ARYA VIDYA MANDIR GROUP OF SCHOOLS
PRELIMINARY REVIEW –FEBRUARY 2022
Mathematics
Time:1½hrs
Std:X
Max Marks: 40
Date: - 11/02/2022

Answers to this paper must be written on the paper provided separately.
You will **NOT** be allowed to write during the first **15** minutes.
This time is to be spent reading the question paper.
The time given at the head of this paper is the time allowed for writing the answers.
Attempt all questions from Section A and Section B The intended marks for questions or parts of questions are given in brackets [ ].
This paper consists of **5** printed pages.

SECTION A (40 Marks)
(Attempt **all** questions from this Section)

Question 1
Choose the correct answers to the questions from the given options. (Do not copy the question, Write the correct answer only.)   [10]

(i) Calculate the co-ordinates of the point P which divides the line segment joining, A (1, 3) and B (5, 9) in the ratio 1:2.

(a) (- 7/3, 5)   (b) (5, 3/7)   (c) (7/3, 5)   (d) (5, 3)

(ii) In the given figure, PT is a Tangent at T to the circle with centre O. If $\angle TPO = 25^0$, then the value of x is:
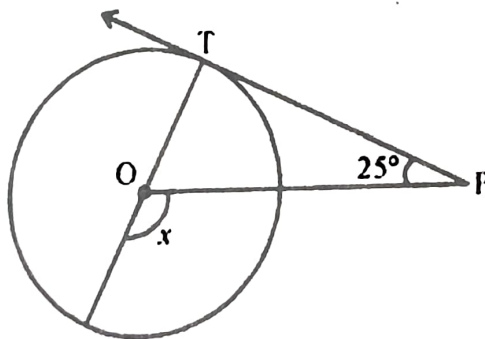
(a) 25^0 (b) 65^0 (c) 115^0 (d) 90^0

(iii) The point (-3, 2) lies on the line ax + 3y + 6 = 0, Calculate the value of **a**.
(a) 5   (b) 4   (c) -5   (d) -4

(iv) (Sec A + tan A) (1 – sin A) is equal to

    (a)   Sec A   (b) sin A   (c) cosec A   (d) cos A

(v) If the mean of 6, 7, x, 8, y, 14 is 9, then

    (a) x + y = 21,   (b) x + y = 19,   (c) x – y = 19,   (d) x – y = 9

(vi) The total surface area of a cone whose radius is $\frac{r}{2}$ and slant height $2l$ is

    (a) $2\pi r (l + r)$ (b) $\pi r \left(l + \frac{r}{2}\right)$ (c) $\frac{\pi r}{4} (4l + r)$ (d) $2\pi r l$

(vii) If a letter is chosen at random from the letters of English Alphabet, then the probability that it is a letter of the word 'DELHI' is

    (a) $\frac{1}{5}$ (b) $\frac{1}{26}$ (c) $\frac{5}{26}$ (d) $\frac{21}{26}$

(viii) If a cylindrical ice cube of radius 1 cm and height 3.5 cm is put into a cylindrical cup full of water of radius 5cm and height 6 cm, then the volume of water that flows out of the cylindrical cup is

    (a) 9 cm^3 (b) 11 cm^3 (c) 19 cm^3 (d) 22 cm^3

(ix) The reflection of the point A (4, -1) in the line x = 2 is
    (a)   (0, -1)   (b) (8, -1)   (c) (0, 1)   (d) (-1, 0)

(x) If one end of a diameter of a circle is (2, 3) and the centre is (-2, 5), then the other end is

    (a)   (-6, 7)   (b) (6, -7)   (c) (0, 8)   (d) (0, 4)

Section B
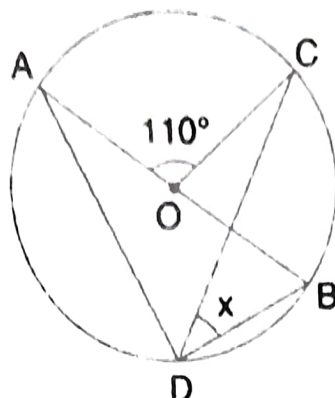### (Attempt *any three* questions from this Section)

Question 2

(i) In what ratio is the joining of (4, 3) and (2, -6) divided by the x-axis.   [2]

(ii) In the figure, AB is the diameter, $\angle AOC = 110°$. Find $\angle BDC$.

