Mock Paper 3

BITS MCA

Birla Institute of Technology, Ranchi (Mesra)

Instructions

(i) 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.
(ii) Attempts all the questions.
(iii) Each test paper carries 200 marks. Each question consists of 4 marks. One mark will be deducted for wrong answer.
(iv) Use a soft HB pencil darken the appropriate bubble.

Sub Test-I. Quantitative and Mathematical Ability Test

M. Marks: 200 **Time: 75 min.**

1. The number of generators of a cyclic group of order n is
(a) n
(b) n 1
(c) a^p, where p is the number of integer between 0 and n respectively prime to n
(d) None of the above

2. Let S be the set of all straight lines in a plane, let a relation R be defined on S by aRb a b. Then, R is
(a) reflexive but neither symmetric nor transitive
(b) symmetric but neither reflexive nor transitive
(c) transitive but neither reflexive nor symmetric
(d) an equivalence relation

3. Let two binary compositions and be defined on set 2 of all integers, as given below
a b a b 1
a b a b ab, V ab Z
then, (Z, ,) is a
(a) non- commutative ring without unity
(b) commutative ring without unity
(c) commutative ring with unity
(d) None of these

4. The value of arg (z) arg ($\bar{z}$) is
(a) $2n$ (b) n (c) n (d) $2n$

5. The determinant $A = \begin{vmatrix} a & b & c \\ 4a & 3b & 2c \\ 10a & 6b & 3c \end{vmatrix} \begin{vmatrix} a & b & a \\ 3a & 2b & 2a \\ 6a & 3b & 3a \end{vmatrix}$ is independent of

(a) a (b) b (c) c (d) None of these

6. The lines $px + qy + r = 0$, $qx + ry + p = 0$, and $rx + py + q = 0$ are concurrent, if

(a) $pq + qr + rp = 0$ (b) $p^3 + q^3 + r^3 = 3pqr$

(c) $p^2 + q^2 + r^2 = 2pqr$ (d) None of these

7. Sum of the roots of the equation $9^{\log_3(\log_2 x)} - (\log_2 x) - (\log_2 x)^2 + 1$ is $(\log_2 x) - (\log_2 x)^2 + 1$ is

(a) 8 (b) 6 (c) 4 (d) 2

8. The value of s for which the points with position vectors $(\hat{\mathbf{j}} - \hat{\mathbf{k}})$, $4\hat{\mathbf{i}} - 5\hat{\mathbf{j}} + s\hat{\mathbf{k}}$, $3\hat{\mathbf{i}} - 9\hat{\mathbf{j}} - 4\hat{\mathbf{k}}$ and $4(-\hat{\mathbf{i}} + \hat{\mathbf{j}} - \hat{\mathbf{k}})$ are coplanar is

(a) -1 (b) 0 (c) 1 (d) None of these

9. For non-zero vectors $\mathbf{a}$, $\mathbf{b}$, $\mathbf{c}$ the relation $|(\mathbf{a} \cdot \mathbf{b})\ \mathbf{c}| = |\mathbf{a}||\mathbf{b}||\mathbf{c}|$ holds, if

(a) $\mathbf{a} \perp \mathbf{b}$, $\mathbf{b} \perp \mathbf{c}$ (b) $\mathbf{b} \perp \mathbf{c}$, $\mathbf{c} \perp \mathbf{a}$

(c) $\mathbf{c} \perp \mathbf{a}$, $\mathbf{a} \perp \mathbf{b}$ (d) $\mathbf{a} \perp \mathbf{b} \perp \mathbf{c} \perp \mathbf{a}$

10. In a system of linear equations, if A is the coefficient matrix and D the constant matrix, such that $|A| = 0$ and $(\text{adj}\, A) \cdot D = 0$, then the system of equations has

(a) a unique solution (b) an infinite number of solutions

(c) two solutions (d) no solution

11. Let $f(x) = x$ and $g(x) = |x|$ for all $x \in R$. Then, the function $\phi(x)$ satisfying $[\phi(x) - f(x)]^2 + [\phi(x) - g(x)]^2 = 0$ is

