline{B}$

49. (b) A

50. (d) 11

51. (a) 101110000

Explanation: 368/2 = 184, remainder is 0

184/2 = 92, remainder is 0

92/2 = 46, remainder is 0

46/2 = 23, remainder is 0

23/2 = 11, remainder is 1

11/2 = 5, remainder is 1

5/2 = 2, remainder is 1

2/2 = 1, remainder is 0

1/2 = 0, remainder is 1

Read from the bottom (MSB) to top (LSB) as 101110000.

52. (b) 3

Explanation: There are 3 control lines, for an 8 to 1 Multiplexer. The control signals are utilized to steer any one of the eight inputs to the output.

53. (a) $A + B$

54. (a) $x + yz$

Explanation: $XX + XY + XZ + YZ = X(1 + Y + Z) + YZ = X + YZ$

55. (a) 26

Explanation: $(11010)_2 = (26)_{10}$

Write down the binary number:

11010

Multiply each digit of the binary number by the corresponding power of two:

$1 \times 24 + 1 \times 23 + 0 \times 22 + 1 \times 21 + 0 \times 20$

Solve the powers:

$1 \times 16 + 1 \times 8 + 0 \times 4 + 1 \times 2 + 0 \times 1 = 16 + 8 + 0 + 2 + 0$

Add up the numbers written above:

$16 + 8 + 0 + 2 + 0 = 26$. This is the decimal equivalent of the binary number 11010.

❏❏

Implementation of algorithms to solve problems

Multiple choice questions

1. The worst-case run-time complexity in binary search algorithms
   - (a) O(n2)
   - (b) O(nlog n)
   - (c) O(n3)
   - (d) O(n)

2. What do you understand by linear data structure –
   - (a) Queue
   - (b) Stack
   - (c) Arrays
   - (d) All of the above

3. The travelling salesman problem is an example of
   - (a) Dynamic Algorithm
   - (b) Greedy Algorithm
   - (c) Recursive Approach
   - (d) Divide & Conquer

4. State the searching technique which do not require the data to be in sorted form
   - (a) Binary Search
   - (b) Interpolation Search
   - (c) Linear Search
   - (b) All of the above

5. Choose the series which is in Non-Increasing Order.
   - (a) 1, 3, 4, 6, 8, 9
   - (b) 9, 8, 6, 3, 4, 1
   - (c) 9, 8, 6, 3, 3, 1
   - (d) 1, 3, 3, 6, 8, 9

6. Using binary heap, the root›s rightmost component of the last level is substituted by the root where the root is removed. What will be the reason?
   - (a) It is the easiest possible way.
   - (b) To make sure that it is still a complete binary tree.
   - (c) Because the left and right subtrees might be missing.
   - (d) None of the above!

7. The Θ notation in asymptotic evaluation represents –
   - (a) Base case
   - (b) Average case
   - (c) Worst case
   - (d) NULL case

8. Identify the algorithm which cannot be designed without recursion –
   - (a) Tower of Hanoi
   - (b) Fibonacci Series
   - (c) Tree Traversal
   - (d) None of the above

9. The following sorting algorithms maintain two sub-lists, one sorted and one to be sorted –
   - (a) Selection Sort
   - (b) Insertion Sort
   - (c) Merge Sort
   - (d) both A & B

10. A posterior analysis is more accurate than Piori analysis because –
    - (a) it contains the actual data.
    - (b) It undertakes all other factors to be dynamic.
    - (c) It undertakes all other factors to be constant.
    - (d) It is a result of reverseengineering.

11. What is the worst-case time complexity of linear search algorithms?
    - (a) O(1)
    - (b) O(n)
    - (c) O(log n)
    - (d) O(n2)

12. Which of the following uses FIFO method ?
    - (a) Queue
    - (b) Stack
    - (c) Hash Table
    - (d) Binary Search Tree

13. A complete graph can have
    - (a) n2 spanning trees
    - (b) nn - 2 spanning trees
    - (c) nn + 1 spanning trees
    - (d) nn spanning trees

14. From the options given below, identify which one is not the divide and conquer approach?
    - (a) Insertion Sort
    - (b) Merge Sort
    - (c) Shell Sort
    - (d) Heap Sort

15. Prefix notation is also known as
    - (a) Reverse Polish Notation
    - (b) Reverse Notation
    - (c) Polish Reverse Notation
    - (d) Polish Notation

16. In order traversal of binary search,the tree will produce −

(a) unsorted list

(b) reverse of input

(c) sorted list

(d) none of the above

17. In a min-heap:

(a) parent nodes have values more than or equal to their child

(b) parent nodes have values less than or equal to their child

(c) both statements are true

(d) both statements are wrong

18. A procedure that calls itself is called

(a) illegal call

(b) reverse polish

(c) recursive

(d) none of the above

19. For a binary search algorithm to work, the array (list) must be

(a) sorted

(b) unsorted

(c) in a heap

(d) popped out of stack

20. push() and pop() functions are found in

(a) queues   (b) lists

(c) stacks   (d) trees

21. Queue data structure works on

(a) LIFO   (b) FIFO

(c) FILO   (d) none of the above

22. The highest number of nodes in a binary tree with height k, where the root is height 0, is

(a) 2k − 1   (b) 2k+1 − 1

(c) 2k-1 + 1   (d) 2k − 1

23. What data structure is used for the depth-first traversal of a graph?

(a) queue   (b) stack

(c) list   (d) none of the above

24. Name data structure that is used for the breadth-first traversal of a graph.

(a) queue   (b) stack

(c) list   (d) none of the above

25. Which data structure can be used to check if the syntax has balanced parenthesis?

(a) queue   (b) tree

(c) list   (d) stack

26. Postfix expression is just a contrary of prefix expression.

(a) True

(b) False

27. Stack is used for

(a) CPU Resource Allocation

(b) Breadth-First Traversal

(c) Recursion

(d) None of the above

28. A circular linked list can use for

(a) Stack

(b) Queue

(c) Both Stack & Queue

(d) Neither Stack nor Queue

29. Which is an instance of a dynamic programming approach?

(a) Fibonacci Series

(b) Tower of Hanoi

(c) Dijkstra Shortest Path

(d) All of the above

30. The following formula is of

left_subtree (keys) ≤ node (key) ≤ right_subtree (keys)

(a) Binary Tree

(b) Complete Binary Tree

(c) Binary Search Tree

(d) All of the above

31. node.next -> node.next.next; will make

(a) node.next inaccessible

(b) node.next.next inaccessible

(c) this node inaccessible

(d) none of the above

Fill in the blanks

32. Visiting root node after visiting left and right sub-trees is called _____ .

(a) In-order Traversal

(b) Pre-order Traversal

(c) Post-order Traveller

33. The worst-case complexity of binary search matches with _____

(a) interpolation search

(b) linear search

(c) merge sort

(d) none of the above

34. _____ Algorithm does not divide the list.

(a) Linear search

(b) Binary search

(c) Merge sort

(d) Quick sort

35. Heap is an example of _____.

(a) complete binary tree

(b) spanning-tree

(c) sparse tree

(d) binary search tree

36. Quicksort running time depends on the selection of

(a) size of array

(b) pivot element

(c) sequence of values

(d) none of the above!

37. _____ sorting techniques has highest best-case runtime complexity −

(a) Quick sort

(b) Selection sort

(c) Insertion sort

(d) Bubble sort

38. _____ sorting algorithms are not stable?

(a) Selection Sort

(b) Bubble Sort

(c) Merge Sort

(d) Insertion Sort

39. A queue data-structure can be used for_____

(a) expression parsing

(b) recursion

(c) resource allocation

(d) all of the above

40. _____algorithm cannot be designed without recursion.

(a) Tower of Hanoi

(b) Fibonacci Series

(c) Tree Traversal

(d) None of the above

41. If there›s no base criteria in a recursive program, the program will_____

(a) not be executed.

(b) execute until all conditions match.

(c) execute infinitely.

(d) Obtain a progressive approach.

Match the following

42. Match the columns:

Group A	Group B	
1. Completeness	(i)	time it take to find a solution
2. Time Complexity	(ii)	memory need to perform the search
3. Space Complexity	(iii)	Is the strategy by which we find the solution.

(a) 1-(iii), 2-(ii), 3-(i)

(b) 1-(i), 2-(ii), 3-(iii)

(c) 1-(iii), 2-(i), 3-(ii)

(d) 1-(i), 2-(iii), 3-(ii)

43. Match the columns:

Group A	Group B	
1. Bubble Sort	(i)	O(n)
2. Shell Sort	(ii)	O(n2)
3. Selection Sort	(iii)	O(n log n)

(a) 1-(i), 2-(ii), 3-(iii)

(b) 1-(ii), 2-(iii), 3-(i)

(c) 1-(i), 2-(iii), 3-(ii)

(d) 1-(ii), 2-(i), 3-(iii)

Numerical based questions

44. The number of swaps which are needed to sort the numbers 8, 22, 7, 9, 31, 5, 13 in ascending order, using bubble sort is

(a) 11   (b) 12

(c) 13   (d) 10

45. How many swaps are essential to sort the given array using bubble sort - { 2, 5, 1, 3, 4}

(a) 4   (b) 5

(c) 6   (d) 7

46. The sum of binary trees with 3 nodes which when traversed in post-order gives the sequence A,B,C is?

(a) 3   (b) 4

(c) 5   (d) 6

47. What will be the worth of top, if there is a proportion of stack STACK_SIZE is 5

(a) 5   (b) 6

(c) 4   (d) None

48. The minimum number of comparisons essential to find the minimum and the maximum of 100 numbers is
   (a) 148   (b) 146
   (c) 147   (d) 100

49. State the Huffman code for the letters a,b,c,d,e?
   (a) 0,10,110,1110,1111
   (b) 10,011,11,001,010
   (c) 10,01,0001,100,1010
   (b) 100,110,001,000,010

50. Out of 4 distinct keys, how many distinct primary keys can be created?
   (a) 5   (b) 20
   (c) 45   (d) 14

51. The complexity of the bubble sort algorithm is …..
   (a) O(n)   (b) O(logn)
   (c) O(n2)   (d) O(n logn)

52. The given array is arr = {1,2,4,3}. Bubble sort is being used to sort the array elements. How many iterations will be done to sort the array with an improvised version?
   (a) 4   (b) 2
   (c) 1   (d) 0

53. How many passes does a Bubble sort algorithm require for sorting a given list of n items?
   (a) n*2   (b) n*1
   (c) n+1   (d) n-1

Programming based questions

54. The following program code sorts a single dimensional array in ascending order using Insertion Sort technique. There are some places in the code marked as ?1?, ?2?, ?3?, ?4? and ?5? which are to be replaced by a statement/expression so that the code works correctly.

```
voidsort(intarr[])
{
    int n =?1?;
    for(int i = 1; i< n; ++i) {
        int key = ?2?
        int j =?3? ;

        /* Move elements of arr[0..i-1], that are
        greater than key, to one position ahead
        of their current position */
        while(j >= 0&&arr[j] > key) {
```

```
            ?4?= arr[j];
            j =?5?;
        }
        arr[j + 1] = key;
    }
}
```

Answer the following question:

(a) What is the statement or expression at ?1?
   (i) arr.length   (ii) array.length
   (iii) length   (iv) -1

(b) What is the statement or expression at ?2?
   (i) arr[i];   (ii) array[j+1]
   (iii) array[j]   (iv) 0

(c) What is the statement or expression at ?3?
   (i) i - 1   (ii) array[j]
   (iii) i+1   (iv) n

(d) What is the statement or expression at ?4?
   (i) arr[j + 1]   (ii) key
   (iii) array[j]   (iv) array[i]

(e) What is the statement or expression at ?5?
   (i) array[i+1]   (ii) j - 1
   (iii) j   (iv) array[i]

55. The following program code sorts a single dimensional array in ascending order using Selection Sort technique. There are some places in the code marked as ?1?, ?2?, ?3?, ?4? and ?5? Are to be replaced by a statement/expression so that the code works correctly.

```
voidsort(int ?1?)
{
    intn =?2?;

    // One by one move boundary of unsorted
    subarray
    for(int i = 0; i< n-1; i++)
    {
        // Find the minimum element in unsorted
        array
        int ?3?=i;
        for(int j = i+1; j < n; j++)
        if(?4? <arr[min_idx])
                min_idx = j;

        // Swap the found minimum element with the
        first
        // element
```

```
inttemp =?5?;
arr[min_idx] = arr[i];
arr[i] = temp;
}
```

(a) What is the statement or expression at ?1?
   (i) arr[]   (ii) array.length
   (iii) length   (iv) -1

(b) What is the statement or expression at ?2?
   (i) arr.length   (ii) array[j+1]
   (iii) array[j]   (iv) 0

(c) What is the statement or expression at ?3?
   (i) min_idx   (ii) array[j]
   (iii) i+1   (iv) n

(d) What is the statement or expression at ?4?
   (i) arr[j]   (ii) key
   (iii) array[j]   (iv) array[i]

(e) What is the statement or expression at ?5?
   (i) array[i+1]   (ii) arr[min_idx]
   (iii) j   (iv) array[i]

56. The following program code is using the quick sort technique. Some places in the code marked as ?1?, ?2?, ?3?, ?4? and ?5? Are to be replaced by a statement/expression so that the code works properly.

```
quickSort(arr[], low, high)
{
    if (?1?)
    {
        /* pi is partitioning index, arr[pi] is now
           at right place */
        ?2?= partition(arr, low, high);
    quickSort(arr, low,?3?);  // Before pi
    ?5?(arr, ?4?, high); // After pi
    }
}
```

(a) What is the statement or expression at ?1?
   (i) first + last   (ii) low < high
   (iii) length   (iv) -1

(b) What is the statement or expression at ?2?
   (i) arr[mid]   (ii) pi
   (iii) array[j]   (iv) 0

(c) What is the statement or expression at ?3?
   (i) mid + 1   (ii) pi - 1
   (iii) i+1   (iv) n

(d) What is the statement or expression at ?4?
   (i) mid - 1   (ii) pi + 1
   (iii) array[j]   (iv) array[i]

(e) What is the statement or expression at ?5?
   (i) array[i+1]   (ii) quickSort
   (iii) j   (iv) array[i]

Answers

Multiple choice questions

1. (d) O(n)
   Explanation: Binary Search is a process finding an element from the ordered set of elements. The worst case time Complexity of binary search is O(log 2 n).

2. (d) All of the above
   Explanation: It is a type of data structure where the arrangement of the data follows a linear trend. The data elements are arranged linearly such that the element is directly linked to its previous and the next elements. As the elements are stored linearly, the structure supports single-level storage of data.

3. (b) Greedy Algorithm
   Explanation: An algorithm that always takes the best immediate, or local, solution while finding an answer.

4. (a) Binary Search
   Explanation: Binary Search: Search a sorted array by repeatedly dividing the search interval in half. Begin with an interval covering the whole array.

5. (c) 9, 8, 6, 3, 3, 1
   Explanation: Non increasing order simply refers to the idea of sorting things where subsequent items are less than, or equal to the previous item.

