MOCK 2

Subject: Mathematics

Class X

Time: Two and Half Hours Maximum Marks: 80

Reading time: 15 Minute

Attempt all question from Section A and any four from Section B. All working, including rough work must be clearly shown and must be as the done on the same sheet of the rest of the answer. Omission of essential working will result in loss of marks. Mathematical tables are provided.

Section A (40 Marks)

(Attempt all questions from this section)

Questions 1.
[15]

Choose the correct answers to the questions from the given options.

(i) If $A = \begin{bmatrix} 5 & 0 \\ 4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 2 \\ 4 & 1 \end{bmatrix}$, then $A - 2B = ?$

(a) $\begin{bmatrix} 1 & 4 \\ 0 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & -4 \\ -4 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & -4 \\ 4 & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 4 \\ -4 & 0 \end{bmatrix}$

(ii) When p (x) $=-x^3-3x^2+4x+2$ divided by (x+2), the remainder is :

(a) 0 (b) 32 (c) 26 (d) -26

(iii) The marked price of an article is Rs. 5000. The shopkeeper gives a discount of 1 0%. If the rate of GST is 12%, then the amount paid by the customer including GST is?

(a) Rs. 5040 (b) Rs. 6100 (c) Rs. 6272 (d) Rs. 6160

(iv) The roots of the equation $x^2 + 7x + 10 = 0$ are:

(a) (-5, -2) (b) (5,2) (c) (5, -2) (d) (-5,2)

(v)Which is the correct answer of the term 'n' if the first term of an AP (arithmetic Progression) is 5, the common difference is -3 and the nth term is -7?

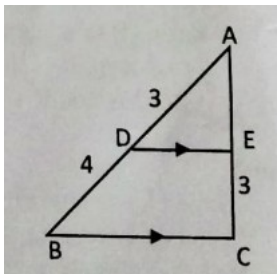
i. n=-7 ii. n=5 iii. n=7

(a) only (1) (b) only (2) (c) only (3) (d) all i, ii, and iii

(vii) In ΔABC, DE | BC and all measurement are in centimetres.

The length AE is

(a) 2 (b) 2.25 (c) 3.5 (d) 4



(viii)If the volume of a conical tent is 462 m' and the area of the base is 154 m', then

(a) The height of the cone is 9 m

(b) The height of the cone is 900 mm

Which of the statements) is/are valid?

(a) Only 1 (b) only 2 (c) both 1 & 2 (d) neither 1 nor 2

(ix)Event A : Dipika tosses two coins simultaneously she gets at least one tail.

Event B: Liza tosses two coins simultaneously she gets at least one head.

Event C: Ruchika tosses two coins simultaneously. She gets at least one head.

Which of the above events) has probability greater than or equal to 0.5?

(a) all events A, B and C (b) both events A and B

(c) both events B and C (d) both events A and C

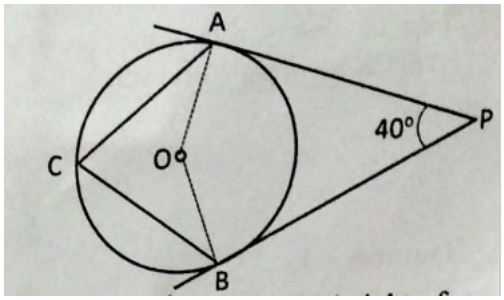
(x)The point in which the three medians of the triangle intersect.

The points is :

(a) orthocentre (b) Incentre (c) circumcentre (d) centroid of the triangle

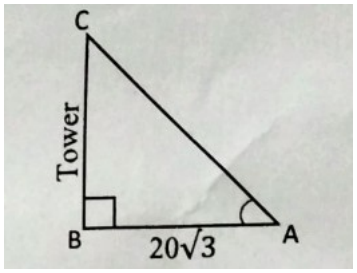
(xii)PA and PB are tangents at points A and B respectively to a circle with centre O. If C is a point on the circle and LAPB = 40°, then LACB is equal to

(a) 80° (b) 70° (c) 90° (d) 140°



(xii)In the given figure, the angle of elevation is 60° and the distance AB = 20/3m, then the height of the tower is :

(a) 1003m (b) 20/3m (c) 60m (d) 30/3m



(xiii) If the lines 2x +3y = 5 and kx - 6y = 7 are parallel, then the value of k is:

(a) 4 (b)-4 (c)$\frac{1}{4}$ (d)$\frac{-1}{4}$

(xiv) Assertion (A): The median for a grouped frequency distribution is found graphically by drawing a cumulative frequency curve,

Reason (R) : A cumulative frequency curve is also called a histogram.

