

# Mock Paper 1



# BITS MCA

Birla Institute of Technology, Ranchi (Mesra)

## Instructions

- This Mock Paper consists of two subjects. Sub Test-I (Quantitative and Mathematical Ability Test) consisting of 50 objective questions. Sub Test-II (Computer and Logical Ability Test) consisting of 50 objective questions.
- Attempt all the questions.
- Each test paper carries 200 marks. Each question consists of 4 marks. One mark will be deducted for wrong answer.
- Use a soft HB pencil darken the appropriate bubble.

### Sub Test-I. Quantitative and Mathematical Ability Test

M. Marks: 200

Time: 75 min.

- The smallest integer  $n$  for which  $\frac{1-i}{1+i}^n$  is real is  
(a) 8 (b) 12 (c) 16 (d) 4
- Let  $D_r = \begin{vmatrix} 2^r - 1 & 2 & 3^r - 1 & 4 & 5^r - 1 \\ 2^n - 1 & 3^n - 1 & 4^n - 1 & \dots & \dots \end{vmatrix}$ , then the value of  $\lim_{r \rightarrow \infty} \frac{D_r}{r-1}$  is  
(a)  $2^n - 2^n - 4^n$  (b)  $2^n - 2^n - 4^n$  (c)  $2 - 3 - 4$  (d) None of these
- If  $A = (a_{ij})_{m \times n}$  is a matrix of order  $n$ , then rank of  $(In)$  is  
(a) 1 (b)  $n$  (c) 0 (d) None of these
- The existence of the unique solution of system  $x + y + z = b$ ,  $2x + 3y + z = 6$ ,  $5x + y + az = 10$  depends on  
(a)  $b$  only (b)  $a$  only (c)  $a$  and  $b$  (d) neither  $a$  nor  $b$
- The number of asymptotes of the polar curve  $r = \frac{a}{1 - \cos \theta}$ , is  
(a) infinitely many solution (b) 3  
(c) 2 (d) 0



6. In what interval is the infinite series  $1 - 2(x - 3) + 3(x - 3)^2 - 4(x - 3)^3 + \dots$  convergent?  
 (a)  $1 < x < 1$  (b)  $1 < x < 1$  (c)  $x < 4$  (d)  $2 < x < 4$
7. The series  $\sum_{n=1}^{\infty} \frac{(n - \sqrt{n})^n}{2^n (n)^{n-1}}$  is  
 (a) convergent (b) divergent (c) not convergent (d) None of these
8. If  $a_n = \frac{1}{n} [(n - 1)(n - 2) \dots (n - 4)]^{1/n}$ , then the sequence  $a_n$  converges to  
 (a)  $\frac{1}{e}$  (b)  $\frac{2}{e}$  (c)  $\frac{3}{e}$  (d)  $\frac{4}{e}$
9. Let  $f(x) = (x - 1)^2 - 1$ ,  $x \in \mathbb{R}$ . Then, the set  $\{x : f(x) = f^{-1}(x)\}$  is  
 (a)  $0, 1, \frac{3 + i\sqrt{3}}{2}, \frac{3 - i\sqrt{3}}{2}$  (b)  $\{0, 1, -1\}$   
 (c)  $\{0, -1\}$  (d) empty
10. In a group  $(G_1, *)$  the equation  $x * a = b$  has a  
 (a) unique solution  $b * a^{-1}$  (b) unique solution  $a^{-1} * b$   
 (c) unique solution  $a^{-1} * b^{-1}$  (d) many solution
11. Which of the following algebraic structures is not a field?  
 (a)  $(\mathbb{Q}, +, *)$  (b)  $(\mathbb{I}, +, *)$  (c)  $(\mathbb{R}, +, *)$  (d)  $(\mathbb{C}, +, *)$
12. If  $S_n, U_n$  and  $t_n$  be sequences such that  $S_n = U_n + t_n$  for each  $n$  and  $\lim S_n = \lim t_n$ , then  
 (a)  $\lim U_n = \lim t_n$  (b)  $\lim U_n = \lim S_n$   
 (c)  $\lim U_n = \lim t_n$  (d) None of these
13. For real numbers  $x$  and  $y$ , are define  $x R y$  if  $x - y = \sqrt{2}$  is an irrational number. Then, the relation  $R$  is  
 (a) reflexive but neither symmetric nor transitive (b) reflexive and symmetric but not transitive  
 (c) reflexive and transitive but not symmetric (d) an equivalence relation
14. If  ${}^{15}P_r - 1 : {}^{16}P_r - 2$ , then  $r$  is equal to  
 (a) 8 (b) 14 (c) 12 (d) 10
15. If the sum of the coefficients in the expansion of  $(2x^2 - 2 - x + 1)^{51}$  vanishes, then the value of  $x$  is  
 (a) 2 (b) 1 (c) 1 (d) 2
16. The largest term in the expansion of  $(3 - 2x)^{50}$  where  $x = \frac{1}{5}$  is  
 (a) 7th (b) 51st (c) 5th (d) 6th
17. If  $A = [a_{ij}]_{m \times n}$  is a matrix of rank  $r$  and  $B$  is a square submatrix of order  $r - 1$ , then  
 (a)  $B$  is invertible (b)  $B$  is not invertible  
 (c)  $B$  may or may not be invertible (d) None of these
18. The equation whose roots are 6 times the roots of the equation  $6x^4 - 7x^3 - 8x^2 - 7x - 2 = 0$  is  
 (a)  $x^4 - 7x^3 - 48x^2 - 252x - 432 = 0$  (b)  $x^4 - 24x^3 - 36x^2 - 252x - 432 = 0$   
 (c)  $x^4 - 7x^3 - 48x^2 - 252x - 432 = 0$  (d)  $x^4 - 7x^3 - 48x^2 - 252x - 432 = 0$