(a) $\phi(x) = x, x \in [0, \infty)$ (b) $\phi(x) = x, x \in R$

(c) $\phi(x) = x, x \in (-\infty, 0)$ (d) $\phi(x) = x = |x|, x \in R$

12. If $f(a) = 2, f'(a) = 1, g(a) = -1, g'(a) = 2$, then the value of $\lim_{x \to a} \frac{g(x) f(a) - g(a) f(x)}{x - a}$ is

(a) -5 (b) $\frac{1}{5}$ (c) 5 (d) None of these

13. The function $f(x) = \frac{\tan[x]}{1 + [x]^2}$, where $[x]$ denotes the greatest integer less than or equal to x, is

(a) discontinuous at some x

(b) continuous at all x, but $f'(x)$ does not exist for some x

(c) $f'(x)$ exists for all x, but $f(x)$ does not exist

(d) $f'(x)$ exists for all x

14. If $x^p y^q = (x + y)^{p+q}$, then $\frac{dy}{dx}$ is equal to

(a) $\frac{y}{x}$ (b) $\frac{py}{qx}$ (c) $\frac{x}{y}$ (d) $\frac{qy}{px}$

15. If at any point on a curve is the subtangent and subnormal are equal, then the tangent is equal to

(a) ordinate (b) $\sqrt{2}$ ordinate (c) $\sqrt{2\,(\text{ordinate})}$ (d) None of these

16. The difference between the greatest and least values of the function $f(x)$ $\sin 2x$ x on $\frac{}{2}, \frac{}{2}$ is

(a) $\frac{\sqrt{3}\quad\sqrt{2}}{2}$ (b) $\frac{\sqrt{3}\quad\sqrt{2}}{2}\quad\frac{}{6}$ (c) $\frac{\sqrt{3}}{2}\quad\frac{}{3}$ (d)

17. If $ax\quad\frac{b}{x}\quad c$, for all positive values of x and a, b, c, are positive constants, then

(a) $ab\quad\frac{c^2}{4}$ (b) $ab\quad\frac{c^2}{4}$ (c) $bc\quad\frac{a^2}{4}$ (d) $ac\quad\frac{b^2}{4}$

18. Between any two real numbers there is

(a) no irrational number

(b) an infinite number of integers

(c) an infinite number of rational and irrational numbers

(d) an infinite number of complex numbers

19. The origin is a point of a inflexion on the curve $a^m\quad{}^1y\quad x^m$, if

(a) m is odd and $m > 2$ (b) m is even and $m > 2$ (c) m is odd (d) m is even

20. The value of the integral $\int_0^{\frac{1}{2}}\frac{x\sin{}^1x}{\sqrt{1\quad x^2}}\,dx$ is

(a) $\frac{1}{2}\quad\frac{\sqrt{3}}{\sqrt{2}}$ (b) $\frac{1}{2}\quad\frac{}{12\sqrt{3}}$ (c) $\frac{1}{2}\quad\frac{\sqrt{3}}{12}$ (d) None of these

21. If $l^{\,r}(n)$ means log log log /...n, the log being repeated r times, then $[nl\,(n)\,l^{\,2}(n)l^{\,3}(n)l^{\,r}(n)]^{\,1}\,dn$ is equal to

(a) $l^{\,r\quad1}(n)\quad c$ (b) $\frac{l^{\,r\quad1}(n)}{r\quad1}\quad c$ (c) $l^{\,r}(n)\quad c$ (d) None of these

22. The area included between the curve $xy^2\quad4a^2(2a\quad x)$ and its asymptote is

(a) $2\;a^2$ (b) $4\;a^2$ (c) a^2 (d) None of these

23. The order of the differential equation associated with the primitive $y\quad C_1\quad C_2e^x\quad C_3e^{\,2x}\quad C_4$, where C_1, C_2, C_3, C_4 are arbitrary constants is

