DO NOT OPEN THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

Set No. **01**

18P/203/21

Total No. of Printed Pages: 24

Question Booklet No.:- **17501**

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.: | | | | | | | | | | |

Roll No.:- (Write the digits in words) .....

Serial No.of OMR Answer Sheet .....

Centre Code No. | | | | |

Day and Date ..... **(Signature of Invigilator)**

MCA Code 48

208

INSTRUCTIONS TO CANDIDATES

Use only ***blue/black ball-point pen*** in the space above and on both sides of the **Answer Sheet**)

1. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page / question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall ***except the Admit Card.***
3. ***A separate OMR Answer Sheet is given. It should not be folded or mutilated. A second OMR Answer Sheet shall not be provided. Only the OMR Answer Sheet will be evaluated.***
4. Write all entries by blue/black pen in the space provided above.
5. ***On the front page of the OMR Answer Sheet, write by pen your Roll Number in the space provided at the top and by darkening the circles at the bottom. Also, write the Question Booklet Number, Center code Number and the Set Number whereever applicable in appropriate places.***
6. ***No overwriting is allowed in the entries of Roll No., Question Booklet no. and Set no. (if any) on OMR Answer sheet and Roll No. and OMR Answer sheet no. on the Question Booklet.***
7. ***Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.***
8. ***Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the OMR Answer Sheet.***
9. For each question, darken only one circle on the OMR Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).*
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. On completion of the Test, the candidate must handover the OMR Answer Sheet to the Invigilator in the examination room/hall. However, candidates are allowed to take away Test Booklet and copy of OMR Answer Sheet with them.
13. Candidates are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

No. of Questions : 120

Full Marks : 360

Time : 2 Hours

Note: (1) Attempt as many questions as you can. Each question carries **3** marks. **One** mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

Q1) Two dice are thrown. The probability of getting an odd number on the first die and multiple of 3 on the other, is:

1) $\frac{1}{6}$ **2)** $\frac{1}{5}$

3) $\frac{5}{6}$ **4)** $\frac{1}{3}$

Q2) Solution of the inequation given below is:

$$\left|\frac{2}{x-4}\right| > 1, x \neq 4$$

1) $(2, 4) \cup (4, 6)$ **2)** $[2, 4)$

3) $[2, 6]$ **4)** $(2, 6)$

Q3) If $y = \log_x 2$,

then $\frac{dy}{dx}$ is equal to :

1) $-\frac{1}{(\log_2 x)^2} \cdot \frac{1}{(x \log_e 2)}$ **2)** $(\log_x 2).\log_e 2$

3) $2\log_x 2 . \left(\frac{\log_e 2}{x}\right)$ **4)** $-\frac{1}{(\log_2 x)} \cdot \frac{1}{(x.\log_e 2)}$

Q4) The quadratic equation $x^2(a^2 + b^2) + 2x(ac + bd) + (c^2 + d^2) = 0$ has no real roots, if

1) $ad = bc$ **2)** $ab \neq cd$

3) $ab = cd$ **4)** $ad \neq bc$

Q5) Find the least positive integral value of 'k', if

$$\begin{bmatrix} \cos\frac{2\pi}{7} & -\sin\frac{2\pi}{7} \\ \sin\frac{2\pi}{7} & \cos\frac{2\pi}{7} \end{bmatrix}^k = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

1) 6 **2)** 7

3) 8 **4)** 5

Q6) If a matrix A is both symmetric and skew-symmetric, then:

1) A is a diagonal matrix **2)** A is a zero matrix

3) A is a square matrix **4)** A is a scalar matrix

Q7) Find the value of x, if

$$\begin{vmatrix} x-2 & 2x-3 & 3x-4 \\ x-4 & 2x-9 & 3x-16 \\ x-8 & 2x-27 & 3x-64 \end{vmatrix} = 0$$

1) 3 **2)** 5

3) 4 **4)** 2

Q8) If ω is a non-real cube root of unity and n is not a multiple of 3, then

$$\begin{vmatrix} 1 & \omega^n & \omega^{2n} \\ \omega^{2n} & 1 & \omega^n \\ \omega^n & \omega^{2n} & 1 \end{vmatrix}$$ is equal to :

1) 2n **2)** 1

3) n^2 **4)** 0

Q9) The value of $\int \sin^{-1}(\cos x)dx$, $0 < x < \pi/2$, is (C being constant of integration):

1) $\frac{\pi}{2} - x + C$ **2)** $-\frac{\text{Sin } x}{\sqrt{1-x^2}} + C$

3) $\frac{\pi}{2}x + \frac{x^2}{2} + C$ **4)** $\frac{\pi}{2}x - \frac{x^2}{2} + C$

Q10) A particle moves along a curve, $6y = x^3 + 2$ such that at some instant the y-coordinate is changing 8 times as fast as the x-coordinate. The position of the particle at that instant is:

1) (4, 6) **2)** (1, 4)

