

This Question Paper contains 20 printed pages.
(Part - A & Part - B)

Sl.No. 104425

12 (E)

Set No. of
Question Paper:

1

(MARCH, 2014)

Part - A : Time : 1 Hour / Marks : 50

Part - B : Time : 2 Hours / Marks : 50

(Part - A)

Time : 1 Hour]

[Maximum Marks : 50

Instructions :

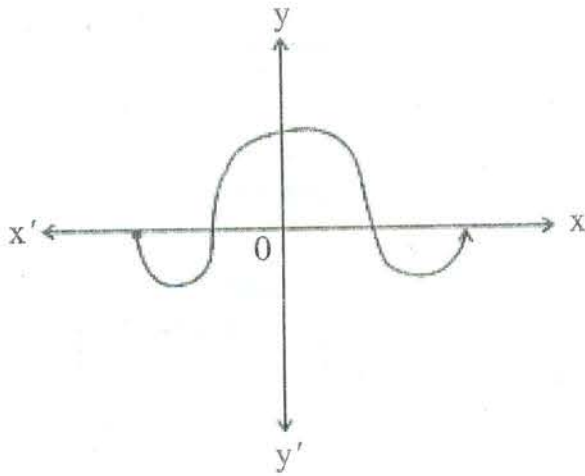
- 1) There are 50 objective type (M.C.Q) questions in Part - A and all questions are compulsory.
- 2) The questions are serially numbered from 1 to 50 and each carries 1 mark.
- 3) Read each question carefully, select proper alternative and answer in the O.M.R. sheet.
- 4) The OMR sheet is given for answering the questions. The answer of each question is represented by (A) O, (B) O, (C) O, (D) O. Darken the circle ● of the correct answer with ball-pen.
- 5) Rough work is to be done in the space provided for this purpose in the Test Booklet only.
- 6) Set No. of Question Paper printed on the upper-most right side of the Question Paper is to be written in the column provided in the OMR sheet.

1) $\sqrt{4 + \sqrt{83}}$ Its correct option is _____.

- (A) Does not exist as real number
- (B) Does not exist as quadratic surd
- (C) $2 + \sqrt{83}$
- (D) $\sqrt{83} - 2$

Rough Work

- 2) $2^m \cdot 5^n$ ($m, n \in \mathbb{N}$) ends with _____.
- (A) 0 (B) 5
(C) 25 (D) 125
- 3) From the graph given below, $y = p(x)$ has _____ zeros.



- (A) 5 (B) 1
(C) 3 (D) 4
- 4) The zero of a polynomial $p(x) = \sqrt{5} \cdot x - 5$ is _____.
- (A) $-\sqrt{5}$
(B) $\sqrt{5}$
(C) $\frac{\sqrt{5}}{5}$
(D) -5

- 5) In $\triangle PQR$, the bisector of $\angle P$ intersects \overline{QR} in D. If $QD : RD = 4 : 7$, $PR = 14$, then $PQ =$ _____.
- (A) 8 (B) 4
(C) 12 (D) 16
- 6) If $\operatorname{cosec} A = \frac{4}{3}$ and $A + B = 90$, then $\sec B =$ _____.
- (A) $\frac{4}{3}$ (B) $\frac{16}{9}$
(C) $\frac{3}{4}$ (D) $\frac{7}{3}$
- 7) From the top of a building h meter high, the angle of depression of an object on the ground has measure θ . The distance of the object from the building is _____.
- (A) $h \sin \theta$ meter
(B) $h \cos \theta$ meter
(C) $h \tan \theta$ meter
(D) $h \cot \theta$ meter
- 8) For A (1, 2) and B (3, -2), the coordinates of the midpoint of \overline{AB} is _____.
- (A) (0, 0) (B) (2, 2)
(C) (2, 0) (D) (0, 2)

- 9) On walking _____ meters on a hill making an angle of measure 30° with the ground, one can reach the height 'a' meters from the ground.

(A) $\frac{\sqrt{3}}{2}a$

(B) $\frac{2a}{\sqrt{3}}$

(C) $2a$

(D) $\frac{a}{2}$

10) $\frac{\sin^4 \theta - \cos^4 \theta}{\sin^2 \theta - \cos^2 \theta} = \underline{\hspace{2cm}}$.