19. The function  $f(x) = \begin{cases} 1, & |x| < 1 \\ \frac{1}{n^2}, & \frac{1}{n} < |x| < \frac{1}{n-1}, n = 2, 3 \\ 0, & x = 0 \end{cases}$
- (a) is discontinuous at finitely many points (b) is continuous everywhere  
(c) is discontinuous only at  $x = \frac{1}{n}$  (d) None of these
20.  $N$  characters of information are held on magnetic tape, in batches of  $x$  characters each, the batch processing time is  $x^2$  seconds, and  $a, b$  are constants. The optimal value of  $x$  for fast processing is
- (a)  $\frac{a}{b}$  (b)  $\frac{a}{2b}$  (c)  $\sqrt{\frac{a}{b}}$  (d)  $\sqrt{\frac{a}{2b}}$
21. Let  $f$  be differentiable for all  $x$ . If  $f(1) = 2$  and  $f'(x) = 2$  for all  $x \in [1, 6]$ , then
- (a)  $f(6) = 8$  (b)  $f(6) = 8$  (c)  $f(6) = 10$  (d)  $f(6) = 5$
22. If  $U = x f \frac{y}{x} = \frac{y}{x}$ , then  $xu_x - yu_y$  is equal to
- (a)  $x f \frac{y}{x}$  (b)  $y f \frac{x}{y}$  (c)  $f(\frac{y}{x})$  (d) None of these
23. The derivative of the function  $f(x) = |\ln x|$  at  $x = 1$ , is
- (a) 1 (b) -1 (c) 0 (d) does not exist
24. If  $\int_0^n e^{-x} x^{n-1} dx$ , then  $\int_0^n e^{-x} x^{n-1} dx$  is equal to
- (a)  $\frac{1}{n} \int_0^n e^{-x} dx$  (b)  $\frac{1}{n} \int_0^n e^{-x} dx$  (c)  $\frac{1}{n} \int_0^n e^{-x} dx$  (d)  $\frac{1}{n} \int_0^n e^{-x} dx$
25. For  $y = f(x) = \int_0^x 2|t| dt$ , the tangent lines parallel to the bisector of the first quadrant angle are
- (a)  $y = x + \frac{1}{4}$  (b)  $y = x + \frac{3}{2}$  (c)  $y = x + \frac{1}{2}$  (d) None of these
26. The area bounded by  $y = x^2, y = [x - 1], x = 1$  and the  $y$ -axis
- (a)  $\frac{1}{3}$  (b)  $\frac{2}{3}$  (c) 1 (d)  $\frac{7}{3}$
27. If the polar of a point  $(p, q)$  with respect to the circle  $x^2 + y^2 = a^2$  touches the circle  $(x - c)^2 + (y - d)^2 = b^2$ , then
- (a)  $b^2(p^2 - q^2) = (a^2 - cp - dq)^2$  (b)  $b^2(p^2 - q^2) = (a^2 - cq - dp)^2$   
(c)  $a^2(p^2 - q^2) = (b^2 - cp - dq)^2$  (d) None of these
28. For the curve  $y^2 = (x - 1)(x - 2)^2$
- (a)  $(0, 2)$  is a node (b)  $(1, 2)$  is a cusp  
(c)  $(1, 1)$  is an isolated point (d)  $(2, 0)$  is a node
29. The eccentricity of the ellipse which meets the straight line  $\frac{x}{7} + \frac{y}{2} = 1$  on the axis of  $x$  and the straight line  $\frac{x}{3} + \frac{y}{5} = 1$  on the axis of  $y$  and whose axis lie along the axis of coordinate is
- (a)  $\frac{3\sqrt{2}}{7}$  (b)  $\frac{2\sqrt{6}}{7}$  (c)  $\frac{\sqrt{3}}{7}$  (d) None of these



