

Instructions :

- i) Answer all the questions under Part - A in a separate answer book.
- ii) Write the answers to the questions under part - B on the question paper itself and attach it to the answer book of Part - A.
- iii) Part - A contains 3 (I, II, III) sections.
- iv) Write the answers as per instructions given in each Section.

\* \* \*

Section - I

Note: i) Answer ALL the following questions.

ii) Each question carries 2 marks.

6x2=12

1. Draw the venn diagram of the following sets.
  - i)  $A - B$
  - ii)  $A \cap B$
2. If  $\tan \theta + \cot \theta = 2$ , then find the value of  $\tan^2 \theta + \cot^2 \theta$  ?
3. Show that  $-3, -4$  are roots of the equation  $x^2 + 7x + 12 = 0$ .
4. The perimeter of two similar triangles are 27 cm and 18 cm respectively. If one side of the first triangle is 9 cm, determine the corresponding side of the second triangle.

[ Turn Over

5. The length of the rectangular park is 2 m more than its breadth and the area of the rectangular park is  $168 \text{ m}^2$  form a quadratic equation using above information.
6. A ladder 25 m long reaches a window of building 24 m above the ground. Determine the distance of the foot of the ladder from the building.

**Section - II**

**Note:** i) Answer ALL the following questions.

ii) Each question carries 4 marks.

**6x4=24**

7. If A, B and 'C' are interior angles of triangle ABC, then show that  $\tan\left(\frac{A+B}{2}\right) = \cot\frac{c}{2}$ .
8. Solve the pair of linear equations using graph.

$$2x + 3y = 8 \text{ and } 3x - 2y = -1$$

9. In an arithmetic progression 7<sup>th</sup> term is 84 and 3<sup>rd</sup> term is 36, then find its 10<sup>th</sup> term.
10. Convert the following sets in "Roster" form.
- a)  $A = \{ x : x = n, n = \text{prime number}, n < 17 \}$
  - b)  $B = \{ x : x = n, n = \text{composite number } n \leq 13 \}$
  - c)  $C = \{ x : x = 2n, n \in W, n < 7 \}$
  - d)  $D = \{ x : x = n^2, n \in N, n \leq 6 \}$

[ Contd...on 3rd page

11. If three coins are tossed at a time, then find the probability of getting atleast two heads.
12. The angle of elevation of the top of a tower from two points at a distance of 9 m and 16 m, find the height of the tower from the base of the tower and in the same straight line with its are complementary.

### Section - III

**Note:** i) Answer any 4 of the following questions.

ii) Each question carries 6 marks.

4x6=24

13. If  $\log\left(\frac{x+y}{5}\right) = \frac{1}{2}(\log(x) + \log(y))$ , then show that  $\frac{x}{y} + \frac{y}{x} = 23$ .
14. Find the zeroes of the polynomial  $x^2 + 3x + 4$  using graph.
15. A solid toy is in the form of right circular cylinder with hemispherical shape at one end and a cone at the other end, their common diameter is 14 cm and the height of the cylindrical and conical portions are 14 cm and 7 cm respectively. Find the volume of the solid toy.
16. Check whether the given points A (7, 3), B (6, 1), C (8, 2) and D (9, 4) are form a rectangle ?
17. A chord of a circle of radius 8 cm subtends an angle of  $60^\circ$  at the centre. Find the area of the corresponding minor segment of the circle ?
18. Find the mode of the following data.

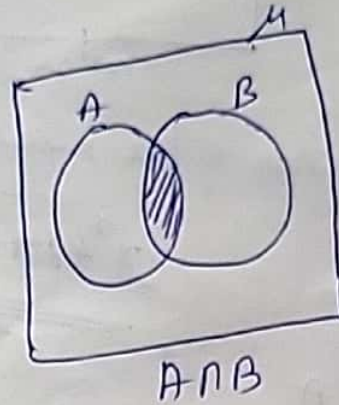
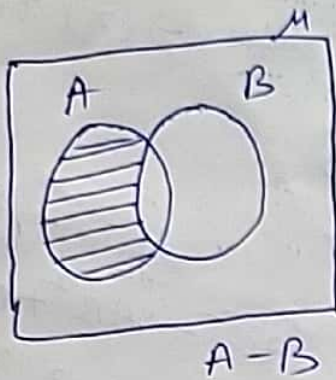
C.I.	118-126	127-135	136-144	145-153	154-162	163-171	172-180
Frequency	3	5	9	12	5	4	2