3) (2, 11) **4)** (4, 11)

Q11) If $(a + b)^2x^2 + 8(a^2 - b^2)x + 16(a - b)^2 = 0$, then the value of x is:

1) $\frac{4(b - a)}{a + b}$ **2)** $\frac{4(a - b)}{a + b}$

3) $\frac{(b - a)}{a + b}$ **4)** $\frac{a + b}{a - b}$

Q12) If the coefficients of three consecutive terms in the expansion of $(1 + x)^n$ are in the ratio 1 : 7 : 42, then value of 'n' is:

1) 50 **2)** 55

3) 30 **4)** 52

Q13) A rod AB of length 15 cm rests in between two coordinate axis in such a way that the end point A lies on x-axis and end point B lies on y-axis. A point P is taken on the rod in such a way that AP = 6cm. If the locus of P is an ellipse, then its eccentricity(e) is:

1) $\frac{\sqrt{5}}{3}$ **2)** $\frac{5}{3}$

3) $\sqrt{\frac{117}{81}}$ **4)** $\sqrt{\frac{5}{7}}$

Q14) If ${}^nC_{15} = {}^nC_8$, then value of ${}^nC_{21}$ is:

1) 554 **2)** 253

3) 251 **4)** 250

Q15) If the sum of n terms of an A.P. is $3n^2 + 5n$ then which of its term is 164?

1) 27^{th} **2)** 28^{th}

3) 30^{th} **4)** 26^{th}

Q16) The letters of the word ' RANDOM ' are written in all possible orders and these words are written in dictionary. The rank of word "RANDOM" is:

1) 612 **2)** 610

3) 600 **4)** 614

Q17) The number of terms with integral coefficients in the expansion of $(17^{1/3}+35^{1/2}x)^{600}$ is:

1) 100 **2)** 301

3) 101 **4)** 200

Q18) The sum of the series

$$\frac{1}{\log_2 4} + \frac{1}{\log_4 4} + \frac{1}{\log_8 4} + \frac{1}{\log_{16} 4} + \ldots\ldots + \frac{1}{\log_{2^n} 4} \text{ is :}$$

1) $\frac{n(n+1)}{4}$ **2)** $\left[\frac{n(n+1)}{2}\right]^2$

3) $\frac{n(n+1)(2n+1)}{12}$ **4)** $n.\log_2 4$

Q19) In a flight of 600 Km an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time increased by 30 minutes. Duration of the flight is:

1) 30 minutes **2)** 2 hours

3) 1 hour 20 minutes **4)** 1 hour

Q20) An arc is in the form of a parabola with its axis vertical and one of its end is at the vertex. The arc is 10m high and 5m wide at the base. How wide is it 2m from the vertex of parabola?

1) $\sqrt{\frac{5}{2}}$ m. **2)** $\frac{\sqrt{5}}{2}$ m.

3) $\sqrt{5}$ m. **4)** 2.5 m.

Q21) If $R = \{(x, y) : x, y \in \mathbb{Z}, x^2 + y^2 \leq 4\}$ is a relation defined on the set $\mathbb{Z}$ of integers, then the domain of R is:

1) {0, 1, 2, 3, 4} **2)** {0, 1, 2}

3) {1, 2} **4)** {-2, -1, 0, 1, 2}

Q22) If 'f' is a function satisfying $f(x+y)=f(x).f(y)$ for all $x,y \in N$ such that $f(1) = 3$ and $\sum_{x=1}^{n} f(x) = 120$, then the value of 'n' is :

1) 6 **2)** 8

3) 7 **4)** 4

Q23) If $\frac{3 + 2i\,Sin\theta}{1 - 2i\,Sin\theta}$ is a purely real then the value of θ is (n being integer):

1) $\theta = \frac{n\pi}{2}$ **2)** $\theta = (n + 1)\frac{\pi}{2}$

3) $\theta = n\pi$ **4)** $\theta = \frac{\pi}{2}$

Q24) The coefficient of x^6y^3 in the expansion of $(x + 2y)^9$ is:

1) 670 **2)** 1348

3) 674 **4)** 672

Q25) The value of $\frac{i^{592} + i^{590} + i^{588} + i^{586} + i^{584}}{i^{582} + i^{580} + i^{578} + i^{576} + i^{574}}$ is ($i=\sqrt{-1}$):

1) 0 **2)** -2

3) 1 **4)** -1

Q26) The point on the curve $9y^2 = x^3$, where normal to the curve makes equal intercepts with the axes is:

1) $\left(1, \pm\frac{1}{3}\right)$ **2)** $\left(2, \pm\frac{2\sqrt{2}}{3}\right)$

3) $\left(2, \sqrt{\frac{8}{3}}\right)$ **4)** $\left(4, \frac{8}{3}\right)$

Q27) If B is a matrix, such that

$B.\begin{bmatrix}1 & -2\\ 1 & 4\end{bmatrix} = \begin{bmatrix}6 & 0\\ 0 & 6\end{bmatrix}$, then value of B is :