(a) 3 (b) 4 (c) 2 (d) None of these

24. The solution of the differential equation $(2x\quad10y^3)\frac{dy}{dx}\quad y\quad0$ is

(a) $x\quad2y^3\quad\frac{c}{y}$ (b) $x\quad y^3\quad\frac{c}{y^2}$ (c) $x\quad2y^3\quad\frac{c}{y^2}$ (d) None of these

25. Taylor's expansion of the function $f(x)\quad\frac{1}{1\quad x^2}$ is

(a) $\sum_{n\quad0}\;(\;1)^n\quad x^{2n}$, when $1\quad x\quad1$ (b) $\sum_{n\quad0}\;(\;1)^n\quad x^{2n}$, $\quad x\quad R$

(c) $\sum_{n\quad0}\;x^{2n}$,when $1\quad x\quad1$ (d) $\sum_{n\quad0}\;(\;1)^n\quad x^n$, when $1\quad x\quad1$

26. The interval of convergence of the sequence $\sum_{k=0} \frac{(x-1)^k}{2k-1}$ is

(a) $0 \quad x \quad 2$ (b) $0 \quad x \quad 2$ (c) $0 \quad x \quad 2$ (d) $0 \quad x \quad 2$

27. An alternating series $(-1)^n \, {}^{1}U_n$ is said to be conditionally convergent if

(a) $(-1)^n U_n$ and $|U_n|$ both converges (b) $(-1)^n U_n$ converges but $|U_n|$ diverges

(c) $(-1)^n U_n$ and $|U_n|$ both diverges (d) None of these

28. The function $f(x) \quad x^2 \quad 6x \quad 1$ satisfies the condition of Lagrange's mean value theorem. The coordinates of the point at which the tangent is parallel to the chord joining A (1, 4) and B (3, 8) are

(a) (2, 7) (b) (2, 7) (c) (1, 7) (d) (1, 7)

29. A monotonically increasing sequence which is not bounded above

(a) converges (b) diverges to (c) diverges (d) None of these

30. A positive term series U_n is such that from and after a fixed term, $\lim_{n \quad a} \frac{U_n}{U_{n \quad 1}} \quad k$ then the series U_n, converges, if

(a) $k \quad 1$ (b) $k \quad 1$ (c) $k \quad 1$ (d) None of these

31. Which of the following is not a converges region?

(a) $\{(x, y) : x^2 \quad y^2 \quad 1\}$ (b) $\{(x, y) : 4x^2 \quad 9y^2 \quad 36\}$

(c) $\{(x, y) : x^2 \quad y^2 \quad 1\}$ (d) $\{(x, y) : y \quad 1 \text{ and } y \quad 4\}$

32. Let a population of size N be normally distributed with mean and variance ^{2}. If from the population samples, each of size n, are drawn, then variance of sampling distribution of means is

(a) $^2/n$, when sampling is with replacement

(b) $^2/n$, when sampling is without replacement

(c) $n \quad /N$, when sampling is with replacement

(d) $n \quad ^2/N$, when sampling is without replacement

33. The coefficient of Skewness of the following data is:

Marks	10-25	25-40	40-55	55-70	70-85	85-100
Frequency	6	20	44	26	3	1

(a) 0.4 (b) 0.4 (c) 0.04 (d) 0.043

34. If $x \quad 125, \quad y \quad 100$

$x^2 \quad 1650, \quad y^2 \quad 1500$

$xy \quad 50$ and $n \quad 25$, then the line of regression of x on y is

(a) $22x \quad 9y \quad 74$ (b) $22x \quad 9y \quad 146$ (c) $22x \quad 9y \quad 146$ (d) None of these

35. The 7th decimal of the following data is:

Wages (in Rs)	0-10	10-20	20-30	30-40	40-50
Frequency	20	40	36	33	20

(a) 30.6 (b) 27.75 (c) 32.51 (d) 36.2

36. Suppose that the number of telephone calls coming into a telephone exchange between 10 am and 11 am say X_1 is a.r.v. with Poisson distribution with parameter 2. Similarly number of calls arriving between 11 am and 12 noon say X_2 are independent, what is the probability that more than S cases comes in between 10 am and 12 noon:

(a) $1 \sum_{n=0}^{S} \frac{e^{-8} 8^x}{x!}$ (b) $\sum_{x=0}^{S} \frac{e^{-8} 8^x}{x!}$

(c) $\sum_{x=0}^{S} \frac{e^{-2} 2^x}{x!} \sum_{x=0}^{s} \frac{e^{-6} 2^x}{x!}$ (d) None of these

37. At an election a voter may vote for any number of candidates not greater than the number to be chosen. There are seven candidates and four members are to be chosen. The number of ways in which a person can vote, is

(a) 95 (b) 97 (c) 97 (d) 98

38. The SD of a distribution is 5. The value of the fourth central moment (*Mu*), in order that the distribution be Mesokurtic should be

(a) 3 (b) greater than 1875 (c) 1875 (d) less than 1875

39. If successive trials are independent and the probability of success in any trial is *p*, the probability that the first success occurs on the *n*th trial is

(a) $(1 \quad p)\, p^{n \quad 1}$ (b) $p\,(1 \quad p)^{n \quad 1}$ (c) $(1 \quad p)^{n \quad 2} \quad p^2$ (d) None of these

40. If *A*, *B*, *C* are events such that:

$P(A) \quad 0.3, \quad P(B) \quad 0.4, \; P(C) \quad 0.8,$

$P(AB) \quad 0.08, \quad P(AC) \quad 0.28,$

$P(ABC) \quad 0.09,$

If $P(A \quad B \quad C) \quad 0.75$ then $P(BC)$ lies in the interval

(a) (0, 0.23) (b) (0, 0.48) (c) (0.23, 0.48) (d) None of these

41. The equation of the sphere; concentric with the sphere $x^2 \quad y^2 \quad z^2 \quad 4x \quad 6y \quad 8z \quad 5 \quad 0$ and which passes through (0, 1, 0), is

(a) $x^2 \quad y^2 \quad z^2 \quad 4x \quad 6y \quad 8z \quad 1 \quad 0$ (b) $x^2 \quad y^2 \quad z^2 \quad 4x \quad 6y \quad 8z \quad 5 \quad 0$

(c) $x^2 \quad y^2 \quad z^2 \quad 4x \quad 6y \quad 5z \quad 2 \quad 0$ (d) $x^2 \quad y^2 \quad z^2 \quad 4x \quad 6y \quad 5z \quad 3 \quad 0$

42. The axis of the right circular cylinder $x^2 \quad y^2 \quad a^2$ is parallel to the

(a) *x*-axis (b) *y*-axis (c) *z*-axis (d) None of these

43. The locus of the middle point of all normal chords of the rectangular hyperbola $xy \quad c^2$ is

(a) $(x^2 \quad y^2) \quad c^2 \; x^2 \; y^2 \quad 0$ (b) $(x^2 \quad y^2)^2 \quad c^2 \; x^3 \; y^3 \quad 0$

(c) $c^2 \; (x^2 \quad y^2)^2 \quad 4x^3 \; y^3 \quad 0$ (d) $4 \; (x^2 \quad y^2) \quad c^2 \; x^3 \; y^3 \quad 0$

44. The eccentricity of the ellipse $3x^2 \quad 4y^2 \quad 6x \quad 8y \quad 5 \quad 0$ is

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

45. If , , are the angles which a directed line makes with the positive directions of the coordinate axes, then $\sin^2 \quad \sin^2 \quad \sin^2$ is equal to

(a) 1 (b) 2 (c) 3 (d) None of these

46. The locus of a point *p* which divides the line joining (1, 0) and (2cos , 2sin) internally in the ratio 2 : 3 for all , is a

(a) straight line (b) circle (c) pair of straight lines (d) parabola

47. The equation of a circle with origin as centre and passing through the vertex of an equilateral triangle whose median is of length 3*a* is