\* \* \* \* \*

PRE-FINAL Exam SSC-2026

PART-A

①



②

$$\sec \theta + \csc \theta = 2$$

$$(\sec \theta + \csc \theta)^2 = 2^2 \Rightarrow$$

$$\sec^2 \theta + \csc^2 \theta + 2 \sec \theta \csc \theta = 4$$

$$\sec^2 \theta + \csc^2 \theta + 2 = 4$$

$$\sec^2 \theta + \csc^2 \theta = 4 - 2$$

$$\therefore \sec^2 \theta + \csc^2 \theta = 2$$

③

$$x^2 + 7x + 12 = 0$$

$$p(x) = x^2 + 7x + 12$$

$$p(-3) = (-3)^2 + 7(-3) + 12$$

$$= 9 - 21 + 12$$

$$= 21 - 21$$

$$\therefore p(-3) = 0$$

$$p(x) = x^2 + 7x + 12$$

$$p(-4) = (-4)^2 + 7(-4) + 12$$

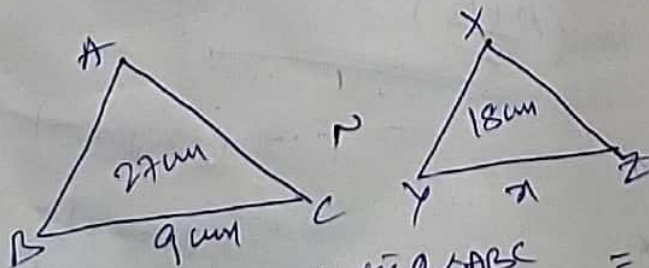
$$p(-4) = 16 - 28 + 12$$

$$= 28 - 28$$

$$\therefore p(-4) = 0$$

$\therefore -3, -4$  are roots of the equation  $x^2 + 7x + 12 = 0$

④

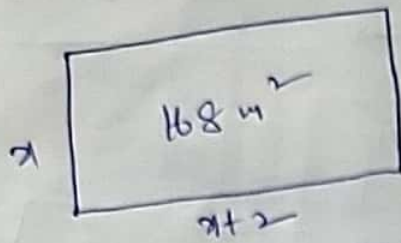


$$\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle XYZ} = \frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$$

$$\frac{27}{18} = \frac{9}{x}$$

$$\therefore x = 6 \text{ cm}$$

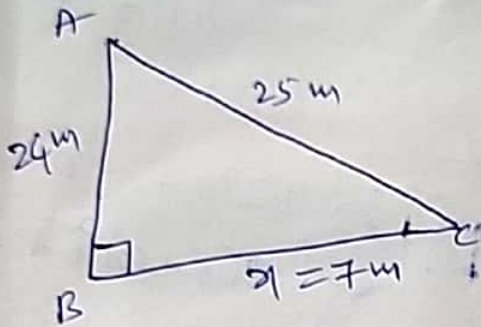
5.



area of the rectangular park  $\Rightarrow (x)(x+2) = 168$

$$x^2 + 2x - 168 = 0$$

6.



$$AC^2 = AB^2 + BC^2$$

$$BC^2 = AC^2 - AB^2$$

$$= 25^2 - 24^2$$

$$= 625 - 576$$

$$BC^2 = 49$$

$$\therefore BC = 7 \text{ m}$$

Section - II

7.

$$A+B+C = 180$$

$$\frac{A+B+C}{2} = \frac{180}{2}$$

$$\frac{A+B}{2} + \frac{C}{2} = 90$$

$$\frac{A+B}{2} = 90 - \frac{C}{2}$$

$$\tan\left(\frac{A+B}{2}\right) = \tan\left(90 - \frac{C}{2}\right)$$

$$\therefore \tan\left(\frac{A+B}{2}\right) = \cot\left(\frac{C}{2}\right)$$

8.