6. (b) To make sure that it is still a complete binary tree.
   Explanation: A binary heap is a heap data structure that takes the form of a binary tree. Binary heaps are a common way of implementing priority queues.

7. (a) Base case
   Explanation: Theta notation of an expression is to drop low order terms and ignore leading constants.

8. (d) None of the above

9. (d) both A & B

10. (b) It undertakes all other factors to be dynamic.

11. (d) O(n2)

    Explanation: The worst case occurs in the Linear Search Algorithm when the item to be searched is in end of the Array.

12. (a) Queue

    Explanation: First in First out Queue: For this, the element that goes first will be the first to come out. To work with FIFO, you have to call Queue() class from queue module.

13. (b) nn - 2 spanning trees

14. (b) Merge Sort

    Explanation: Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the two sorted halves. The merge() function is used for merging two halves.

15. (d) Polish Notation

    Explanation: Polish notation is a notation form for expressing arithmetic, logic and algebraic equations. Its most basic distinguishing feature is that operators are placed on the left of their operands. If the operator has a defined fixed number of operands, the syntax does not require brackets or parenthesis to lessen ambiguity.

16. (c) sorted list

    Explanation: A sorted list is a combination of an array and a hash table. It contains a list of items that can be accessed using a key or an index. If you access items using an index, it is an Array List, and if you access items using a key, it is a Hash table. The collection of items is always sorted by the key value.

17. (a) parent nodes have values more than or equal to their child

    Explanation: A min-heap is a binary tree such that. - the data contained in each node is less than (or equal to) the data in that node›s children. - the binary tree is complete.

18. (c) recursive

    Explanation: A recursive algorithm is an algorithm which calls itself with «smaller (or simpler)» input values, and which obtains the result for the current input by applying simple operations to the returned value for the smaller input.

19. (a) sorted

20. (c) stacks

21. (b) FIFO

22. (b) 2k+1 − 1

    Explanation: The maximum number of nodes at level 'l' of a binary tree is 2l-1

23. (a) queue

    Explanation: Depth First Traversal (or Search) for a graph is similar to Depth First Traversal of a tree. The only catch here is, unlike trees, graphs may contain cycles, a node may be visited twice. To avoid processing a node more than once, use a Boolean visited array.

24. (a) queue

    Explanation: Breadth-first search is an algorithm for searching a tree data structure for a node that satisfies a given property. It starts at the tree root and explores all nodes at the present depth prior to moving on to the nodes at the next depth level.

25. (d) stack

26. (b) False

27. (c) Recursion

28. (c) Both Stack & Queue

29. (d) All of the above

30. (c) Binary Search Tree

31. (a) node.next inaccessible

Fill in the blanks

32. (c) Post-order Traveller

33. (b) linear search

34. (a) linear search

35. (a) complete binary tree

36. (b) pivot element

37. (b) selection sort

38. (a) Selection Sort

39. (c) resource allocation

40. (d) None of the above

41. (c) Execute infinitely.

Match the following

42. (c) 1-(iii), 2-(i), 3-(ii)

43. (b) 1-(ii), 2-(iii), 3-(i)

Numerical based

44. (d) 10

Explanation: (1ST-8,7,9,22,5,13,31 (4 SWAPS)

2ND-7,8,9,5,13,22,31 (3SWAPS)

3RD-7,8,5,9,13,22,31(1 SWAPS)

4TH-7,5,8,9,13,22,31(1 SWAPS)

5TH-5,7,5,9,13,22,31 (1 SWAPS)

4+3+1+1+1=10

45. (a) 4

Explanation: In 1 st pass, 25134, 2 and 5 are compared. No change in that case

Same pass 5 and 1 are compared thus swapped (total swap = TS = 1), => 21534 => 21354 (TS = 2), => 21345 (TS = 3),

Next pass i.e 2 => 1 and 2 swapped => 12345 (TS = 4)

46. (c) 5

Explanation: 2^n -n where n = number of nodes

47. (c) 4

48. (a) 148

Explanation: (N = 100 MIN NO OF COMPARISONS = (3N/2)-2

(3 X 100)/2 - 2 = 148)

49. (a) 0,10,110,1110,1111

Explanation: The probability are ½,1/4, 1/8,1/16,,1/32

So, the Huffman code according to the tree is unique.

50. (d) 14

Explanation: The number of distinct BST for n nodes are given as ((2n)Cn)/(n+1) So, for 4 distinct nodes, we can have (8C4)/5 = 14 distinct BSTs.

51. (c) O(n2)

Explanation: Bubble Sort is an easy-to-implement, stable sorting algorithm with a time complexity of $O(n^2)$ in the average and worst cases – and O(n) in the best case.

52. (a) 4

Explanation: The given array is arr = {1, 2, 4, 3}. Bubble sort is used to sort the array elements. How much iteration will be done to sort the array? Explanation: Even though the first two elements are already sorted, bubble sort needs 4 iterations to sort the given array.

53. (d) n-1

Programming based questions

54. (a) (i) arr.length

(b) (i) arr[i];

(c) (i) i - 1

(d) (i) arr[j + 1]

(e) (i) array[i+1]

55. (a) (i) arr[]

(b) (i) arr.length

(c) (i) min_idx

(d) (i) arr[j]

(e) (ii) arr[min_idx]

56. (a) (ii) low < high

(b) (ii) pi

(c) (ii) pi - 1

(d) (ii) pi + 1

(e) (ii) quickSort

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Programming in Java

Multiple choice questions

1. Which is not OOPS concept in Java?
   - (a) Inheritance
   - (b) Encapsulation
   - (c) Polymorphism
   - (d) Compilation

2. Identify the type of polymorphism in Java?
   - (a) Compile time polymorphism
   - (b) Execution time polymorphism
   - (c) Multiple polymorphism
   - (d) Multilevel polymorphism

3. At what time method overloading is determined?
   - (a) At run time
   - (b) At compile time
   - (c) At coding time
   - (d) At execution time

4. Overloading does not occur when?
   - (a) More than one method with same name but different method signature and different number or type of parameters
   - (b) More than one method with same name, same signature but different number of signature
   - (c) More than one method with same name, same signature, same number of parameters but different type
   - (d) More than one method with same name, same number of parameters and type but different signature

5. Which concept of Java is used to convert a real world objects in terms of class?
   - (a) Polymorphism
   - (b) Encapsulation
   - (c) Abstraction
   - (d) Inheritance

6. The concept of Java which is achieved by combining methods and attribute into a class
   - (a) Encapsulation
   - (b) Inheritance
   - (c) Polymorphism
   - (d) Abstraction

7. An object which has its own lifecycle and there is no owner is called ?
   - (a) Aggregation
   - (b) Composition
   - (c) Encapsulation
   - (d) Association

8. Name the term where if parents object is killed, child object is also killed.
   - (a) Aggregation
   - (b) Composition
   - (c) Encapsulation
   - (d) Association

9. What is it called where object has its own lifecycle and child object cannot belong to another parent object?
   - (a) Aggregation
   - (b) Composition
   - (c) Encapsulation
   - (d) Association

10. Combination of inheritance and polymorphism is Method overriding?
    - (a) True
    - (b) false

11. Which object is encapsulated inside the System class?
    - (a) out
    - (b) println
    - (c) Both (a) and (b)
    - (d) None of the above

12. Employee emp = ___ Employee (); Choose a suitable word so that an object of the class Employee is created.
    - (a) object
    - (b) class
    - (c) run
    - (d) new

13. What is the output for the code:
    System.out.println ("Hello World");
    - (a) Shows error
    - (b) Hello World
    - (c) "Hello World"
    - (d) None of the above

14. What element provides a standard interface to common system resources.
    - (a) new
    - (b) API
    - (c) System
    - (d) None of the above

15. SDK is also know as :
    - (a) devkit
    - (b) JVM
    - (c) JDK
    - (d) None of the above

16. Feature of Java which is used to dynamically link code in a safe and expedient manner:
    - (a) Secure
    - (b) Distributed
    - (c) Dynamic
    - (d) Robust

17. Which additional package is included by JDK:

(a) java.awt

(b) sun.addtools.debug

(c) java.util

(d) sun.tools.debug

18. Which is not a feature of Java?

(a) Portable

(b) Structured

(c) Distributed

(d) High Performance

19. Java run-time system that chooses to execute the JAVA Bytecode:

(a) SDK   (b) JDK

(c) JVM   (d) None of the above

20. Operators that are used to compare two values and give the results:

(a) Increment and Decrement

(b) Logical

(c) Comparison

(d) Arithmetic

21. What is the result of the expression: 10+5*8-15/5

(a) 3   (b) 47

(c) 7   (d) 21

22. Common programming construct that is based upon a sequence of nested if:

(a) switch   (b) nested if

(c) if-else-if ladder   (d) None of the above

23. Identify the Java's multi-way branch statement.

(a) switch   (b) nested if

(c) break   (d) if-else-if ladder

24. Loop that always executes its body at least once, even though the condition is not true:

(a) for   (b) do-while

(c) while   (d) continue

25. Which statement is used to exit from a loop?

(a) continue   (b) quit

(c) break   (d) None of the above

26. State the method which can be used to set the size of the buffer:

(a) ensureCapacity( )   (b) length( )

(c) capacity( )   (d) setLength( )

27. The method that returns the reversed object on which it is called is:

(a) insert( )   (b) replace( )

(c) delete( )   (d) reverse( )

28. String indexes begin with

(a) 1   (b) 3

(c) 0   (d) 2

29. Name the special operator to allocate memory

(a) New   (b) Old

(c) ++   (d) –

30. String and StringBuffer classes are defined in ____ package:

(a) java.awt   (b) java.io

(c) java.lang   (d) java.util

Fill in the blanks

31. _____Method used to extract a single character from a String:

(a) toCharArray( )   (b) getChars( )

(c) getBytes( )   (d) charAt( )

32. Human Being and Elephant fall under _____ of the following relationship:

(a) Kind-Of   (b) Is-A

(c) Part-Of   (d) Has-A

33. _____ allows the creation of hierarchical classifications?

(a) Interface   (b) Inheritance

(c) Package   (d) Polymorphism

34. A class member that has been declared as private will be ___ to its class.

(a) Friendly   (b) Public

(c) Protected   (d) Private

35. _____ keywords is used to prevent inheritance:

(a) final   (b) catch

(c) extends   (d) super

36. Java supports ___ access specifiers.

(a) 1   (b) 2

(c) 3   (d) 4

37. ___ is used as a base class to derive specific classes of the same kind.

(a) private   (b) friend class

(c) abstract class   (d) superclass

38. Writing the same code in different places, leading to unnecessary replication of code is know as:

(a) Code extensibility   (b) Code redundancy

(c) Code reusability   (d) None of the above

39. The block which can be nested is:

(a) catch   (b) finally

(c) try   (d) None of the above

40. Number of final blocks which are used for an exception-handler.

(a) 1   (b) 2

(c) 3   (d) 4

Match the following

41. Match the columns:

Group A		Group B
1. an object of an exception class as a parameter.	(i)	Filter streams
2. Data Input Stream and Data Output Stream classes	(ii)	catch
3. In Unicode character is represented by	(iii)	Random Access File
4. To perform I/O operations	(iv)	16 bits

(a) 1-(iii), 2-(ii), 3-(i), 4-(iv)

(b) 1-(iii), 2-(iv), 3-(i), 4-(ii)

(c) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(d) 1-(i), 2-(iv), 3-(iii), 4-(ii)

42. Match the columns:

Group A		Group B
1. foundation for the output class hierarchy	(i)	skip( )
2. Input Stream class method is	(ii)	Output Stream
3. Graphics class is a part of	(iii)	start( )
4. called immediately after the init() is called	(iv)	java.awt package

(a) 1-(i), 2-(iii), 3-(ii), 4-(iv)

(b) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(iv), 2-(ii), 3-(i), 4-(iii)

43. Match the columns:

Group A		Group B
1. abstract data type	(i)	extends
2. inherit a class	(ii)	Class
3. private member of a class is accessible	(iii)	Access Modifiers
4. private, public & protected are	(iv)	only members of the same class

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(c) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(d) 1-(iv), 2-(i), 3-(ii), 4-(iii)

44. Match the columns:

Group A		Group B
1. Abstract Method	(i)	Abstract class
2. We can't create an instance of	(ii)	doesn't have a body
3. Constructor can return a value	(iii)	Alan Kay
4. OOPs is invented by	(iv)	False

(a) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(b) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(c) 1-(iv), 2-(i), 3-(ii), 4-(iii)

(d) 1-(iv), 2-(iii), 3-(ii), 4-(i)

45. Match the columns:

Group A		Group B
1. OOP boost the code reusability	(i)	Exceptions
2. common class for exception handling	(ii)	Inheritance
3. Java is developed by	(iii)	James Gosling
4. one of the inventors of Java	(iv)	Sun Microsystems

(a) 1-(i), 2-(ii), 3-(iii), 4-(iv)

(b) 1-(iii), 2-(ii), 3-(i), 4-(iv)

(c) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(d) 1-(i), 2-(ii), 3-(iv), 4-(iii)

Programming based questions

46. Which syntax is used to create an object of Class in Java?

(a) Classname obj = new() Classname()

(b) Classname obj = new Classname;

(c) Classname obj = new Classname();

(d) None of the above

47. Choose the correct statement

syntax to create an object of Class in Java:

Classname obj = new Classname();

How to create an Abstract class?

(a) Creating at least one member function as a pure virtual function

(b) Creating at least one member function as a virtual function

(c) Declaring as Abstract class using virtual keyword

(d) Declaring as Abstract class using static keyword

48. Pick the correct syntax for class ?

```
class A
{
    int a,b;
    public : void disp();
}
```

(a) void disp::A(){ }

(b) void A::disp(){ }

(c) void A:disp() { cout<<a<<b ; }

(d) void disp:A(){ cout<<a<<b; }

49. Select the correct statement for the given code?

```
class student
{
    private: student()
    {
    }
    public : student( int x)
    {
        marks =x;
    }
};
```

(a) The object can never be created

(b) The object can be created without parameters

(c) Only the object with only 1 parameter can be created

(d) Only the object with some parameters can be created

50. The true statement for the code is:

```
class A
{
    private : int marks; char name[20];
    public :
    A(int x=100)
    {
        marks=x;
    }
};
```

(a) Objects can be created with one parameter or without parameter

(b) Object can be created only with one parameter

(c) Object can be created with more than one parameter

(d) Objects can be create only without parameter

51. Choose correct option for the code .

```
class A{ static int c=0; public: A(){ c++; } };
```

(a) Constructor will make c=1 for each object created

(b) Constructor will make c=0 for each object created

(c) Constructor will keep number of objects created

(d) Constructor will just initialize c=0 then increment by 1

52. Identify the data member in following code which will be used when an object is created?

```
Class A
{
    int x; int y; int z;
    public : A()
    {
        y=100; x=100*y;
    }
};
```

(a) x will be used   (b) y will be used

(c) z will be used   (d) All will be used

53. Select the member considered most secure in the code ?

```
class A()
{
    int a;
    private : int b;
    protected : int c;
    public : int d;
};
```

(a) a   (b) b

(c) c   (d) d

54. Choose the correct option for the given code?

```
class A
{
    private : A()
    {
    }
    public : A(int x)
    {
```

}
};
A a;
A b(100);

(a) Program will give compile time error

(b) Program will run fine

(c) Program will give runtime error

(d) Program will give logical error

55. About the program code given below, answer the questions that follow:

```
public class AddTwoNumbers {
    public static void main(String[] args) {
        int num1 = 5, num2 = 15, sum;
        sum = num1 + num2;
            System.out.println("Sum    of    these
            numbers: "+sum);
    }
}
```

(a) What will be the output?