30. The condition of the chord  $x \cos p + y \sin p = 0$  of  $x^2 + y^2 = a^2$  may subtend a right angle at the centre of the circle is  
 (a)  $a^2 = 2p^2$  (b)  $p^2 = 2a^2$  (c)  $a = 2p$  (d)  $p = 2a$
31. The locus of the point of intersection of the straight lines  $\frac{x}{a} + \frac{y}{b} = 1$  and  $\frac{x}{a} + \frac{y}{b} = \frac{1}{t}$  ( $t$  is a variable) is  
 (a) a circle (b) a parabola (c) an ellipse (d) a hyperbola
32. If  $a, b, c$  are in GP, then the equations  $ax^2 + 2bx + c = 0$  and  $dx^2 + 2ex + f = 0$  have a common root, if  $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$  are in  
 (a) GP (b) HP (c) AP (d) None of these
33. The ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  and the straight line  $y = mx + c$  intersect in real points only if  
 (a)  $c^2 - b^2 - a^2m^2$  (b)  $a^2m^2 - c^2 - b^2$   
 (c)  $a^2m^2 - c^2 - b^2$  (d)  $c - b$
34. The spheres  $x^2 + y^2 + z^2 = 9$  and  $x^2 + y^2 + z^2 - 24x - 40y - 18z - 225 = 0$   
 (a) touch internally (b) touch externally  
 (c) intersect orthogonally (d) None of these
35. The moment of the couple formed by the forces  $5\hat{i} + \hat{k}$  and  $5\hat{i} + \hat{k}$  acting at the point  $(9, 1, 2)$  and  $(3, 2, 1)$  respectively, is  
 (a)  $\hat{i} + \hat{j} + 5\hat{k}$  (b)  $\hat{i} + 11\hat{j} + 5\hat{k}$   
 (c)  $\hat{i} + 11\hat{j} + 5\hat{k}$  (d)  $\hat{i} + \hat{j} + 5\hat{k}$
36. A vector  $\mathbf{a}$  has components  $2p$  and  $1$  with respect to a rectangular cartesian system. This system is rotated through a certain angle about the origin in the counterclockwise sense. If with respect to new system,  $\mathbf{a}$  has components  $p - 1$  and  $1$ , then  
 (a)  $p = 0$  (b)  $p = 1$  or  $p = \frac{1}{3}$   
 (c)  $p = 1$  or  $p = \frac{1}{3}$  (d)  $p = 1$  or  $p = 1$
37. Let  $X_1$  and  $X_2$  are optimal solutions of a LPP, then  
 (a)  $X = X_1 + (1 - \lambda)X_2$ ,  $R$  is also an optimal solution  
 (b)  $X = X_1 + (1 - \lambda)X_2$ ,  $0 \leq \lambda \leq 1$  gives an optimal solution  
 (c)  $X = X_1 + (1 - \lambda)X_2$ ,  $0 \leq \lambda \leq 1$  gives an optimal solution  
 (d)  $X = X_1 + (1 - \lambda)X_2$ ,  $R$  is also an optimal solution
38. Choose the correct statement  
 (a)  $\mathbb{R}(\mathbb{C})$  is a vector space but  $\mathbb{C}(\mathbb{R})$  is not a vector space  
 (b)  $\mathbb{C}(\mathbb{R})$  is a vector space but  $\mathbb{R}(\mathbb{C})$  is not a vector space  
 (c)  $\mathbb{R}(\mathbb{C})$  as well as  $\mathbb{C}(\mathbb{R})$  is a vector space  
 (d) None of the above
39. If  $(x) = (x)$  and  $(1) = 2$  then  $(3)$  equals  
 (a)  $2e^2$  (b)  $e^2$  (c)  $3e^2$  (d)  $2e^3$
40. If  $y_1(x)$  and  $y_2(x)$  are two solutions of the differential equation  $\frac{dy}{dx} + f(x)y = r(x)$ , then  $y_1(x) - y_2(x)$  is a solution of



