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

Sl.No.

12 (E)

(MARCH, 2019)

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

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

પ્રશ્ન પેપરનો સેટ નંબર જેની સામેનું વર્તુળ OMR શીટમાં ઘટ્ટ કરવાનું રહે છે.
Set No. of Question Paper, circle against which is to be darken in OMR sheet.
01

(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.**

Rough Work

1) Product of four consecutive positive integers is divisible by _____.

(A) 32

(B) 24

(C) 48

(D) 16

Rough Work

2) The decimal expansion of $\frac{2517}{6250}$ will terminate after _____ digits.

(A) 3 (B) 5

(C) 4 (D) 6

3) The zeros of a quadratic polynomial _____ are 4 and 3.

(A) $x^2 + 7x - 12$

(B) $x^2 - 7x + 12$

(C) $x^2 + 7x + 12$

(D) $x^2 - 7x - 12$

4) When $p(x) = 40x^2 + 11x - 63$ is divided by $x + 2$ then _____ is obtained as remainder.

(A) 245 (B) 85

(C) 75 (D) –75

5) If α, β and γ are the zeros of a cubic polynomial $p(x) = ax^3 + bx^2 + cx + d$, $a \neq 0$ then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} =$ _____.

(A) $-\frac{b}{d}$

(B) $\frac{c}{d}$

(C) $-\frac{c}{d}$

(D) $-\frac{c}{a}$

Rough Work

6) If $3x + 2y = 7$ and $2x + 3y = 3$, then $x - y =$ _____.

(A) 4

(B) –4

(C) 2

(D) –2

7) If, in a two digit number, the digit at unit place is x and the digit at tens place is 4, then the two digit number is _____.

(A) $40 + x$

(B) $4x$

(C) $40x + 4$

(D) $10x + 4$

8) _____ is a solution of the linear equation of two variable $2x - y = 5$.

(A) (3, 1)

(B) (–3, –1)

(C) (–3, 1)

(D) (3, –1)

9) The graph of linear polynomial $p(x) = 5x + 3, x \in R$ is _____.

(A) Ray

(B) Line

(C) Parabola open downward

(D) Parabola open upward

Rough Work

10) The solution set of the given pair of linear equation $5x - 5y = -5$ and $\frac{3x}{2} - \frac{3y}{2} + \frac{3}{2} = 0$ is _____.

(A) $\left(\frac{5}{2}, 0\right)$

(B) empty set

(C) infinite set

(D) $\left(0, -\frac{3}{2}\right)$

11) If one root of quadratic equation $Kx^2 - 4\sqrt{5}x + 5 = 0$ is $\sqrt{5}$, then K = _____.

(A) 3

(B) –3

(C) $-\sqrt{5}$

(D) 5

12) If _____, then the quadratic equation has no real roots.

(A) $D = 0$

(B) $D > 0$

(C) $D < 0$

(D) $D = 1$

Rough Work

13) Discriminant D = _____, for the quadratic equation $25x^2 - 10x + 1 = 0$.

(A) 0

(B) 1

(C) –10

(D) 25

14) The formula to find the root of a quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$, by method of completing square was given by mathematician _____.

(A) Pythagoras

(B) Sridhar Acharya

(C) Hilbert

(D) Uclid

15) For an A.P. if $T_3 = 8$ and $T_7 = 24$, then T_{10} = _____.

(A) –4

(B) 28

(C) 32

(D) 36

16) If $x + 2$, $3x - 1$, $4x + 1$ are the three consecutive terms of an A.P. then x = _____.

(A) 1

(B) $\frac{1}{5}$

(C) 5

(D) –1

Rough Work

17) If $5 + 7 + 9 + \ldots\ldots n = 437$ then $n =$ _____.

(A) 19

(B) 20

(C) 21

(D) 22

18) – 4 and 3 are the roots of variable x of a quadratic equation _____.

(A) $x^2 - x - 12 = 0$

(B) $x^2 + x - 12 = 0$

(C) $x^2 - 7x - 12 = 0$

(D) $x^2 + 7x - 12 = 0$

19) In ΔABC and ΔDEF, $ABC \leftrightarrow DEF$ is a similarity. If $AB + BC = 10$ and $DE + EF = 12$, $AC = 6$, then $DF =$ _____.