(i) Sum of these numbers: 20

(ii) Sum of these numbers: 40

(iii) Sum of these numbers: 60

(v) Sum of these numbers: 80

(b) What is the name of the class?

(i) AddTwoNumbers

(ii) System.out.println

(iii) public

(iv) static void main()

56. Regarding the program code given below, answer the questions that follow:

```
// filename Test.java
class Test {
    public static void main(String[] args) {
    for(int i = 0; 1; i++) {
    System.out.println("Hello");
    break;
    }
    }
}
```

(a) What will be the output?

(i) Compiler Error

(ii) syntax error

(iii) run time error

(iv) logic error

(b) What is the name of the class?

(i) System.out.println

(ii) static void main()

(iii) public

(iv) Test()

Answers

Multiple choice questions

1. (d) Compilation

    Explanation: The OOPs Concepts in Java are abstraction, encapsulation, inheritance, and polymorphism.

2. (a) Compile time polymorphism

    Explanation: If you overload a static method in Java, it is the example of compile time polymorphism.

3. (b) At compile time

    Explanation: Overloading is determined at compile time. Hence, it is also known as compile time polymorphism.

4. (d) More than one method with same name, same number of parameters and type but different signature

    Explanation: Overloading occurs when more than one method with same name but different

constructor and also when same signature but different number of parameters and/or parameter type.

5. (c) Abstraction

    Explanation: abstract is a non-access modifier in java applicable for classes, methods but not variables. It is used to achieve abstraction which is one of the pillar of Object Oriented Programming(OOP).

6. (a) Encapsulation

    Explanation: Encapsulation in Java is a mechanism of wrapping the data and code acting on the data together as a single unit.

7. (d) Association

    Explanation: Association in Java is a connection or relation between two separate classes that are set up through their objects.

8. (b) Composition

Explanation: A composition in Java between two objects associated with each other exists when there is a strong relationship between one class and another. Other classes cannot exist without the owner or parent class.

9. (a) Aggregation

   Explanation: Aggregation in Java is a relationship between two classes .The aggregate class contains a reference to another class and is said to have ownership of that class.

10. (a) True

11. (a) out

12. (d) new

13. (b) Hello World

14. (c) System

15. (a) devkit

16. (c) Dynamic

17. (d) sun.tools.debug

18. (b) Structured

   Explanation: Java is fast, Portable, Distributed, High Performance ,secure, and reliable

19. (c) JVM

20. (c) Comparison

21. (b) 47

22. (c) if-else-if ladder

   Explanation: Java if-else-if ladder is used to decide among multiple options. The if statements are executed from the top down.

23. (a) switch

   Explanation: The switch statement is a multi-way branch statement. It provides an easy way to dispatch execution to different parts of code based on the value of the expression. Basically, the expression can be byte, short, char, and int primitive data types.

24. (b) do-while

   Explanation: do-while loop is used to iterate a part of the program repeatedly, until the specified condition is true. If the number of iteration is not fixed and you must have to execute the loop at least once, it is recommended to use a do-while loop.

25. (c) break

   Explanation: Break Statement is a loop control statement that is used to terminate the loop. As soon as the break statement is encountered from within a loop, the loop iterations stop there, and control returns from the loop immediately to the first statement after the loop.

26. (a) ensureCapacity( )

   Explanation: The ensureCapacity() method of java.util.ArrayList class increases the capacity of this ArrayList instance, if necessary, to ensure that it can hold at least the number of elements specified by the minimum capacity argument.
   Syntax:
   public void ensureCapacity(int minCapacity)

27. (d) reverse( )

   Explanation: The Java. lang. StringBuffer. reverse() is an inbuilt method which is used to reverse the characters in the StringBuffer. The method causes this character sequence to be replaced by the reverse of the sequence.

28. (c) 0

   Explanation: Strings are ordered sequences of character data, 00:15 and the individual characters of a string can be accessed directly using that numerical index. String indexing in Java is zero-based, so the very first character in the string would have an index of 0 , 00:30 and the next would be 1 , and so on.

29. (a) New

   Explanation: You can allocate memory at run time within the heap for the variable of a given type using a special operator in JAVA which returns the address of the space allocated. This operator is called new operator.

30. (c) java.lang

   Explanation: java.lang provides classes that are fundamental to the design of the Java programming language. The most important classes are object , which is the root of the class hierarchy, and class , instances of which represent classes at run time.

Fill in the blanks

31. (d) charAt( )
32. (a) Kind-Of
33. (b) Inheritance
34. (d) Private
35. (a) final
36. (c) 3
37. (c) abstract class
38. (b) Code redundancy

39. (c) try
40. (a) 1

Match the following

41. (c) 1-(ii), 2-(i), 3-(iv), 4-(iii)
42. (b) 1-(ii), 2-(i), 3-(iv), 4-(iii)
43. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
44. (c) 1-(iv), 2-(i), 3-(ii), 4-(iii)
45. (d) 1-(i), 2-(ii), 3-(iv), 4-(iii)

Programming based questions

46. (c) Classname obj = new Classname();
47. (a) Creating at least one member function as a pure virtual function
48. (b) void A::disp(){ }

49. (c) Only the object with only 1 parameter can be created
50. (a) Objects can be created with one parameter or without parameter
51. (c) Constructor will keep number of objects created
52. (c) z will be used
53. (b) b
54. (a) Program will give compile time error
55. (a) (i) Sum of these numbers: 20
　　　(b) (i) AddTwoNumbers
56. (a) (i) Compiler Error
　　Explanation: There is a mistake in condition check expression of for loop. instead of using 1 use valid.
　　(b) (iv) Test()

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Objects

Multiple choice questions

1. Member variables are often called its _____, and its member functions are referred to as its _____ in a class.
   (a) attributes, methods   (b) none of these
   (c) values, morals   (d) data, activities

2. Keywords that are access specifiers
   (a) near and far   (b) opened and closed
   (c) table and row   (d) private and public

3. Use of _____ protects data from inadvertent modifications.
   (a) protect() member function
   (b) private access specifier
   (c) class protection operator, @
   (d) none of these

4. Which other attribute can be use to distinguish, When two people have same name
   (a) Colour   (b) Name
   (c) Birth date   (d) Behavior

5. How can we identify the value of attribute used ?
   (a) Personality   (b) Objects
   (c) Procedure   (d) Identity

6. By whom the behavior is always associated?
   (a) Personality   (b) Objects
   (c) Procedure   (d) Identity

7. Behavior of objects is called ?
   (a) Method   (b) Technique
   (c) Process   (d) Procedure

8. Property of object can be change due to its behavior ?
   (a) State   (b) Method
   (c) Status   (d) Class

9. To describe an object
   (a) What it is called (identity)
   (b) What it is (its state)
   (c) What it does (its behavior)
   (d) All of these

10. Attributes that describe the object is:
   (a) Information   (b) method
   (c) data   (d) name

11. Data attributes and behaviour methods collectively is called
   (a) Components   (b) Associate
   (c) Part   (d) Member

12. System which uses the concept of class that enables to express the set of objects that are abstractly equivalent differing only in the values of their attributes?
   (a) Object oriented   (b) Value oriented
   (c) Data oriented   (d) All of these

13. Element which can be considered as a blueprint for various objects?
   (a) Method   (b) class
   (c) object   (d) member

14. What is a class for multiple objects with similar features called?
   (a) Image   (b) representation
   (c) template   (d) guide

15. What things does a class describe with a group of object and common behaviour?
   (a) Features   (b) attribute
   (c) values   (d) States

16. Which element in the same class can share a common semantic purpose?
   (a) Methods   (b) classes
   (c) objects   (d) members

17. Name the concept which is used to embody all the common features of a particular set of objects?
   (a) Method   (b) class
   (c) object   (d) members

18. What represent a collection of classes ,constraints and relationship among classes?
   (a) Diagram   (b) map
   (c) drawing   (d) figure

19. How do we model the static view of an application?

    (a) Diagram   (b) map

    (c) drawing   (d) figure

20. What do we call the variable which are of class type?

    (a) Orientation   (b) position

    (c) reference   (d) indication

21. Name the keyword that is used to create an object?

    (a) Int   (b) float

    (c) new   (d) real

22. Identify that operator allocates the memory for an object and returns the address of the object for later use?

    (a) Int   (b) Float

    (c) new   (d) real

23. The memory location where the object is stored is known as?

    (a) Memory   (b) variable

    (c) reference   (d) none of these

24. Name the special portion of memory where the objects live?

    (a) heap   (b) Pile

    (c) stack   (d) all of these

25. When an object is created a special method is executed to perform initial task what it is called?

    (a) Function   (b) constructor

    (c) class   (d) method

26. Which of the following is correct when an object is created of type Room and assign its address to a variable r l

    (a) rl=new room ();   (b) rl=room () new;

    (c) RL= class room ();   (d) None of these

27. What is by default created, when there are empty parentheses without arguments?

    (a) Function   (b) constructor

    (c) class   (d) method

28. What initialises the attributes (variables) of the object using default values?

    (a) Function   (b) constructor

    (c) class   (d) method

29. Which of the following contain arguments that determine the initial values of variables?

    (a) Room   (b) brackets

    (c) Parentheses   (d) class

30. Choose the correct address of memory location where only object is created for->

    Room r2= new RoomO :- variable R2

    (a) Memory   (b) variable

    (c) reference   (d) none of these

Fill in the blanks

31. The class determines only the _____ of the variables.

    (a) types   (b) collection

    (c) location   (d) set

32. The actual _____ is contained inside the individual objects and not in the class.

    (a) information   (b) data

    (c) collection   (d) variables

33. Every _____ has its own set of data.

    (a) class   (b) variable

    (c) operator   (d) object

34. _____ allocated different memory space to hold their data values.

    (a) classes   (b) variables

    (c) operators   (d) objects

35. When _____ are no more needed the memory is claimed back to reuse.

    (a) classes   (b) variables

    (c) operators   (d) objects

36. In creating an object is also called _____ instantiation.

    (a) class   (b) object

    (c) inheritance   (d) polymorphism

37. An _____ for an object is created by allocating memory to store data for the object.

    (a) instance   (b) example

    (c) illustration   (d) none of these

38. An object that belongs to a _____ is said to be an instance of that class

    (a) cells   (b) variables

    (c) memory   (d) class

39. And _____ of a class is another word for an actual object.

    (a) instance   (b) example

    (c) memory   (d) none of these

40. _____ is an abstract representation of an object where as an instance is its concrete representation

    (a) cells   (b) variables

    (c) memory   (d) class

Match the following

41. Match the columns:

Group A		Group B	
1.	Instance and Object	(i)	methods
2.	To define an object's behavior	(ii)	OOP
3.	Keyword for object	(iii)	heap
4.	Instance allocated in memory	(iv)	new

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

42. Match the columns:

Group A		Group B	
1.	Object Oriented Programming	(i)	object
2.	Unique entity	(ii)	data
3.	Combining data and methods	(iii)	inheritance
4.	Class acquires properties from another class	(iv)	encapsulation

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

43. Match the columns:

Group A		Group B	
1.	Blue print	(i)	instantiating a class
2.	Creating objects of a class	(ii)	class
3.	Restricting the free flow of data	(iii)	fundamental concept OOPS
4.	Object	(iv)	encapsulation

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

44. Match the columns:

Group A		Group B	
1.	Declare class variable	(i)	class
2.	Attributes and methods	(ii)	static
3.	Passed by value	(iii)	methods
4.	Defined using static keyword	(iv)	parameters

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

45. Match the columns:

Group A		Group B	
1.	Called without creating instance	(i)	overloaded methods
2.	More than one method having same name	(ii)	class method
3.	Invoked automatically	(iii)	class
4.	methods are global	(iv)	Constructor

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(ii), 4-(iii)

Programming based questions

46. What is the use of constructor File Output Stream

(a) File not found exception

(b) File out of bounds exception

(c) File found exception

(d) None of these

47. Which instance will be created from the following FileOutputStreamfosobject= new File Output Stream ("/home/Akash/myfile.txt");

(a) File output stream   (b) File input stream

(c) File reader screen   (d) File constructor

48. What is the subclass of input stream and is generally used to read byte data from the file.

(a) File input stream

(b) File reader screen

(c) File writer screen

(d) File output stream

49. Name the method of file input stream class that reserve byte of data from this input stream.

(a) Void close ()   (b) Int read (byte [] b)

(c) Int read()   (c) Void write()

50. Identify the method of file input stream class that closes the file input stream and releases any system resources associated with the stream.

(a) Void close()   (b) Int read (byte [] b)

(c) Int read()   (d) Void write()

51. State the method of file input stream class that reads up to b.length bytes of data from this inputstream into an array of bytes

(a) Void close()   (b) Int read (byte [] b)

(c) Int read()   (d) Void write()

52. Which of the following can get input from live interaction through keyboard/ GUI for it may take input as command line arguments or from the files.

(a) Program   (b) code

(c) class   (d) method

53. Which class belongs to the Java.util package?

(a) Printer   (b) console

(c) scanner   (d) keyboard

54. What is default delimiter?

(a) Delimiter   (b) printer

(c) console   (d) white space

55. What can be of different type for example a string Like "India 1947" can also be read as a "string int" values

(a) Symbol   (b) Token

(c) word   (d) mark

56. Concerning the program code given below, answer the questions that follow:

```
class Main
{
    private String name;
    // constructor
    Main()
    {
        System.out.println("Constructor Called:");
        name = "Programiz";
    }
    public static void main(String[] args)
    {
        // constructor is invoked while
        // creating an object of the Main class
        Main obj = new Main();
        System.out.println("The name is " + obj.name);
    }
}
```

(a) What is the name of the constructor in the above program

(i) Constructor

(ii) Main()

(iii) String[] args

(iv) Name

(b) What is variable in this program

(i) Constructor

(ii) Main()

(iii) String[] args

(iv) Name

57. Concerning the program code given below, answer the questions that follow:

```
class Helper
{
    private int data;
    private Helper()
    {
        data = 5;
    }
}
public class Test
{
    public static void main(String[] args)
    {
        Helper help = new Helper();
        System.out.println(help.data);
    }
}
```

(a) What is the output of the following program?