(A) 2

(B) 3

(C) 0

(D) 1

- 11) From the natural numbers of single digit, the probability of getting an even number is _____.

(A) $5/10$

(B) $5/9$

(C) $4/9$

(D) $1/9$

- 12) In $\triangle ABC$, correspondence $ABC \leftrightarrow BAC$ is similarity. From the following, _____ is true.

(A) $\angle B \cong \angle C$

(B) $\angle C \cong \angle A$

(C) $\angle A \cong \angle B$

(D) $\angle A \cong \angle B \cong \angle C$

- 13) If $\sin 7\theta = \cos 2\theta$ for acute angles 7θ and 2θ , then $\theta =$ _____.
- (A) 90 (B) 10
(C) 20 (D) 30
- 14) In a two digit number, the digit at unit place is x and the digit at ten place is y . If $y = 5$ then the number is _____.
- (A) $5x$ (B) $50x + 5$
(C) $30x + 5$ (D) $x + 50$
- 15) The chord of a $\odot(0,5)$ touch the $\odot(0,3)$. The length of the chord is _____.
- (A) 6 (B) 8
(C) 7 (D) 2
- 16) The perimeter of an equilateral triangle is 6. The length of an altitude drawn on any of its side is _____.
- (A) $\frac{\sqrt{3}}{2}$ (B) $2\sqrt{3}$
(C) 2 (D) $\sqrt{3}$

21) If $y = \frac{2}{3}$ is a root of the quadratic equation $3y^2 - ky + 8 = 0$ then the value of k is _____.

- (A) -14 (B) 13
(C) 14 (D) -13

22) From the equations given below, a root of one equation is 3.
∴ The equation is _____.

- (A) $x^2 - x - 6 = 0$
(B) $x^2 + x - 6 = 0$
(C) $x^2 - x + 6 = 0$
(D) $x^2 + x + 6 = 0$

23) If α, β, γ are the zeros of a polynomial $P(x) = ax^3 + bx^2 + cx + d$ ($a \neq 0$) then

$$\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} = \underline{\hspace{2cm}}$$

- (A) $-c/d$ (B) $-b/a$
(C) c/d (D) $-c/a$

- 27) In the A.P. $S_n - 2S_{n-1} + S_{n-2} = \underline{\hspace{2cm}}$ ($n > 2$).
- (A) $2d$ (B) $a + d$
 (C) d (D) a
- 28) The foot of the perpendicular drawn from $P(-3, 2)$ to Y-axis is M. The coordinates of M are $\underline{\hspace{2cm}}$.
- (A) $(3, 0)$ (B) $(0, 2)$
 (C) $\left(\frac{3}{2}, -1\right)$ (D) $(-3, 2)$
- 29) If $7\cos^2\theta + 3\sin^2\theta = 4$ then $\cot\theta = \underline{\hspace{2cm}}$.
- (A) 7 (B) $\frac{7}{3}$
 (C) $\sqrt{3}$ (D) $\frac{1}{\sqrt{3}}$
- 30) The formula to find total surface area of ₹ 5 coin is $\underline{\hspace{2cm}}$.
- (A) $\pi r(r+h)$ (B) $\pi r^2 h$
 (C) $\pi r^3 h$ (D) $2\pi r(h+r)$
- 31) If the area and the circumference of a circle are numerically equal then the radius of the circle is $\underline{\hspace{2cm}}$.
- (A) 2 (B) $\frac{5}{2}$
 (C) 1 (D) $\frac{2}{5}$

- 32) If the ratio of the areas of two circles is 1 : 4 then the ratio of their circumference is _____.
- (A) 2 : 3 (B) 1 : 4
(C) 1 : 2 (D) 3 : 2
- 33) The product of the zeros of the polynomial $x^2 - 4x + 3$ is _____.
- (A) 1 (B) 4
(C) -4 (D) 3
- 34) When the length of the shadow of a pole is equal to the height of the pole, the angle of elevation of the sun is has measure _____.
- (A) 45 (B) 30
(C) 60 (D) 75
- 35) The area of a minor sector of $\odot(P, 30)$ is 300 cm^2 . The length of the corresponding arc is _____ cm.
- (A) 10 (B) 20
(C) 30 (D) 40
- 36) The volume of a sphere with radius 3 cm is _____ cm^3 .
- (A) 18π (B) 14π
(C) 2π (D) 36π

