

**Bombay Scottish School, Mahim**  
**PRELIMINARY ASSESSMENT**  
**MATHEMATICS**

Grade : 10  
Date : 16.02.2022  
Duration : 1 ½ hrs

Max. Marks : 40  
No. of Questions : 06  
No. of printed sides: 09

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*Answers to this Paper must be written on the paper provided separately.*

*You will not be allowed to write during the first 10 minutes.*

*This time is to be spent in reading the question paper.*

*The time given at the head of this Paper is the time allowed for writing the answers.*

*Log tables and graph paper will be provided*

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*Attempt **all** questions from **Section A** and **any three** questions from **Section B**.  
The intended marks for questions or parts of questions are given in brackets [ ].*

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**SECTION A**

*(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) The reflection of point A(-5,4) in the x-axis is
- a) (5,4)
  - b) (-5,4)
  - c) (-5,-4)
  - d) (-5,0)

ii) If a card is drawn from a well shuffled pack of cards, then the probability that the card drawn is a red and a king is

a)  $\frac{7}{13}$

b) 0

c)  $\frac{1}{26}$

d)  $\frac{1}{13}$

iii) A right angled triangle ABC with sides 5cm, 12cm and 13cm is revolved about the side of 12cm, the volume of the solid so formed is

a)  $300\pi$

b)  $240\pi$

c)  $100\pi$

d)  $720\pi$

iv) The slope of a line parallel to x-axis is

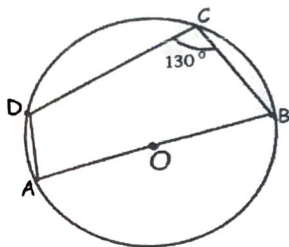
a) 1

b) 0

c) -1

d) not defined

v) In the figure given below, if AB is the diameter of a circle with centre O,  $\angle BCD = 130^\circ$ , then  $\angle DBA$  is equal to

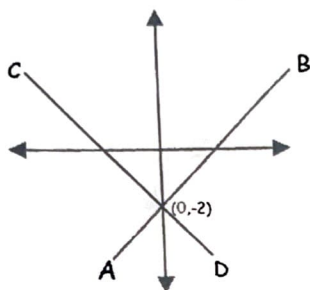


- a)  $50^\circ$
- b)  $40^\circ$
- c)  $30^\circ$
- d)  $60^\circ$

vi)  $\sec \theta - \tan \theta \sin \theta$  is equal to

- a)  $\sec \theta$
- b)  $\tan \theta$
- c) 1
- d)  $\cos \theta$

vii) In the figure given below, if the lines AB and CD are equally inclined to the coordinate axes and passing through the point  $(0, -2)$



then the equation of line CD is

- a)  $y = 2x + 1$
- b)  $y + x + 2 = 0$
- c)  $y - x + 2 = 0$
- d)  $y - x - 2 = 0$

viii) If point  $P(3, a)$  divides the segment joining the points  $A(7, 1)$  and  $B(0, 8)$  in the ratio  $4 : 3$ , then the value of  $a$  is

- a) 5
- b) -4
- c) -5
- d) 4

ix) Which of the following cannot be the probability of an event?

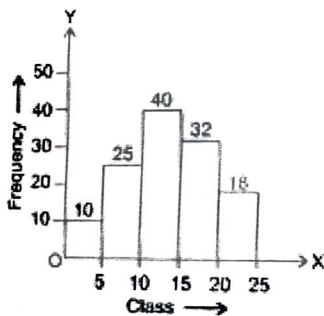
a)  $\frac{3}{5}$

b) 43%

c) 0.25

d) 2.7

x) From the histogram given below, the modal class is



a) 10-15

b) 5-10

c) 20-25

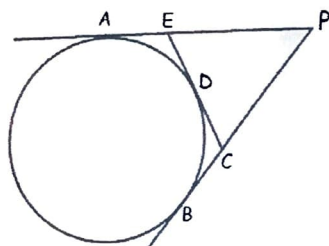
d) 15-20

## SECTION B

(Attempt **any three** questions from this Section.)