(A) 6

(B) 5

(C) 16

(D) 7.2

20) In ΔPQR, the bisector of $\angle P$ intersects $\overrightarrow{QR}$ in M. If $PQ = 10$, $PR = 12$, $QM = 8$ then $QR =$ _____.

(A) 9.6

(B) 17.6

(C) 10

(D) 18

Rough Work

21) In ΔABC, $A-M-B$, $A-N-C$, $\overline{MN} \| \overline{BC}$. If $AM : AB = 2 : 3$ and $AC = 15$, then $NC =$ _____.

(A) 3

(B) 6

(C) 9

(D) 5

22) In ΔABC, $m\angle B = 90^\circ$ and $\overline{BM}$ is altitude. If $AB = 4\sqrt{6}$, $AM = 8$ then $AC =$ _____.

(A) 4

(B) 12

(C) 3

(D) 11

23) $\overline{XM}$ is a median in ΔXYZ, $XY^2 + XZ^2 = 328$ and $XM = 8$ then $YZ =$ _____.

(A) 10

(B) 22

(C) 20

(D) 5

24) The perimeter of a square ABCD is 32. Then the measure of its diagonal $\overline{AC}$ = _____.

(A) $8\sqrt{2}$

(B) $2\sqrt{8}$

(C) $\sqrt{8}$

(D) $\frac{\sqrt{8}}{2}$

Rough Work

25) If A(3, 5) and B(8, 9) are given points, then _____ is the mid point of $\overline{AB}$.

(A) (4, 7)

(B) (3, 9)

(C) (11, 14)

(D) $\left(\frac{11}{2}, 7\right)$

26) If the distance between the points (2, 3) and (a, 0) is 3 then a = _____.

(A) 2 (B) 3

(C) 5 (D) 1

27) A(0, 0); B(2, 0); C(0, –2) are the vertices of a _____ triangle.

(A) Equilateral

(B) Obtuse angled

(C) Right angled isosceles

(D) Acute angled

28) A(2, 4), B(3, 5), C(4, 3) are the vertices of ΔABC. Hence the coordinate of centroid of the triangle is _____.

(A) (4, 3) (B) (3, 4)

(C) (9, 12) (D) (4.5, 6)

Rough Work

29) If $5\sin\theta = 4\cos\theta$ then $\tan\theta =$ _____.

(A) $\frac{5}{4}$ (B) 5

(C) 4 (D) $\frac{4}{5}$

30) $(1 + \tan^2\theta)(1 - \sin^2\theta) =$ _____.

(A) 1 (B) 0

(C) -1 (D) 2

31) For ΔABC, $\sin\left(\frac{B+C}{2}\right) =$ _____.

(A) $\cos A$

(B) $\sin A$

(C) $\cos\frac{A}{2}$

(D) $\sin\frac{A}{2}$

32) If $\tan 7\theta \cdot \tan 3\theta = 1$ then $\theta =$ _____.

(A) 0 (B) 9

(C) 10 (D) 18

Rough Work

33) As observed from the top of the lighthouse, the angle of depression of the two ships A and B have measures 25 and 40 respectively. Then from the lighthouse _____.

(A) A and B are at equal distance

(B) The distance of B is more than A

(C) The distance of A is more than B

(D) The distance of B is twice the distance of A

34) 10m long ladder $\overline{AC}$ leans on the wall such that its lower end (C) remains 8 m away from the base of the wall, then $\sin C =$ _____.

(A) $\frac{3}{4}$ (B) $\frac{4}{3}$

(C) $\frac{5}{3}$ (D) $\frac{3}{5}$

35) When the length of the shadow of a tree becomes equal to the height of the tree, then the angle of elevation of the Sun becomes _____.

(A) 90° (B) 45°

(C) 30° (D) 60°

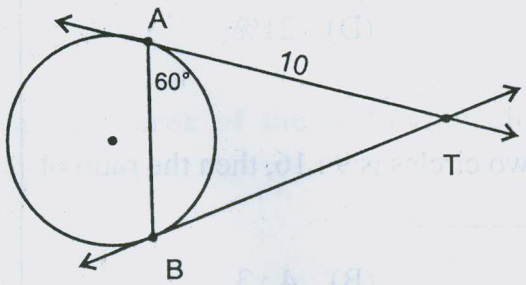
36) If all the four vertices of a quadrilateral ABCD lie on the circle and $m\angle D = 60°$ then $m\angle B =$ _____.