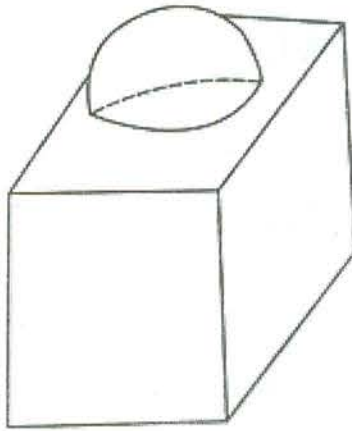
- 37) Two consecutive even numbers are _____.
- (A) $x, x+2$ (B) $x, x+1$
(C) $x, x-1$ (D) $x, 2x$
- 38) The area of a sector formed by two mutually perpendicular radii in $\odot(0,5\text{cm})$ is _____ cm^2 .
- (A) 25π (B) 4π
(C) $\frac{4}{25}\pi$ (D) $\frac{25}{4}\pi$
- 39) $\square ABCD$ is cyclic. If $m\angle B = 60$ then $m\angle D =$ _____.
- (A) 100 (B) 120
(C) 30 (D) 90
- 40) The sum of two numbers is 10 and their positive difference is 2. \therefore The bigger number is _____.
- (A) 4 (B) 8
(C) 2 (D) 6
- 41) If _____ then the roots of the quadratic equation are equal.
- (A) $D \neq 0$ (B) $D = 0$
(C) $D < 0$ (D) $D > 0$

- 42) In usual symbols, $Z-M = \underline{\hspace{2cm}}$ $(M - \bar{X})$.
- (A) 2 (B) 3
(C) 4 (D) 1
- 43) If $P(C) = \frac{2}{7}$ then $P(\bar{C}) = \underline{\hspace{2cm}}$.
- (A) $\frac{2}{7}$ (B) $\frac{5}{7}$
(C) 0 (D) 1
- 44) For $2x + 3y = 7$ and $3x + 2y = 3$, $x - y = \underline{\hspace{2cm}}$.
- (A) -4 (B) 4
(C) 10 (D) 21
- 45) Distance between the points $(2, -3)$ and $(5, a)$ is 5.
 $\therefore a = \underline{\hspace{2cm}}$.
- (A) 6 (B) -1
(C) 1 (D) 7

- 46) The modal class of the following frequency distribution is _____.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency	7	15	13	17	10

- (A) 10 - 20 (B) 20 - 30
(C) 30 - 40 (D) 40 - 50
- 47) A show piece, as shown in the figure, is made of a cube and a hemisphere. If the measure of total surface area of the cube is represented by A, the curved surface area of the hemisphere is represented by B and the area of the base of the hemisphere is represented by C, then _____ is true for the total surface area of the show - piece.



- (A) $A + B - C$ (B) $A + B + C$
(C) $B + C - A$ (D) $A + C - B$
- 48) The distance between A(-6, 7) and B(-1, -5) is _____.
- (A) 13 (B) 12
(C) 7 (D) $\sqrt{37}$

49) The discriminant (D) of the equation

$$P(x) = 5x - 6 + \frac{1}{x} = 0 \text{ is } \underline{\hspace{2cm}}.$$

(A) $\sqrt{56}$

(B) 4

(C) 16

(D) 56

50) In the formula of mean $\bar{X} = A + \frac{\sum fidi}{\sum fi}$, $di = \underline{\hspace{2cm}}$.

(A) $A - xi$

(B) $fi - A$

(C) $A - fi$

(D) $xi - A$

12 (E)

(MARCH, 2014)

(Part - B)

Time : 2 Hours]

[Maximum Marks : 50

Instructions :

- 1) Write in a clear handwriting.
- 2) There are four sections in Part - B of the question paper and total 1 to 17 questions are there.
- 3) All the questions are compulsory. Internal options are given.
- 4) The numbers at the right side represent the marks of the questions.
- 5) Draw figure wherever required. Retain all the lines of construction.
- 6) Start new section on new page.
- 7) Maintain Sequence.

