

This Question Paper contains 20 printed pages.

(Part - A & Part - B)

Sl.No. 0101735

12 (E)

(MARCH, 2019)
(NCERT OTHERS)

પ્રશ્ન પેપરનો સેટ નંબર બેની સામેનું વર્તુળ OMR શીટમાં ઘટ્ટ કરવાનું રહે છે.

Set No. of Question Paper, circle against which is to be darken in OMR sheet.

01

Question Paper Reading 15 Minutes

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 multiple choice type questions in Part - A and all of them 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) Separate OMR sheet is given for answering these questions. The answer of each question is to be given by darkening the circle against options (A), (B), (C), (D) . Circle ● representing the most correct answer is to be darken with ball-pen.
- 5) Set No. of Question Paper printed on the upper-most right side of the Question Paper, the same is to be written in the space provided in the OMR sheet and circle depicting the correct set No. is to be darken with ball pen.

1) If a, b and c are prime numbers then their HCF is _____.

(A) $a + b + c$

(B) abc

(C) 1

(D) 3

2) The decimal expansion of $\frac{2517}{6250}$ terminates after _____ decimal points.

(A) 4

(B) 5

(C) 3

(D) 6

Rough Work

3) Applying Euclid's lemma to c and d , we find whole numbers, q and r such that $c = dq + r$, where _____.

(A) $0 \leq r < d$

(B) $0 < r \leq d$

(C) $0 \leq r \leq d$

(D) $0 < r < d$

4) The graph of the polynomial $p(x) = x^2 + x + 1$ intersects X-axis at _____ point/points.

(A) 1

(B) 2

(C) 3

(D) none of these

5) Which of the following is not a zero of the polynomial $p(x) = x^3 - x$?

(A) 0

(B) 1

(C) -1

(D) 3

6) α and β are the zeros of the polynomial $p(x) = ax^2 + bx + c$,

$a \neq 0$ such that $a, b, c \in \mathbb{R}$, then, $\frac{1}{\alpha} + \frac{1}{\beta} =$ _____.

(A) $\frac{c}{a}$

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

(C) $\frac{b}{c}$

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

7) The zero of the standard form of linear polynomial in one variable is _____.

(A) $\frac{a}{b}$

(B) $\frac{b}{a}$

(C) $-\frac{a}{b}$

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

8) The pair of equations $3x - 2y = 5$ and $\frac{x}{2} - \frac{y}{3} = 1$ has _____ solution/solutions.

(A) no

(B) many

(C) unique

(D) two

9) If the pair of equations $ax + 2y = 7$ and $2x + 3y = 8$ have unique solution, then $a \neq$ _____.

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

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

(C) $\frac{4}{3}$

(D) $-\frac{4}{3}$

10) After 4 years from now the sum of ages of 4 friends will be 90 years, then before 3 years the sum of their ages was _____ years.

(A) 74

(B) 30

(C) 62

(D) 83

11) If one root of the equation $5x^2 - kx - 2 = 0$ is -1 then the other root is _____.

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

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

(C) $-\frac{2}{5}$

(D) $-\frac{5}{2}$

12) If the value of discriminant of a quadratic equation is 41, then the nature (type) of roots is _____.

(A) distinct and rational

(B) distinct and irrational

(C) identical and rational

(D) (A) and (B) both

13) If the roots of the equation $3x^2 - 2x - k = 0$ are repeated, then $k =$ _____.

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

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

(C) $\frac{2}{3}$

(D) $-\frac{1}{3}$

14) For an arithmetic progression if $S_m = S_n$ then $S_{m+n} =$ _____.

