THE SCHOLAR HIGH SCHOOL

PREILIMINARY EXAMINATION 2018-19

SUBJECT- MATHEMATICS

STD - X

TIME- 2 ½ HOURS

Maximum Marks: 80

Answer 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 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.

Attempt all questions from **section A** and **any four** questions from **section B.**

All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets [ ].

Mathematical tables are provided.

SECTION- A (40 MARKS)

(Attempt all questions from this section)

QUESTION-1

(a) Given $A=\begin{bmatrix}2 & -1\\ 2 & 0\end{bmatrix}$,$B=\begin{bmatrix}-3 & 2\\ 4 & 0\end{bmatrix}$ and $C=\begin{bmatrix}1 & 0\\ 0 & 2\end{bmatrix}$.

Find the matrix X such that A+X = 2B+ C (3)

(b) Using the properties of proportion, solve the following equation for x,

Given $\frac{x^3+3x}{3x^2+1}=\frac{341}{91}$ (3)

(c) The mean of the following frequency distribution is 57.6 and the sum of all the frequencies is 50. Find the values of p and q. (4)

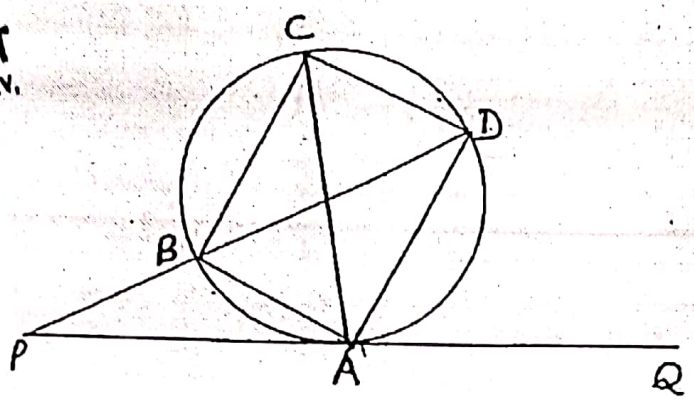
Class	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	7	P	12	q	8	5

QUESTION-2

(a) Mohan deposits ₹1600 per month in a cumulative account for 3 years at the rate of 9%p.a simple interest .Find the amount Mohan will get at the time of maturity. (3)

(b) Determine the ratio in which x axis divides the line segment joining the points A (2,-2) and B (3, 7).Also find point of intersection. (3)

(c) In the given figure, QAP is the tangent at point A and PBD is a straight line. If $\angle ACB = 36^0$ and $\angle APB = 42^0$ .Find (i)$\angle BAP$ (ii)$\angle ABD$ (iii)$\angle QAD$ (iv)$\angle BCD$ (4)



QUESTION-3

(a) Prove the following :

$$\frac{\tan A + \sin A}{\tan A - \sin A} = \frac{\sec A + 1}{\sec A - 1}$$ (3)

(b) Find what length of canvas 2m in width is required to make a conical tent 20m in diameter and 42m in slant height allowing 10% for folds and stitching .Also find the cost of the canvas at the rate of ₹80 per meter. (3)

(c) The point P(3,4) is reflected to P' in the x axis and O' is the image of O in the line PP' find :
(i)The co–ordinates of P' and O'.
(ii)The length of the segment PP' and OO'.
(iii) The perimeter of the quadrilateral POP'O'
(iv) What is the special name of the quadrilateral POP'O'? (4)

QUESTION-4

a) Solve the inequation and represent the solution set on the number line.

$$-3 + x \leq \frac{8x}{3} + 2 \leq \frac{14}{3} + 2x, \text{ Where } x \in I$$ (3)

b) (b) Solve the equation $3x^2 + 5x - 9 = 0$.Give your answer correct to two decimal places. (3)

c) The three vertices of a parallelogram taken in order are A (-1, 0), B (3, 1) and C (2, 2).
a. (i)Find the co-ordinates of the fourth vertex D.
b. (ii)Find the equation of side BC of the parallelogram ABCD. (4)

QUESTION -5

(a) Prove that $(5x+4)$ is a factor of $5x^3+4x^2-4$. Hence factorise the given polynomial completely (3)

(b) Mukul invests ₹ 4500 in 8%, ₹10 shares at ₹15. He sells the shares when the price rise to ₹30, and invests the proceeds in 12 % ₹100 shares at ₹125. Calculate: (i)the sale proceeds (ii)the number of ₹125 shares he buys (iii) the change in his annual income from dividend. (3)

(c) Using ruler and compasses only, construct a ABC in which BC=6cm, $\angle B = 45^0$ and $\angle C = 60^0$. Draw the circumcircle of Δ ABC and measure its radius. (4)