$$2x + 3y = 8$$

$$3y = 8 - 2x$$

$$y = \frac{8 - 2x}{3}$$

x	1	4
y	2	0

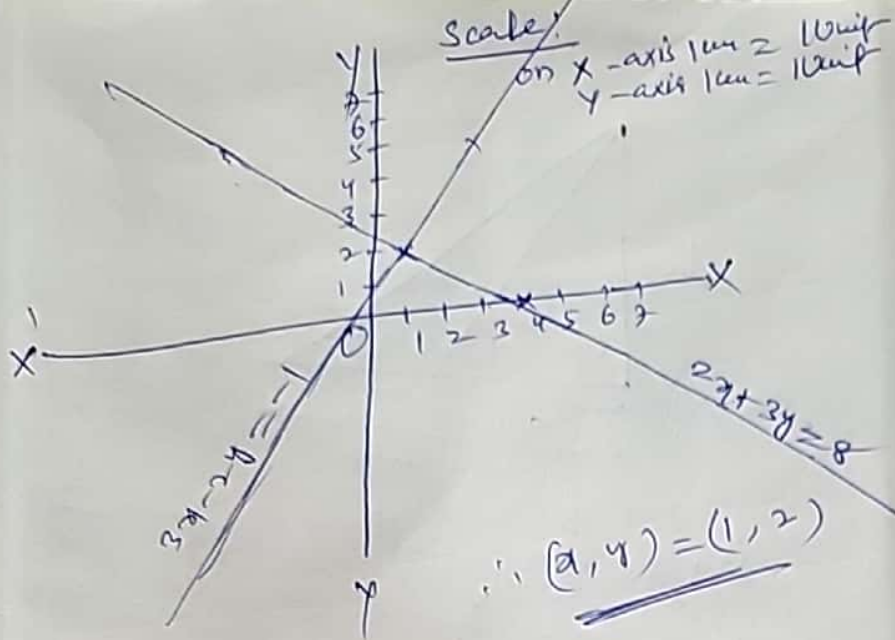
$$3x - 2y = -1$$

$$-2y = -1 - 3x$$

$$2y = 3x + 1$$

$$y = \frac{3x + 1}{2}$$

x	1	3
y	2	5



9

$$\begin{aligned}
 \text{1st term} &= 84 \Rightarrow d + 6d = 84 \\
 \text{3rd term} &= 36 \Rightarrow a + 2d = 36 \quad \text{sub} \\
 \text{10th term} &=? \\
 4d &= 48 \\
 \therefore d &= 12 \\
 a + 2(12) &= 36 \\
 a + 24 &= 36 \\
 a &= 36 - 24 \\
 \therefore a &= 12
 \end{aligned}$$

$$\begin{aligned}
 \therefore \text{10th term} &= a + 9d \\
 &\Rightarrow 12 + 9(12) \\
 &\Rightarrow 12 + 108 \\
 &\Rightarrow 120 \\
 \therefore \text{10th term} &= 120
 \end{aligned}$$

10

$$\begin{aligned}
 A &= \{2, 3, 5, 7, 11, 13, \dots\} \\
 B &= \{4, 6, 8, 9, 10, 12, \dots\} \\
 C &= \{0, 2, 4, 6, 8, 10, 12, \dots\} \\
 D &= \{1, 4, 9, 16, 25, 36, \dots\}
 \end{aligned}$$

11

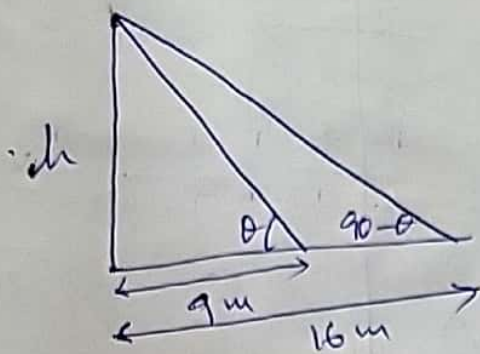
$$\text{Probability} = \frac{\text{favourable outcomes}}{\text{total outcomes}}$$