- (a)  $\frac{dy}{dx} = f(x)y - 0$  (b)  $\frac{dy}{dx} = 2f(x)y - r(x)$   
 (c)  $\frac{dy}{dx} = f(x)y - 2r(x)$  (d)  $\frac{dy}{dx} = 2f(x)y - 2r(x)$

41. A variable has Poisson distribution with mean  $m$ . The probability that the variable takes any of the values 0 or 2 is

- (a)  $e^{-m} (1 + m + \frac{m^2}{2!})$  (b)  $e^{-m} (1 + m + \frac{m^3}{2})$   
 (c)  $e^{-m} (1 + m^2 + \frac{1}{2})$  (d)  $e^{-m} (1 + \frac{m^2}{2!})$

42. The probability of occurrence of two events  $E$  and  $F$  are 0.25 and 0.50 respectively. The probability of their simultaneous occurrence is 0.14. The probability that neither  $E$  occurs nor  $F$  occurs is

- (a) 0.39 (b) 0.89 (c) 0.12 (d) None of these

43. If  $P$  is chosen at random in the interval  $0 < P < 5$ , the probability that the roots of the equation  $x^2 - Px + \frac{P}{4} - \frac{1}{2} = 0$  are real, is

- (a)  $\frac{1}{5}$  (b)  $\frac{2}{5}$  (c)  $\frac{3}{5}$  (d)  $\frac{4}{5}$

44. For a certain normal distribution, the first moment about 10 is 40 and the fourth moment about 10 is 48. What is the arithmetic mean and standard deviation of the distribution ?