(a) $x^2 \quad y^2 \quad 9a^2$ (b) $x^2 \quad y^2 \quad 16a^2$ (c) $x^2 \quad y^2 \quad 4a^2$ (d) $x^2 \quad y^2 \quad a^2$

48. If the points (4, 2) and (3, *b*) are conjugate with respect to the circle $x^2 \quad y^2 \quad 24$, then the value of *b* is

(a) 4 (b) 4 (c) 6 (d) 6

49. For a continuous series, mode is given by

(a) $l \quad \frac{f_1}{f_m \quad f_1 \quad f_2} \quad x_i$ (b) $l \quad \frac{f_m \quad f_1}{f_m \quad f_1 \quad f_2} \quad x_i$

(c) $l \quad \frac{f_m \quad f_1}{2f_m \quad f_1 \quad f_2} \quad x_i$ (d) $l \quad \frac{2f_m \quad f_1}{2f_m \quad f_1 \quad f_2} \quad x_i$

50. In a binomial distribution the mean is 4 and variance is 3, then, its mode is

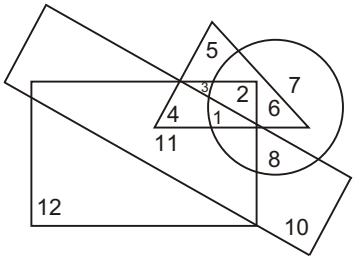
(a) 4 (b) 5 (c) 6 (d) None of these

Sub Test-II. Computer and Logical Ability Test

M. Marks: 200 **Time: 60 min.**

Directions (51-55) :

In the following figures, the circle stands for employed, the square stands for hard working, the triangle stands for usual and the rectangle stands for intelligent. Study the figure carefully and answer the questions that follows:



51. Non-rural employed, hard working and intelligent people are indicated by region

(a) 8 (b) 9 (c) 10 (d) 11

52. Non-rural, employed people who are neither intelligent nor hard working are re-presented by region

(a) 12 (b) 11 (c) 10 (d) 7

53. Intelligent, employed and hard working non-rural people are indicated by region

(a) 11 (b) 6 (c) 9 (d) 4

54. Hard-working non-rural people who are neither employed nor intelligent are indicated by region

(a) 8 (b) 12 (c) 7 (d) 10

55. Employed, hard working and intelligent rural people are indicated by region

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

Directions (56-60) :

A number series is given with one term missing. Choose the correct alternative that will continue the same pattern.

56. 8, 9, 8, 7, 10, 9, 11, 10 (....), 12

(a) 5 (b) 7 (c) 8 (d) 11

57. 3, 4, 7, 7, 13, 13, 21, 22, 31, 44, (.....)

(a) 42 (b) 43 (c) 51 (d) 52

58. 2Z5, 7Y7, 14X9, 23WII, 34V13?

(a) 27U24 (b) 47U15 (c) 45U15 (c) 47U14

59. shg, rif, gje, pkd?

(a) ole (b) nmc (c) olc (d) nlb

60. Q1F, S2E, U6D, W21C?

(a) Y66B (b) Y44B (c) Y88B (d) Z88B

61. What will be output of the following program segment

```
main ( )
    {
        int x, y, z;
        x   y   z     1;
        z       x &&     y ||     z;
        printf ("x   %d y   %d z   %d \ n", x, y , z);
    }
```