(a) A is true, R is false (b) A is false, R is true (c)Both A and R are true

(d) Both A and R are false

(xv) i. Company 'P' invested Rs. 12,500 in shares and get annual dividend of Rs. 500

ii. Company 'Q' invested Rs. 13,000 in shares and get annual dividend of Rs. 650

iii. Company 'R' invested Rs. 15,000 in shares and get annual dividend of Rs. 600.

Which Company has less rate of rate of return of investment ?

(a)Company P (b)Company R (c)Company Q (d)Company R

Question 2. [4+4+4=12]

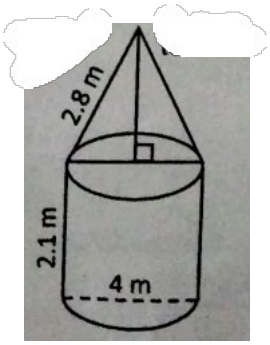
(i)Sohan has a recurring deposit account in SBI for 2 yars at 6% p.a. Simple Interest. If he gets Rs.

1200 as interest at the time of maturity, find:

(a) the monthly instalment

(b) the amount of maturity

(ii)A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of cylindrical part are 2.1 m and 4m respectively, and the slant height of the top is 2.8 m, find the arca of canvas used for making the tent. Also find the Cost of the canvas of the tent at the rate of Rs. 500/m.



(iii)Find:

(a) $(\text{Sin A} + \text{Cosee A})^2$

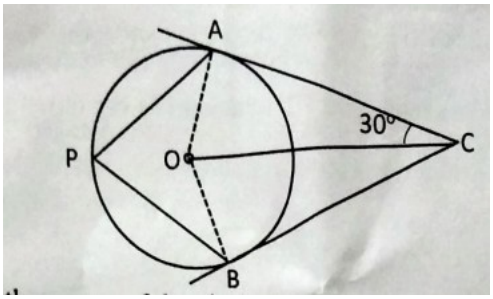
(b) $(\text{Cos A} + \text{Sec A})^2$

Using the above results prove the following trigonometry identity.

$(\text{Sin A} + \text{Cosec A})^2 + (\text{Cos A} + \text{Sec A})^2 = 5 + \text{Sec}^2 \text{A}.\text{Cosec}^2 \text{A}$

Question 3. [4+4+5=13]

(i)If x = $\frac{\sqrt{a+1}+\sqrt{a-1}}{\sqrt{a+1}-\sqrt{a-1}}$ using properties of proportion, show that x^2- 2ax 1=0



In the figure, O is the centre of the circle, Tangents to the circle at A and B meet at C. If ACO = 30^0 find,(a) <BCO (b) LAOB (c) LAPB.

(iii)Study the graph and answer each of the following:

(a) Name of the curve

(b) The median marks

(c) The lower quantity

(d) The number of students who did not pass the exam if the Pass percentage was 40 marks.

[Graph for the above question is attached at the back of the Question Paper]

Section B (40 marks)

Attempt any four questions

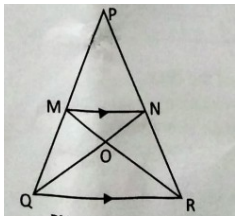
Question 4

[3+3+4=10]

(i) Let = $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$, B=$\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$ and C = $\begin{bmatrix} 1 & 3 \\ 3 & 1 \end{bmatrix}$

(ii) Solve the following quadratic equation and give your answer correct to two significant figures (use

formula) 5x7 - 3x - 4 = 0. (you may use mathematical table)



(iii) In the $\Delta_P QR$,MN is parallel to QR and $\frac{PM}{MQ} = \frac{2}{3}$

(i)Find, $\frac{MN}{QR}$

(ii) Prove that ΔOMN and ΔORQ are similar.

(iii)Find area of ΔOMN: are of ΔORQ

Question 5

[3+3+4=10]

(i) Calculate the mean of the following distribution using step deviation method:

No.of Patients	10-20	20-30	30-40	40-50	50-60	60-70
No.of Days	5	2	7	9	2	5

(ii) The Printed Price of an article is Rs. 50,000. The wholesaler allows a discount of 10% to a shopkeeper. The shopkeeper sells the article to a consumer at 4% above the Marked Price. If the sales are intrastate and the rate of GST is 18%, find :

(a) The amount inclusive of tax (under GST) which the shopkeeper pays for the article

(b) The amount paid by the consumer for the article

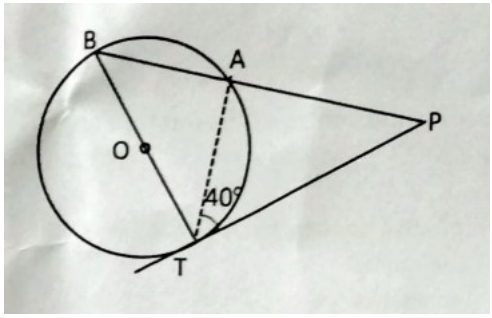
(c) The amount of tax (under GST) paid by the shopkeeper to the Central Government.