(A) -1 (B) 1 (C) 0 (D) $m + n$

- 15) If $4k + 1$, 15 and $12k - 3$ the consecutive terms of an A.P., then $k =$ _____.
- (A) -2 (B) 15
(C) 4 (D) 2
- 16) For an arithmetic progression, $S_n - 2S_{n-1} + S_{n-2} =$ _____ ($n > 2$).
- (A) d (B) $2d$
(C) a (D) $a + d$
- 17) In $\triangle ABC$, $A - P - B$, $A - Q - C$ and $PQ \parallel BC$. If $PQ = 5$, $AP = 4$, $AB = 12$ then $BC =$ _____.
- (A) 9.6 (B) 5
(C) 15 (D) 20
- 18) In $\triangle ABC$, $m\angle A = 90$ and $AB = AC$, then $BC : AB =$ _____.
- (A) $1 : 2$ (B) $2 : 1$
(C) $1 : \sqrt{2}$ (D) $\sqrt{2} : 1$
- 19) Sides of two similar triangles are in the ratio $4 : 9$. Areas of these triangles are in the ratio _____.
- (A) $2 : 3$ (B) $4 : 9$
(C) $81 : 16$ (D) $16 : 81$
- 20) The distance of the point $(-4, 5)$ from the origin is _____ units.
- (A) 41 (B) $\sqrt{41}$
(C) 1 (D) 9

- 21) The co-ordinates of the foot of perpendicular drawn from $P(5, -1)$ on X-axis are _____.
- (A) $(\frac{5}{2}, -\frac{1}{2})$ (B) $(0, 5)$
 (C) $(5, 0)$ (D) $(-5, 0)$
- 22) If $P(-1, 0)$ and $Q(-4, 2)$ are the points of trisection of line-segment joining the points $A(2, -2)$ and $B(k, 4)$ then $k =$ _____.
- (A) -4 (B) 6
 (C) 7 (D) -7
- 23) If $A(1, 7)$, $B(4, 2)$, $C(-1, -1)$ and $D(-4, 4)$ are the vertices of a quadrilateral, then $\square ABCD$ is _____.
- (A) parallelogram (B) rhombus
 (C) rectangle (D) all (A), (B) & (C)
- 24) For an acute angle θ , $\cot^2\theta - \operatorname{cosec}^2\theta =$ _____.
- (A) 1 (B) -1
 (C) 0 (D) $\sin^2\theta$
- 25) If $\sin\theta + \cos\theta = \sqrt{2} \cos\theta$ then $\cos\theta - \sin\theta =$ _____.
- (A) $\sqrt{2} \tan\theta$ (B) $\sqrt{2} \operatorname{cosec}\theta$
 (C) $\sqrt{2} \cos\theta$ (D) $\sqrt{2} \sin\theta$

- 26) If $7\cos^2\theta + 3\sin^2\theta = 4$, then $\cot\theta =$ _____.
- (A) 7 (B) $\sqrt{3}$
(C) $\frac{7}{3}$ (D) $\frac{1}{\sqrt{3}}$
- 27) If $\cot 5\theta \cdot \cot 4\theta = 1$, then $\theta =$ _____.
- (A) 9 (B) 10
(C) 7 (D) 3
- 28) If angle of depression of a ship from a 30 m high tower is 60° , then the distance of the ship from the tower is _____ m.
- (A) $30\sqrt{3}$ (B) $10\sqrt{3}$
(C) $20\sqrt{3}$ (D) $5\sqrt{3}$
- 29) If the ratio of the length of shadow of a tower and its height is $\sqrt{3}:1$, then the angle of elevation of the Sun is _____.
- (A) 60 (B) 45
(C) 30 (D) 90

30) If Akshay walks $2a$ m on a slope, making an angle of measure 30° with the ground, he will reach at the height _____ m.

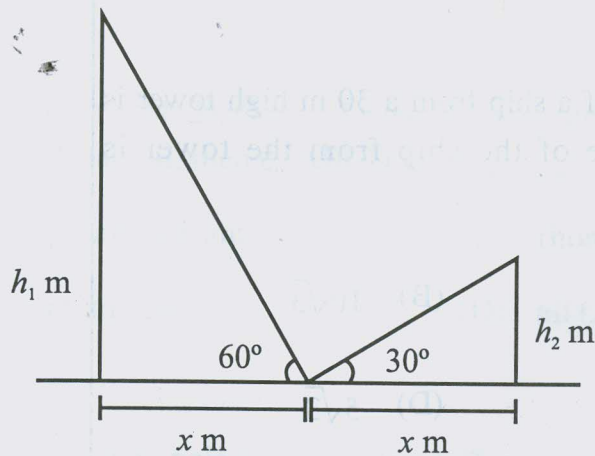
(A) $\frac{\sqrt{3}}{2}a$

(B) a

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

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

31) Two towers of height h_1 and h_2 subtend angles 60° and 30° respectively at the mid point of the line joining their feet. Which of these is the same as $h_1 : h_2$?