SECTION - A

- Answer the following questions 1 to 8 by doing calculations in brief.
[Each question carries 2 marks].

- 1) Find the square root of $6 + 4\sqrt{2}$. [2]

- 2) Find the sum of the roots and the product of the roots of the quadratic polynomial $p(x) = 3x^2 + 7x + 4$, without finding the roots. [2]

- 3) Solve the pair of equations by cross multiplication method.
 $2x - 5y = 4, 3x - 8y = 5$ [2]

- 4) Add the following.
 $(-100) + (-92) + (-84) + \dots + 92$ [2]

OR

In the A.P. $a = 8, T_n = 33, S_n = 123$. Find d and n .

5) In $\triangle ABC$, $m \angle B = 90^\circ$, $\overline{BM} \perp \overline{AC}$, $M \in \overline{AC}$. If $AM - MC = 7$ and $AB^2 - BC^2 = 175$ then find AC . [2]

6) Find the distance between $A(a + b, b - a)$ and $B(a - b, a + b)$. [2]

7) If $A + B = 90^\circ$ then prove that $\sqrt{\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B}} = \sec A$ [2]

OR

Prove that : $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = \sec \theta - \tan \theta$.

8) The mean of a data is $\bar{X} = 35.8$. If $\sum f_i u_i = 4$, $\sum f_i = 50$ and $C = 10$ then find the assumed mean (A). [2]

SECTION - B

- Answer the following questions number 9 to 12 with calculations. [Each question is of 3 marks].

9) Solve the pair of linear equations :

$$\frac{3}{\sqrt{x}} + \frac{4}{\sqrt{y}} = 2, \quad \frac{5}{\sqrt{x}} + \frac{7}{\sqrt{y}} = \frac{41}{12}$$

$$(x > 0, y > 0)$$

[3]

10) The angles of elevation of the top of the tower from two points at distance a and b from the base and in the same straight line with it are complementary. Prove that the height of the tower is \sqrt{ab} . [3]

- 11) There are 5 red, 2 yellow and 3 white roses in a flowerpot. Select one rose from it at random. What is the probability that the selected rose is (1) red (2) yellow (3) not white colour. [3]

- 12) Find the mean of the following frequency distribution. [3]

Class	0-50	50-100	100-150	150-200	200-250	250-300	300-350
Frequency	10	15	30	20	15	8	2

OR

Find the median of the following frequency distribution.

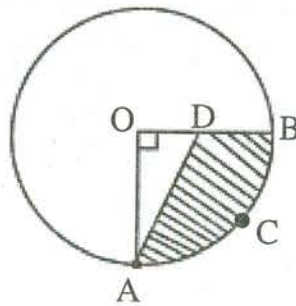
Class	0-100	100-200	200-300	300-400	400-500	500-600
Frequency	64	62	84	72	66	52

SECTION - C

- Answer the following questions from No. 13 to 15 as required, with the calculations. [Each question is of 4 marks].

- 13) Prove that A tangent to a circle is perpendicular to the radius drawn from the point of contact. [4]

- 14) \overline{OA} and \overline{OB} are two mutually perpendicular radii of a circle with radius 10.5 cm. $D \in \overline{OB}$ and $OD = 6$ cm. Find the area of the shaded region in the figure given below. [4]



- 15) The cost of painting the surface of a sphere is ₹ 1526 at the rate of ₹ 6 per m^2 . Find the radius of the sphere ($\pi = 3.14$). [4]

OR

A well of diameter 7m and 30m deep is dug and the soil obtained by digging the well is evenly spread out to form a platform $30\text{ m} \times 10\text{ m}$. Find the height of the platform.

SECTION - D

- Answer the following questions No. 16 to 17 [Each of 5 marks].

- 16) $\odot (P, 4\text{ cm})$ is given. Draw a pair of tangents through A, which is in the exterior of $\odot (P, 4\text{ cm})$ such that the measure of the angle between the tangents is 60° . Write the construction steps. [5]

- 17) Prove that The areas of two similar acute triangles are proportional to the squares of the corresponding sides. [5]

OR

In $\triangle ABC$, $m\angle B = 90^\circ$. Prove that $AC^2 = AB^2 + BC^2$.

