(Part - A)  

Time : 1 Hour  

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) 900 can be expressed as product of prime numbers as ________.

   (A) $3^2 \times 2 \times 5^2$  
   (B) $2^2 \times 3^2 \times 5^2$
   (C) $3^3 \times 2^2 \times 5$  
   (D) $5^3 \times 2 \times 3$

2) L.C.M. of 1200 and 1400 = ________.

   (A) 6000  
   (B) 4200  
   (C) 8400  
   (D) 2100
3) H.C.F. \((a, b) = 12\) then their L.C.M. ≠ ________.
   (A) 24  (B) 36  (C) 48  (D) 40

4) Product of zeros of \(2x^2 - 7x + k\) is \(-4\) :: \(k = \) ________.
   (A) \(\frac{7}{2}\)  (B) \(\frac{2}{7}\)
   (C) \(-8\)  (D) 8

5) Graph of \(3x - 2 - x^2\) intersect X axis in ________ points.
   (A) 2  (B) 0
   (C) 3  (D) 1

6) Zeros of \(-4u^2 + 8u\) are ________.
   (A) \(2, -8\)  (B) \(-8, 2\)
   (C) \(0, -2\)  (D) \(0, 2\)

7) If sum of zeros and product of zeros are \(-\frac{1}{3}\) and \(-\frac{1}{2}\)
   respectively of a polynomial \(p(x)\) then \(p(x) = \) ________.
   (A) \(k(3x^2 - 2x + 1)\)
   (B) \(k(6x^2 + 2x - 3)\)
   (C) \(k(6x^2 - 2x + 3)\)
   (D) \(k(3x^2 + 2x - 1)\)

12 (E) /01 (NCERT OTHERS) 2
8) For a Linear Equation \( \frac{3x}{2} + \frac{y}{5} = -\frac{1}{10} \)

\[ y = \underline{\text{________.}} \]

(A) \( \frac{10x - 1}{5} \)

(B) \( \frac{15x - 1}{2} \)

(C) \( \frac{2x - 1}{10} \)

(D) \( \frac{3x - 1}{10} \)

9) For two pairs of Linear Equation \( 5x - 4y = 1, \, 3x + ky = 4 \) for their unique solution. \( k \neq \underline{\text{______}} \).

(A) \( \frac{12}{5} \)

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

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

(D) \( \frac{12}{5} \)

10) If \( 3x - 4y = 6, \, \frac{3}{2}x - 2y = 3 \) these pair of Equations have _____ solution.

(A) Infinite

(B) Finite

(C) Unique

(D) No solution
11) For a Quadratic Equation \( ax^2 + bx + c = 0 \) if value of
\( b^2 - 4ac < 0 \) then its roots are ________.

(A) Real
(B) Non-Real
(C) Positive integers
(D) Negative integers

12) For a Quadratic Equation \( 9x^2 - kx + 1 = 0 \) has identical roots
\( \therefore k = \) ________.

(A) \( \pm \sqrt{6} \)
(B) \( \pm 6 \)
(C) \( \pm 9 \)
(D) \( \pm \sqrt{3} \)

13) Discriminant of Equation \( 3x^2 - 2x + \frac{1}{3} = 0 \) is ________.

(A) 1
(B) 2
(C) 3
(D) 0

14) \( 2k + 1, 13, 5k - 3 \) are the consecutive terms of A.P. then
\( k = \) ________.

(A) 4
(B) 3
(C) 1
(D) 2
15) For an A.P. if $T_7 = 4$, $T_4 = 7$

$\therefore T_{10} = \boxed{\_\_\_\_\_\_}$.

(A) 2  \hspace{1cm} (B) 5  \\
(C) 7  \hspace{1cm} (D) 1

16) For an A.P. if $a = 2$, $d = 4$

$\therefore S_{20} = \boxed{\_\_\_\_\_\_}$.

(A) 100  \hspace{1cm} (B) 500  \\
(C) 800  \hspace{1cm} (D) 300

17) A line $l$ intersect $\overline{AB} \& \overline{AC}$ in two distinct points $D \& E$ respectively. If line $l$ is parallel to $\overline{BC}$ and $AD = 3$, $BD = 0.75$, $AE = 1.2$

$\therefore AC = \boxed{\_\_\_\_\_\_}$.

(A) 1.5  \hspace{1cm} (B) 1.2  \\
(C) 1.6  \hspace{1cm} (D) 1.9

18) Diagonals of a trapezium $\Box ABCD$ where $\overline{AB} \parallel \overline{CD}$ intersect each other at point $O$ if $AB = 2CD$

$\therefore Ar (AOB) : Ar (COD) = \boxed{\_\_\_\_\_\_}$.