1) $\begin{bmatrix}4 & 2\\ -1 & 1\end{bmatrix}$ **2)** $\begin{bmatrix}4 & 3\\ 2 & 1\end{bmatrix}$

3) $\begin{bmatrix}4 & -2\\ -1 & 1\end{bmatrix}$ **4)** $\begin{bmatrix}4 & -3\\ 2 & -1\end{bmatrix}$

Q28) The locus of the point which moves so that the sum of its distances from (3, 0) and (-3, 0) is less than 9, is:

1) $\frac{x^2}{36} + \frac{y^2}{16} < 1$ **2)** $36x^2 + 20y^2 < 405$

3) $16x^2 + 20y^2 < 399$ **4)** $20x^2 + 36y^2 < 405$

Q29) If the third term in the expansion of

$\left(\frac{1}{x} + x^{\log_{10} x}\right)^5$ is 1000, then the value of x is :

1) 21 **2)** 50

3) 100 **4)** 10

Q30) The foci of the hyperbola coincide with the foci of the ellipse

$\frac{x^2}{25} + \frac{y^2}{9} = 1$. If eccentricity of the hyperbola is 2, then equation of the hyperbola is:

1) $\frac{x^2}{16} - \frac{y^2}{36} = 1$ **2)** $\frac{x^2}{12} - \frac{y^2}{4} = 1$

3) $\frac{x^2}{36} - \frac{y^2}{16} = 1$ **4)** $\frac{x^2}{4} - \frac{y^2}{12} = 1$

Q31) The axes of an ellipse are along the coordinate axes, vertices are at (0, ± 10) and eccentricity $e=4/5$. The equation of the ellipse is:

1) $\frac{x^2}{36} + \frac{y^2}{100} = 1$ **2)** $\frac{x^2}{36} + \frac{y^2}{164} = 1$

3) $\frac{x^2}{164} + \frac{y^2}{36} = 1$ **4)** $\frac{x^2}{64} + \frac{y^2}{100} = 1$

Q32) Probability of solving a problem of A, B, C are $1/3$, $2/7$ and $3/8$ respectively. If all the three try to solve the problem simultaneously, find the probability that exactly one of them can solve it.

1) $\frac{1}{2}$ **2)** $\frac{35}{168}$

3) $\frac{101}{168}$ **4)** $\frac{25}{56}$

Q33) Value of x in the inequation $|x-1| + |x-2| \geq 4$, is

1) $\left(-\infty, -\frac{1}{2}\right] \cup \left[\frac{7}{2}, \infty\right)$ **2)** $\left(-\infty, +\frac{1}{2}\right] \cup \left[\frac{7}{2}, \infty\right]$

3) $\left(-\infty, -\frac{1}{2}\right)$ **4)** $\left[-\frac{1}{2}, \frac{7}{2}\right]$

Q34) The radius of the circle $25x^2 + 25y^2 - 20x + 2y - 60 = 0$, is:

1) $\frac{\sqrt{464}}{5}$ **2)** $\frac{8}{5}$

3) $\frac{16}{25}$ **4)** $\frac{\sqrt{1601}}{25}$

Q35) The number of diagonals with n-sides polygon is:

1) $\frac{n(n-2)}{2}$ **2)** $\frac{n(n-1)}{2}$

3) $\frac{n(n-3)}{2}$ **4)** $\frac{n(n+1)}{2}$

Q36) If a line perpendicular to the line segment joining the points (1, 0) and (2, 3) divides in ratio 1 : n, then equation of the line is:

1) $(n+1)x + 3(n+2)y = n + 10$ **2)** $(n+1)x - (n-2)y = n + 11$

3) $nx + (1+n)y = n + 11$ **4)** $(n+1)x + 3(n+1)y = n + 11$

Q37) A line passes through the point (3, -2). The locus of the middle point of the portion of the line intercepted between the axis is:

1) $3x - 2y = 2$ **2)** $\frac{2x}{3} + \frac{y}{1} = 1$

3) $3y - 2x = 2xy$ **4)** $3x - 2y = 2xy$

Q38) If $f: \mathbb{R} \to \mathbb{R}$ be a function defined by $f(x) = \frac{x^2}{1+x^2}$, then the range of the function 'f' is:

1) $\mathbb{R}\setminus\{1\}$ **2)** $\mathbb{R}$

3) $[0, \infty)$ **4)** $[0, 1)$

Q39) The value of

$\int \frac{x^2+1}{(x+1)^2}\,dx$ is (C being constant of integration):

1) $\log|x+1| + \frac{1}{(x+1)^2} + C$ **2)** $x - \frac{2}{x+1} + C$

3) $x - \log|x+1| - \frac{1}{x+1} + C$ **4)** $x - 2\log|x+1| - \frac{2}{x+1} + C$