(i) Compilation error

(ii) 5

(iii) Runtime error

(iv) None of the above

(b) What is the name of the constructor in the above program

(i) Constructor

(ii) Helper()

(iii) String[] args

(iv) Name

58. Concerning the program code given below, answer the questions that follow:

```
classTemp
{
    private Temp(intdata)
    {
        System.out.print(" Constructor called ");
    }
    protected static Temp create(int data)
    {
        Temp obj = newTemp(data);
        returnobj;
    }
    public void myMethod()
    {
        System.out.print(" Method called ");
    }
}
```

```
public class Test
{
    public static void main(String[] args)
    {
        Temp obj = Temp.create(20);
        obj.myMethod();
    }
}
```

(a) What is the output of the following program?

(i) Constructor called method called

(ii) Compilation error

(iii) Runtime error

(iv) None of the above

(b) What is the name of the class object created?

(i) test

(ii) obj

(iii) String[] args

(iv) Temp

Answers

Multiple choice questions

1. (a) attributes, methods

Explanation: An attribute is another term for a field. It's typically a public constant or a public variable that can be accessed directly.

A method is a block of code or collection of statements or a set of code grouped together to perform a certain task or operation.

2. (d) private and public

Explanation: Private members cannot be accessed from the child class of the same package. Public member can be accessed from non-child class of same package. Private members cannot be accessed from non-child class of same package. Public members can be accessed from child class of outside package.

3. (b) private access specifier

Explanation: The private access modifier is specified using the keyword private. The methods or data members declared as private are accessible only within the class in which they are declared. private means "only visible within the enclosing class".

4. (c) Birth date

5. (b) Objects

Explanation: It is a basic unit of Object-Oriented Programming and represents the real life entities. A typical Java program creates many objects, which as you know, interact by invoking methods. An object consists of : State: It is represented by attributes of an object.

6. (b) Objects

7. (a) Method

8. (a) State

9. (d) All of these

10. (c) data

11. (d) Member

Explanation: Member variables are known as instance variables in java. Instance variables are declared in a class, but outside a method, constructor or any block. When space is allocated for an object in the heap, a slot for each instance variable value is created.

12. (a) Object oriented

Explanation: Java is an object-oriented programming language where every program has at least one class. Programs are often built from many classes and objects, which are the instances of a class.

13. (b) class

Explanation: A class is a group of objects which have common properties. It is a template or blueprint from which objects are created.

14. (c) template
15. (b) attribute
16. (c) objects
17. (b) class
18. (a) Diagram
19. (a) Diagram
20. (c) reference
21. (c) new
22. (c) new
23. (c) reference
24. (a) heap
25. (b) constructor

   Explanation: A constructor in Java is a special method that is used to initialize objects. The constructor is called when an object of a class is created.

26. (a) rl=new room ();
27. (b) constructor
28. (b) constructor
29. (c) Parentheses
30. (c) reference

Fill in the blanks

31. (a) Types
32. (b) Data
33. (d) Object
34. (d) Objects
35. (d) Objects
36. (b) Object
37. (a) Instance
38. (d) Class
39. (a) Instance

40. (d) Class

Match the following

41. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
42. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
43. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
44. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
45. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

Programming based questions

46. (a) File not found exception
47. (a) File output stream
48. (d) File output stream
49. (c) Int read()
50. (a) Void close()
51. (b) Int read (byte [] b)
52. (a) Program
53. (d) keyboard
54. (d) white space
55. (b) Token
56. (a) (ii) Main()
    (b) (iv) Name
57. (a) (i) Compilation error
    (b) (ii) Helper()
58. (a) (i) Constructor called method called

   Explanation: When a constructor is marked as private, the only way to create a new object of that class from some external class is using a method that creates a new object, as defined above in the program. The method creates () is responsible for the creation of the Temp object from some other external class. Once the object is created, its method can be invoked from the class in which the object is created.

   (b) (ii) obj

❑❑

Primitive values, Wrapper classes, Types and casting

Multiple choice questions

1. First four data types hold-
   - (a) Real numbers
   - (b) Integers
   - (c) Single character
   - (d) Whole numbers

2. Next two data types hold-
   - (a) Real numbers
   - (b) Integers
   - (c) Single character
   - (d) Whole numbers

3. From the Unicode character set, what does a character data type hold ?
   - (a) Real numbers
   - (b) Integers
   - (c) Single character
   - (d) Word

4. Data types used in Java are also called:
   - (a) Fixed Data Types
   - (b) Ancient Data Types
   - (c) Primitive Data Types
   - (d) New Data Types

5. Elements which are machine independent in Java:
   - (a) Data types
   - (b) Variables
   - (c) Literals
   - (d) Characters

6. In Java what are adaptable with IEEE 754?
   - (a) Real numbers
   - (b) Integers
   - (c) Single character
   - (d) Corrective

7. Which character set is used in Java:
   - (a) Numerical
   - (b) IEEE
   - (c) Character
   - (d) Integer

8. How many bits of precision are there in char type?
   - (a) 13
   - (b) 14
   - (c) 15
   - (d) 16

9. Which data type is not a number ?
   - (a) Char
   - (b) Real
   - (c) Boolean
   - (d) Integer

10. Which element manipulates the data that is stored in memory?
    - (a) Information
    - (b) Programs
    - (c) Comments
    - (d) Characters

11. If anything is to be remembered by the computer, what will be required during program execution? It should be stored in the memory of the computer. What will be that?
    - (a) Variables
    - (b) Literals
    - (c) Comments
    - (d) Operators

12. Which address of the location in memory is needed if we want to refer a data in machine language?
    - (a) Numerical
    - (b) Alpha numerical
    - (c) Alphabetical
    - (d) Real

13. Language in which names are used instead of numerical address of the memory location to refer to data is :
    - (a) Low level
    - (b) Middle level
    - (c) High level
    - (d) Top level

14. If we use a name to refer to the data stored in the memory, it is called?
    - (a) Variable
    - (b) Literal
    - (c) Comment
    - (d) Operator

15. Where do we declare variables in Java?
    - (a) Beginning
    - (b) Initial
    - (c) Declaration
    - (d) Comment

16. To be specified by user in conventional syntax, an item should not be enclosed with:
    - (a) Curly bracket
    - (b) Square brackets
    - (c) Angle brackets
    - (d) Round bracket

17. The list of item should not have _____ if separated by commas in conventional syntax.
    - (a) Curly bracket
    - (b) Square brackets
    - (c) Angle brackets
    - (d) Round bracket

18. Lists containing more than one item can be separated by:
    - (a) Using semi colon
    - (b) Using commas
    - (c) Using full stops
    - (d) Using Colon

19. Which is the incorrect statement while defining the variable name?

    (a) It must begin with an alphabet underscore (_)

    (b) It must begin with a percentage sign (%)

    (c) No spaces are allowed in variables

    (d) It cannot be a reserved word

20. Which example of variable is correct?

    (a) Int marks;

    (b) Double amount, interest

    (c) Float rate;

    (d) All of these

21. In which type of statement Computer sets aside memory for the variable and associates the variables name with that memory ?

    (a) Data type

    (b) Initial

    (c) Variable declaration statement

    (d) Comment

22. What is used to determine the size of variable the value it can hold and the operations that can be performed on it?

    (a) Real numbers   (b) Variables

    (c) Data types   (d) Floats

23. Which classes are not included in Java.language ?

    (a) Byte   (b) Integer

    (c) Array   (d) Class

24. Which of the following is a process of converting the simple data type into a class?

    (a) Type wrapping   (b) Type conversion

    (c) Type casting   (d) None of the above

25. Which of the following class is a super class of wrappers double and integer?

    (a) Long   (b) Digits

    (c) Float   (d) Number

26. Which is a wrapper for simple data type float?

    (a) Float   (b) double

    (c) float   (d) Double

27. Which method is a method of wrapper float for converting the value of an object into byte?

    (a) bytevalue()   (b) byte bytevalue()

    (c) byteBytevalue()   (d) Bytevalue()

28. Which is a wrapper for data type int?

    (a) Integers   (b) Long

    (c) Byte   (d) Double

29. Which of the following options are the method of heparin teacher for obtaining hash code for the invoking object?

    (a) int hash()

    (b) int hashcode()

    (c) int hashCode()

    (d) interger hashcode()

30. Which is a super class of wrappers long ,character and integer?

    (a) Long   (b) Digits

    (c) Float   (d) Number

31. Which is a wrapper for simple data type char?

    (a) Float   (b) Character

    (c) String   (d) Integer

32. Which method of integer is used for converting the value of an object into int?

    (a) Bytevalue()   (b) int intValue();

    (c) int Bytevalue()   (d) Byte Bytevalue()

33. Which method is used to obtain value of invoking object as a long?

    (a) long value ()   (b) long longValue()

    (c) Long longvalue()   (d) Long Longvalue()

34. What type of conversions are available in Java language?

    (a) Narrowing type conversion

    (b) Widening type conversion

    (c) A and B

    (d) None of the above

35. Which of the following is higher data type in Java language?

    (a) Data type which holds more data than other data types

    (b) Order type whose size is more than other data type

    (c) Order type which can hold more precision digits than other data type

    (d) All of the above

36. Widening type conversion in Java includes?

    (a) Conversion of data from higher data type to lower data type

    (b) Conversion of data from lower data type to higher data type

    (c) Conversion of data from any data type to any data type

    (d) None of the above

37. Narrowing type conversion in Java includes?
   (a) Conversion of data from lower data type to higher data type
   (b) Conversion of data from a higher data type to lower data type
   (c) Conversion of data from any data type to any data type
   (d) None of the above

Fill in the blanks

38. _____ is the result of a narrowing type conversion.
   (a) Loss of data   (b) Addition of data
   (c) Corruption of data   (d) None of the above

39. _____ is the result of widening type conversion in Java.
   (a) Loss of data   (b) Gain of data
   (c) No change   (d) None of the above

40. Type promotion in Java uses only _____ .
   (a) Narrowing type conversion
   (b) Widening type conversion
   (c) No type conversion
   (d) None of the above

41. Type casting in Java uses _____ type conversion.
   (a) Narrowing type conversion
   (b) Widening type conversion
   (c) No type conversion
   (d) None of the above

42. Explicit type conversion in Java refers to _____.
   (a) Narrowing type conversion
   (b) Widening type conversion
   (c) No type conversion
   (d) None of the above

43. Implicit type conversion in java is also called _____.
   (a) Narrowing type conversion
   (b) Widening type conversion
   (c) No type conversion
   (d) None of the above

44. _____ are the compatible data types for type promotion or type casting.
   (a) byte, char , short   (b) char. int, float
   (c) float. long , double   (d) All of the above

45. A boolean literal in Java can be type casted to _____ data type.
   (a) Byte   (b) Short
   (c) Int   (d) None of the above

46. If a variable or operand in an expression is type long then all the brands are type promoted to _____ data type.
   (a) Int   (b) Long
   (c) Float   (d) Double

47. Java is an object oriented programming language developed by _____ .
   (a) Oracle
   (b) Sun Microsystems
   (c) UNIX
   (d) Netscape

Match the following

48. Match the columns:

Group A		Group B	
1.	Java program is composed of	(i)	Native
2.	Code is faster to execute	(ii)	classes
3.	Java provides tools	(iii)	slow execution speed
4.	Disadvantage of byte codes	(iv)	convert javabyte into native codes

   (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
   (b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
   (c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
   (d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

49. Match the columns:

Group A		Group B	
1.	Primitive	(i)	a class whose object wraps
2.	Wrapper classes	(ii)	data type
3.	Primitive types	(iii)	convert data type to another data type
4.	User defined casting	(iv)	int, short, long, byte

   (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
   (b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
   (c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
   (d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

50. Match the columns:

Group A		Group B	
1.	Primitive data types	(i)	32 bit
2.	int in java	(ii)	8
3.	Signed	(iii)	byte
4.	Smallest integer type	(iv)	int, short, long, byte

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

51. Match the columns:

Group A		Group B	
1.	Size of float and double	(i)	int to long
2.	Automatic type conversion	(ii)	32 and 64
3.	Word true is	(iii)	double
4.	Not an integer data type	(iv)	Boolean literal

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

52. Match the columns:

Group A		Group B	
1.	Floating data type	(i)	string
2.	Character data type cannot store	(ii)	double
3.	Range of byte data type	(iii)	4 byte
4.	Size of integer	(iv)	-128-127

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

Programming based questions

53. Choose the right statement:

int x = 25;

Integer y = new Integer(33);

What is the difference between these two statements?

(a) Primitive data types

(b) Primitive data type and an object of a wrapper class

(c) Wrapper class

(d) None of the above

54. Choose the correct output of the following Java Code:

int a=9;

float b = a/2;

System.out.println(b);

(a) 4.0   (b) 4.5

(c) 5.0   (d) None of the above

55. Choose the correct output of the Java code snippet?

char ch = 'A';//ASCII 65

int a = ch + 1;

ch = (char)a;

System.out.println(ch);

(a) 66   (b) A

(c) B   (d) 65

56. Regarding the program code given below, answer the questions that follow:

```
// char can be handled like integers
public class CharClass
{
    public static void main(String args[])
    {
    char myChar1 = 'A';
    char myChar2 = 'B';
    System.out.println("myChar1: " +myChar1);
    System.out.println("myChar2: " +myChar2);
    }
}
```

(a) What will be the output?

   (i) myChar1: A

     myChar2: B

  (ii) myChar1: B

     myChar2: C

 (iii) myChar1: C

     myChar2: D

 (iv) myChar1: D

     myChar2: E

(b) What is the name of the class?

   (i) System.out.println

  (ii) static void main()

(iii) public

(iv) CharClass

57. Concerning the program code given below, answer the questions that follow:

```
public class ShortDataType
{
    public static void main(String args[])
    {
    short myShort = 6000;
    System.out.println("myShort: " + myShort);
    }
}
```

(a) What will be the output?

(i) myShort: 6000

(ii) myShort: 7000

(iii) myShort: 8000

(iv) myShort: 4000

(b) What is the name of the data type used to store myshort price?

(i) ShortDatatype

(ii) static void main()

(iii) public

(iv) Short

Answers

Multiple choice questions

1. (b) Integers

   Explanation: Integer. ,Floating-point number. Character. Boolean

2. (a) Real numbers

3. (c) Single character

4. (c) Primitive Data Types

   Explanation: The eight primitives defined in Java are int, byte, short, long, float, double, boolean, and char – those aren't considered objects and represent raw values.

5. (a) Data types

6. (a) Real numbers

7. (c) Character

8. (d) 16

   Explanation: The char data type is a single 16-bit Unicode character. It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535 inclusive).

9. (c) Boolean

   Explanation: The BOOLEAN data type stores TRUE or FALSE data values as a single byte.

10. (b) Programs

11. (a) Variables

12. (a) Numerical

13. (c) High level

14. (a) Variable

    Explanation: Syntax type variable = value;

15. (a) Beginning

16. (c) Angle brackets

17. (a) Curly bracket

18. (b) Using commas

19. (b) It must begin with a percentage sign (%)

20. (d) All of these

21. (c) Variable declaration statement

22. (c) Data types

23. (c) Array

24. (b) Type conversion

    Explanation: Syntax dataType variableName = (dataType) variableToConvert;

25. (d) Number

26. (a) Float

27. (b) byte bytevalue()

28. (a) Integers

    Explanation: The wrapper class in Java provides the mechanism to convert primitive into object and object into primitive.

