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CHRIST NAGAR HR SEC. SCHOOL, TRIVANDRUM

SECOND TERMINAL EXAMINATION 2024-'25

Std: X (ICSE) Time : 3 hrs

MATHEMATICS Marks : 80

Instructions:

* ***First 15 minutes must be spent for reading the question paper. The time for writing the exam is 3 hrs.***
* ***All questions in Section A are compulsory. Answer any four questions from Section B.***
* ***All working, including rough work, must be done on the same sheet as the remaining answer.***
* ***Omission of essential steps will result in loss of marks.***

SECTION A (40 Marks)

(Attempt *all* questions from this Section)

Question 1 (15x1=15)

Choose the correct answer to the questions from the given options:

a) The SGST paid by a customer to the shopkeeper for an article which is priced at ₹500 is ₹15. The rate of GST charged is:

(i) 1.5% (ii) 3% (iii) 5% (iv) 6%

b) A man has a 4 year time deposit account and deposits ₹650 per month. If received ₹5096, as interest at the time of maturity, the rate of interest is

(i) 8%p.a. (ii) 8.5%p.a. (iii) 9%p.a. (iv) 10%p.a.

c) The ratio in which p(m,4) divides the line segment joining the points A(2,5) and B(6,-3) is

(i) 1:2 (ii) 2:1 (iii) 1:3 (iv) 1:7

d) The centroid of a ΔABC is G(6,7). The coordinates of the vertices are A, B and C are (a,5), (7,9) and (5,7) respectively. The value of a is

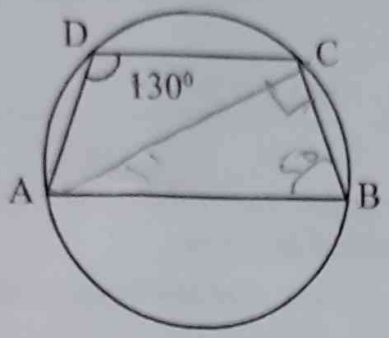
(i) 9 (ii) 6 (iii) 3 (iv) 7

e) The angle of inclination of the line $\sqrt{3}x - y = 1$ is

(i) 30^o (ii) 45^o (iii) 60^o (iv) 90^o

[P.T.O]

f) ABCD is a cyclic quadrilateral such that AB is the diameter of the circle circumscribing it and $\angle ADC = 130^\circ$, then $\angle BAC$ is equal to



(i) 40° (ii) 50° (iii) 90° (iv) 30°

g) The volume of a cylinder is 330 cm^3. The volume of the cone having same radius and height as that of the given cylinder is:

(i) $330cm^3$ (ii) $165cm^3$ (iii) $110cm^3$ (iv) $220cm^3$

h) The probability of getting a prime number on a single throw of a six sided die is

(i) $\frac{1}{3}$ (ii) $\frac{1}{2}$ (iii) 0 (iv) 1

i) Point P is 26cm away from the centre O of a circle and the length PT of the circle is 24cm. Then the radius of the circle is

(i) 7cm (ii) 9cm (iii) 10cm (iv) 12cm

j) The equation of line with slope –3 and Y-intercept –3 is

(i) $3x+y+3=0$ (ii) $3x-y-9=0$ (iii) $y-6=0$ (iv) $3y=x$

k) In a given set of data $x_1, x_2, x_3 \ldots x_n$

Assertion(A): To find the mode of the given data, the variable needs to be arranged in ascending or descending order.

Reason(R): The mode is the value which occurs most frequently.

(i) A is true, R is false.

(ii) A is false, R is true.

(iii) Both A and R are true.

(iv) Both A and R are false.

l) The lateral surface area of a cone is $60\pi\ cm^2$. If the slant height of the cone is 8cm, then the diameter of its base is

(i) 25cm (ii) 18cm (iii) 12cm (iv) 15cm

m) The median of the data 24, 25, 26, x+2, x+3, 30, 31, 34 arranged in order is 27.5, then the value of x is

(i) 25 (ii) 27 (iii) 28 (iv) 30

n) The lines $7y=ax+4$ and $2y=3-x$ are parallel to each other, then the value of a is

(i) -1 (ii) $\frac{-7}{2}$ (iii) $\frac{-2}{7}$ (iv) 14

o) 500 shares of ₹100 each get a dividend of 15%. The dividend is

(i) ₹5000 (ii) ₹750 (iii) ₹1000 (iv) ₹7500

Question 2

a) Manish opened a recurring deposit account in a bank. He deposits ₹2500 per month for two years. If he gets ₹66250 at the time of maturity find: [4]

(i) the interest paid by the bank.

(ii) the rate of interest.

b) Find the amount for the following intra-state transaction of goods/services.[4]

MRP(in₹)/item	300	600	480
Number of items	40	50	70
GST%	12	12	18

c) Amith invests ₹36,000 in buying ₹100, shares at ₹20 premium. The dividend is 15% per annum. Find [4]

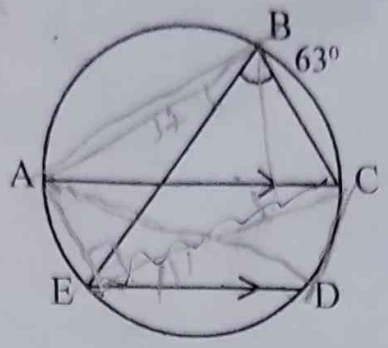
(i) the number shares he buys.

(ii) the yearly dividend.