(A) 30° (B) 90°

(C) 120° (D) 100°

Rough Work

37) In the following figure, $\overleftrightarrow{TA}$ and $\overleftrightarrow{TB}$ are the tangents drawn from the exterior point T to the circle. If TA = 10 and $m\angle TAB = 60^\circ$ then the length of the chord $\overline{AB}$ is _____.



(A) 10 (B) 20

(C) 5 (D) 8

38) In a $\odot(O, r)$ if the angle subtended by the minor arc at the centre of the circle is θ, then the length of the minor arc (l) is _____.

(A) $\frac{\pi^2\theta}{90}$

(B) $\frac{\pi r\theta}{360}$

(C) $\frac{\pi r^2\theta}{360}$

(D) $\frac{\pi r\theta}{180}$

39) The length of an arc of a circle having radius 15 cm is 20 cm. Hence its area of minor sector is _____ cm^2.

(A) 150 (B) 300

(C) 200 (D) 125

Rough Work

40) If the radius of the circle is increased by 20% then the corresponding increase in the area of the circle is _____. ($\pi = 3.14$).

(A) 20%
(B) 44%
(C) 40%
(D) 21%

41) The ratio of the area of two circles is 9 : 16, then the ratio of their circumference _____.

(A) 9 : 16
(B) 4 : 3
(C) 3 : 4
(D) 16 : 9

42) The formula to find volume of a cone is _____.

(A) $\frac{4}{3}\pi r^3$
(B) $\pi r^2 h$
(C) $\frac{2}{3}\pi r^3$
(D) $\frac{1}{3}\pi r^2 h$

43) The formula to find curved surface area of a one rupee coin is _____.

(A) $2\pi rh$
(B) $\pi r^2 h$
(C) $\pi r(h + r)$
(D) $2\pi r(h + r)$

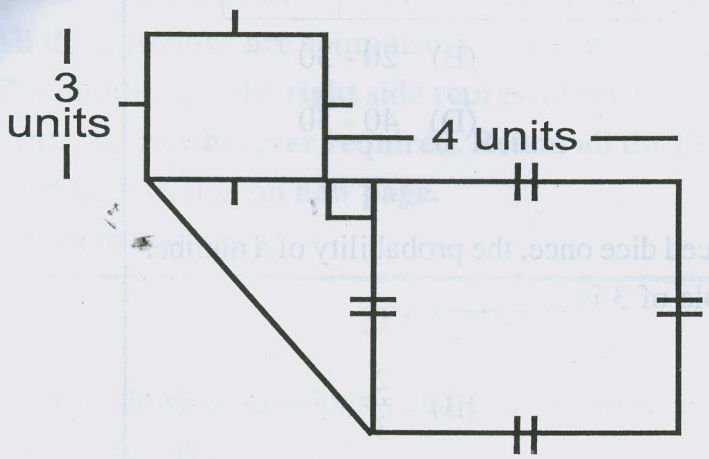
Rough Work

44) The volume of a cylinder is 1408 cm^3 and its height is 7 cm. Hence its radius is _____ cm.

(A) 5 (B) 8

(C) 12 (D) 10

45) Total surface area of the following closed figure is _____ $units^2$.



(A) 25 (B) 45

(C) 31 (D) 40

46) For some data, Z = 20 and M = 30 then $\overline{X}$ = _____.

(A) 25 (B) 35

(C) 37.5 (D) 32.5

Rough Work

47) For $M+\bar{X}=22$ and $M-\bar{X}=2$, we have $Z =$ _____.

(A) 16 (B) 14

(C) 10 (D) 12

48) The modal class of the frequency distribution given below 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

49) On tossing a balanced dice once, the probability of a number obtained as multiple of 3 is _____.