[2]

(iii) From the top of a tower, a man finds that the angle of depression of a car on the ground is $30°$. If the car is at a distance of 40 metres from the tower, find the height of the tower.

[3]

(iv) A bag contains 10 red balls, 16 white balls and 8 green balls. A ball is drawn out of the bag at random. What is the probability that the ball drawn will be:
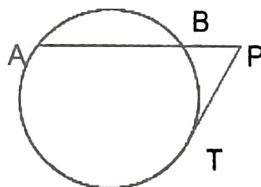(i) Not Red   (ii) neither red nor green   (iii) white or green

[3]

Question 3

(i) The lateral surface area of a right cone is 550 cm² and its slant height is 25 cm. Find the radius of the base.

[2]

(ii) AP is a secant and PT is a tangent to a circle. If PT = 15 cm and AB = 8BP, find AP

[2]

(iii) Find the equation of the line passing through the point (-2, 0) and perpendicular to the line $4x - 3y = 2$.
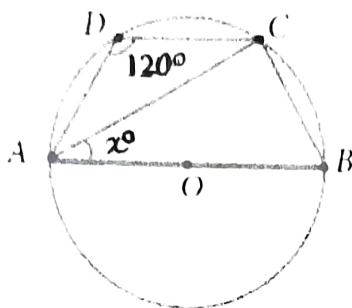
[3]

(iv) Prove the following identity:

$$\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A} = \cos A + \sin A$$

[3]

...4

Question 4

(i) Two unbiased coins are tossed simultaneously. Find the probability [2]
of getting:
   (a) At least one head   (b) no head

(ii) Find x in the following figure, given O is the centre of the circle with [2]
diameter AB.

(iii) Using graph paper and taking 1cm = 1 unit along both the axes [3]

   (a) Plot the points A (-4, 4), B (2, 2).
   (b) Reflect A and B in origin to get the images A' and B'.
   (c) Give Geometrical name of the figure ABA'B'

(iv) The volume of metallic cylindrical pipe is 748 cm³. Its length is [3]
14 cm and its external radius is 9 cm. Find its thickness.

Question 5

(i) The tower is 100√3 metre high. Find the angle of elevation if its top [2]
from a point 100 metres away from its foot.

(ii) Find the equation of a line that has y – intercept 4 and is parallel to [2]
the line joining (3, -2) and (1, 4).

(iii) A circus tent is cylindrical up to a height of 3 m and conical above it. [3]
If the diameter of the base is 105 m and the slant height of the
conical part is 53 m, find the total canvas used in making the tent.

(iv) Draw the Histogram and estimate the mode for the following [3]
frequency distribution:

Classes	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	2	8	10	5	4	3

Question 6

(i)   Prove that: $(\sec^2 A - 1)(\csc^2 A - 1) = 1$ [2]

(ii)   Marks obtained by 40 students in a short-term assessment are given below, find the missing entry *a*:   [2]

Marks	5	6	7	8	9
No. of Students	6	1	16	13	*a*

If the mean of the distribution is 7.2, find *a*.

(iii)   The slant height and base diameter of a conical tomb are 25m and 14m respectively. Find the cost of white washing its curved surface area at the rate of ₹ 210 per 100 m².   [3]

(iv)   P(2,3), Q(7, -2) and R(-2, -1) are the vertices of the Triangle PQR, Write the equation of the median of the triangle through the vertex R.   [3]

-------THE END-------