

EDWARDS ENGLISH SCHOOL, JAMTARA
 Mathematics-X [SEMESTER 2 EXAM 2022]

Time: 1 1/2 Hrs.

Max. Marks: 40

General instruction

1. Attempt all questions from section A and any 3 question from section B.
2. All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.
3. The intended marks for questions or parts of question of section B are [3+3+4]

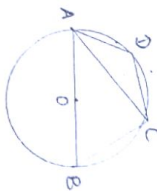
SECTION - A

1. (i) A point P is reflected in the X-axis. Co-ordinate of its image is (-4,5). Find the co-ordinate of P

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

(ii) ABCD is a cyclic quadrilateral in a circle with centre O. If angle ADC = 130°, find angle BAC

- (a) 40° (b) 50° (c) 90° (d) none



(iii) Two cylinders have radii in the ratio 3:5 and heights in the ratio 2:3. Find the ratio between their curved surface areas.

- (a) 6:25 (b) 5:2 (c) 2:5 (d) 2:3

(iv) Calculate the co-ordinate of the centroid of the triangle ABC, if A = (7,-2), B = (0,1) and C = (-1,4)

- (a) (1,2) (b) (2,1) (c) (2,2) (d) (4,2)

(v) what may be the value of $\cos^2 A \sin^2 A + \tan^2 A + \sec^2 A$

- (a) $\sec^2 A + \sec^4 A$ (b) $\sec^2 A \sec^4 A$ (c) $\cos^2 A \sec^4 A$ (d) $\sec^4 A \sec^2 A$

(vi) Find the modal class

Class	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	7	9	11	6	2

- (a) 40-50 (b) 30-40 (c) 20-30 (d) 10-20

(vii) Find the value of k for which the lines $kx - 5y + 4 = 0$ and $5x - 2y + 5 = 0$ are perpendicular to each other.

(a) -2 (b) 2 (c) 3 (d) 4

(viii) If the mean of 6, 4, 7, a , and 10 is 8, find the value of ' a '.

(a) 13 (b) 14 (c) -13 (d) 11

(ix) If $\cos^2 A - \cos A = 0$, find A

(a) $(30^\circ, 60^\circ)$ (b) $(0^\circ, 90^\circ)$ (c) $(45^\circ, 45^\circ)$ (d) none

(x) Which of the following cannot be the probability of an event?

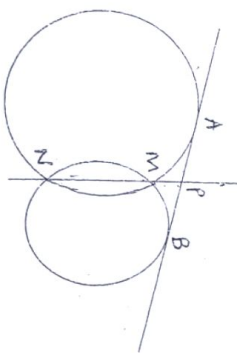
(a) 43% (b) $3/5$ (c) 2.7 (d) 0.35

SECTION - B (Attempt any 3 questions from this section)

2.(a) Find the equation of the line passing through $(2, -1)$ and parallel to the line $2x - y = 4$

(b) A pair of dice is thrown. Find the probability of getting a sum of 10 or more, if 5 appears on the first.

(c) In the given figure, MN is the common chord of two intersecting circles and AB is their common tangent. Prove that the line NM produced bisects AB at P .



3.(a) Find the height of a tree when it is found that on walking away from it 20 m, in horizontal line through its base, the elevation of its top changes from 60° to 30° .

(b) Find the volume of the largest cylinder formed when a rectangular piece of paper 22 cm by 15 cm is rolled along its longer side.

(c) Estimate the median for the given data by drawing ogive.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	4	9	15	14	8

4.(a) Prove that : $2 \sin^2 A + \cos^4 A = 1 + \sin^4 A$

(b) A solid cone of height 8 cm and base radius 6 cm is melted and recast into identical cones, each of height 2 cm and diameter 1 cm. Find the number of cones.

(c) Using a graph paper, plot the points A(6,4) and B(0,4). (i) Reflect A and B in the origin to get the images A' and B' (ii) Write the co-ordinate of A' and B' (iii) State the geometrical name of the figure ABA'B' (iv) Find its perimeter.

5.(a) Prove that : The rhombus, inscribed in a circle, is a square.

(b) Prove the identities: $\sqrt{\frac{1 - \cos A}{1 + \cos A}} = \frac{\sin A}{1 + \cos A}$

(c) The following are the marks obtained by the 70 boys in a class test.

Marks	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No.of boys	10	12	14	12	9	7	6

Calculate the mean by step deviation method.

6.(a) In a single throw of two dice, find the probability of

(i) a doublet (ii) a number less than 3 on each dice (iii) an odd number as a sum

(b) Find the co-ordinates of points of trisection of the line segment joining the point (6,-9) and the origin.

(c) An airplane, at an altitude of 250 m, observes the angles of depression of two boats on the opposite banks of a river to be 45° and 60° respectively. Find the width of the river correct to nearest whole number.