### Question 2

- a) Find the equation of a line whose inclination is  $60^\circ$  and y-intercept is -4 [2]
- b) A bag contains twenty ₹ 5 coins, fifty ₹ 2 coins and thirty ₹ 1 coins. If it is equally likely that one of the coins will fall down when the bag is turned upside down, what is the probability that the coin  
i) will be a ₹ 1 coin?  
ii) will not be a ₹ 2 coin? [2]
- c) Prove that  $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$  [3]
- d) In the figure given below, from an external point P, tangents PA and PB are drawn to a circle. CE is a tangent to the circle at D. If  $AP = 15\text{cm}$ , find the perimeter of the triangle PEC. [3]



### Question 3

- a) Calculate the ratio in which the line joining  $A(6,5)$  and  $B(4,-3)$  is divided by  $y = 2$  [2]
- b) Find the value of  $p$  for which the lines  $6x + 5y - 7 = 0$  and  $2px + 5y + 1 = 0$  are parallel to each other. [2]

- c) Use graph paper for this question.  
Marks obtained by 100 students in an examination are given below:

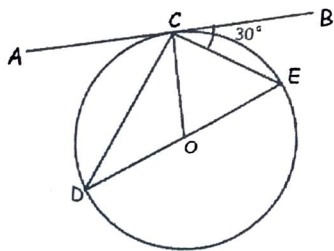
Marks obtained	0-10	10-20	20-30	30-40	40-50
No. of students	8	10	22	40	20

Draw an ogive for the given distribution taking  $2\text{cm} = 10$  marks on one axis and  $2\text{cm} = 10$  students on the other axis. Using the graph, determine the median marks. [3]

- d) From a solid cylinder of height 12 cm and diameter 10 cm, a conical cavity of the same base radius and of the same height is hollowed out. Find the total surface area of the remaining solid. (Take  $\pi = \frac{22}{7}$ ) [3]

#### Question 4

- a) AB is the diameter of a circle with centre (2, -1). If A(-2, 5), find the coordinates of B. [2]
- b) In the figure given below, O is the centre of the circle,  $\angle BCE = 30^\circ$  and AB is a tangent to the circle at C.



- Find  
i)  $\angle ACD$   
ii)  $\angle COE$

[2]

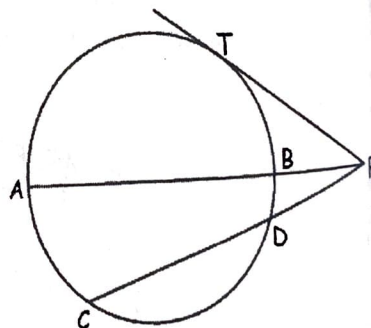
c) If the mean of the following distribution is 24, find the value of a. [3]

Marks	0-10	10-20	20-30	30-40	40-50
Number of students	7	a	8	10	5

- d) The point P is the foot of a perpendicular from A(-5,7) to the line  $2x - 3y + 18 = 0$   
Find :  
i) the equation of the line AP.  
ii) the coordinates of P. [3]

### Question 5

- a) A cylindrical container of radius 6cm and height 15cm is filled with ice cream. The whole ice cream is to be distributed to 5 children in equal cones. The height of the cone is 12 times the radius at the base of the cone. Find the radius of each cone. [2]
- b) Prove that :  $\frac{\tan A}{\sec A - 1} + \frac{\tan A}{\sec A + 1} = 2 \operatorname{cosec} A$  [2]
- c) In the adjoining figure, diameter AB and chord CD of a circle meet at P. PT is a tangent to the circle at T.  $CD = 7.8$  cm,  $PD = 5$  cm,  $PB = 4$  cm. Find



- i) AB  
ii) the length of tangent PT.



d) Use graph paper for this question. Take 1cm = 1 unit on both the axes.  
Plot the points A(3,5) and B(-2,-4)

i) Reflect A in the x-axis to get the image A' and reflect B in the y-axis, followed by reflection in the origin to get the image B'. Write down the coordinates of A' and B'.

ii) Write down the geometrical name of the figure AA'BB'.

iii) Name one invariant point under the reflection in the x-axis. [3]

### Question 6

a) The coordinates of two points P and Q are (2,6) and (-3,5) respectively. Find:

i) the equation of PQ.

ii) the coordinates of the point where PQ intersects the x-axis. [2]

b) Two dice are rolled together. Find the probability of getting

i) the sum of the numbers on the upper-most faces between 5 and 8. [2]

ii) a prime number on each dice.

c) A pilot seated in an aircraft at an altitude of 250m, observes the angle of depression of two boats on the opposite banks of a river to be  $45^\circ$  and  $60^\circ$  respectively. Find the width of the river. Give your answer correct to 3 significant figures. [3]

d) Use graph paper for this question.

Using an appropriate scale on both axes, estimate the mode of the given distribution by plotting a histogram. [3]

Expenditure (₹)	20-25	25-30	30-35	35-40	40-45	45-50
No. of girls	4	7	23	18	6	2