(A) 1 : 2  \hspace{1cm} (B) 2 : 1  \\
(C) 4 : 1  \hspace{1cm} (D) 1 : 4
19) Which of the following is not a triplet of a right angled triangle
(A) 15, 8, 17
(B) 12, 5, 13
(C) 24, 7, 25
(D) 20, 9, 21

20) Area of $\triangle ABC$ where A (5, 2), B (4, 7), C (7, -4) is ________.
(A) 6 (B) 2
(C) 8 (D) 10

21) Distance of point $A(a+b, a-b)$ from origin is ________.
(A) $\sqrt{a^2 + b^2}$
(B) $2\sqrt{a^2 + b^2}$
(C) $\sqrt{2(a^2 + b^2)}$
(D) $\sqrt{2(a^2 - b^2)}$

22) In $\odot (O, r)$, $\overline{AB}$ is diameter A (-5, 4), B (5, -4) then coordinates of O are ________.
(A) (1, 1)
(B) (0, 0)
(C) (2, 1)
(D) (-2, 1)
23) Coordinates of foot of perpendicular from point P (4, -5) on y-axis are ________.

(A) (0, 0)
(B) (-5, 4)
(C) (0, -5)
(D) (4, -5)

24) \[ \frac{5 \cos^2 60 + 4 \sec^2 30 - \tan^2 45}{\sin^2 60 + \cos^2 60} = \] ________.

(A) \( \frac{59}{12} \)
(B) \( \frac{43}{12} \)
(C) \( \frac{79}{12} \)
(D) \( \frac{67}{12} \)

25) If \( \sin 2A = 2 \sin A \) is true then \( A = \) ________.

(A) 0
(B) 45
(C) 60
(D) 90
26) If \( \tan(A + B) = \sqrt{3} \), \( \tan(A - B) = \frac{1}{\sqrt{3}} \), \( 0 < A + B \leq 90 \), \( A > B \) then

\[ A = \underline{\text{________}}. \]

(A) 30  (B) 60  (C) 90  (D) 45

27) If \( A + B = 90 \) then sec \( B = \underline{\text{________}}. \)

(A) \( \cos A \)  
(B) cosec \( A \)  
(C) cot \( A \)  
(D) tan \( A \)

28) A ladder leans against a wall its lower end touches the ground and makes \( 60^\circ \) with it, if the height of wall is \( \sqrt{3} \) m then length of ladder is \( \underline{\text{________}} \) m.

(A) \( \frac{2}{\sqrt{3}} \)  
(B) 1  
(C) \( \frac{\sqrt{3}}{2} \)  
(D) 2

29) On walking \( \underline{\text{______}} \) meters on a hill making an angle of \( 30^\circ \) with ground, one can reach height of \( x \) meters from ground.

(A) \( \frac{\sqrt{3}x}{2} \)  
(B) \( \frac{2x}{\sqrt{3}} \)  
(C) \( 2x \)  
(D) \( \frac{x}{2} \)
30) Angle of elevation of a tower $50 \sqrt{3}$ m high from a point $50$ m away from its base is ________.

(A) 45
(B) 60
(C) 30
(D) 90

31) Angle of depression of a ship from the top of a tower $30$ m high measures $60^\circ$ then distance of ship from base of tower is _______ m.

(A) 10
(B) $\frac{10}{\sqrt{3}}$
(C) $10\sqrt{3}$
(D) $30\sqrt{3}$

32) A circle can have at most _______ tangents from an external point.

(A) 1
(B) 2
(C) 0
(D) 4

33) From a point $Q$ in the exterior of circle, a tangent is drawn to the circle. If length of the tangent is $15$ cm and its distance from center is $17$ cm then radius of circle = _______ cm.

(A) 16
(B) 8
(C) 10
(D) 17

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34) If AT and BT are two tangents touching \( \odot(O, r) \) in two distinct points A and B if \( m \angle AOB = 150 \) then \( m \angle ATB = \ldots \).

(A) 60  
(B) 90  
(C) 30  
(D) 45

35) If perimeter and area of a circle are numerically equal then radius of circle = \ldots.

(A) 1  (B) 2  
(C) 3  (D) 4

36) Area of a sector of a circle whose radius is 14 cm, angle of sector is 90 is \ldots cm.

(A) 140  
(B) 154  
(C) 160  
(D) 180

37) Area of minor segment of a circle = \ldots.

(A) Area of sector – length of Arc  
(B) Area of sector – major segment  
(C) Area of sector – area of circle  
(D) Area of sector – area of corresponding triangle
38) If the ratio of areas of two circles is 1 : 4 then ratio of their circumferences is ________.

(A) 1 : 4
(B) 1 : 2
(C) 4 : 1
(D) 2 : 1

39) Formula to find volume of Frustum of a cone = ________.

(A) \( \frac{1}{3} \pi h \left( r_1^2 + r_2^2 + r_1 r_2 \right) \)
(B) \( \frac{1}{3} \pi r^2 h \)
(C) \( \frac{1}{3} \pi h \left( r_1^2 + r_2^2 + 2r_1 r_2 \right) \)
(D) \( \frac{1}{3} \pi r h \left( r_1^2 + r_2^2 + r_1 r_2 \right) \)

40) In case of a right circular cone where \( l \) is slant height, \( h \) is height and \( r \) is radius of cone then \( r = \) ________.