(A) $\frac{1}{6}$ (B) $\frac{2}{3}$

(C) $\frac{1}{3}$ (D) $\frac{1}{5}$

50) If $P(C) = \frac{3}{5}$ then $P(\bar{C})$ = _____.

(A) $\frac{2}{5}$ (B) $\frac{3}{5}$

(C) $\frac{1}{5}$ (D) 1

12 (E)

(MARCH, 2019)

(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 number 1 to 8 with calculations in brief. [Each question carries 2 marks].**

1) Find the square root : $14 + 6\sqrt{5}$. [2]

2) Find zeros of $p(x) = x^2 + 9x + 14$. Also find the sum and product of the zeros. [2]

3) Find solution set for the given pair of equations $x + y = 7$; $3x - 2y = 11$. [2]

4) For an A.P. 1, 1.5, 2, 2.5, ... find the sum of first 16 terms. [2]

OR

4) Find 10^{th} term of an A.P. 115, 100, 85, 70, ... [2]

5) In ΔABC, $m\angle B = 90^\circ$ and $\overline{BM}$ is altitude of $\overline{AC}$. If $BM = 2\sqrt{30}$, $MC = 6$, then find AC. **[2]**

6) In ΔABC, $m\angle B = 90^\circ$, A(2, 3); B(4, 5) and C(a, 2). Then find a. **[2]**

7) Prove that $\frac{\sin 70}{\cos 20} + \frac{\text{cosec}20}{\sec 70} - 2\cos 70 - \text{cosec}20 = 0$. **[2]**

OR

7) Prove that $(\sin\theta + \text{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$. **[2]**

8) For certain data, if $\bar{X} = 35.8$, C = 10; $\sum f_i u_i = 4$, $\sum f_i = 50$ then find assumed mean A. **[2]**

SECTION - B

■ **Answer the following questions number 9 to 12 with calculations. [Each question carries 3 marks].**

9) The sum and product of two numbers are 27 and 182 resp. Find the two numbers. **[3]**

10) The angle of elevation of the top of a tower as observed from the foot of a temple has measure 60. The angle of elevation of the top of the temple as observed from the foot of the tower has measure 30. **[3]**

If the temple is 50 m high, find the height of the tower.

11) Find the median of the following data : **[3]**

Class	4-8	8-12	12-16	16-20	20-24	24-28
Frequency	9	16	12	7	15	1

OR

11) Find the mode of the following data **[3]**

Class	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	12	17	28	23	7	8	5

12) A box contains 8 black, 7 white and 6 yellow balls in it. One ball is taken out from the box at random. What is the probability that the ball taken out is : **[3]**

a) Yellow?

b) Not a black?

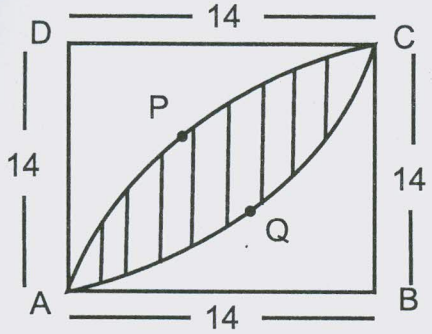
c) White?

SECTION - C

Answer the following questions number 13 to 15 with calculations.
[Each question is of 4 marks].

13) A circle touches all the sides of □ ABCD. If $\overline{AB}$ is the largest side then prove that $\overline{CD}$ is the smallest side. **[4]**

14) What will be the cost of making design in the coloured region at the rate of ₹ 25 per cm^2? **[4]**



15) A metallic sphere of radius 5.6 cm is melted to make a cylinder having radius 6 cm. Find the height of the cylinder. [4]

OR

15) A cylindrical tank with hemispherical ends having radius 0.42m and total height 3.84m. Find Total surface area of the closed tank. [4]

SECTION - D

■ **Answer the following questions no. 16 to 17. [Each question carries 5 marks].**

16) Draw $\odot(O, 3\,cm)$. Construct a pair of tangents from point P at a distance of 7 cm from the centre O. Also write points of constructions. [5]

17) State and prove Pythagoras theorem. [5]

OR

17) If a line parallel to one of the sides of a triangle intersects the other two sides in distinct points, then the segments of the other two sides in one half plane are proportional to the segments in the other half planes. [5]