LILAVATIBAI PODAR HIGH SCHOOL (ISC)

Preliminary paper (semester -2) 2021 -22

Subject: Mathematics
Std.: X

Points: 40
Duration : 1hr.30mins.

Instructions

The 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 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 3 questions from section B.
The intended marks for questions and parts of questions are given in brackets [ ]

SECTION A (attempt **all** questions from this section)

Question 1.

Choose the correct answer to the questions from the given options . (Do not copy the question write the correct answer only) **[10]**

(i) . A point P (-3 , 4) is reflected in the origin , to form image P′ . The co ordinates of P′ are ..

a. (3 , - 4) b. (3 , 4) c . (- 3 , -4) d. (4 , -3)

(ii) . A square piece of chart paper with side 7 cm. is rolled along one side , after which the free ends are joined without overlapping to form an open cylinder. The curved surface of this cylinder is ....

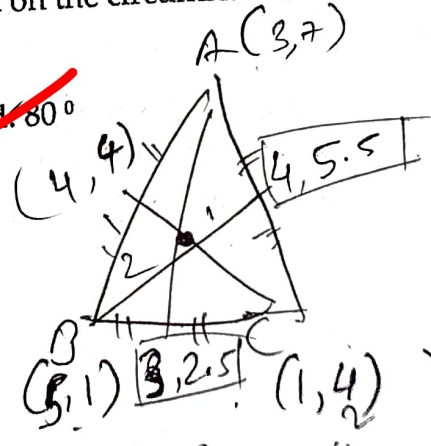
a. 1078 sq . cm. b. 49 sq. cm. c. 14 sq cm. d. 154 sq cm.

(iii) Find the co ordinates of the centroid triangle ABC , A (3 , 7) , B (5 , 1) C (1 , 4) .

a. (4 , 3) b. (4.5 , 6) c. (3 , 4) d. (0 , 3)

(iv) A circle has a centre O and diameter AB , C is a point on the circumference of the circle , if angle CAO is 40 ^{0} , find angle COB ....

a. 20 ^{0} b. 50 ^{0} c. 40 ^{0} d. 80 ^{0}



This paper consists of 4 printed sides

(v) Find the value of $(1 + \tan^2 x^0) \cdot (\cos^2 x^0)$

a. 1 b. 0 c. 2 d. 4

(vi) Find the slope of a line , making equal positive intercepts of 5 units on both the axes .

a. 1 b. -1 c. 5 d. 0

(vii) The histogram is a graphical representation in which the tallest bar can be used to estimate the .....

a. median b. mean c. mode d. average

(viii) A solid cone and a solid cylinder have the same radius and the same height , if the volume of the cone is 30 cm^3 , find the volume of the cylinder .

a. 10 cm^3 b. 60 cm^3 c. 15 cm^3 d. 90 cm^3

(ix) Find the median of the given data 5 , 17 , 8 , 10 , 6 , 14 , 6 , 11 , 19

a. 10 b. 10 . 5 c. 11 d. 8

(x) The probability of winning a game is 0.75 , thus the probability of losing the same game is .....

a. 0.75 b. 0.25 c. 1 d. 0

SECTION B (attempt any 3 questions from this section)

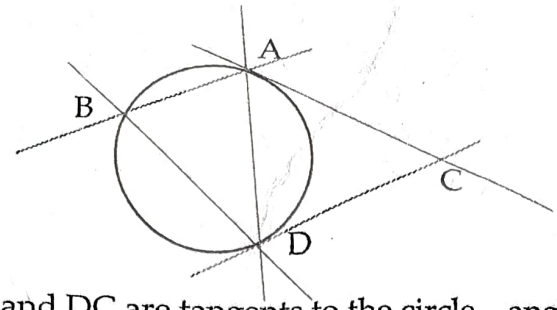
Question 2.