29. (c) int hashCode()

30. (d) Number

31. (b) Character

32. (b) int intValue();

33. (b) long longValue()

34. (c) A and B

35. (d) All of above

36. (b) alteration of data from lower data type to higher data type

37. (b) alteration of data from a higher data type to lower data type

Fill in the blanks

38. (a) Loss of data

39. (c) No change

40. (b) Widening type conversion

41. (a) Narrowing type conversion

42. (a) Narrowing type conversion

43. (b) Widening type conversion

44. (d) All of the above

45. (d) None of the above

46. (b) Long

47. (b) Sun Microsystems

Match the following

48. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

49. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

50. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

51. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

52. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

Programming based questions

53. (b) Primitive data type and an object of a wrapper class

54. (a) 4.0

55. (c) B

56. (a) (i) myChar1: A
   myChar2: B

   (b) (iv) CharClass

57. (a) (i) myShort: 6000

   (b) (iv) Short

❏❏

Chapter 7

Variables, Expressions

Multiple choice questions

1. Where do we declare local variables ?
   - (a) It declares inside the class and outside of method.
   - (b) It declares inside the class with static prefix and outside of method.
   - (c) It declares inside the method.
   - (d) none of these

2. Where do we declare instance variables ?
   - (a) It declares inside the class and outside of method.
   - (b) It declares inside the class with static prefix and outside of method.
   - (c) It declares inside the method.
   - (d) none of these

3. Where do we declare class variables ?
   - (a) It declares inside the class and outside of method.
   - (b) It declares inside the class with static prefix and outside of method.
   - (c) It declares inside the method.
   - (d) none of these

4. Which element can not be used as variable name in Java programming language ?
   - (a) literal
   - (b) Keywords
   - (c) Identifier
   - (d) Identifier and Keywords

5. Name of variable is called:
   - (a) Data Type
   - (b) Constant
   - (c) Identifier
   - (d) None of the above

6. Which variable name is invalid variable name ?
   - (a) tenthTeam
   - (b) TenthTeam
   - (c) 10thTeam
   - (d) None of the Above

7. A variable name should never begin with.
   - (a) A number
   - (b) Special characters but underscore and dollar sign
   - (c) All of the above

8. Choose a valid variable name.
   - (a) 5thTeam
   - (b) &5thteam
   - (c) _5thTeam
   - (d) None of the Above

9. Which variable names are the invalid variable names ?
   - (a) 1stLevel
   - (b) first Level
   - (c) *firstLevel
   - (d) All of the Above

10. Which variable names are the valid variable names ?
    - (a) $1stLevel
    - (b) _1stLevel
    - (c) £1stLevel
    - (d) All of the Above

11. The two possible Logical Operator types are:
    - (a) Bitwise Logical
    - (b) Boolean Logical
    - (c) Arithmetic Logical
    - (d) (a) and (b)

12. Which data type do we use with Boolean logical operators in Java ?
    - (a) true/false boolean data
    - (b) 1 and 0 of individual Bits
    - (c) characters of a String
    - (d) None of the above

13. Which type of data can be used with Bitwise logical operators in Java?
    - (a) true/false boolean data
    - (b) 0 and 1 individual bits of data
    - (c) Characters of a String
    - (d) None of the above

14. Bitwise logical operators are also called _____.
    - (a) Logical operators
    - (b) Bitwise operators
    - (c) Binary operators
    - (d) None of the above

15. Input used for Logical Operators are:
    - (a) 1 and 0
    - (b) true / false
    - (c) char / String
    - (d) None of the above

16. Output given by any Logical operation in Java:

(a) 1 or 0

(b) true or false

(c) char or String

(d) None of the above

17. Which Logical operator works with a Single Operand?

(a) Logical AND

(b) Logical OR

(c) Logical Exclusive OR

(d) Logical NOT

18. Which is a Logical Unary NOT operator in Java?

(a) ~

(b) !

(c) #

(d) ^

19. What will be the output of a Logical OR (|) operation if one of the inputs/operands is false?

(a) false

(b) true

(c) true or false

(d) None of the above

20. What will be the output of Logical AND (&) operation if one of the inputs/operands is false?

(a) false

(b) true

(c) true or false

(d) None of the above

21. What will be the output for a Logical OR (|) operation when inputs/operands is true?

(a) false

(b) true

(c) true or false

(d) None of the above

22. What will be the output of a Logical AND (&) operation when inputs/operands is true?

(a) false

(b) true

(c) true or false

(d) None of the above

23. What will be the output of a Logical AND (&) operation if both inputs/operands are true?

(a) false

(b) true

(c) true or false

(d) None of the above

24. What will be the output of a Logical OR (|) operation if both the inputs/operands are true?

(a) true

(b) false

(c) true or false

(d) None of the above

25. Which operator is fast AND (&) and Short Circuit AND(&&) operators in Java?

(a) AND operator

(b) Short Circuit AND

(c) Both work at the same speed

(d) None of the above

26. Which operator is fast OR(|) and Short Circuit OR (||) operators in Java?

(a) OR Operator

(b) Short Circuit OR operator

(c) Both work at the same speed

(d) None of the above

27. Why Short Circuit AND (&&) and Short Circuit OR (||) operators are fast in Java?

(a) By skipping the second expression or operand if possible and save time.

(b) By using extra memory on the machine

(c) By using extra CPU processing power

(d) None of the above

28. Which operators are involved in Arithmetic expression in Java ?

(a) Addition (+), Subtraction (-)

(b) Multiplication (*), Division (/)

(c) Modulo Division (%), Increment/Decrement (++/--), Unary Minus (-), Unary Plus (+)

(d) All of the above

29. Which is the correct Compound Assignment Arithmetic Operators in Java .

(a) +=, -=

(b) *=, /=

(c) %=

(d) All of the above

30. Choose the correct output of Java code snippet?

int a = 2 - - 7;

System.out.println(a);

(a) −5

(b) 10

(c) 9

(d) Compiler Error

31. Choose the correct output of Java code snippet ?

short p = 1;

short k = p + 2;

System.out.println(k);

(a) 1

(b) 2

(c) 3

(d) Compiler error

32. The arithmetic operator in Java that gives the Remainder of Division is :

(a) /

(b) @

(c) %

(d) &

33. What type of associativity do Arithmetic operators +, -, /, * and % have?

(a) Right to Left

(b) Left to Right

(c) Right to Right

(d) Left to Left

34. Which of the following operators have more priority?

(a) Postfix operators have more priority than Prefix operators

(b) Prefix operators have more priority than Postfix operators

(c) Both Prefix and Postfix operators have equal priority

(d) None of the above

35. Which of the following operator has less priority?

(a) Postfix Decrement has less priority than Prefix Increment

(b) Prefix Increment has less priority than Postfix Decrement

(c) Both operators have same priority

(d) None of the above

36. How is the associativity used by Increment and Decrement arithmetic operators in Java ?

(a) Left to Right   (b) Right to Left

(c) Left to Left   (d) Right to Right

37. Which of the following is the correct statement about Java Operators +, -, *, / and %.

(a) + and - have equal priority

(b) * and / have equal priority

(c) / and % have equal priority

(d) All the above

38. Choose the group with higher priority in operator groups (++, --) and (+, -, *, /, %) in Java.

(a) (++, --) group has higher priority than (+, -, *, /, %) group

(b) (++, --) group has lower priority than (+, -, *, /, %) group

(c) (++, --) group and (+, -, *, /, %) group have equal priority

(d) None of the above

39. Operator with highest precedence:

(a) ()   (b) ++

(c) *   (d) >>

Fill in the blanks

40. _____should be expression1 evaluate to in using ternary operator in the following line?

expression1 ? expression2 : expression3

(a) Integer

(b) Floating – point numbers

(c) Boolean

(d) None of the above

41. _____ is the value stored in x in the following lines of Java code?

int x, y, z;

x = 0;

y = 1;

x = y = z = 8;

(a) 0   (b) 1

(c) 9   (d) 8

42. _____ is the order of precedence (highest to lowest) of following operators?

1. &

2. ^

3. ?:

(a) 1 -> 2 -> 3 ====   (b) 2 -> 1 -> 3

(c) 3 -> 2 -> 1   (d) 2 -> 3 -> 1

43. _____ statement is incorrect?

(a) Equal to operator has least precedence

(b) Brackets () have highest precedence

(c) Division operator, /, has higher precedence than multiplication operator

(d) Addition operator, +, and subtraction operator have equal precedence

44. _____ returned by greater than, <, and equal to, ==, operator?

(a) Integers

(b) Floating - point numbers

(c) Boolean

(d) None of the mentioned

45. _____operators can operate on a boolean variable?

1. &&

2. ==

3. ?:

4. +=

(a) 3 & 2   (b) 1 & 4

(c) 1, 2 & 4   (d) 1, 2 & 3

46. _____ operators can skip evaluating right hand operand.

(a) !   (b) |

(c) &   (d) &&

47. _____ operator is having highest precedence.

(a) ()   (b) ++

(c) *   (d) >>

48. Expression1 should be _____ to evaluate using ternary operator?

expression1 ? expression2 : expression3

(a) Integer

(b) Floating – point numbers

(c) Boolean

(d) None of the mentioned

49. _____ is the value stored in x in following lines of code?

int x, y, z;
x = 0;
y = 1;
x = y = z = 8;
(a) 0   (b) 1
(c) 9   (d) 8

Match the following

50. Match the columns:

Group A		Group B
1. Operands of arithmetic operators	(i)	Integers and floating - point numbers
2. Modulus operator, %,	(ii)	Numeric & Characters
3. Operator, âˇâˇ, decreases the value	(iii)	( ) , { }
4. Highest order precedence operator	(iv)	by 1

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

51. Match the columns:

Group A		Group B
1. && and || operators	(i)	Ternary Operator
2. Colon (?:) operator	(ii)	Combine two boolean values
3. Java Ternary operator	(iii)	true or false
4. Condition of a Java Ternary operator	(iv)	Conditional Operator

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

52. Match the columns:

Group A		Group B
1. Assignment operator	(i)	must return a value
2. True part of conditional operator	(ii)	Assignment and Lambda operator
3. False Part of conditional operator	(iii)	\ \
4. Character escape code not in java	(iv)	Must return a value

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

53. Match the columns:

Group A		Group B
1. Portability and security of Java	(i)	Use of pointers
2. Not a Java features	(ii)	Byte code is executed by JVM
3. \u0021 article	(iii)	JDB
4. Find and fix bugs	(iv)	Unicode escape sequence

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

54. Match the columns:

Group A		Group B
1. Return type of the hash Code() method	(i)	0xnf029L
2. Valid long literal	(ii)	int
3. Float a = 35 / 0 return?	(iii)	It has no class name
4. Anonymous inner class	(iv)	Infinity

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

Programming based questions

55. Choose correct output of Java code snippet?

short k=1;

k += 2;

System.out.println(k);

(a) 1
(b) 2
(c) 3
(d) Compiler error about Type Casting

56. With reference to the program code given below, answer the questions that follow:

public class ReverseNumber

```
{
    public static void main(String[] args)
    {
    int number = 987654, reverse = 0;
    while(number != 0)
    {
    int remainder = number % 10;
    reverse = reverse * 10 + remainder;
    number = number/10;
    }
    System.out.println("The reverse of the given number is: " + reverse);
    }
}
```

(a) What is the output of the following program?

(i) The reverse of the given number is: 456789

(ii) Compilation error

(iii) 15

(iv) Runtime error

(b) What is the name of the class in the above program

(i) Constructor

(ii) ReverseNumber

(iii) String[] args

(iv) Name

57. Regarding the program code given below, answer the questions that follow:

public class SumOfNaturalNumber2

```
{
    public static void main(String[] args)
    {
    int num = 100, i = 1, sum = 0;
    //executes until the condition returns true
    while(i<= num)
    {
    //adding the value of i into sum variable
    sum = sum + i;
    //increments the value of i by 1
    i++;
    }
    //prints the sum
    System.out.println("Sum of First 100
```

Natural Numbers is = " + sum);

```
    }
}
```

(a) What is the output of the following program?

(i) Sum of First 100 Natural Numbers is = 5050

(ii) Compilation error

(iii) 15

(iv) Runtime error

(b) What is the name of the class in the above program ?

(i) Constructor

(ii) Sum of Natural Number 2

(iii) String[] args

(iv) Name

58. Regarding the program code given below, answer the questions that follow:

public class CheckPositiveOrNegative

```
{
    public static void main(String[] args)
    {
    //number to be check
    int num=912;
    //checks the number is greater than 0 or not
    if(num>0)
    {
    System.out.println("The     number     is     positive.");
    }
    //checks the number is less than 0 or not
    else if(num<0)
    {
    System.out.println("The     number     is     negative.");
    }
    //executes when the above two conditions return false
    else
    {
    System.out.println("The number is zero.");
    }
    }
}
```

(a) What is the output of the following program?

(i) The number is positive.

(ii) The number is Negative.

(iii) 15

(iv) Runtime error

(b) What does the above program do?

(i) Initialize a number

(ii) Check whether the number is positive or negative

(iii) Give odd or even number

(iv) None of the above

Answers

Multiple choice questions

1. (c) It declares inside the method.

   Explanation: A variable declared inside the body of the method is called local variable. You can use this variable only within that method and the other methods in the class aren't even aware that the variable exists. A local variable cannot be defined with "static" keyword.

2. (a) It declares inside the class and outside of method.

   Explanation: Instance variables are declared in a class, but outside a method, constructor or any block. When space is allocated for an object in the heap, a slot for each instance variable value is created.

3. (b) It declares inside the class with static prefix and outside of method.

   Explanation: Class variables also known as static variables are declared with the static keyword in a class, but outside a method, constructor or a block. There would only be one copy of each class variable per class, regardless of how many objects are created from it.

4. (b) Keywords

   Explanation: Java keywords are also known as reserved words. Keywords are particular words that act as a key to a code.

5. (c) Identifier

   Explanation: Identifiers in Java are symbolic names used for identification. They can be a class name, variable name, method name, package name, constant name, and more.

6. (d) None of the Above

7. (c) All of the above

8. (c) _5thTeam

9. (d) All of the Above

10. (d) All of Above

11. (d) A and B

12. (a) true/false boolean data

13. (b) 0 and 1 individual bits of data

14. (b) Bitwise operators

    Explanation: Java defines several bitwise operators, which can be applied to the integer types, long, int, short, char, and byte.

15. (b) true / false

16. (b) true or false

17. (d) Logical NOT

18. (b) !

19. (c) true or false

20. (a) false

21. (b) true

22. (c) true or false

23. (b) true

24. (a) true

25. (b) Short Circuit AND

    Explanation: In Java logical operators, if the evaluation of a logical expression exits in between before complete evaluation, then it is known as Short-circuit. ... If there is an expression with &&(logical AND), and first operand itself is false, then short circuit occurs, the further expression is not evaluated and false is returned.