- (a) 48, 2 (b) 50, 2 (c) 52, 4 (d) None of these

45. If each observation of a raw data whose variances is  $\sigma^2$  is multiplied by  $h$ , then the variance of the new set is

- (a)  $\sigma^2$  (b)  $h\sigma^2$  (c)  $h^2\sigma^2$  (d)  $h^2\sigma^2$

46. In a distribution, the coefficient of skewness is 0.5. If the sum of lower and upper quantities is 120 and median is 40, then upper and lower quantities are

- (a) 50, 70 (b) 60, 60 (c) 100, 20 (d) 100, 40

47. If a linear relation  $aX + bY + c = 0$  exists between the variable  $X$  and  $Y$  and  $ab \neq 0$ , then the coefficient of correlation between  $X$  and  $Y$  is

- (a) 1 (b) -1  
 (c) 0 (d) any number between -1 and 1

48. If the regression coefficient of  $Y$  on  $X$  is  $\frac{4}{3}$ , then the regression coefficient of  $X$  on  $Y$  is

- (a)  $\frac{3}{4}$  (b) less than 1  
 (c) less than  $\frac{3}{4}$  (d) can take any value

49. In student's  $t$  test, the parameter  $t$  is given by

- (a)  $\frac{|\bar{x} - \mu|}{\frac{S}{\sqrt{n}}}$  (b)  $\frac{|\bar{x} - \mu|}{S} \cdot n$  (c)  $\frac{|\bar{x} - \mu|}{S} \cdot \sqrt{n}$  (d)  $\frac{|\bar{x} - \mu| \cdot S}{\sqrt{n}}$

50. The equation of the cylinder which generates parallel to the line

$x = \frac{1}{2}, y = \frac{1}{3}, z = 0$  and whose guiding curve is the ellipse  $x^2 + 2y^2 = 1, z = 0$ , is

- (a)  $3x^2 + 6y^2 + 3z^2 + 8yz + 2zx + 3 = 0$  (b)  $3x^2 + 6y^2 + 3z^2 + 8yz + 2zx + 3 = 0$   
 (c)  $3x^2 + 6y^2 + 3z^2 + 8yz + 2zx + 3 = 0$  (d)  $3x^2 + 6y^2 + 3z^2 + 8yz + 2zx + 3 = 0$



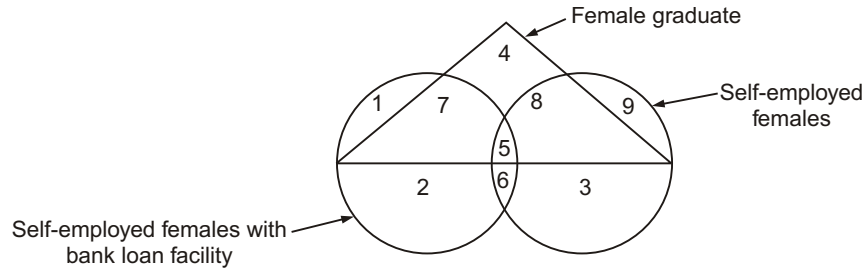
## Sub Test-II. Computer and Logical Ability Test

**M. Marks: 200**

**Time: 60 min.**

**Directions (51-53) :**

*Study the diagram carefully and answer the following questions on the basis of the number shown in the*



*different sections of the diagram.*

51. How many female graduates are self-employed?  
 (a) 12                                      (b) 13                                      (c) 15                                      (d) 20
52. How many female graduates are not self-employed?  
 (a) 4    (b) 10                                      (c) 12                                      (d) 15
53. How many non-graduate females are self-employed?  
 (a) 9    (b) 11                                      (c) 12                                      (d) 21

**Directions (54-55) :**

*Write the missing term in the following series*

54. 2, 3, 8, 63, (.....)  
 (a) 1038                                      (b) 1998                                      (c) 3008                                      (d) 3968
55. LXF, MT NPN, OLR?  
 (a) PHV                                      (b) PIU                                      (c) PJW                                      (d) PKK
56. What will be the output of the following program segment?  

```
# define CUBE (X) (X*X*X)
main ( )
{
    int a, b;
    b = 3;;
    a = CUBE (b++)/b++;
    print f ("a = %d b =%d", a, b);
}
```