the probability of getting atleast two heads  $P(E) = \frac{4}{8}$

$$\therefore P(E) = \frac{1}{2}$$

- HHH ✓
- HTT ✓
- THT ✓
- TTH ✓
- HHT ✓
- HTH ✓
- THT ✓
- THT ✓

12



$$\tan \theta = \frac{h}{9} \quad \text{--- (1)}$$

$$\tan(90 - \theta) = \frac{h}{16}$$

$$\cot \theta = \frac{h}{16}$$

$$\tan \theta = \frac{16}{h} \quad \text{--- (2)}$$

$$\frac{h}{9} = \frac{16}{h}$$

$$h^2 = 9 \times 16$$

$$h = 3 \times 4$$

$$\therefore h = 12 \text{ m}$$

$\therefore$  height of tower (h) = 12 m

Section - III

13

$$\log\left(\frac{x+y}{5}\right) = \frac{1}{2} (\log x + \log y)$$

$$\log\left(\frac{x+y}{5}\right) = \frac{1}{2} \log x + \frac{1}{2} \log y$$

$$\log\left(\frac{x+y}{5}\right) = \log \sqrt{x} + \log \sqrt{y}$$

$$\log \frac{x+y}{5} = \log \sqrt{x} \sqrt{y}$$

$$\frac{x+y}{5} = \sqrt{xy}$$

Squaring both side

$$\left(\frac{x+y}{5}\right)^2 = (\sqrt{xy})^2$$

$$\frac{x^2 + y^2 + 2xy}{25} = xy$$

$$x^2 + y^2 + 2xy = 25xy$$

$$x^2 + y^2 = 23xy$$

dividing both side with 'xy'

$$\frac{x^2 + y^2}{xy} = \frac{23xy}{xy} \Rightarrow \frac{x^2}{xy} + \frac{y^2}{xy} = 23$$

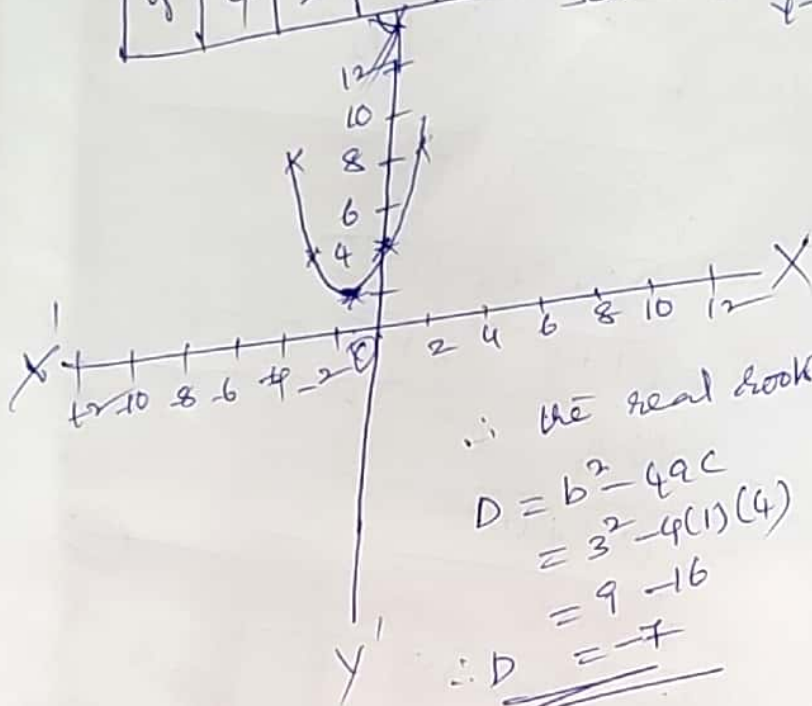
$$\boxed{\frac{x}{y} + \frac{y}{x} = 23}$$

(14)

$$p(x) = x^2 + 3x + 4$$

x	0	-1	-2	-3	-4	1	
y	4	2	2	4	8	8	

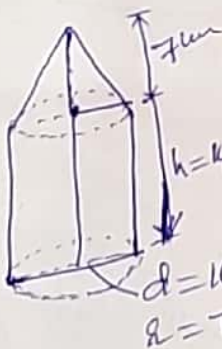
Scale: on X-axis 1cm = 2 units  
Y-axis 1cm = 2 units



∴ the real root doesn't exist

$$\begin{aligned}
 D &= b^2 - 4ac \\
 &= 3^2 - 4(1)(4) \\
 &= 9 - 16 \\
 \therefore D &= -7
 \end{aligned}$$