26. (b) Short Circuit OR operator

27. (a) By skipping the second expression or operand if possible and save time.

28. (d) All of the above

29. (d) All of the above

30. (c) 9

31. (d) Compiler error

32. (c) %

33. (b) Left to Right

34. (a) Postfix operators have more priority than Prefix operators

35. (b) Prefix Increment has less priority than Postfix Decrement

36. (b) Right to Left

37. (d) All of the above

38. (a) (++, --) group has higher priority than (+, -, *, /, %) group

39. (a) ()

Fill in the blanks

40. (c) Boolean

41. (d) 8

42. (a) 1 -> 2 -> 3 ====

43. (c) Division operator, /, has higher precedence than multiplication operator

44. (c) Boolean

45. (d) 1, 2 & 3

46. (d) &&

47. (a) ()

48. (c) Boolean

49. (d) 8

Match the following

50. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

51. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

52. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

53. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

54. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

Programming based questions

55. (c) 3

56. (a) (i) The reverse of the given number is: 456789

(b) (ii) ReverseNumber

57. (a) (ii) Compilation error

Explanation: Constructors can be chained and overloaded. When Test() is called, it creates another Test object calling the constructor Test(int temp).

(b) (ii) Sum of natural Number 2

58. (a) (i) The number is positive.

(b) (ii) Check whether the number is positive or negative

❑❑

Multiple choice questions

1. Which selection statements test only for equality?
   - (a) if
   - (b) switch
   - (c) if & switch
   - (d) none of the mentioned

2. Which of the selection statements are used in Java?
   - (a) if()
   - (b) for()
   - (c) continue
   - (d) break

3. Which of the following loops will execute the body of loop even when condition controlling the loop is false?
   - (a) do-while
   - (b) while
   - (c) for
   - (d) none of the mentioned

4. Jump statements that can skip processing the remainder of the code in its body for a particular iteration are _____.
   - (a) break
   - (b) return
   - (c) exit
   - (d) continue

5. Choose the statement which is incorrect.
   - (a) switch statement is more efficient than a set of nested ifs
   - (b) two case constants in the same switch can have identical values
   - (c) switch statement can only test for equality, whereas if statement can evaluate any type of boolean expression
   - (d) it is possible to create a nested switch statements

6. IF-ELSE statement is also called ___.
   - (a) Branching statement
   - (b) Control statement
   - (c) Block statements
   - (d) ALL

7. As input before branching IF or ELSE IF statement accepts ___.
   - (a) boolean
   - (b) int
   - (c) float
   - (d) char

8. IF statement is also called a ___ statement in Java.
   - (a) boolean
   - (b) conditional
   - (c) iterative
   - (d) optional

9. IF-ELSE statements are similar to ___ in java.
   - (a) C style
   - (b) C++ Style
   - (c) Both C and C++ style
   - (d) None

10. State TRUE or FALSE. Every IF statement should be followed by an ELSE or ELSE-IF statement.
    - (a) TRUE
    - (b) FALSE

11. ELSE statement should be preceded by ___ statement in Java.
    - (a) IF
    - (b) ELSE IF
    - (c) IF or ELSE IF
    - (d) None

12. State TRUE or FALSE. A Single-Line comment is allowed in between if () and Left Brace ({).
    - (a) FALSE
    - (b) TRUE

13. State TRUE or FALSE. IF statement code should be defined in between two Braces.
    - (a) FALSE
    - (b) TRUE

14. State TRUE or FALSE. Code which is inside an ELSE statement should be surrounded by Braces.
    - (a) FALSE
    - (b) TRUE

15. State TRUE or FALSE An ELSE or ELSE-IF statement can not exist alone without IF statement in Java.
    - (a) FALSE
    - (b) TRUE

16. In condition of IF statement assess to boolean only if, the expression contains?
    - (a) logical operators
    - (b) relational operators
    - (c) boolean operands
    - (d) All

17. When the condition of an IF-statement is false, which statement will be true .

(a) IF block is executed.

(b) ELSE block is executed.

(c) Both IF and ELSE blocks are skipped.

(d) Both IF and ELSE blocks are executed.

18. Maximum lines of code that can be written inside a Java style IF, ELSE or IF-ELSE block.

(a) 32   (b) 64

(c) 512   (d) None

19. How is an IF-ELSE statement better than a SWITCH statement.

(a) Checking for More-than condition

(b) Checking for Less-than condition

(c) Checking for Ranges

(d) All

20. Maximum number of ELSE-IF statements that can present in between starting IF and ending ELSE statements can be _____.

(a) 32   (b) 64

(c) 128   (d) None

21. Choose the correct output of Java program with IF statement:

```
if(1)
{
    System.out.println("OK");
}
```

(a) OK   (b) No output

(c) Compiler error   (d) None

22. Choose the correct output of the Java program with IF-ELSE statements:

```
if(TRUE)
    System.out.println("GO");
else
    System.out.println("STOP");
```

(a) GO   (b) STOP

(c) Compiler error   (d) None

23. Choose the correct output of the Java program:

```
int a=10;
if(a==9)
    System.out.println("OK ");
    System.out.println("MASTER");
else
    System.out.println("BYE");
```

(a) OK MASTER   (b) BYE

(c) Compiler error   (d) None

24. Choose the correct output of the Java program.

```
if(3>1)
{
  4;
}
```

(a) 0   (b) 4

(c) Compiler error   (d) None

25. Choose the correct output of the Java program with IF statement:

```
if(true)
{
    break;
    System.out.println("ELEPHANT");
}
```

(a) No output   (b) ELEPHANT

(c) Compiler error   (d) None

26. A SWITCH case statement is a ___ control statement in Java.

(a) Iteration   (b) Loop

(c) Selection   (d) Jump

27. The alternative to SWITCH in Java language:

(a) break, continue   (b) for, while

(c) if, else   (d) goto, exit

28. The keywords used to implement a SWITCH case in Java language.

(a) switch, case   (b) default

(c) break   (d) All

29. The parts of a SWITCH in java includes:

(a) switch input condition

(b) case constants

(c) case statements

(d) All

30. _____ type of data as input is accepted by a SWITCH statement .

(a) byte   (b) short

(c) int   (d) All

31. In Iterator, hasMoreElements() method of Enumeration has been changed to:

(a) hasNextElement()   (b) isNext()

(c) hasNext()   (d) name remains same

32. What is used by TreeSet internally to store elements?

(a) HashMap   (b) LinkedHashMap

(c) TreeMap

33. Which statement is an iteration statement?

(a) switch   (b) if-else

(c) if   (d) do-while

Fill in the blanks

34. _____ data type is accepted by a switch statement in Java .

(a) enum   (b) String

(c) enum and String   (d) long

35. _____ version of Java supports String as the input data type of a SWITCH.

(a) JDK 5   (b) JDK 6

(c) JDK 7   (d) JDK 8

36. _____ is the output of Java program with Switch.

int a=10;

switch(a)

{

case 10: System.out.println("TEN");

}

(a) No output

(b) TEN

(c) Compiler error as there is no BREAK.

(d) None

37. _____ is the output of the Java program .

int b=20;

switch(b)

{

default: System.out.println("LION");

}

(a) No output

(b) LION

(c) Compiler error as there are no CASE statements.

(d) None

38. _____ is the output of the Java program .

String animal = "GOAT";

switch(animal)

{

   break: System.out.println("DOMESTIC");

}

(a) No output   (b) GOAT

(c) DOMESTIC   (d) Compiler error

39. A SWITCH fall through occurs only in the absence of ___ in Java.

(a) case keyword   (b) break keyword

(c) default keyword   (d) None

40. The main purpose to design a SWITCH logic with a fall-through is _____ in Java.

(a) to define ranges

(b) to define additions

(c) to improve switch block performance

(d) None

41. _____ for loop declaration is not valid.

(a) for (int i = 99; i >= 0; i / 9)

(b) for (int i = 7; i <= 77; i += 7)

(c) for (int i = 20; i >= 2; - -i)

(d) for (int i = 2; i <= 20; i = 2* i)

42. _____ is not a flow control statement in Java.

(a) break   (b) continue

(c) exit()   (d) return

43. _____ is acceptable types for x

switch(x)

{

   default:

       System.out.println("Hello");

}

(a) short   (b) char

(c) long   (d) float

Match the following

44. Match the columns:

Group A		Group B	
1.	Loop statement	(i)	It has empty initialization
2.	Empty loop in Java	(ii)	Which is executed repeatedly clause
3.	nested loop	(iii)	To terminate current iteration
4.	Functionality of break statement	(iv)	A Loop within a Loop

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

45. Match the columns:

Group A		Group B	
1.	Functionality of continue statement	(i)	do while loop runs once even conditional clause is false

2.	Difference between do while loop and while loop in Java	(ii)	To continue current iteration
3.	Switch statement	(iii)	Used inside the switch to terminate a statement sequence.
4.	Break statement	(iv)	Dispatch execution to different parts of your code based on the value of an expression.

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

46. Match the columns:

Group A		Group B	
1.	Switch statement	(i)	switch can only test for equality
2.	Conditional statement	(ii)	provides a better alternative than a large series of if-else-if statements.
3.	A continue statement	(iii)	in the same switch can have identical values
4.	No two case constants	(iv)	control to be transferred directly to the conditional expression

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

47. Match the columns:

Group A		Group B	
1.	A switch statement	(i)	Cannot be reference outside the loop.
2.	Variable declared inside the for loop control	(ii)	usually more efficient than a set of nested ifs.
3.	Control expressions for an if statement	(iii)	you can force immediate termination of the loop
4.	Break statement	(iv)	Boolean expression

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(ii), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

48. Match the columns:

Group A		Group B	
1.	do-while	(i)	select among a large group of values
2.	Switch statement	(ii)	Useful when you process a menu selection.
3.	Default is an optional case	(iii)	More than one else clause.
4.	One if can have	(iv)	Value of the expression does not match with any of the case values.

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

Programming based questions

49. Choose valid data type for variable "a" to print "Hello World"?

```
switch(a)
{
    System.out.println("Hello World");
}
```

(a) int and float

(b) byte and short

(c) char and long

(d) byte and char

50. Will the given Java code-snippet be compiled?

```
switch(45)
{
    case 10: ;
}
```

(a) NO   (b) YES

51. Choose the correct output for code snippet if variable a=10?

```
if(a<=0)
{
    if(a==0)
    {
        System.out.println("1 ");
    }
    else
    {
        System.out.println("2 ");
    }
}
System.out.println("3 ");
```

(a) 1 2 (b) 2 3

(c) 1 3 (d) 3

52. How many times will the loop be executed?

```
ch = 'b';
while(ch >= 'a' && ch <= 'z')
```

(a) 0 (b) 25

(c) 26 (d) 1

53. Choose the correct output of the Code.

```
void main()
{
    static a,b;
    while(a > b++)
}
```

(a) a=0 b=0

(b) a=0 b=0

(c) a=1 b=1

(d) none of the mentioned

54. Which of the following loops will execute the body of loop even when condition controlling the loop is initially false?

(a) do-while

(b) while

(c) for

(d) None of the mentioned

55. Identify how many times the loop will run?

```
for(digit = 0;digit < 9; digit++)
{
    digit = digit *2;
    digit--;
}
```

(a) Infinite (b) 9

(c) 0 (d) 4

56. Concerning the program code given below, answer the questions that follow:

```
//It is a program of odd and even numbers.
public class IfElse
{
public static void main(String[] args)
    {
    //defining a variable
    int number=13;
    //Check if the number is divisible by 2 or not
    if(number%2==0){
        System.out.println("even number");
    }
    else
    {
        System.out.println("odd number");
    }
}
```

(a) What will be the output?

(i) odd number

(ii) even number

(iii) whole number

(iv) natural number

(b) What is the name of the class?

(i) System.out.println

(ii) static void main()

(iii) public

(iv) class IfElse

57. Concerning the program code given below, answer the questions that follow:

```
public class LeapYear {
public static void main(String[] args) {
    int year=2020;
    if(((year % 4 ==0) && (year % 100 !=0)) || (year % 400==0)){
        System.out.println("LEAP YEAR");
    }
    else{
        System.out.println("COMMON YEAR");
    }
}
}
```

(a) What will be the output?

(i) LEAP YEAR

(ii) COMMON YEAR

(iii) WHOLE number

(iv) NATURAL number

(b) What this program is doing?

(i) checking the number is odd or even

(ii) checking the year is leap year or common year

(iii) checking number is divisible by 4 or 400

(iv) giving remainder after dividing by 4

Answers

Multiple choice questions

1. (b) switch

Explanation: Use the switch statement to select one of many code blocks to be executed.

Syntax

switch(expression) {

case x:

    // code block

break;

case y:

    // code block

break;

default:

    // code block

}

2. (a) if()

Explanation: Use the if statement to specify a block of Java code to be executed if a condition is true.

3. (a) do-while

Explanation: The do/while loop is a variant of the while loop. This loop will execute the code block once, before checking if the condition is true, then it will repeat the loop as long as the condition is true.

4. (d) continue

Explanation: The continue statement breaks one iteration (in the loop), if a specified condition occurs, and continues with the next iteration in the loop.

5. (b) two case constants in the same switch can have identical values

6. (d) ALL

7. (a) boolean

8. (b) conditional

Explanation: Use else if to specify a new condition to test, if the first condition is false.

9. (c) Both C and C++ style

10. (b) FALSE

11. (c) IF or ELSE IF

12. (b) TRUE

13. (a) FALSE

14. (b) TRUE

15. (b) TRUE

16. (d) All

17. (d) Both IF and ELSE blocks are executed.

18. (d) None

19. (d) All

20. (c) 128

21. (c) Compiler error

Explanation: Compile Time Errors are those errors which prevent the code from running because of an incorrect syntax such as a missing semicolon at the end of a statement or a missing bracket, class not found, etc. These kind of errors are easy to spot and rectify because the java compiler finds them for you.

22. (c) Compiler error

Explanation: Compile Time Errors are those errors which prevent the code from running because of an incorrect syntax such as a missing semicolon at the end of a statement or a missing bracket, class not found, etc. These kind of errors are easy to spot and rectify because the java compiler finds them for you.

23. (c) Compiler error

24. (c) Compiler error

25. (c) Compiler error

26. (c) Selection

Explanation: Selection statements allow you to control the flow of program execution, on the basis of the outcome of an expression or state of a variable, known during runtime. Selection statements can be divided into the following categories: The if and if-else statements. The if-else statements.

27. (c) if, else

28. (d) All

29. (d) All

30. (d) All

31. (c) hasNext()

32. (c) TreeMap

33. (d) do-while

Fill in the blanks

34. (c) enum and String

35. (c) JDK 7

36. (b) TEN

37. (b) LION

38. (d) Compiler error

39. (b) break keyword

40. (a) To define ranges.