Q40) The 4^{th} term from the end in the expansion of

$\left(\frac{3}{x^2} - \frac{x^3}{6}\right)^7$ is :

1) $\frac{35}{32}x^5$ **2)** $\frac{35}{32}x^6$

3) $\frac{35}{48}x^6$ **4)** $\frac{35}{48}x^5$

Q41) The sum of all 3-digits numbers which leave the remainder 2, when divided by 3, is:

1) 154900 **2)** 154850

3) 109900 **4)** 164850

Q42) If $y = \sin^{-1}x + \sin^{-1}\sqrt{1-x^2}$ and $x \in (-1, 0)$,

then $\frac{dy}{dx}$ is equal to :

1) $\frac{2}{\sqrt{1-x^2}}$ **2)** 0

3) $-\frac{1}{\sqrt{1-x^2}}$ **4)** $\frac{1}{\sqrt{1-x^2}}$

Q43) If a complex number z is given by $z = \frac{1+7i}{(2-i)^2}$, then:

1) $\arg(z) = -\frac{\pi}{4}$ **2)** $\arg(z) = \frac{5\pi}{4}$

3) $\arg(z) = \frac{\pi}{4}$ **4)** $\arg(z) = \frac{3\pi}{4}$

Q44) If $f(2) = 4$ and $f'(2) = 1$, then value of

$\lim\limits_{x\to 2} \frac{x\,f(2) - 2\,f(x)}{x-2}$ is :

1) 1 **2)** 2

3) 4 **4)** 0

Q45) How many words can be formed from the letters of the word 'DAUGHTER' so that the vowels are never together?

1) 4320 **2)** 40320

3) 8! - 6! **4)** 36000

Q46) The value of

$\int_0^{\frac{\pi}{4}} \sqrt{1+\sin 2x}\ dx$ is :

1) 1 **2)** 0

3) $1-\sqrt{2}$ **4)** $\sqrt{2}-1$

Q47) The principal wants to arrange 5 students on the platform such that the boy Salim occupies the second position and the girl Sita is always adjacent to the girl Rita. The number of possible arrangement is:

1) 8 **2)** 4

3) 10 **4)** 5

Q48) The domain of the function $f(x) = \sqrt{x-3-2\sqrt{x-4}} - \sqrt{x-3+2\sqrt{x-4}}$ is, where 'f' be a real valued function of real variable.

1) $[2, \infty)$ **2)** $(-\infty, 4]$

3) $[4, \infty)$ **4)** $\mathbb{R}^+$

Q49) If $x = 1 + a + a^2 + a^3 + \ldots\ldots\infty$, $|a|<1$
and $y = 1 + b + b^2 + b^3 + \ldots\ldots\infty$, $|b|<1$
then value of $1 + ab + a^2b^2 + a^3b^3 + \ldots\ldots\infty$, is:

1) xy

2) $\frac{xy}{x + y - 1}$

3) $1 + xy$

4) $\frac{1 + xy}{x + y + 1}$

Q50) The eccentricity of the conic $9x^2 - 16y^2 = 144$ is:

1) $\frac{\sqrt{7}}{4}$

2) $\frac{5}{3}$

3) $\frac{5}{4}$

4) $\frac{3}{5}$

Q51) If $x > 0$, then sum of the infinite series

$$\frac{1}{1+x} - \frac{1-x}{(1+x)^2} + \frac{(1-x)^2}{(1+x)^3} - \frac{(1-x)^3}{(1+x)^4} + \ldots\ldots\infty, \text{ is :}$$

1) $\frac{3}{4}$

2) 1

3) $\frac{1}{2}$

4) 0

Q52) The value of

$$\int e^{2x}\left(\frac{1 + \sin 2x}{1 + \cos 2x}\right)dx$$ is (C being constant of integration):

1) $\frac{1}{2}e^{2x}\sec^2 x + C$

2) $e^{2x}\sec^2 x + C$

3) $e^{2x}\tan x + C$

4) $\frac{1}{2}e^{2x}\tan x + C$

Q53) The number of terms in the expansion of $(1 - 3x + 3x^2 - x^3)^8$ is:

1) 24

2) 25

3) 26

4) 32

Q54) If

$$S = 1 + \frac{1+2}{2} + \frac{1+2+3}{3} + \frac{1+2+3+4}{4} + \ldots\ldots \text{n terms then the value of 'S' is :}$$

1) $\frac{n(n + 3)}{4}$

2) $\frac{n(n + 1)(2n + 1)}{12}$

3) $\frac{n^2}{2}$

4) $\frac{n(n + 2)}{4}$

Q55) If n arithmetic means are inserted between 20 and 80 such that the ratio of the first mean to the last mean is 1 : 3, then the value of 'n' is:

1) 11 **2)** 12

3) 10 **4)** 15

Q56) The sum of all the natural numbers that can be formed with the digits 2, 3, 4, 5 taken all at a time is:

1) 93240 **2)** 93004

3) 93324 **4)** 90002

Q57) The area bounded by the curves $y^2 = 4x$ and $x^2 = 4y$ is:

1) $\frac{8}{3}$ sq.units **2)** $\frac{16}{3}$ sq.units

3) $\frac{14}{3}$ sq.units **4)** $\frac{3}{14}$ sq.units

Q58) The length of latus-rectum of the parabola $x^2 - 4x - 8y + 12 = 0$ is:

1) 4 **2)** 8

3) 10 **4)** 2

Q59) A bag contains 4 red and 4 blue balls. Four balls are drawn one-by-one from the bag, then the probability that the drawn balls are in alternate colour, is:

1) $\frac{1}{35}$ **2)** $\frac{9}{31}$

3) $\frac{6}{35}$ **4)** $\frac{7}{31}$

Q60) If $(x + iy)^{1/3} = a + ib$, $x, y, a, b \in \mathbb{R}$, then $\frac{x}{a} + \frac{y}{b}$ is equal to:

1) a - b **2)** $4 (a^2 + b^2)$

3) a + b **4)** $4(a^2 - b^2)$

Q61) If S_n denotes the sum of first n terms of the series $S_n = 3+7+13+21+31+.....$to n terms, then the value of S_n is:

1) $\frac{n}{6} (n^2 + n + 3)$ **2)** $\frac{n}{3} (n^2 + 3n + 5)$

3) $\frac{n^2}{3} (3n + 5)$ **4)** $\frac{n}{2} (n^2 + n + 5)$

Q62) In how many ways 5 boys and 3 girls can be seated in a row so that no two girls are together?

1) 14400 **2)** 7200

3) 2400 **4)** 1440

Q63) If

$A = \begin{bmatrix} 1 & na \\ 0 & 1 \end{bmatrix}$, then A^n is equal to $(n \in \mathbb{N})$:

1) $\begin{bmatrix} 1 & na \\ 0 & n \end{bmatrix}$ **2)** $\begin{bmatrix} 1 & na \\ 0 & 1 \end{bmatrix}$

3) $\begin{bmatrix} 1 & n^2a \\ 0 & 1 \end{bmatrix}$ **4)** $\begin{bmatrix} n & na \\ 0 & 1 \end{bmatrix}$

Q64) The equation of the smallest degree with the real coefficients having (1 + i) as one o the roots is:

1) $x^2 + x + 2 = 0$ **2)** $x^2 - 2x + 2 = 0$

3) $x^2 + 2x + 2 = 0$ **4)** $x^2 + x + 1 = 0$

Q65) The equation of the circle passing through (1, 0) and (0, 1) and having the smallest possible radius is:

1) $x^2 + y^2 + x + y + 1 = 0$ **2)** $x^2 + y^2 + x - y + 1 = 0$

3) $x^2 + y^2 - x - y = 0$ **4)** $x^2 + y^2 + x + y = 0$

Q66) How many words can be formed by taking 4 letters at a time out of the letters of the word "MATHEMATICS"?

1) 2454 **2)** 2625

3) 1698 **4)** 1680

Q67) Out of 9 outstanding students in a college, there are 4 boys and 5 girls. A team of 4 students is to be selected for a quiz programme. Find the probability that two are boys and two are girls?

1) $\frac{11}{21}$ **2)** $\frac{10}{21}$

3) $\frac{2}{63}$ **4)** $\frac{20}{41}$

Q68) Let 'f' be a real valued function defined on a set $D \subseteq \mathbb{R}$ and given by

$f(x) = \frac{1}{\log_{10}(1-x)} + \sqrt{x+2}$. Then the set D is:

1) [-2, 0) U (0, 1) **2)** [-2, 1]

3) $x \geq 2$ **4)** $\{x : x \in \mathbb{R}\}$

Q69) A box contains 5 different red balls and 6 different white balls. In how many ways can 6 balls be selected so that there are at least two balls of each colour?

1) 400 **2)** 525

3) 625 **4)** 425

Q70) In the first four papers each of 100 marks, Rishi got 95, 72, 73, 83 marks. If he wants an average of greater than or equal to 75 marks and less than 80 marks, the range of marks he should score in the fifth paper, is:

1) between 70 and 80 marks **2)** between 52 and 77 marks

3) between 55 and 75 marks **4)** between 60 and 70 marks

Q71) Set of solutions of the equation $z^2 + |z| = 0$, where z is a complex number (z=x+iy), is:

1) {0, i, -i} **2)** {0, i, 1}

3) {0, 1} **4)** {0, i, 2i}

Q72) The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then $P(\overline{A}) + P(\overline{B})$ is:

1) 1.6 **2)** 0.4

3) 0.8 **4)** 1.2

Q73) The value of

$$\int_0^{\frac{\pi}{2}} \sin 2x \log \tan x \, dx, \text{ is :}$$

1) 0 **2)** 2π

3) -1 **4)** 1

Q74) In a Geometric Progression (G.P.), if the $(m+n)^{th}$ term is 'p' and $(m-n)^{th}$ term is 'q' then its m^{th} term is:

1) $\sqrt{pq}$ **2)** pq

3) p+q **4)** $\frac{1}{2}(p+q)$

Q75) If

$$f(x) = \log\left(\frac{1+x}{1-x}\right), \text{ then } f\left(\frac{2x}{1+x^2}\right) \text{ is equal to :}$$

1) $[f(x)]^2$ **2)** $2\,f(x)$

3) $3f(x)$ **4)** $[f(x)]^3$

Q76) If $z = 2 - 3i$, then value of $4z^3 - 3z^2 + 169$ is:

1) 160 **2)** 199

3) 140 **4)** 0

Q77) For a post three persons A, B and C appear in the interview. The probability of A being selected is twice that of B and the probability of B being selected is thrice that of C. The probability of A being selected is:

1) $\frac{1}{10}$ **2)** $\frac{2}{5}$

3) $\frac{3}{5}$ **4)** $\frac{3}{10}$

Q78) It is given that at $x = 1$, the function $f(x) = x^4 - 62x^2 + ax + 9$ attains its maximum value on the interval [0, 2], the value of 'a' is:

1) 120 **2)** 119

3) 140 **4)** 100

Q79) The equation of the parabola, whose vertex is at (2, 1) and directrix is $x = y - 1$, is given by:

1) $x^2 - 14x = 4xy$ **2)** $y^2 = 8x + 1$

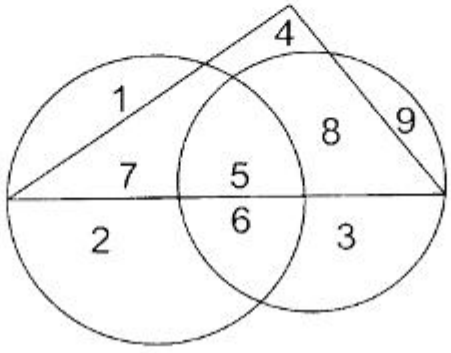
3) $x^2 + 2y^2 - 4x + y = 18$ **4)** $x^2 + y^2 - 14x + 2y + 2xy + 17 = 0$

Q80) If $z = \frac{1}{1 - \cos\theta - i\sin\theta}$, then Re(z) is equal to:

1) $\cot\frac{\theta}{2}$ **2)** 1

3) $\frac{1}{2}.\cot\theta$ **4)** $\frac{1}{2}$

Directions (Question Nos.81 to 85): These questions are based on the following diagram in which the triangle represents female graduates. Small circle represents self - employed females having a car and the big circle represents self - employed females with bank loan facility. Numbers are shown in the different sections of the diagram. On the basis of these numbers answer the following questions:



Q81) How many female graduates are not self - employed?

1) 12 **2)** 10

3) 4 **4)** 15

Q82) How many non - graduate self - employed females are with bank loan facility?

1) 12 **2)** 3

3) 8 **4)** 9

Q83) How many non - graduate females are self - employed?

1) 11 **2)** 21

3) 9 **4)** 12

Q84) How many self - employed female graduates are with bank loan facility?

1) 20 **2)** 12

3) 7 **4)** 5

Q85) How many female graduates are self - employed and having a car?

1) 20 **2)** 12

3) 13 **4)** 15

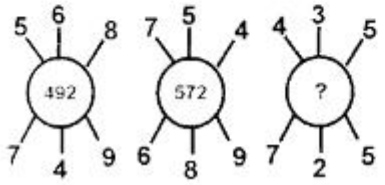
Directions (Question Nos.86 to 95): Which number should come in place of question mark (?) in the following questions.

Q86)

1) 14 **2)** 20

3) 13 **4)** 21

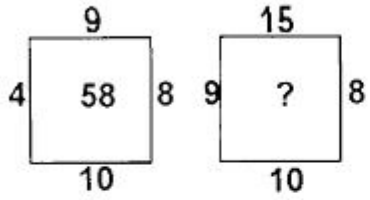
Q87)



1) 130 **2)** 140

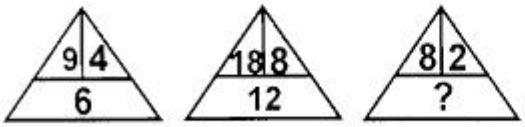
3) 135 **4)** 115

Q88)



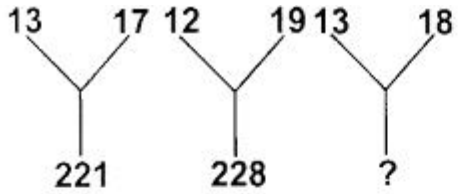
1) 78
2) 117
3) 63
4) 100

Q89)



1) 6
2) 5
3) 4
4) 7

Q90)