(15)



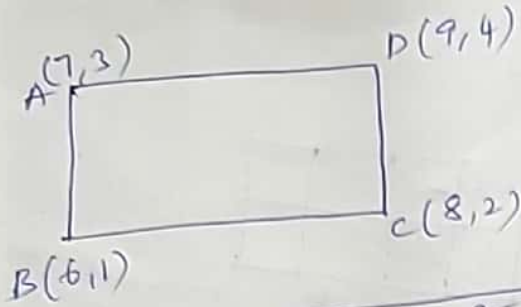
Cone  $\Rightarrow$   $h = 7\text{ cm}$   
 $r = 7\text{ cm}$   
 cylinder  $\Rightarrow$   $h = 14\text{ cm}$   
 $r = 7\text{ cm}$

hemisphere  $\Rightarrow$   $h = 7\text{ cm}$   
 $r = 7\text{ cm}$

The total volume of the solid toy = Volume of cone + Volume of cylinder + Volume of hemisphere

$$\begin{aligned}
 V &= \frac{1}{3} \pi r^2 h_1 + \pi r^2 h_2 + \frac{2}{3} \pi r^3 \\
 &= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 + \frac{22}{7} \times 7 \times 7 \times 14 + \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 \\
 &= \frac{22 \times 49}{3} + 22 \times 7 \times 14 + \frac{44 \times 7 \times 7}{3} \\
 &= \cancel{102.66} + \cancel{2156} + \\
 &= 359.33 + 2156 + 718.66 \\
 &= 3233.99 \\
 \therefore V &= 3234 \text{ cm}^3
 \end{aligned}$$

(16)



$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(6-7)^2 + (1-3)^2}$$

$$= \sqrt{(-1)^2 + (-2)^2}$$

$$= \sqrt{1+4} = \sqrt{5} \text{ --- (1)}$$

$$BC = \sqrt{(8-6)^2 + (2-1)^2}$$

$$= \sqrt{(2)^2 + (1)^2}$$

$$= \sqrt{4+1} = \sqrt{5} \text{ --- (2)}$$

$$CD = \sqrt{(8-9)^2 + (2-4)^2}$$

$$= \sqrt{(-1)^2 + (-2)^2} = \sqrt{1+4} = \sqrt{5} \text{ --- (3)}$$

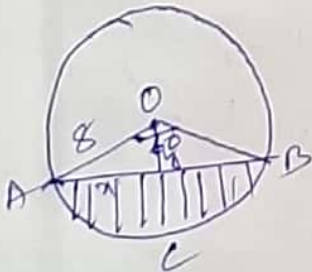
$$AD = \sqrt{(9-7)^2 + (4-3)^2}$$

$$= \sqrt{(2)^2 + (1)^2} = \sqrt{4+1} = \sqrt{5} \text{ --- (4)}$$

from eq (1), (2), (3) and (4) all sides are equal  
 $\therefore$  ABCD is not a rectangle

area of the sector OAB = minor area square

(17)



Shaded minor segment area =  $\frac{\pi}{360} \times r^2 \times \theta + \frac{1}{2} \times b \times h$

$$\sin 30 = \frac{r}{8}$$

$$\frac{1}{2} = \frac{r}{8}$$

$$\therefore r = 4$$

$$\cos 30 = \frac{h}{8}$$

$$\frac{\sqrt{3}}{2} = \frac{h}{8}$$

$$h = 4\sqrt{3}$$

$$= \frac{60}{360} \times \frac{22}{7} \times 8 \times 8 + \frac{1}{2} \times 4\sqrt{3} \times 4$$

$$= \frac{1}{6} \times \frac{22}{7} \times 64 + 8\sqrt{3}$$

$$= \frac{11 \times 64}{7} - 8\sqrt{3}$$

$$= 33.49 - 27.71$$

$$A = 5.78 \text{ cm}^2$$

C.I	frequency
117.5 - 126.5	3
126.5 - 135.5	5
135.5 - 144.5	9 $f_0$
144.5 - 153.5	12 $f_1$
153.5 - 162.5	5 $f_2$
162.5 - 171.5	4
171.5 - 180.5	2