(A) \( \sqrt{l^2 + r^2} \)
(B) \( \sqrt{l^2 - h^2} \)
(C) \( \sqrt{l + h} \)
(D) \( \sqrt{l - h} \)
41) A frustrum of cone $h = 15$ cm, $r_1 = 12$ cm, $r_2 = 4$ cm then its slant height $l =$_______.

(A) 16
(B) 17
(C) 18
(D) 20

42) Formula to find volume of a 5 Rupee coin =______.

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

43) For a statistical data, if Mean = 6, Mode = 18, then value of its Median $M =$______.

(A) 5
(B) 15
(C) 12
(D) 10
44) If Mean − Mode = 3 Mean + Mode = 45 then
Median = _________.

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

45) The modal class of following frequency distribution is

<table>
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<tr>
<th>Class</th>
<th>0 -10</th>
<th>10 - 20</th>
<th>20 - 30</th>
<th>30 - 40</th>
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<td>8</td>
<td>12</td>
<td>23</td>
<td>17</td>
<td>10</td>
</tr>
</tbody>
</table>

(A) 30 - 40
(B) 20 - 30
(C) 0 - 10
(D) 40 - 50

46) For a statistical data \( n = 100, l = 24, C.F = 16, f' = 34, h = 10 \)
then value of Median \( M = \) _________.

(A) 34  (B) 26
(C) 29  (D) 30

47) Probability of getting at most one head, when two coins are tossed is _________.

(A) \( \frac{1}{4} \)  (B) \( \frac{3}{4} \)
(C) \( \frac{1}{2} \)  (D) 1
48) 25 defective screws are mixed in a bag containing 175 non-defective screws, then probability of taking out one screw, randomly, out of the bag is non-defective is _______.

(A) \( \frac{7}{8} \)

(B) \( \frac{5}{8} \)

(C) \( \frac{3}{8} \)

(D) \( \frac{1}{8} \)

49) If \( P(\overline{A}) = 0.135 \), \( P(A) = \) _______.

(A) 0.856

(B) 0.815

(C) 0.865

(D) None of the above

50) Sum of probabilities of all elementary events of a random experiment is _______.

(A) 0

(B) 2

(C) 1

(D) −1
12 (E)
(JULY, 2018)
(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 represent 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) Prove that $7 - 2\sqrt{5}$ is irrational. [2]

2) Solve following pair of Linear Equation by elimination method.

\[
\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2, \quad \frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1.
\] [2]

3) If $\triangle ABC \sim \triangle PQR$ \ AB: PQ = 3:5. If $\text{Ar}(ABC) = 81$ find $\text{Ar}(PQR)$. [2]
4) If \( p(x) = x^4 - x^2 + 1 \) find value of \( p(2\sqrt{2}) \). [2]

5) Find distance AB if A \((a, b)\), B \((-a, -b)\). [2]

6) If \( \sec 4A = \cosec (A - 20) \) where 4A is acute angle then find value of A. [2]

7) In \( \triangle ABC \) prove that
\[
\tan \left(\frac{A + C}{2}\right) = \cot \frac{B}{2}.
\] [2]

8) In a bag there are 4 yellow balls, 3 red balls and 3 green balls. Find probability that a ball is drawn at random from bag is neither red nor green. [2]

\[ \text{SECTION - B} \]

- Questions (9 to 12) [Each carries 3 marks].

9) A sum of Rs. 2500 cash prize distributed among First Four Rankers of Std. X. If each prize is Rs. 250 less than its preceding prize, find value of each prize. [3]
10) The length of a minute hand of a clock is 21 cm. Find the area swept by minute hand in 20 minutes.

11) Two concentric circles whose radii are 25 cm and 7 cm. A chord of outer circle touches inner circle. Find length of chord.

12) Metallic spheres of radii 6 cm, 8 cm, 10 cm respectively, are melted to form a single solid sphere. Find the radius of resulting sphere.

SECTION - C

■ Questions (13-15) [Each carries 4 marks].

13) The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find those two numbers.

14) A tree breaks due to storm and its broken bends so that the top of the tree touches the ground makes an angle of 30° with it. The distance between the foot of the tree to the point where top touches the ground is 8 m. Find the height of the tree.

15) Mean of the following group data is 18. Find unknown frequency ‘f’.

<table>
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<tr>
<th>Class</th>
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<th>13 - 15</th>
<th>15 - 17</th>
<th>17 - 19</th>
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<td>5</td>
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</table>

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SECTION-D

Questions (16 to 17) [Each carries 5 marks].

16) If a line drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in same ratio. [5]

OR

In \( \triangle ABC \) if \( AC^2 = AB^2 + BC^2 \) prove that \( \angle B \) is Right angle.

17) Draw \( \triangle ABC \), where \( BC = 6 \text{ cm}, AB = 5 \text{ cm}, \) and \( \angle ABC = 60. \) Construct triangle whose sides are \( \frac{3}{4} \) of corresponding sides of triangle \( \triangle ABC. \) Write the steps of construction.