 (a) a = 9, b = 7                                      (b) a = 27, b = 7  
 (c) a = 27, b = 64                                      (d) None of these
57. The output of the following boolean expression  $pqr \quad pqr \quad pq \ r \quad p \ qr$  is  
 (a)  $p \ q \ r$                                       (b)  $pq \ r$   
 (c)  $pq \ qr \ rp$                                       (d) None of these
58. In a flow chart what is the use of the symbol hexagon?  
 (a) comment                                      (b) decision box



(c) indicating the input output (d) preparation box

59. Bubble memories are preferable to floppy disks because

- (a) of their higher transfer rate (b) cost needed to store a bit is less  
(c) they consume less power (d) of their reliability

60. The decimal equivalent of  $(1000011.01)_2$  is

- (a)  $64.25_{10}$  (b)  $67.25_{10}$   
(c)  $121.75_{10}$  (d) None of these

61. Consider the C program shown below;

```
# include <. h>
# define print (X) print f ("% d", X)
int X;
void Q (int z) {
    zt x; print (z);
}
void p (int*y) {
    int x * y + 2;
    Q (x); *y = x - 1;
    print (x)
}
main (void) {
    x 5;
    p (&x);
    print (x);
}
```

The output of this Program is

- (a) 1276 (b) 221211 (c) 1466 (d) 766

62. Where was the India's first computer installed and when?

- (a) Institute of Social Science, Agra, 1955  
(b) Indian Institute of Statistics, Delhi, 1957  
(c) Indian Statistical Institute Calcutta, 1955  
(d) Indian Institute of Science Bangalore, 1971

63. c font

- (a) is front end of a C compiler  
(b) is the pre-processor of a C compiler  
(c) translates a C++ code to its equivalent C code  
(d) None of the above

64. In a Boolean algebra  $(B, , )$  the value of  $[x (x y )] [x (y z )]$  is

- (a) x (b) y (c) z (d) x y z

65. Study the following algorithm

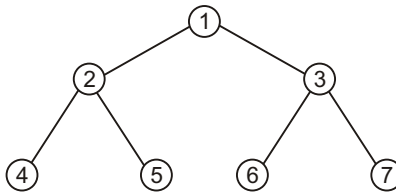
```
sum 0
I 0
Repeat
sum sum + (2I + 1)
I I + 1
```



until  $I > 6$

Then the value of sum is

- (a) 36 (b) 49 (c) 170 (d) None of these
66. If  $(x\ 567)_8$   $(2yx\ 5)_8$   $(71\ yx)_8$ . Find the value of  $x$  and  $y$   
(a) 4, 3 (b) 3, 3 (c) 4, 4 (d) 4, 5
67. The gray code of binary 11101 is  
(a) 01111 (b) 10110 (c) 11100 (d) 00100
68. The binary equivalent to the Octal Number  $7326405_8$  is  
(a)  $110011010110100001101_2$  (b)  $111011101101000001101_2$   
(c)  $111011010110100000101_2$  (d) None of these
69. Consider the following tree:



If the post order traversal gives  $ab\ cd^*\ +$  then the label of the nodes 1, 2, 3, ... will be

- (a) +, -, \*, a, b, c, d (b) a, -, b, +, c, \*, d  
(c) a, b, c, d, -, \*, + (d) -, a, b, +, \*, c, d
70. In flow chart diamond is used for  
(a) decision (b) input, output  
(c) processing (d) None of these

71. What will be the output of the following segment.

```
main ( )  
{  
    static char str [ ] {48, 48, 48, 48, 48, 48, 48, 48, 48, 48};  
    char*s;  
    int i;  
    s = str;  
    for (i = 0; i < 9; i++)  
    {  
        if (*s)  
            printf ("%c", *s);  
        s++;  
    }  
}
```

- (a) 1234567890 (b) 0000000000  
(c) 48484848484848484848 (d) None of these
72. The Central Processing Unit (CPU) consists of  
(a) Input, output and processing  
(b) Control unit, primary storage and secondary storage  
(c) Control unit, processing, primary storage