$$\text{mode} = lt + \left[ \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right] \times h$$

$$= 144.5 + \left[ \frac{12 - 9}{2 \times 12 - 9 - 5} \right] \times 9$$

$$= 144.5 + \left[ \frac{3}{10} \right] \times 9$$

$$= 144.5 + \frac{27}{10}$$

$$= 144.5 + 2.7$$

$$\therefore \text{mode} = \underline{\underline{147.2}}$$

PART-B

- |       |       |
|-------|-------|
| 1. B  | 11. C |
| 2. C  | 12. D |
| 3. B  | 13. C |
| 4. A  | 14. A |
| 5. D  | 15. D |
| 6. B  | 16. D |
| 7. B  | 17. D |
| 8. A  | 18. A |
| 9. C  | 19. D |
| 10. C | 20. A |

$$+7+8+5 = \frac{7+4}{5}$$

20 = 12

$$\frac{PR}{YZ} = \frac{RQ}{ZX} = \frac{PQ}{XY}$$

$$\frac{1000}{0.198} = \frac{0.802}{2+3+5+7+11}$$

$$= \frac{5 \times 6}{5} = 6$$

RP - 11 A

PRACTICE / PRE - PUBLIC EXAMINATIONS - FEBRUARY 2026  
MATHEMATICS

(English Version)

PART - B

X Class]

(Max.Marks : 20)

[Time: ½ Hr.

Student Name ..... Roll No.....

Instructions:

- i) Answer all the questions.
- ii) Write the capital letters (A / B / C / D) showing the correct answer for the following questions in the brackets provided against them.
- iii) Each question carries 1 mark.
- iv) Marks will not be awarded in any case of over writing, re-writing or erased answers.

\* \* \*

I. Write the capital letters (A, B, C, D), showing the correct answer for the following questions in the brackets provided against them. 20x1=20

1. The  $\frac{p}{q}$  form of 12.5 is ----- [ B ]  
A)  $\frac{125}{100}$                       B)  $\frac{125}{10}$   
C)  $\frac{125}{1000}$                       D)  $\frac{125}{10000}$
2. If  $n(A) = 100$ , then the number of subsets of 'A' is ----- [ C ]  
A)  $2^{100-1}$                       B)  $100^2$                       C)  $2^{100}$                       D)  $2 \times 100$
3. If  $P(x) = x^3 - 7x^2 + 8x + 5$ , then  $P(1) =$  ----- [ B ]  
A) 6                                      B) 7  
C) 14                                      D) 13

[ Turn Over

4. Which of the following equation is parallel to  $3x - 4y + 7 = 0$  to is ---- [ A ]
- A)  $6x - 8y + 9 = 0$     B)  $6x + 8y + 9 = 0$   
C)  $3x + 4y + 7 = 0$     D)  $x + y + 1 = 0$
5. In equation  $3x + 7y + 10 = 0$ , if  $x = 1$  then  $y = \dots\dots\dots$  [ D ]
- A)  $\frac{10}{7}$     B) 3  
C)  $\frac{7}{10}$     D)  $\frac{-13}{7}$
6. If 1, 2 are roots of the quadratic equation, then equation is ---- [ B ]
- A)  $(x+1)(x+2) = 0$     B)  $(x-1)(x-2) = 0$   
C)  $(x+1)(x-2) = 0$     D)  $(x-1)(x+2) = 0$
7. Which of the following is Geometric progression (G.P). [ B ]
- A) 3, 6, 9, 12 ....    B) 1, 3, 9, 27 .....  
C) 1, 2, 3, 4, 5 ...    D) 3, 9, 36 ....
8. The slope of the line parallel to  $x$ -axis. [ A ]
- A)  $\tan 0^\circ$     B)  $\tan 30^\circ$   
C)  $\tan 60^\circ$     D)  $\tan 90^\circ$
9. If the volume of the sphere  $V = \frac{4}{3}\pi r^3$ , then  $r^3 = \dots\dots$  [ C ]
- A)  $\frac{4v}{3\pi}$     B)  $\frac{4v}{3v}$   
C)  $\frac{3v}{4\pi}$     D)  $\frac{4\pi}{3v}$
10.  $\sin 0^\circ \sin 1^\circ \sin 2^\circ \dots\dots \sin 90^\circ = \dots\dots\dots$  [ C ]
- A)  $\frac{1}{2}$     B) 1  
C) 0    D)  $\frac{\sqrt{3}}{2}$