(a) *x* 0 *y* 0 *z* 0 (b) *x* 1 *y* 0 *z* 0

(c) *x* 0 *y* 0 *z* 1 (d) *x* 0 *y* 1 *z* 0

62. Which of the following set of component(s) is/are sufficient to implement any arbitrary boolean function?

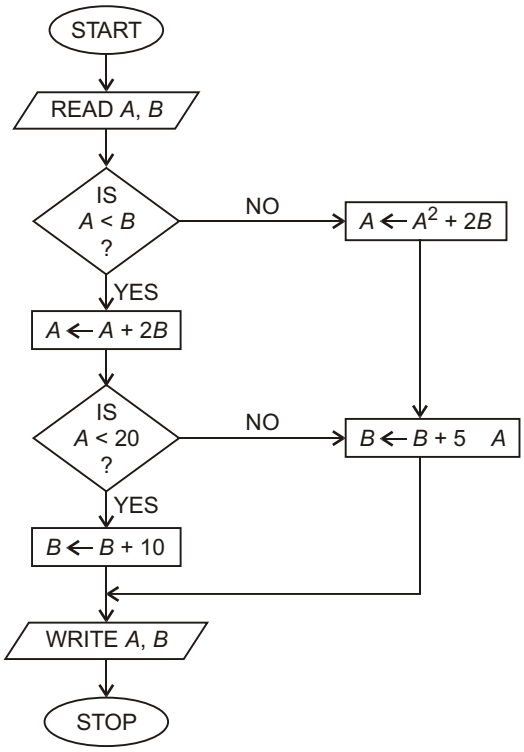
(a) XOR gates, NOT gates

(b) 2 to 1 multiplexers

(c) AND gates, XOR gates

(d) Three-input gates that output (*A.B*) *C* for the inputs *A.B* and *C*.

63. Trace the value of *A* and *B* through the flowchart given below at *A* 25 and *B* 30



(a) *A* 75, *B* 355 (b) *A* 85, *B* 405

(c) *A* 85, *B* 455 (d) None of these

64. In a Boolean algebra (*B*, …), the value of [*x* (*x* *y*)] [*y* (*y* *x*)] [*y*(*y* *x*)]

(a) 1 (b) *y* (*x* *y*) (c) *x* (*x* *y*) (d) *x* (*x* *y*)

65. Which of the following is/are advantages of virtual memory?

(a) Faster access to memory on an average

(b) Processes can be given protected address spaces

(c) Linker can assign addresses independent of where the program will be loaded in physical memory

(d) Programs larger than the physical memory size can be run

66. *B* trees are preferred to binary trees in databases because

(a) Disk capacities are greater than memory capacities

(b) Disk access is much slower than memory access

(c) Disk data transfer rates are much less than memory data transfer rates

(d) Disks are more reliable than memory

67. The decimal equivalent to the binary number $(0.1101)_2$ is

(a) $(0.8125)_{10}$ (b) $(0.7125)_{10}$ (c) $(2.8135)_{10}$ (d) None of these

68. Which of the following is true?

(a) The complement of a recursive language is recursive

(b) The complement of a recursively enumerable language is recursively enumerable

(c) The complement of a recursive language is either recursive or recursively enumerable

(d) The complement of a context-free language is context free

69. What will be the output of the following program?

```
# include < iostream . h >
        class sample {
                private:
                        static int count;
                public:
                        sample ( );
                void display ( );
};
int sample: count = 0;
sample: sample ( )
{
++count;
}
        void sample: display ( )
{
        cout <<"counter value =" << count << endl;
}
        void main ( )
{
        sample obj 1, obj 2, obj 3, obj 4;
        obj 4. display ( );
}
```

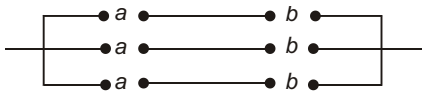
(a) counter value 3 (b) counter value 5

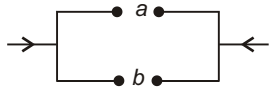
(c) counter value 6 (d) counter value 4

70. The hexadecimal equivalent to decimal number 36.875 is

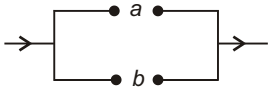
(a) $(24.E)_{16}$ (b) $(14.E)_{16}$ (c) $(24.14)_{16}$ (d) None of these

71. An equivalent simple circuit for the following network

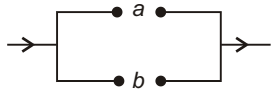


(a) 

Network *a* *b*

(b) 