(A) 1 : 2

(B) 1 : 3

(C) 2 : 1

(D) 3 : 1

32) If two circles do not intersect each other then _____ common tangents can be drawn to both the circles.

(A) 2

(B) 3

(C) 4

(D) 1

33) Which of the following is not true for a circle lying in a plane?

- (i) A circle divides a plane in 3 set points.
- (ii) All the points of a chord of a circle lie in the interior of a circle.
- (iii) All the points of a tangent of a circle lie in the exterior of circle.
- (iv) The longest chord of a circle is the diameter of the circle.

(A) (i)

(B) (iv)

(C) (i) and (iv)

(D) (ii) and (iii)

34) A line intersecting a circle at one and only one point is called _____ of the circle.

(A) a chord

(B) a secant

(C) a tangent

(D) can not be said

35) Which of the following is not true?

- (i) Area of minor sector = $\frac{\pi r^2 \theta}{360}$
 - (ii) Total surface area of a 10 rupees coin is πr^2 .
 - (iii) Total surface area of a cube is $8l^2$.
 - (iv) Volume of a cylinder is 3 times the volume of a cone.
- (A) (i)
 - (B) (i) and (iv) both
 - (C) (ii) and (iii) both
 - (D) (iv)

36) Volume of a frustum of a cone is given by _____.

- (A) $\frac{1}{3} \pi h (r_1^2 + r_2^2 + 2r_1 r_2)$
- (B) $\frac{1}{3} \pi h (r_1^2 - r_2^2 - 2r_1 r_2)$
- (C) $\frac{1}{3} \pi h (r_1^2 - r_2^2 + r_1 r_2)$
- (D) $\frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 r_2)$

37) The ratio of radii of two cones with same height is 2 : 3, then the ratio of their volumes is _____.

- (A) 4 : 9
- (B) 9 : 4
- (C) 8 : 27
- (D) 4 : 6

38) If radius of a sphere is doubled then its volume becomes _____ of the original volume.

- (A) double
- (B) 4 times
- (C) 8 times
- (D) 16 times

39) Area of a circle increases by _____ if its radius is increased by 10%.

- (A) 10%
- (B) 19%
- (C) 20%
- (D) 21%

40) The circumference of a circle is 44, then the length of a side of a square inscribed in this circle is _____.

- (A) $\frac{7\sqrt{2}}{\pi}$
- (B) $14\sqrt{2}$
- (C) $7\sqrt{2}$
- (D) $\frac{44}{\pi}$

- 41) The length of a minute hand of a clock is 15 cm. The minute hand will sweep _____ cm^2 area in 20 minutes. (Take $\pi = 3.14$)
- (A) 471
(B) 141.3
(C) 235.5
(D) 706.5
- 42) If the area of a circle and its circumference are numerically equal, then the radius of circle is _____.
- (A) 1
(B) 2
(C) π
(D) $\frac{\pi}{2}$
- 43) The probability of scoring 73 marks in mathematics out of 100 in an exam is _____.
- (A) $\frac{73}{100}$
(B) $\frac{1}{100}$
(C) $\frac{1}{101}$
(D) 1

Rough Work

44) One card is drawn from a well shuffled deck of 52 cards. The probability of getting a king of red colour is _____.

(A) $\frac{1}{4}$

(B) $\frac{1}{26}$

(C) $\frac{1}{52}$

(D) $\frac{1}{13}$

45) For an event A, of a random experiment, the probability of event A i.e. $P(A)$ can not be _____.

(A) 0

(B) 1

(C) 0.5

(D) $\frac{5}{2}$

46) The sum of the probabilities of all the elementary events of an experiment is _____.

(A) 0

(B) 1

(C) 2

(D) 100

47) The mode of the following data is _____.

x_i	5	10	15	20	25	30	35	40	45	50
f_i	2	5	8	10	12	15	6	4	2	1

- (A) 50
- (B) 40
- (C) 30
- (D) 25

48) For a data if mode = 52, $h = 15$, $f_0 = 3$, $f_1 = 7$, $f_2 = 6$ then lower boundary of the modal class is _____.