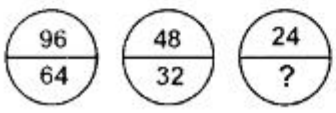
1) 229
2) 234
3) 31
4) 312

Q91)

1	7	9
2	14	?
3	105	117

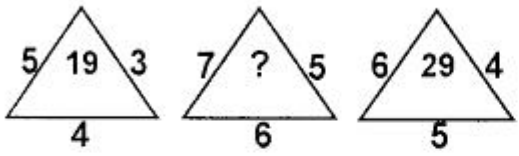
1) 26
2) 16
3) 20
4) 12

Q92)



1) 16
2) 21
3) 8
4) 10

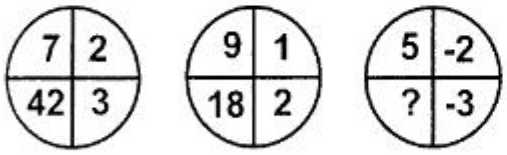
Q93)



1) 41 **2)** 47

3) 25 **4)** 37

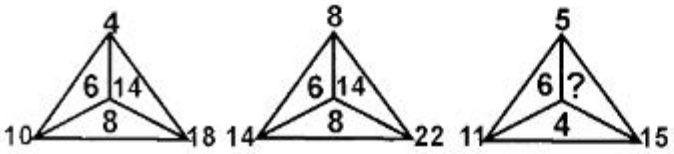
Q94)



1) 18 **2)** -30

3) 13 **4)** 30

Q95)



1) 8 **2)** 14

3) 6 **4)** 10

Q96) Letters of which of the alternative answers when placed at the blank places one after another will complete the given letter - series?

a _ b b c _ a a b _ c c a _ b b c c

1) c a b a **2)** b a c b

3) a b b a **4)** a c b a

Directions (Question Nos.97 to 101): In each of the following questions one number-series is given in which one term is wrong. Find out the wrong term.

Q97) 5, 12, 19, 33, 47, 75, 104

1) 75 **2)** 47

3) 104 **4)** 33

Q98) 0, 3, 8, 15, 24, 36, 48

1) 24 **2)** 15

3) 36 **4)** 48

Q99) 8, 36, 149, 596, 2388, 9556

1) 9556 **2)** 149

3) 2388 **4)** 596

Q100) 4, 11, 21, 34, 49, 69, 91

1) 49 **2)** 21

3) 34 **4)** 69

Q101) 5, 7, 11, 20, 35, 67

1) 67 **2)** 35

3) 20 **4)** 11

Directions (Question Nos.102 to 105): Read the following information carefully and answer the questions given below:

Ravi and Kunal are good in Hockey and Volleyball. Sachin and Ravi are good in Hockey and baseball. Gaurav and Kunal are good in Cricket and Volleyball. Sachin, Gaurav and Michael are good is Football and Baseball.

Q102) Who is good in Baseball, Cricket, Volleyball and Football?

1) Ravi **2)** Gaurav

3) Kunal **4)** Sachin

Q103) Who is good in Hockey, Cricket and Volleyball?

1) Ravi **2)** Sachin

3) Kunal **4)** Gaurav

Q104) Who is good in Hockey, Baseball and Football?

1) Gaurav **2)** Sachin

3) Kunal **4)** Ravi

Q105) Who is good in Baseball, Volleyball and Hockey?

1) Sachin **2)** Gaurav

3) Kunal **4)** Ravi

Q106) If in a class of 37 students the places of Anuradha and Saroj are 10th and 16th respectively, what are their places from the last?

1) 27th and 21st **2)** 28th and 22nd

3) 28th and 20th **4)** 27th and 22nd

Directions (Question Nos.107 to 110): In each of the following questions, a statement/group of statements is given followed by some conclusions, choose the conclusion which logically follows from the given statements.

Q107) Statements:

a. Processed meat is a perishable food.
b. All perishable foods are packed in sealed tins.
c. Sealed tins some times do not contain processed meat.

Conclusions:

1) Non - perishable foods are never packed in sealed tins.
2) Sealed tins always contain perishable food.
3) Processed meat is sometimes not packed in sealed tins.
4) Processed meat is always packed in sealed tins.

Q108) Statements:

1. All members of Mohan's family are honest.
2. Some members of Mohan's family are not employed.
3. Some employed persons are not honest.
4. Some honest persons are not employed.

Conclusions:

1) The honest members of Mohan's family are not employed.
2) The employed members of Mohan's family are honest.
3) The employed members of Mohan's family are not honest.
4) All members of Mohan's family are employed.

Q109) Statements:

1. I watch T.V. only if I am bored.
2. I am never bored when I have my brother's company.
3. Whenever I go to the theatre I take my brother along.

Conclusions:

1) If I am not bored, I do not watch T.V.
2) If I am not with my brother then I watch T.V.
3) If I am bored, I watch T.V.
4) If I am bored, I seek my brother's company.