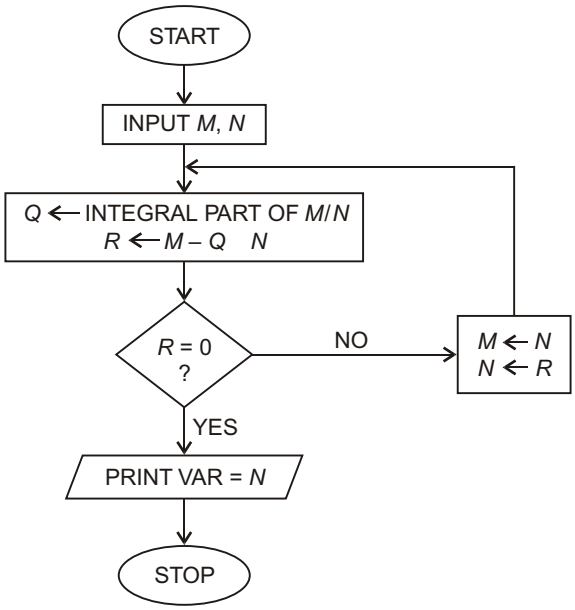
Network *a* *b*

(c) 

Nework *a* *b*

(d) None of these

72. The following flow chart shows



(a) LCM to two numbers
(b) HCF of two numbers
(c) LCM and HCF of two numbers
(d) None of these

73. What will be the output of the following program segment is

```
main ( )
        {
            int x  10, y  20;
            if (! (!x) && x)
                printf ("x = %d", x);
            else
                printf ("y = %d", y);
        }
```

(a) *x* 10, *y* 20
(b) *x* 10
(c) *y* 20
(d) None of these

74. The following program fragment

```
int i  10;
void main ( )
        { int i  20;
            { int i  30;
                printf ("%d %d", i, ::i);
            }
        }
```

(a) prints 30, 10 (b) prints 30, 20

(c) will result in execution error (d) None of these

75. Canonical form of the Boolean function $F(x)$ $x\ y\ z\ \ x\ z$ is

(a) $x\ y\ \ z\ y\ x\ \ x\ y\ z$ (b) $x\ y\ z\ \ x\ y\ z\ \ x\ y\ z$

(c) $x\ y\ z\ \ x\ y\ z\ \ x\ y\ z$ (d) $x\ y\ z\ \ x\ y\ z\ \ x\ y\ z$

76. A software is to be developed for a system which has a small memory. The software should

(a) use recursion whenever possible (b) avoid using recursion

(c) use macros instead of functions (d) not use macros instead of functions

77. Which of the following algorithm design technique is used in the quick sort algorithm ?

(a) Dynamic programming (b) Backtracking

(c) Divide and conquer (d) Greedy method

78. $(10110011100011110000)_2$ is base 32 is

(a) 2214716 (b) 1192331 (c) 119716 (d) 11142316

Directions (79–84) :

A cube is painted red on two adjacent surfaces and black on the surfaces opposite to red surfaces and green on the remaining faces. Now the cube is cut into sixty four smaller cube of equal size.

79. How many cubes have only one surface painted?

(a) 8 (b) 16 (c) 24 (d) 32

80. How many smaller cubes will have no surface painted?

(a) 0 (b) 4 (c) 8 (d) 16

81. How many smaller cubes have less than three surface painted?

(a) 8 (b) 24 (c) 28 (d) 48

82. How many smaller cubes have three surfaces painted?

(a) 4 (b) 8 (c) 16 (d) 24

83. How many smaller cubes with two surfaces painted have one face green and one of the adjacent faces black or red?

(a) 8 (b) 16 (c) 24 (d) 28

84. How many smaller cubes have at least one surface painted with green colour?

(a) 8 (b) 24 (c) 32 (d) 56

85. The remainder when $6^{6^{6\cdots}}$ is divided by 10 is

(a) 3 (b) 6 (c) 0 (d) can't be determined

86. A number P when divided by D it leaves the remainder 18 and if another number Q is divided by the same divisor D it leaves the remainder 11. Further if we divide P Q by D, then we obtain the remainder 4. Then the common divisor D is