[ Contd...on 3rd page

11. If  $\Delta PRQ \sim \Delta YZX$ , then which of the following is correct.

[ C ]

A)  $\frac{PQ}{XY} = \frac{PR}{YZ} = \frac{RQ}{ZX}$     B)  $\frac{PR}{YZ} = \frac{PQ}{ZX} = \frac{RQ}{XZ}$

C)  $\frac{PR}{YZ} = \frac{RQ}{ZX} = \frac{PQ}{XY}$     D)  $\frac{PR}{YZ} = \frac{PQ}{XZ} = \frac{RQ}{YX}$

12. Which of the following does not exist if  $(0 \leq \theta \leq 90^\circ)$

[ D ]

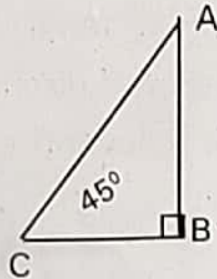
A)  $\sin \theta = \frac{3}{5}$

B)  $\cos \theta = \frac{4}{5}$

C)  $\sin \theta = \frac{7}{25}$

D)  $\cos \theta = \frac{25}{24}$

13. Observe the figure, which of the following is correct. [ C ]



A)  $AC = AB$

B)  $AC = BC$

C)  $AB = BC$

D)  $AB \neq BC$

14. If  $P(E) = 0.198$ , then what is the probability of not 'E'. [ A ]

A) 0.802

B) 1.802

C) 0.820

D) 0.8

15. Mean of first five prime numbers.

[ D ]

A) 5.7

B) 5.5

C) 6.5

D) 5.6

[ Turn Over

16. Which of the following is sure event.

[ D ]

A)  $P(E) = \frac{1}{2}$

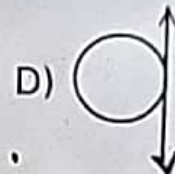
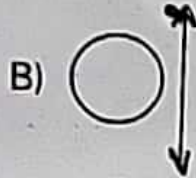
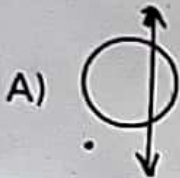
B)  $P(E) = 0$

C)  $P(E) = \frac{2}{3}$

D)  $P(E) = 1$

17. Which of the following is tangent to a circle.

[ D ]



18. In arithmetic progression,  $a=3$  and  $d=2$ , then A.P is -- [ A ]

A) 3, 5, 7.....

B) 3, 5, 8.....

C) 3, 5, 6.....

D) 3, 5, 9.....

19. The distance between the points  $(0, 0)$  and  $(\sin \theta, \cos \theta)$  is -----

[ D ]

A)  $\sin \theta$

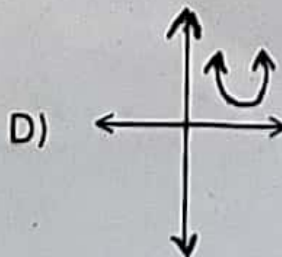
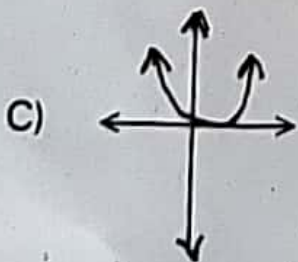
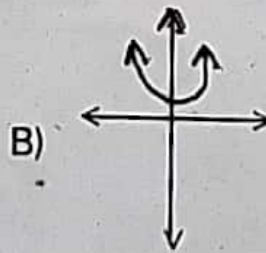
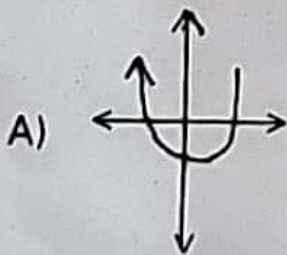
B)  $\cos \theta$

C)  $\tan \theta$

D) 1

20. In quadratic equation  $ax^2 + bx + c = 0$  if discriminant  $b^2 - 4ac > 0$ , then which of the following diagram is suitable.

[ A ]



\* \* \* \* \*