(iii) In the given figure PAB is a secant and PT a tangent to the circle with centre O. if LATP = 40,

PA = 9 cm and AB = 7 cm. Find :

(a) Measurement of LAPT

(b) The length of tangent PT



Question 6 [3+3+4=10]

(i) The 4* term of a G.P. is 16 and the 7th term is 128. Find the first term and the common ratio of the G.P.

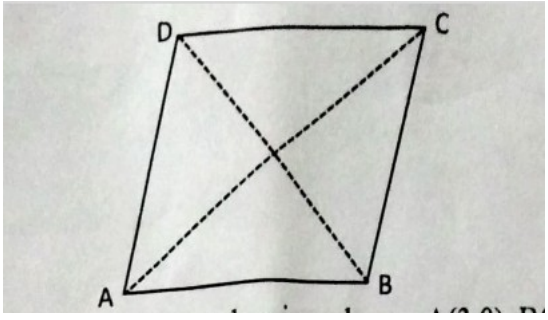
(ii) A certain number of metallic cones each of radius 2 cm and height 3 cm are melted and recast in a solid sphere of radius 6cm. Find the number of cones.

(iii) Using a graph paper draw a histogram for the given distribution showing the number of runs scored by 50 batsman.

Runs scored	3000-4000	4000-5000	5000-6000	6000-7000	7000-8000	8000-9000	9000-10000
No. of Batsman	4	18	9	6	7	2	4

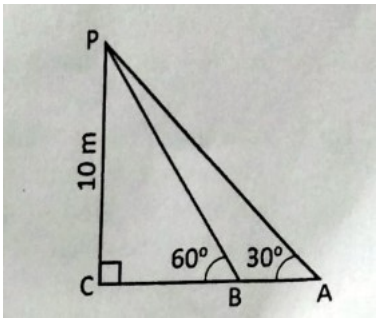
Estimate the mode of the data:
Take 2 cm = 1000 runs along x-axis and
2 cm = 5 batsman along y-axis

Question 7
[5+5=10]



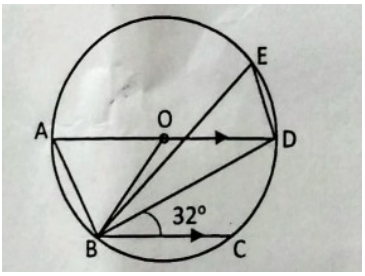
(i)Three vertices of a parallelogram ABCD taken in order are A(3,0), B(5,10), C(3,6), find :
(a) Coordinates of the fourth vertex D(x,y)
(b)Slope of CD
(c) Equation of side AB of the parallelogram ABCD

(ii)A From the points A and B on the same side of a building, the angle of elevation of the top of the building are 30° and 60° respectively. If the height of the building is 10 m, find the distance between A and B correct to two decimal places.



Question 8
[3+3+4=10]
(i) Solve the following inequation, write the solution set and represent it on the real number line.

$$4x+19<\frac{3x}{5}-2\leq\frac{2}{5}\times ER$$



In the figure, AD is a diameter, O is the centre of the circle. AD is parallel to BC and ¿CBD =

32°. Find:

(a) ¿OBD

(b) <AOB

(c) ¿BED

Points A and B have coordinates (7, -3) and (1,9) respectively. Find

(a) The slope of AB.

(b) The equation of the perpendicular bisector of the line segment AB.

(c) The value if (-2, P) lies on it. find the volume of P

Question 9 [3+3+4=10]

(i)If a, b, c are in continued proportion, prove that

$$\frac{pQ^2+qab+rb}{pb^2_{+q}bc+rc^2}=\frac{a}{c}$$

(ii) A school bus transported an extension party to a picnic spot 150 km away. While returning, it was raining and the bus had to reduce its speed by 5km/hr, and it took one hour longer to make the return trip .Find the time taken to return.

(iii) Using ruler and compass construct a triangle ABC in which AB = 7 cm, LCAB = 60° and AC=

5cm. Construct the locus of :

(a) Point equidistant from AB and AC

(b) Point equidistant from BA and BC

(c) Hence construct a Circle touching the three sides of the triangle internally.

Question 10

[3+3+4=10]

(i) Using remainder and factor theorem, factorise completely, the given polynomial:

2x3 + 3x2 - 9x – 10

(ii) Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card which is:

(a) A prime number

(b) A number divisible by 4

(c) A number that is multiple of 6

(iii) Use graph paper to answer the following question.

(Take 2 cm = 1 unit along both axis)

(a) Plot the point A(-4, 2) and B(2, 4)

(b) A' is the image of A when reflection in the y-axis, plot it on the graph paper and write the coordinates of A'

(c) B' is the image of B when reflected in the line AA! Write the coordinates of B'.

(d)Write the geometric name of the figure ABA’B’