41. (a) for (int i = 99; i >= 0; i / 9)

42. (c) exit()

43. (a) short

Match the following

44. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

45. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

46. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

47. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

48. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

Programming based questions

49. (d) byte and char

50. (b) YES

51. (d) 3

52. (b) 25

53. (a) a=0 b=0

54. (a) do-while

55. (a) Infinite

56. (a) (i) odd number

(b) (iv) class IfElse

57. (a) (i) LEAP YEAR

(b) (ii) checking the year is leap year or common year

Multiple choice questions

1. All Java methods should have a return type. (TRUE / FALSE)

(a) TRUE   (b) FALSE

2. (TRUE or FALSE) We can have same name of Java method as the class name.

(a) TRUE   (b) FALSE

3. A method name can contain numbers from 2nd character onwards in java. (TRUE / FALSE).

(a) TRUE   (b) FALSE

4. What is the identifier for a method name in Java?

(a) 1show   (b) $hide

(c) *show$ (d) 3_click

5. Local variable declared inside a method can not be used in expressions without its initialization. (TRUE / FALSE).

(a) TRUE   (b) FALSE

6. Static-method is shared among all instances of a class. (TRUE / FALSE)

(a) TRUE   (b) FALSE

7. Java never allow nesting of methods. (TRUE / FALSE)

(a) TRUE   (b) FALSE

8. What is the return type of a method that does not return any value?

(a) int   (b) float

(c) void   (d) double

9. The process of defining more than one method in a class which are differentiated by method signature is :

(a) Function overriding

(b) Function overloading

(c) Function doubling

(d) None of the mentioned

10. The method having same name as of it's class :

(a) finalize   (b) delete

(c) class   (d) constructor

11. Identify a method that is defined only once in a program?

(a) main method   (b) finalize method

(c) static method   (d) private method

12. Choose an incorrect statement ?

(a) All object of a class are allotted memory for the all the variables defined in the class

(b) If a function is defined public it can be accessed by object of other class by inheritance

(c) main() method must be made public

(d) All object of a class are allotted memory for the methods defined in the class

13. Which of the given statements best defines abstraction?

(a) Hiding the implementation

(b) Showing the important data

(c) Hiding the important data

(d) Hiding the implementation and showing only the features

14. Which of the given statements are incorrect ?

(a) Every class containing abstract method must be declared abstract

(b) Abstract class defines only the structure of the class not its implementation

(c) Abstract class can be initiated by new operator

(d) Abstract class can be inherited

15. Which packages contains abstract keyword?

(a) java.lang   (b) java.util

(c) java.io   (d) java.system

16. The syntax of abstract class in java is :

(a) abstract A{}   (b) abstract class A

(c) abstract class A{}   (d) abstract class A[]

17. Identify the main advantage of abstraction.

(a) Class usage

(b) Program complexity

(c) Idealized interface

(d) Unstable interface

18. The program element where we can apply abstraction is
    (a) Control and data
    (b) Only data
    (c) Only control
    (d) Classes

19. What is the element that can be viewed as combination of abstraction of data and code?
    (a) Class   (b) Object
    (c) Inheritance (d) Interfaces

20. Abstraction principle includes :
    (a) Use abstraction at its minimum
    (b) Use abstraction to avoid longer codes
    (c) Use abstraction whenever possible to avoid duplication
    (d) Use abstraction whenever possible to achieve OOP

21. Higher the levels of abstraction, higher are the details.
    (a) True   (b) False

22. Difference between Encapsulation and abstraction is :
    (a) Binding and Hiding respectively===
    (b) Hiding and Binding respectively
    (c) Can be used any way
    (d) Hiding and hiding respectively

23. How can we call abstraction in terms of stream and files?
    (a) Abstraction is called a stream and device is called a file
    (b) Abstraction is called a file and device is called a stream
    (c) Abstraction can be called both file and stream
    (d) Abstraction can't be defined in terms of files and stream

24. Where will be the abstraction used if two classes combine some private data members and have public member functions to access and manipulate those data members?
    (a) Using private access specifier for data members
    (b) Using class concept with both data members and member functions
    (c) Using public member functions to access and manipulate the data members
    (d) Data is not sufficient to decide what is being used

25. A phone is having many components (motherboard, camera, sensors). If the processor represents all the functioning of phone, display shows the display only, and the phone is represented as a whole, which component will have highest level of abstraction?
    (a) Motherboard   (b) Display
    (c) Camera   (d) Phone

26. Which is not a level of abstraction?
    (a) Logical level   (b) Physical level
    (c) View level   (d) External level

27. What is the advantage of higher degree of abstraction?
    (a) May get unsafe
    (b) May reduce readability
    (c) Can be safer
    (d) Can increase vulnerability

28. Which keywords are used to define an abstract class?
    (a) abst   (b) abstract
    (c) Abstract   (d) abstract class

29. Which element is not abstract?
    (a) Thread
    (b) AbstractList
    (c) List
    (d) None of the Mentioned

30. A class inheriting an abstract class does not define all of its function, It is known as _____
    (a) Abstract
    (b) A simple class
    (c) Static class
    (d) None of the mentioned

Fill in the blanks

31. We can compare java methods to ____ in c language.
    (a) structure   (b) union
    (c) function   (d) enum

32. ___ should be added to a constructor to convert it into a method.
    (a) if statement   (b) static
    (c) return type   (d) semicolon

33. Combination of ___ becomes Java method signature.
    (a) Return type   (b) Method name
    (c) Argument List   (d) All of the above

34. We cannot start method name with a _____ in java.
    (a) number
    (b) # (pound)
    (c) - (hyphen)
    (d) All of the above

35. In Method name we can also use ___ .
    (a) Alphabet
    (b) Underscore (_)
    (c) Dollar ($)
    (d) All of the above

36. A "this" operator refers to ___ variable.
    (a) Global variable
    (b) Method local variable
    (c) Instance variable
    (d) None

37. Local variables are stored in __ memory and instance variables are stored in ___ memory in java.
    (a) Stack, Stack
    (b) Heap, Heap
    (c) Stack, Heap
    (d) Heap, Stack

38. We can hide the implementation complexity by _____
    (a) Making the programming easy
    (b) Make the programming complex
    (c) Provide more number of features
    (d) Provide better features

39. A class is _____ abstraction.
    (a) Object
    (b) Logical
    (c) Real
    (d) Hypothetical

40. An Object is _____ abstraction.
    (a) Object
    (b) Logical
    (c) Real
    (d) Hypothetical

Match the following

41. Match the columns:

Group A		Group B
1. Java methods	(i)	to convert it into a method
2. Add a return type to a constructor	(ii)	function
3. Method signature is a combination of	(iii)	Instance variable
4. A "this" operator	(iv)	return type , method name ,arguement list.

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

42. Match the columns:

Group A		Group B
1. An abstract class	(i)	Multilevel
2. Abstract classes support	(ii)	can extend a concrete class
3. An abstract class can define	(iii)	abstract
4. Abstract class	(iv)	Inner abstract class

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

43. Match the columns:

Group A		Group B
1. contains abstract keyword	(i)	abstract class A { abstract void unfinished(); }
2. define abstract class	(ii)	java.lang
3. declare abstract method	(iii)	can be abstracted
4. A subclass of a non-abstract superclass	(iv)	public abstract void method();

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

44. Match the columns:

Group A		Group B
1. Java static variable is used to	(i)	Pass as an argument to a method.
2. "this" keyword is used to	(ii)	Refer common properties to all objects.
3. Object	(iii)	methods must be made static
4. main()	(iv)	cannot be declared static

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)
(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)
(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

45. Match the columns:

Group A		Group B	
1.	Defining two or more methods within same class	(i)	can be overloaded
2.	Constructors	(ii)	method overloading
3.	Recursion	(iii)	to define behavior
4.	Methods can be added to objects	(iv)	a method that calls itself

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

Programming based questions

46. Identify the correct output of Java program with an empty return statement.

```
public class TestingMethods2
{
    void show()
    {
        System.out.println("SHOW Method..");
        return;
    }
    public static void main(String[] args)
    {
    TestingMethods2 t2 = new TestingMethods2();
    t2.show();
    }
}
```

(a) SHOW Method   (b) No output

(c) Compiler error   (d) None

47. Identify the correct output of Java program with a void method.

```
public class TestingMethods3
{
    void show2()
    {
        System.out.println("SHOW Method 2");
    }
    public static void main(String[] args)
    {
    TestingMethods3 t3 = new TestingMethods3();
    t3.show2();
```

```
    }
}
```

(a) SHOW Method 2

(b) No output

(c) Compiler error

(d) None

48. Identify the output of Java program with a "this" operator.

```
public class TestingMethods4
{
    int cakes=5;
    void order(int cakes)
    {
        this.cakes = cakes;
    }
    public static void main(String[] args)
    {
    TestingMethods4 t4 = new TestingMethods4();
    t4.order(10);
        System.out.println("CAKES=" + t4.cakes);
    }
}
```

(a) CAKES=5   (b) CAKES=0

(c) CAKES=10   (d) Compiler error

49. Choose the output of Java program

```
public class TestingMethods5
{
    public static void main(String[] args)
    {
    int localVariable;
    System.out.println(localVariable);
    }
}
```

(a) 0

(b) garbage value

(c) NullPointerException

(d) Compiler error

50. Choose the output of Java program with a final local variable

```
public class TestingMethods8
{
    int cars = 20;
    void change(final int cars)
    {
    cars = 10;
```

```
this.cars = cars;
}
public static void main(String[] args)
{
TestingMethods8 t8 = new TestingMethods8();
t8.change(30);
System.out.println(t8.cars);
}
}
```

(a) 30   (b) 20

(c) 10   (d) Compiler error

51. Choose the output of Java program

```
class Road
{
    static void show()
    {
    System.out.println("Inside static method.");
    }
    public class TestingMethods10
    {
    public static void main(String[] args)
    {
    Road.show();
    }
    }
}
```

(a) Inside static method.

(b) empty message

(c) Compiler error

(d) Runtime error / exception

52. Choose the correct option for Java code, which call to sum() method .

```
class Output
{
    public static int sum(int ...x)
    {
    return;
    }
    static void main(String args[])
    {
        sum(10);
        sum(10,20);
        sum(10,20,30);
        sum(10,20,30,40);
    }
```

}

(a) only sum(10)

(b) only sum(10,20)

(c) only sum(10) & sum(10,20)

(d) all of the mentioned

53. Choose the correct output for the code.

```
abstract class Bank
{
    private abstract void withdraw(); // Line 1
    abstract void deposit();
    public void balance(){} //Line 2
}
    class office extends Bank{ // Line 3
    void deposit() { // Line 4
    // TODO Auto-generated method stub
    }
}
```

(a) Compilation error in Line 1(abstract method cannot be private)

(b) Compilation error in Line 2(abstract class cannot have concrete method)

(c) Compilation error in Line 3(abstract class cannot be extended)

(d) Compilation error in Line 4(deposit method should have public access modifier)

54. Will this Java code with abstract method compile?

```
class Puppy
{
    abstract void showName();
}
```

(a) NO   (b) YES

55. Choose the correct output of Java program with an abstract class.

```
public abstract class AbstractClassTest5
{
    public static void main(String[] args)
    {
    System.out.println("Inside Main() method..");
    }
}
```

(a) No output

(b) Compiler error

(c) Inside Main() method.

(d) None of the above

56. Regarding the program code given below, answer the questions that follow:

```java
public class IfElseTernary {
public static void main(String[] args) {
    int number=13;
    //Using ternary operator
    String output=(number%2==0)?"even number" : " odd number";
    System.out.println(output);
}
}
```

(a) What will be the output?

   (i) odd number

   (ii) EVEN number

   (iii) WHOLE number

   (iv) NATURAL number

(b) What is the name of the class?

   (i) System.out.println

   (ii) static void main()

   (iii) public

   (iv) IfElseTernary

57. Concerning the program code given below, answer the questions that follow:

```java
public class PositiveNegative {
public static void main(String[] args) {
    int number=-13;
    if(number>0){
    System.out.println("POSITIVE");
    }else if(number<0){
    System.out.println("NEGATIVE");
    }else{
    System.out.println("ZERO");
    }
}
}
```

(a) What will be the output?

   (i) NEGATIVE   (ii) POSITIVE

   (iii) ZERO   (iv) NONE

(b) What number is given as input for checking?

   (i) 03   (ii) 31

   (iii) 13   (iv) -13

58. Concerning the program code given below, answer the questions that follow:

```java
public class Switch {
public static void main(String[] args) {
    //Declaring a variable for switch expression
    int number=20;
    //Switch expression
    switch(number){
    //Case statements
    case 10: System.out.println("10");
    break;
    case 20: System.out.println("20");
    break;
    case 30: System.out.println("30");
    break;
    //Default case statement
    default:System.out.println("Not in 10, 20 or 30");
}
}
}
```

(a) What will be the output?

   (i) 20   (ii) 21

   (iii) 22   (iv) 23

(b) Switch case can be replaced with_____

   (i) For loop

   (ii) Do while condition

   (iii) If condition

   (iv) IF else condition

Answers

Multiple choice questions

1. (a) TRUE
2. (a) TRUE
3. (a) TRUE
4. (b) $hide
5. (a) TRUE
6. (a) TRUE
7. (a) TRUE
8. (c) void

   Explanation: Void: It is a keyword and used to specify that a method doesn't return anything. As main() method doesn't return anything.

9. (b) Function overloading

Explanation: If a class has multiple methods having same name but different in parameters, it is known as Method Overloading. If we have to perform only one operation, having same name of the methods increases the readability of the program.

10. (d) constructor

    Explanation: A constructor in Java is a block of code similar to a method that's called when an instance of an object is created. A constructor doesn't have a return type. The name of the constructor must be the same as the name of the class. Unlike methods, constructors are not considered members of a class.

11. (a) main method

    Explanation: Java main method is the entry point of any java program. Its syntax is always public static void main(String[] args) . You can only change the name of String array argument, for example you can change args to myStringArgs.

12. (d) All object of a class are allotted memory for the methods defined in the class

13. (d) Hiding the implementation and showing only the features

    Explanation: Data Abstraction is the property by virtue of which only the essential details are displayed to the user. The trivial or the non-essentials units are not displayed to the user. In java, abstraction is achieved by interfaces and abstract classes.

14. (c) Abstract class can be initiated by new operator

15. (a) java.lang

    Explanation: java.lang. Provides classes that are fundamental to the design of the Java programming language. The most important classes are Object , which is the root of the class hierarchy, and Class , instances of which represent classes at run time.

16. (c) abstract class A{} = = =

17. (c) Idealized interface

18. (a) Control and data

19. (b) Object

20. (c) Use abstraction whenever possible to avoid duplication

21. (b) False

22. (a) Binding and Hiding respectively===

23. (b) Abstraction is called a file and device is called a stream

24. (c) Using public member functions to access and manipulate the data members

25. (d) Phone

26. (d) External level

27. (c) Can be safer

28. (b) abstract

29. (a) Thread

30. (a) Abstract

Fill in the blanks

31. (c) function

    Explanation: A method is a block of code or collection of statements or a set of code grouped together to perform a certain task or operation.