(a) 22 (b) 15 (c) 25 (d) can't be determined

87. *abcde* is a five digit number when multiplied by 13 it gives a number, purely formed by the digit 9. Then the value of a b c d e is

(a) divisible by 8 (b) equal to 27 (c) divisible by 11 (d) All of these

88. The average age of Donald, his wife and their two children is 23 yr. His wife is just 4 yr younger than Donald himself and his wife was 24 yr old when his daughter was born. He was 32 yr old when his son was born. The average age of Donald and his daughter is

(a) 25 yr (b) 22.5 yr (c) 26 yr (d) can't be determined

89. The average of 26, 29, n, 35 and 43 lies between 25 and 35. If n is always an integer and greater than the average of the given integers, then the value of n is

(a) 33 n 47 (b) 34 n 43 (c) 33 n 42 (d) None of these

90. Mr. Manmohan calculated the average of 10, three digit numbers. But due to mistake he reversed the digits of a number and thus his average increased by 19.8. The difference between the unit digit and hundreds digit of that number is

(a) 8 (b) 4 (c) 2 (d) can't be determined

91. Two varities of soda water with different prices is mixed in the ratio 2:3, the price of first soda water is Rs 10 per litre while the price of second soda water is Rs 15 per litre, respectively. The average price of the mixture is

(a) Rs 12 (b) Rs 13 (c) Rs 14 (d) Rs 15

92. A three digit number is such that this number itself is divisible by the sum of its digits. The sum of hundreds and unit digit is 6 while the sum of the tens and unit digit is 5 . What is the ratio of unit and tens digit

(a) 1 : 2 (b) 2 : 3 (c) 3 : 4 (d) 2 : 7

93. A man lost half of his initial amount in the gambling after playing 3 rounds. The rule of gambling is that if he wins he will receive Rs 100, but he has to give 50% of the total amount after each round. Luckily he won all the three rounds. The initial amount with which he had started the gambling was

(a) $\frac{500}{3}$ (b) $\frac{700}{3}$ (c) 300 (d) 600

94. A reduction of 20% in the price of sugar enables a housewife to purchase 6 kg more for Rs 240. What is the original price per kg of sugar?

(a) Rs 10 per kg (b) Rs 8 per kg (c) Rs 6 per kg (d) Rs 5 per kg

95. The compound interest on a certain sum for 2 yr is Rs 756 and SI is Rs 720. If the sum is invested such that the SI is Rs 900 and the number of years is equal to the rate percent per annum. Find the rate percent.

(a) 4 (b) 5/2 (c) 6 (d) 1.0

96. Tap A Can fill a tank in 20 h, B in 25 h tap C can empty a full tank in 30 h. starting with A, followed by B and C each tap opens alternatively for one hour period till the tank gots filled up completely. In how many hours the tank will be filled up completely?

(a) $24\frac{4}{15}$ (b) $25\frac{2}{3}$ (c) $24\frac{4}{11}$ (d) None of these

97. Two runner start running together for a certain distance, one at 5 km/h and another at 3 km/h. The former arrives one and half an hour before the latter. The distance is

(a) 12 (b) 20 (c) 25 (d) 36

98. A girl while walking diametrically across a semicircular playground, takes 3 min less then if she had kept walking round the circular path from *A* to *B*. If she walks 60 m a minute, what is the diameter of the play ground

(a) 60 m (b) 48 m (c) 84 m (d) 315 m

99. If the altitude of an equilateral triangle is $2\sqrt{3}$, then its area is

(a) $4\sqrt{3}\ \text{cm}^2$ (b) $12\sqrt{3}\ \text{cm}^2$ (c) $\frac{8}{\sqrt{3}}\ \text{cm}^2$ (d) None of these

100. The ratio of the lengths of the diagonal of a rhombus is 2 : 5, then the ratio of the area of the rhombus to the square of the shorter diagonal

(a) 5 : 4 (b) 5 : 2 (c) 2 : 5 (d) None of these