(d) None of the above

73. Hexadecimal equivalent of  $1110101101_2$  is

(a)  $(3BD)_{16}$

(b)  $(3AE)_{16}$

(c)  $(3AD)_{16}$

(d) None of these

74. Which one of the following statements is false?

(a) Optional binary search tree construction can be performed efficiently using dynamic programming

(b) Breadth-first search cannot be used to find connected components of a graph

(c) Given the prefix and postfix walks of a binary tree, the binary tree cannot be uniquely reconstructed

(d) Depth-first search can be used to find the connected components of a graph

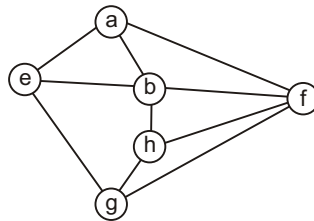
75. The value of the boolean expression  $(a \wedge b) \vee [(a \wedge b) \wedge b]$  is

(a)  $(a \wedge b)$

(b)  $(a \vee b)$

(c)  $b$

(d) 0



76. Consider the following graph

Among the following sequences

I a b e g h f

II a b f e h g

III a b f h g e

IV a f g h b e

Which are depth first traversals of the above graph?

(a) I, II and IV only

(b) I and IV only

(c) II, III and IV only

(d) I, III and IV only

77. The following Program

```
void (int & p)
{cout << p;}
void main (void)
{float m = 11.23; abc(m); cout << m;}
```

This code

(a) results in compilation error

(b) results in run-time error

(c) prints 11.23

(d) prints 11

78. Find the least number that when divided by 16, 18 and 20 leaves a remainder 4 in each case, but is completely divisible by 7

(a) 364

(b) 2254

(c) 2884

(d) 3234

79. The price of a house increased by 25% after 10 yr reduces by 25% during the subsequent 10 yr. If the present cost is Rs 10 lakh, what will be its cost after 20 yr?

(a) Rs 937500

(b) Rs 900000

(c) Rs 850000

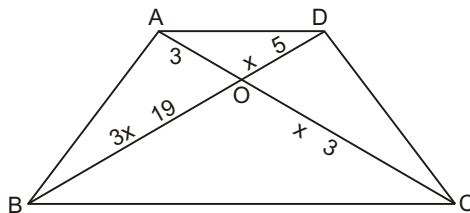
(d) Rs 725000



- 80.** A shopkeeper bought some pencils at 2 for Re 1 and an equal number at 3 for Rs 2. He sold the entire lot at 5 for Rs 3. Find out his gain or loss percentage
- (a)  $2\frac{6}{7}$  % loss (b)  $3\frac{6}{7}$  % gain  
(c)  $2\frac{6}{7}$  % gain (d) None of these
- 81.** The average of 50 numbers is 38. If two numbers, namely 45 and 55 are discarded, the average of remaining number is
- (a) 36.5 (b) 37  
(c) 37.5 (d) 37.52
- 82.** Two bullets were fired at a place at an interval of 38 min. A person approaching the firing point in his car hears the two sound at an interval of 36 min. The speed of sound is 330 m/s. What is the speed of the car?
- (a) 66 km (b) 49 km  
(c) 99 km (d) 98 km
- 83.** A sum of money lent out at simple interest amounts to Rs 460 in 3 yr while in 5 yr it amounts to Rs 500. The sum and the rate of interest will be
- (a) Rs 400, 4% (b) Rs 300, 5%  
(c) Rs 400, 5% (d) Rs 300, 4%
- 84.** A is twice as good a workman as B and together they finish a piece of work in 18 days. In how many days will A alone finish the work?
- (a) 20 days (b) 25 days  
(c) 23 days (d) 27 days
- 85.** Two pipes A and B can fill a cistern in 20 min and 25 min respectively. Both the pipes are opened together, but at the end of 5 min the first is turned off. How long does it take to fill the cistern?
- (a) 16.5 min (b) 22 min  
(c) 18.75 min (d) 20 min
- 86.** A dog pursues a cat and takes 5 leaps for every 6 leaps of the cat, but 4 leaps of the dog are equal to 5 leaps of the cat. Compare the speeds of the dog and the cat
- (a) 15 : 22 (b) 9 : 25  
(c) 25 : 21 (d) 25 : 24
- 87.** A furniture shop allows 20% discount on the marked price of each item what price must be marked on a table costing Rs 560, so as to make a profit of 25%
- (a) 800 (b) 825  
(c) 700 (d) 875
- 88.** 5 yr ago, the average of Ram and Shyam's ages was 20 yr, Now the average age of Ram, Shyam and Mohan is 30 yr. What will be Mohan's age 10 yr hence?
- (a) 45 yr (b) 50 yr  
(c) 49 yr (d) 60 yr