(i) Find the ratio in which the line segment AB is divided by the y-axis , A (- 6 , 2) , B (6 , 10) [2]

(ii) A pair of coins are tossed simultaneously ; find the probability of getting at the least one head . (sample space required) [2]

(iii) The angle of elevation made by an observer from a levelled ground ,to the top of a tower is 60^0 ; find the distance of the observer from the base the tower , if the height of the tower is 120 m . ($\sqrt{3} = 1.732$, answer to the nearest integer) [3]

(iv)



Given AC and DC are tangents to the circle , angle ACD is 40^0 Find angle ABD . If O is the centre of the circle find the angle AOD . [3]

Question 3 .

(i) Given ABCD is a cyclic quadrilateral in a semicircle with diameter AB, and centre O . If angle ADC is 125^0 , find angle COB (diagram required) [2]

(ii) Prove: $1 - \frac{\cos^2 A}{1+\sin A} = \sin A$ [2]

(iii) A cone of radius 10 cm and height 30 cm is carved out / drilled out from a solid wooden cylinder of radius 10 cm and height 60 cm . Find the volume of the resulting solid . ($\pi = 3.14$) [3]

(iv) Plot an ogive for the following distribution and find the median . [3]

Weight Kg	41 - 44	46 - 49	51 – 54	56 - 59
Pupils	4	10	14	4

Use a scale of 2 cm = 5 units on both axes .

Question 4 .

(i) Find the equation of line segment PQ , P (6 , -4) and Q (0 , 10) [2]

(ii) Find the mean for the following data . [2]

Marks	20 - 30	30 - 40	40 - 50	50 – 60
Pupils	4	6	10	5

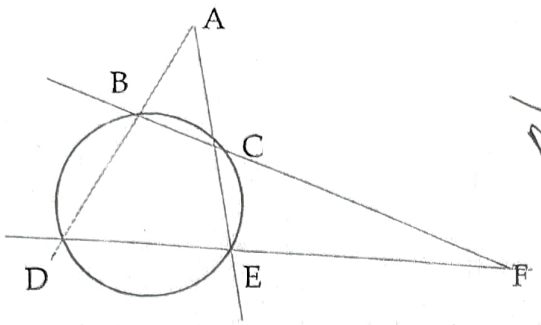
(iii) A solid metal cylinder of radius 7 cm and height 10 cm. is melted and recast into cones of radius 1 cm. and height 3 cm . Find the number of cones recast. [3]

(iv) Use graph paper for this question . (scale 2cm. = 1 unit on both axes)

A point P (3 , 4) is reflected in the y axis to form the image P', another point Q (0 , 1) is reflected in the line y = - 1 , to form and image Q' . Join points P Q P'Q' P to obtain a geometric figure , name the type of figure formed . [3]

Question 5.

(i)



Given angle BDE $= 65^0$, angle BAC $= 35^0$, Find angle EFC [2]

(ii) Prove : $\sqrt{\frac{1-\cos A}{1+\cos A}} = \frac{1-\cos A}{\sin A}$ [2]

(iii) Given A (-2 , 6) , B (8 , 10) , C (4 , -6) . Find the equation of the median through C . [3]

(iv) Plot a Histogram for the following data and estimate the mode . [3]

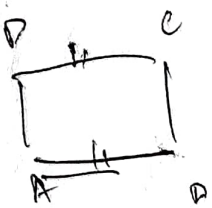
marks	31 - 40	41 - 50	51 - 60	61 - 70
pupils	4	10	5	2

Use the scale y axis 1 cm = 1 unit , x axis 1 cm = 5 units

Question 6 .

(i) A spinner is marked with 20 sections numbered 1 to 20 . On a free spin , and after coming to rest , find the probability of obtaining , – a) a prime number.
b) a multiple of 3 . [2]

(ii) ABCD is a Rhombus A (0 , 4) B (2 , 1) C (0 , -2) find the co ordinates of vertex D [2]



(iii) From a point A on levelled ground the angle of elevation to the top of a tower CD is observed to be 30^0, on moving 60 m towards the base to the tower the angle of elevation to the same top was observed to be 60^0. Find the height of the tower , to the nearest meter. ($\sqrt{3} = 1.732$, diagram required) [3]

(iv) The following distribution has a missing frequency ' a ', if the mean is 27 . 2 ,find 'a' . [3]

x	10	20	30	40	50
f	6	14	a	8	2