- (A) 40
- (B) 45
- (C) 50
- (D) 42

49) For a data if $\bar{X} - Z = 3$ and $\bar{X} + Z = 45$ then median of the data is _____. Where \bar{X} is mean and Z is mode of the data.

- (A) 24
- (B) 22
- (C) 26
- (D) 23

50) The mode of first 50 natural numbers is _____.

- (A) 50
- (B) 0
- (C) 25
- (D) does not exist

12 (E)

(MARCH, 2019)
(NCERT OTHERS)

(Part - B)**Time : 2 Hours]****[Maximum Marks : 50****Instructions :**

- 1) Write in a clear hand writing.
 - 2) There are four sections in Part - B of the question paper and total 1 to 17 questions are there.
 - 3) All questions are compulsory. Internal options are given.
 - 4) The numbers at the right side represents the marks of the questions.
 - 5) New section may be started on a new page of answer book.
 - 6) It is advisable to maintain sequence.
-

SECTION - A**■ Questions 1 to 8, each carries 2 marks.**

- 1) Use Euclid's division algorithm to find HCF of 4052 and 12576. [2]
- 2) Find the zeros of the polynomial $p(x) = 27x^3 - 8$. [2]
- 3) Write only the pair of linear equations for the given statement : "Half the perimeter of garden is 36m and the length of garden is 4m more than its width." [2]
- 4) Sunita's height is 100 cm. She is walking away from the base of a lamp post at a speed of 1.3 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds. [2]

- 5) If the points A(9, 4), B(k, 3), C(6, 1) and D(8, 2) are the vertices of a parallelogram, taken in order, find the value of k . [2]

- 6) Evaluate : [2]
 $\sin 30^\circ + \cos 30^\circ + \tan 30^\circ + \cot 30^\circ + \sec 30^\circ + \operatorname{cosec} 30^\circ$.

- 7) For ΔPQR , prove that $\tan\left(\frac{Q+R}{2}\right) = \cot\frac{P}{2}$. [2]

OR

- 7) Taking any measure of an acute angle for angle A i.e. $0 < A < 90$, prove that, $\sin 2A = 2\sin A \cdot \cos A$. [2]

- 8) If two balanced dice are thrown simultaneously, write the sample space and also find the probability that the sum of two numbers appearing on the top of the dice is less than or equal to 12. [2]

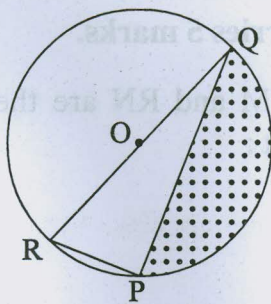
SECTION - B

■ Questions 9 to 12, each carries 3 marks.

- 9) Find the sum of first 40 positive integers divisible by 6. [3]

- 10) PQ is a chord of length 8 cm of a circle with radius 5 cm. The tangents at P and Q intersect at point T. Find the length of TP. [3]

- 11) Find the area of the shaded region in the given figure, if $PQ = 24$ cm, $PR = 7$ cm and O is the centre of the circle. [3]



- 12) Suresh wants to empty a hemispherical tank using a pipe at the rate of $3\frac{4}{7}$ litres per second. How much time will Suresh take to empty half the tank, if the diameter of the tank is 3 m? (Take $\pi = \frac{22}{7}$). [3]

SECTION - C

■ Question number 13 to 15, each carries 4 marks.

- 13) A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream. [4]
- 14) As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30° and 45° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. (Take $\sqrt{3} = 1.73$). [4]
- 15) If the median of the distribution given below is 28.5, find the values of x and y . [4]

Class interval	Frequency
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
Total	60

SECTION - D■ **Questions 16 and 17, each carries 5 marks.**

16) In $\triangle ABC$ and $\triangle PQR$, CM and RN are the medians, respectively. If $\triangle ABC \sim \triangle PQR$, prove that : [5]

a) $\triangle AMC \sim \triangle PNR$ and

b)
$$\frac{CM}{RN} = \frac{AB}{PQ}$$

OR

16) Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. [5]

17) Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle. [5]
Write the steps of construction also.



Class interval	Frequency
0 - 10	2
10 - 20	7
20 - 30	20
30 - 40	15
40 - 50	10
50 - 60	5
Total	60