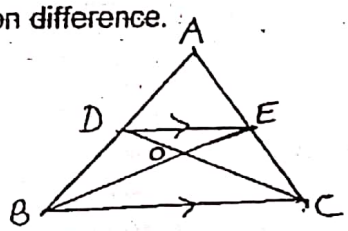
QUESTION-6

(a) If $A = \begin{bmatrix} 2 & x \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 36 \\ 0 & 1 \end{bmatrix}$, find the value of x, given that $A^2 = B$. (3)

(b) The fourth term of an A.P. is equal to 3 times the first term and 7th term exceeds twice the third term by 1. Find the first term and the common difference. (3)

(c) In the given figure DE ∥ BC and AD: DB = 5:4

Find: (i) DE: BC (ii) DO: DC (iii) $\frac{Area\ of \Delta DOE}{Area\ of \Delta COB}$ (4)



QUESTION-7

(a) Cards marked with all two digit numbers are placed in a box and are mixed thoroughly. One card is drawn at random. Find the probability that the number on the card is (i) divisible by 10 (ii) a perfect square number (iii) a prime number less than 25 . (3)

(b) Use ruler and compasses only, construct a Δ ABP such that AB=5cm, BP=3cm and $\angle ABP = 30^0$. Locate a point Q such that (i) Q is equidistant from A and B.(ii) Q is equidistant from AB and BP. (3)

(c) By increasing the speed of a car by 10km/hr, the time of journey for a distance of 72km is reduced by 36 minutes. Find the original speed of the car. (4)

QUESTION-8

(a) The sum of three numbers in G.P is $\frac{13}{12}$ and their product is -1. Find the numbers. (3)

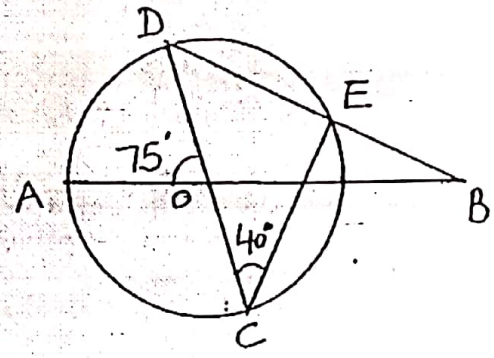
(b) A model of the ship is made to a scale of 1:160.
Find: (i) the length of the ship, if the length of its model is 1.2m.
(ii) The area of deck of the ship, if the area of the deck of its model of $1.2m^2$.
(iii) The volume of the ship, if the volume of its model is $1.2m^3$. (3)

(c) The surface area of a solid metallic sphere is $1256cm^2$. It is melted and recast into solid right circular cones of radius 2.5 cm and height 8cm. Calculate: (i) the radius of the solid sphere (ii) the numbers of cones recast. (4)

QUESTION -9

(a) A straight line passes through the points P(-1,4)and Q (5,-2).It intersects x axis at point A and y axis at point B.M is the midpoint of the line segment AB. Find (i) the equation of line (ii) the co-ordinates of point A and B (iii) the co-ordinates of point M. (3)

(b) In the given figure, straight lines AB and CD pass through the centre O of the circle. If ∠OCE = 40^0 and∠AOD = 75^0, find∠CDE and∠OBE. (3)



(c)Two poles of equal heights are standing opposite to each other on either side of the road which is 80m wide. From a point between them on the road, the angles of elevation of the top of the poles 60^0 and 30^0 respectively. Find the height of the poles and the distances of the point from the poles. (4)

QUESTION -10

(a) Find the value of K for which the following equation has real and equal roots:
$(k-12)x^2+2(k-12)x+2 = 0$. (3)

(b) Prove the following: $\frac{1}{cosec\,A-\cot A}-\frac{1}{\sin A}=\frac{1}{sinA}-\frac{1}{cosecA+\cot A}$ (3)

(c) At a shooting competition the scores of a competitor were as given below:

Score	0	1	2	3	4	5
No. Of shots	0	3	6	4	7	5

i. What was his model score?
ii. What was his median score?
iii. What was his total score?
iv. What was his mean score? (4)

QUESTION-11

(a) The product of first three terms of a G.P is 1000. If 6 is added to its second term and 7 add to its third term, then the terms becomes in A.P. Find the G.P. (4)

(b) Draw ogive for the following distribution :

Monthly Income	600-700	700-800	800-900	900-1000	1000-1100	1100-1200	1200-1300
No. Of worker	40	86	86	120	90	40	26

From the graph determine:

i. The median income
ii. The number of worker whose income exceeds 1180
iii. The lower quartile and the upper quartile
iv. The interquartile

(6)