32. (c) return type

    Explanation: Every method in Java is declared with a return type and it is mandatory for all java methods. A return type may be a primitive type like int, float, double, a reference type or void type(returns nothing). The parameters can be passed in a sequence and they must be accepted by the method in the same sequence.

33. (d) All of the above

34. (d) All of the above

35. (d) All of the above

36. (c) Instance variable

    Explanation: The this keyword refers to the current object in a method or constructor. The most common use of the this keyword is to eliminate the confusion between class attributes and parameters with the same name.

37. (c) Stack, Heap

38. (a) Making the programming easy

    Explanation: Abstraction is process of hiding the implementation details and showing only the functionality. Abstraction in java is achieved by using interface and abstract class.

39. (b) Logical

40. (c) Real

Match the following

41. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

42. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

43. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

44. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

45. (a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

Programming

46. (a) SHOW Method

47. (a) SHOW Method 2

48. (c) CAKES=10

49. (d) Compiler error

50. (d) Compiler error

51. (a) Inside static method.

52. (d) all of the mentioned

53. (a) Compilation error in Line 1(abstract method cannot be private)

54. (a) NO

55. (c) Inside Main() method.

56. (a) (i) odd number

(b) (iv) IfElseTernary

57. (a) (i) NEGATIVE

(b) (iv) -13

58. (a) (i) 20

(b) (iv) IF else condition

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Chapter 10

Arrays

Multiple choice questions

1. Special symbols used to declare an array in Java is :
   (a) Braces { }
   (b) Parentheses ()
   (c) Square Brackets [ ]
   (d) Angled Brackets < >

2. The special symbols used to initialize an array at the time of the declaration itself is :
   (a) Parentheses ( )
   (b) Square Brackets [ ]
   (c) Braces { }
   (d) Angled Brackets < >

3. We can skip initializing some elements of the array during Shorthand Initialization. (TRUE / FALSE)
   (a) FALSE   (b) TRUE

4. We can declare an array without initialization and without mentioning the size. (TRUE / FALSE)
   (a) TRUE   (b) FALSE

5. Default value of an element of Object type array is :
   (a) 0   (b) null
   (c) -1   (d) Garbage value

6. Default value of byte, short, int or long data type elements of an array in Java.
   (a) -1   (b) 1
   (c) 0   (d) Garbage value

7. Identify the default value of float or double data type elements of an array in Java
   (a) 0   (b) 0.0
   (c) 1   (d) 1.0

8. What will be the default value of a char data type elements of an array in Java?
   (a) 'A'   (b) '\0'
   (c) null   (d) '\0' or null

9. How do we describe an array in the best way?
   (a) The Array shows a hierarchical structure.
   (b) Arrays are immutable.
   (c) Container that stores the elements of similar types
   (d) The Array is not a data structure

10. Choose the correct way of declaring an array :
    (a) int javatpoint[10];
    (b) int javatpoint;
    (c) javatpoint{20};
    (d) array javatpoint[10];

11. How to initialize an array in JAVA language?
    (a) int arr[2]=(10, 20)
    (b) int arr(2)={10, 20}
    (c) int arr[2] = {10, 20}
    (d) int arr(2) = (10, 20)

12. Identify the advantage of the array from the given options
    (a) Elements of mixed data types can be stored.
    (b) Easier to access the elements in an array
    (c) Index of the first element starts from 1.
    (d) Elements of an array cannot be sorted

13. What is the highly used concept of an array?
    (a) Binary Search tree
    (b) Caching
    (c) Spatial locality
    (d) Scheduling of Processes

14. The disadvantage of the array is :
    (a) Stack and Queue data structures can be implemented through an array.
    (b) Index of the first element in an array can be negative
    (c) Wastage of memory if the elements inserted in an array are lesser than the allocated size
    (d) Elements can be accessed sequentially.

15. What is the size of int arr[9] assuming that int is of 4 bytes?

(a) 9   (b) 36

(c) 35   (d) None of the above

16. Name the process of inserting an element in the stack?

(a) Insert   (b) Add

(c) Push   (d) None of the above

17. Name the condition when the user tries to delete the element from the empty stack ?

(a) Underflow

(b) Garbage collection

(c) Overflow

(d) None of the above

18. Name the condition where the size of the stack is 10 and we try to add the 11th element in the stack.

(a) Underflow

(b) Garbage collection

(c) Overflow

(d) None of the above

19. At which time the ArrayIndexOutOfBoundsException occur?

(a) Compile-time

(b) Run-time

(c) Not an error

(d) Not an exception at all

20. Which concepts make extensive use of arrays?

(a) Binary trees

(b) Scheduling of processes

(c) Caching

(d) Spatial locality

21. Choose the best reason to use arrays.

(a) Objects of mixed data types can be stored

(b) Elements in an array cannot be sorted

(c) Index of first element of an array is 1

(d) Easier to store elements of same data type

22. Why we should avoid using arrays?

(a) Data structure like queue or stack cannot be implemented

(b) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size

(c) Index value of an array can be negative

(d) Elements are sequentially accessed

23. If int is of 4bytes, what is the size of int arr[15];?

(a) 15   (b) 19

(c) 11   (d) 60

24. Array A[index] = ___(first element in an array) ?

(a) 0   (b) -1

(c) 2   (d) 1

25. Identify an element in an array which a user can access.

(a) randomly   (b) sequentially

(c) exponentially   (d) logarithmically

26. How can we define an array in java?

(a) objects

(b) object references

(c) primitive data type

(d) none of above

27. When we pass an array to a method, a method receives ____

(a) A copy of the array

(b) a copy of the forst element

(c) the reference of the array

(d) the length of the array

28. Name the operators that is used to allocate memory to array variable in Java?

(a) malloc   (b) alloc

(c) new   (d) new malloc

29. Choose the incorrect Statement

(a) It is necessary to use new operator to initialize an array

(b) Array can be initialized using comma separated expressions surrounded by curly braces

(c) Array can be initialized when they are declared

(d) None of the mentioned

30. What is needed to specify time of array initialization?

(a) Row

(b) Column

(c) Both Row and Column

(d) None of the mentioned

Fill in the blanks

31. Array is a collection of elements of ___ data type.

(a) Same

(b) Different

32. JVM implements arrays as ___ type.

(a) Primitive

(b) Object

33. Java-Arrays have ___.

(a) Names

(b) Values

(c) Methods and Fields

(d) None

34. Array declaration without initialization ___ memory.

(a) Does not allocate

(b) Allocates memory

35. An array index starts with ___.

(a) –1   (b) 0

(c) 1   (d) Any integer

36. Name of an array variable can start with ___.

(a) A letter

(b) Underscore (_)

(c) Dollar Symbol ($)

(d) All

37. Array of arrays is called ___ array.

(a) Bidirectional

(b) Combo

(c) Multidimensional

(d) Multi-value

38. Array of dimension N contains __ number of subscripts or brackets?

(a) N-1   (b) N

(c) N+1   (d) 10*N

39. Row number and Column number in Multidimensional array starts with ___ digit.

(a) -1   (b) 0

(c) 1   (d) 2

40. 4-dimensional array is an example of ___ dimensional arrays.

(a) 4   (b) 3

(c) 2   (d) 1

Match the following

41. Match the columns:

Group A		Group B
1. special symbols used to declare an array	(i)	Braces { }
2. to initialize an array	(ii)	Square Brackets [ ]

3. default value of an element of Object type array	(iii)	0
4. default value of byte, short, int or long data type	(iv)	null

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

42. Match the columns:

Group A		Group B
1. default value of a char data type	(i)	stores the elements of similar types
2. array	(ii)	'\0' or null
3. declaring an array	(iii)	int arr[2] = {10, 20}
4. initialize an array	(iv)	int javatpoint[10];

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

43. Match the columns:

Group A		Group B
1. Advantage of the array	(i)	Spatial locality
2. Highly uses the concept of an array	(ii)	Easier to access the elements
3. Disadvantage of the array	(iii)	36
4. Size of int arr[9]	(iv)	Wastage of memory

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

44. Match the columns:

Group A		Group B
1. inserting an element in the stack	(i)	Underflow
2. delete the element from the empty stack	(ii)	Push

3.	size of the stack is 10 and we try to add the 11th element in the stack	(iii)	run time
4.	Array Index Out of Bounds Exception occur at	(iv)	Overflow

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

45. Match the columns:

Group A		Group B	
1.	extensive use of arrays	(i)	Easier to store elements
2.	Advantages of arrays	(ii)	Spatial locality
3.	Disadvantages of arrays	(iii)	0
4.	Index of the first element in an array	(iv)	chances of wastage of memory space

(a) 1-(ii), 2-(i), 3-(iv), 4-(iii)

(b) 1-(i), 2-(ii), 3-(iv), 4-(iii)

(c) 1-(ii), 2-(i), 3-(iii), 4-(iv)

(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

Programming based questions

46. Choose the correct output for Java code snippet with arrays

```
static int[] nums;
public static void main(String args[])
{
    System.out.println(nums.length);
}
```

(a) 0

(b) null

(c) Compiler error

(d) Runtime Exception - Null Pointer Exception

47. Choose the correct output of the below Java program

```
int[] marks = {35,65,95};
System.out.print(marks.length + "," + marks[1]);
```

(a) 2,65   (b) 3,95

(c) 3,65   (d) Compiler error

48. Choose the correct output of Java code snippet

```
int[] balls = {};
System.out.print(balls.length);
```

(a) 0   (b) -1

(c) 1   (d) Compiler error

49. Choose the correct output of Java program with arrays

```
String[] colors = {"RED";"YELLOW";"WHITE"};
System.out.print(colors[2]);
```

(a) RED

(b) YELLOW

(c) WHITE

(d) Compiler error

50. Choose the correct output of Java program with arrays

```
public class Polo {
    public static void main(String args[])
    {
    String[] computer={"RAM","HDD","MOUSE"};
    String[] parts = {computer[0],computer[2]};
    System.out.print(parts[1]);
    }
}
```

(a) RAM   (b) HDD

(c) MOUSE   (d) Compiler error

51. Choose the correct output of Java program

```
int ages[3] = {25, 27, 30};
System.out.println(ages[1]);
```

(a) 25   (b) 27

(c) 30   (d) Compile error

52. When index of an element is N, what will be its actual position in the array

(a) N-1   (b) N

(c) N+1   (d) N+2

53. Choose correct output for the code?

```
#include <stdio.h>
int main()
{
    int arr[5]={10,20,30,40,50};
    system.out.print("%d", arr[5]);
    return 0;
}
```

(a) Garbage value

(b) 10

(c) 50

(d) None of the above

54. With reference to the program code given below, answer the questions that follow:

```
public class Prime
{
    public static void main(String args[])
    {
        int i,m=0,flag=0;
        int n=3;//it is the number to be checked
        m=n/2;
        if(n==0||n==1){
        System.out.println(n+" is not a prime number");
        }else{
        for(i=2;i<=m;i++){
        if(n%i==0){
        System.out.println(n+" is not a prime number");
        flag=1;
        break;
        }
        }
        if(flag==0) {System.out.println(n+" is prime number"); }
        }//end of else
    }
}
```

(a) What will be the output?
    (i) 3 is a prime number
    (ii) 2 is a prime number
    (iii) 4 is a prime number
    (iv) 5 is a prime number

(b) What will be the output if the number entered is 45?
    (i) 45 is a prime number
    (ii) It is a prime number
    (iii) n is not a prime number
    (iv) 45 is not a prime number

55. Concerning the program code given below, answer the questions that follow:

```
class Factorial{
public static void main(String args[]){
int i,fact=1;
int number=5;//It is the number to calculate factorial
for(i=1;i<=number;i++){
fact=fact*i;
}
System.out.println("Factorial of "+number+" is: "+fact);
}
}
```

(a) What will be the output?
    (i) Factorial of 5 is: 120
    (ii) Factorial of 5 is: 121
    (iii) Factorial of 5 is: 122
    (iv) Factorial of 5 is: 123

(b) What is the name of the class?
    (i) System.out.println
    (ii) static void main()
    (iii) Factorial
    (iv) Factor

56. Concerning the program code given below, answer the questions that follow:

```
class Palindrome{
public static void main(String args[]){
int r,sum=0,temp;
int n=454;//It is the number variable to be checked for palindrome
temp=n;
while(n>0){
r=n%10; //getting remainder
sum=(sum*10)+r;
n=n/10;
}
if(temp==sum)
System.out.println("palindrome number ");
else
System.out.println("not palindrome");
}
}
```

(a) What will be the output?
    (i) palindrome number
    (ii) not palindrome
    (iii) Palindrome
    (iv) 454

(b) What is the class Palindrome doing?
    (i) Checking number is prime or not
    (ii) arranging number is ascending order
    (iii) checking number is Palindrome or not
    (iv) none of the above

Answers

Multiple choice questions

1. (c) Square Brackets [ ]
2. (c) Braces { }
3. (a) FALSE
4. (a) TRUE
5. (b) null
6. (c) 0
7. (b) 0.0
8. (d) '\0' or null
9. (c) Container that stores the elements of similar types
10. (a) int javatpoint[10];
11. (c) int arr[2] = {10, 20}
12. (b) Convenient to access the elements in an array
13. (c) Spatial locality
14. (c) Wastage of memory if the elements inserted in an array are lesser than the allocated size
15. (b) 36
16. (c) Push
17. (a) Underflow
18. (c) Overflow
19. (b) Run-time
20. (d) Spatial locality
21. (d) Easier to store elements of same data type
22. (b) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
23. (d) 60
24. (a) 0
25. (a) randomly
26. (a) objects
27. (c) the reference of the array
28. (c) new
29. (a) It is necessary to use new operator to initialize an array
30. (a) Row

Fill in the blanks

31. (a) Same

    Explanation: An array in Java is a set of variables referenced by using a single variable name combined with an index number.

32. (b) Object
33. (c) Methods and Fields
34. (a) Does not allocate

    Explanation: syntax: int[] myArray = {13, 14, 15};

35. (b) 0

    Explanation: The first element of an array is at index 0 , and the last element is at the index value equal to the value of the array's length property minus 1.

36. (d) All
37. (c) Multidimensional
38. (b) N
39. (b) 0
40. (b) 3

Match the following

41. (a) 1-(b), 2-(a), 3-(d), 4-(c)
42. (a) 1-(b), 2-(a), 3-(d), 4-(c)
43. (a) 1-(b), 2-(a), 3-(d), 4-(c)
44. (a) 1-(b), 2-(a), 3-(d), 4-(c)
45. (a) 1-(b), 2-(a), 3-(d), 4-(c)

Programming based questions

46. (d) Runtime Exception - Null Pointer Exception
47. (c) 3,65
48. (a) 0
49. (d) Compiler error
50. (c) MOUSE
51. (d) Compile error
52. (c) N+1
53. (a) Garbage value
54. (a) (i) 3 is a prime number

    (b) (iv) 45 is not a prime number
55. (a) (i) Factorial of 5 is: 120

    (b) (iii) Factorial
56. (a) (i) palindrome number

    (b) (iii) checking number is Palindrome or not

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