Q110) Statements:

1. Only students can participate in the race.
2. Some participants in the race are females.
3. All female participants in the race are invited for coaching.

Conclusions:

1) All participants in the race are males.
2) All participants in the race are invited for coaching.
3) All participants in the race are students.
4) All students are invited for coaching.

Directions (Question Nos.111 to 113): In each of the following problems, there is one question and three statements I, II and III given below the question. You have to decide whether the data given in the statements is sufficient to answer the question. Read all the statements carefully and find out that probable pair which can be sufficient to answer the question. Any one such alternative which contains the statement or a pair of statements sufficient to answer the question, will be your answer. For example, if only statement I is sufficient to answer the question, then statements I and II together should not be accepted as answer to the question. Remember out of the three statements, each of them alone can also be sufficient to answer the question. In such cases for example, your answer should be taken as Only I or Only II or only III and not only I.

Q111) Pankaj is younger than Sunita and Rupali is older than Tom. Who among them is the oldest?

I. Rupali is older than Pankaj
II. Sunita is older than Rupali.
III. Tom is youngest among all.

1) I, II and III all together
2) Only II
3) Only III
4) I & II together

Q112) Five persons - A,B,C,D and E are sitting in a row. Who is sitting in the middle?

I. B is between E and C
II. B is to the right of E.
III. D is between A and E.

1) II and III together
2) I and II together
3) I, II and III together
4) I and III together

Q113) What does 'come' represent in a code language?

I. 'pit na tac' means 'come and go' in that code language.
II. 'ja ta da' means 'you are good' in that code language.
III. 'na da rac' means 'you can come ' in that code language.

1) I, II and III all together
2) I and III together
3) II and III together
4) I and II together

Q114) If the following words are arranged in the dictionary order then which will be the last word?

1) Drench
2) Dredge
3) Dread
4) Dream

Q115) As a 'Shirt' is related to 'Cloth' in the same way 'Chair' is related to what?

1) Weaving
2) Sit
3) Repairing
4) Wood

Q116) **Statement:** "Some kings are not beggars." If this fact is false then which of the following conclusions is false: -

Conclusions:

I All kings are beggars.
II Some beggars are king.
III Some kings are beggars.
IV All beggars are king.
V No king is beggar.

1) Only I and IV
2) Only II and III
3) All
4) Only V

Q117) As 'Earthquake' is related to 'Earth', similarly 'Thundering' is related to what?

1) Sea
2) Sky
3) Earth
4) Fair

Q118) In the following question one word is different from the rest. Find out the word which does not belong to the group.

1) Sun
2) Sky
3) Moon
4) Star

Q119) In the following series, find the term in place of question - mark (?) -
3, 8, 27, 112, 565,**?**

1) 3396
2) 1596
3) 2266
4) 3400

Q120) As 'Author' is related to 'Writing', similarly 'Thief' is related to what?

1) To steal
2) To night
3) To wonder
4) To feel

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर - पत्र के दोनों पृष्ठों पर केवल नीली/काली बाल-प्वाइंट पेन से ही लिखे)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्न पत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है| पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्न पत्र की दूसरी पुस्तिका प्राप्त कर लें।

2. परीक्षा भवन में **प्रवेश-पत्र के अतिरिक्त**, लिखा या सादा कोई भी खुला कागज साथ में न लायें।

3. **ओ.एम.आर. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा ओ.एम.आर. उत्तर-पत्र नहीं दिया जायेगा। केवल ओ.एम.आर. उत्तर-पत्र का ही मूल्यांकन किया जायेगा।**

4. सभी प्रविष्टियाँ प्रथम आवरण-प्रष्ठ पर नीली/काली पेन से निर्धारित स्थान पर लिखें|

5. **ओ.एम.आर. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिए वृत्तों को गाढ़ा कर दें। जहाँ - जहाँ आवश्यक हो वहाँ प्रश्न -पुस्तिका का क्रमांक, केंद्र कोड नम्बर तथा सेट का नम्बर उचित स्थानों पर लिखें।**

6. **ओ.एम.आर. उत्तर-पत्र पर अनुक्रमांक संख्या, प्रश्न -पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक और ओ.एम.आर. उत्तर-पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।**

7. **उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।**

8. **प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको ओ.एम.आर. उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिए गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।**

9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेंगा।

10. **ध्यान दें की एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो सम्बंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।**

11. रफ कार्य के लिए प्रश्न -पुस्तिका के मुख्यप्रष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।

12. परीक्षा की समाप्ति के बाद अभ्यर्थी अपना ओ.एम.आर. उत्तर-पत्र परीक्षा कक्ष/हाल में कक्ष निरीक्षक को सौंप दे। अभ्यर्थी अपने साथ प्रश्न पुस्तिका तथा ओ.एम.आर. उत्तर-पत्र की प्रति ले जा सकते हैं।

13. अभ्यर्थी को परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।

14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।