89. A man sitting in the train which is travelling at 50 km/h observes that a goods train, travelling in opposite direction takes 9 s to pass him. If the goods train is 150 m long. Find its speed  
 (a) 12 km/h (b) 10 km/h  
 (c) 8 km/h (d) 20 km/h
90. A can do a piece of work in 15 days and B alone can do it in 10 days. B works at it for 5 days and then leaves. A alone can finish the remaining work in  
 (a)  $6\frac{1}{2}$  days (b)  $7\frac{1}{2}$  days (c) 8 days (d) 9 days
91. In a factory men, women and children were employed in the ratio 8 : 5 : 1 to finish a job and their individual wages were in the ratio 5 : 2 : 3. Total daily wages of all amount to Rs 318. Find the total daily wages paid to each category  
 (a) 240, 60, 18 (b) 210, 70, 38  
 (c) 190, 95, 33 (d) None of these
92. What will be the remainder when  $(9^6 - 1)$  is divided by 8?  
 (a) 0 (b) 3 (c) 7 (d) 2
93. What is the value of  $(28 - 10\sqrt{3})^{1/2} (7 + 4\sqrt{3})^{1/2}$ ?  
 (a) 3 (b) 5 (c) 7 (d) None of these
94. The price of an article was increased by  $P\%$ , later the new price was decreased by  $P\%$ . If the latest price was Re 1, the original price was  
 (a) Re 1 (b) Rs  $\frac{1 - P^2}{100}$   
 (c)  $\frac{10000}{10000 - P^2}$  (d)  $\frac{\sqrt{1 - P^2}}{100}$
95. A train running at certain speed crosses a stationary engine in 20 s. To find out the speed of the train, which of the following information is necessary  
 (a) only the length of the train  
 (b) only the length of the engine  
 (c) either the length of the train or the length of the engine  
 (d) both the length of the train and the length of the engine
96. In the given figure  $AD \parallel BC$ ,  $AO = 3$  cm  $OC = x + 3$ ,  $BO = 3x + 19$ ,  $OD = x + 5$ , then the value of  $x$  is



- (a)  $x = 8, 9$  (b)  $x = 7, 8$   
 (c)  $x = 8, 10$  (d)  $x = 10, 12$



97. If  $s$  be surface area and  $v$  be the volume of a cuboid of dimensions  $abc$ , then  $\frac{1}{v}$  is equal to  
(a)  $\frac{s}{2}(a + b + c)$       (b)  $\frac{2}{s} \frac{1}{a} \frac{1}{b} \frac{1}{c}$       (c)  $\frac{2s}{abc}$       (d)  $2s(a + b + c)$
98. The positive integer which is nearest to 1000 and divisible by 2, 3, 4, 5 and 6 is  
(a) 1020      (b) 1040      (c) 960      (d) 1030
99. A dishonest dealer professes to sell his goods at cost price. But he uses a false weight and thus gains  $6\frac{18}{47}\%$ .  
Find the weight he uses in place of 1kg  
(a) 960 g      (b) 940 g      (c) 930 g      (d) 970 g
100. The sum of factors of 19600 is  
(a) 54777      (b) 33667      (c) 5428      (d) None of these