(iii) the percentage return on his investment.

Question 3

a) In the given figure, ED is a chord parallel to the diameter AC of the circle ABCDE. If $\angle CBE = 63^{\circ}$, calculate $\angle DEC$ (give reason) [4]



b) A soild metallic sphere of radius 6cm is melted and made into a solid cylinder of height 32cm. Find the [4]

(i) radius of the cylinder

(ii) curved surface area of the cylinder (Take $\pi = 3.1$)

c) The daily expenditure of 100 families is given below. Calculate f_1 and f_2, if the mean daily expenditure is ₹188. [5]

Expenditure(in₹)	140-160	160-180	180-200	200-220	220-240
No of families	5	25	f_1	f_2	5

Section B

(Answer <u>any four</u> questions)

Question 4

a) A cylindrical container with diameter 14 cm and height 16 cm can hold 20 spherical gulab jamun of diameter 6 cm and sweetened liquid such that the can is filled upto the brim. Find how much sweetened liquid the can contains. (Take $\pi = 3.14$) [3]

b) A man invests ₹20800 in 6% ₹100 shares at ₹104 and ₹14300 in 10.5% ₹100 shares ₹143. What will be his annual income from the shares? [3]

c) Find the equation of the median through A of a triangle whose vertices are A(7,-3), B(5,3) and C(3,-1). Also find the equation of the altitude to AC.[4]

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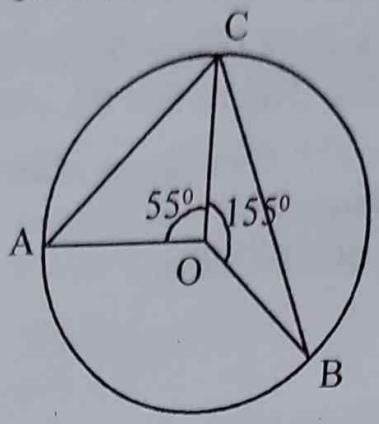
Question 5

a) In the given figure, angles subtended by arc AC and BC at the centre O of the circle are 55^0 and 155^0 respectively. Find $\angle ACB$ and $\angle OCA$. (Give reason). [3]



b) Mr. Sharma has a cumulative deposit account for three years at 7% interest per annum. He receives ₹7977 as the maturity value after three years. Find his monthly investment. [3]

c) Find the mean of the following using step deviation method: [4]

C.I	0-8	8-16	16-24	24-32	32-40	40-48
Frequency	10	20	14	16	18	22

Question 6

a) The probability of selecting a red ball from a bag of red, yellow and green balls is $\frac{7}{15}$ and $\frac{4}{15}$. If there are 16 green balls, find the total number of balls in the bag. [3]

b) The line $4x-3y+12=0$ meets the x-axis at A. Write down the co-ordinates of A. Determine the equation of the line passing through A and perpendicular to $4x-3y+12=0$. [3]

c) An article is marked at ₹2800. The shopkeeper sells it to a customer at a discount of 9%. If customer pays a CGST of ₹127.40. Find [4]

i) rate of GST

ii) price paid by the customer.

Question 7

a) In a triangle PQR which is right angled at Q , PQ=24cm and QR=7 cm. Find the radius of the incircle. (Give reason) [3]

b) Find the ratio in which the point (–3,p) divides the line segment joining the points (–5,-4) and (–2,3). Hence find the value of p. [3]

c) Rohit invests ₹1,20,000 in 10% ₹100 shares at 20% premium. He sold half of the shares at a discount of 10% and invests the proceeds in 15% ₹10 shares at a premium of 50%. What annual income will he receive now from the investment? [4]

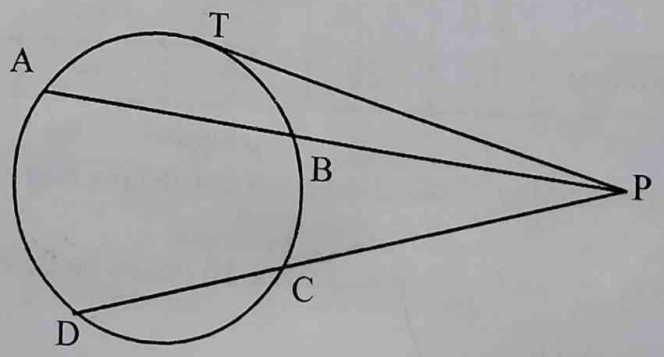
Question 8

a) The diameter of a sphere is 21cm. The radius of the base of the solid cone is same as the radius of the sphere. If the volume of the two solids are equal, find the total surface area of the sphere and height of the cone.[3]

b) In the figure, BP=16cm, CP=18cm, DC=14cm. Calculate, [3]

i) the length of chord AB.

ii) the length of tangent PT.



c)

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60
Number of students	3	5	8	18	12	4

Draw an ogive for the above distribution. Use the Ogive to estimate;

i) the median mark

ii) the number of students who obtained less than 32 marks. [4]

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Question 9

a) A solid right cone whose radius of the base is 14cm and height 7.5cm is melted and drawn into a wire of radius 1.4mm. Find the length of the wire in metres. [3]

b) A, B and T are three points on a circle. The tangent at T meets BA produced at P. Given that $\angle ATB=32^0$ and $\angle APT=48^0$, calculate the angle subtended by BT at the centre of the circle. (Give reasons). [3]

c) A box contains numbered cards 1 to 90. One card is drawn to random from the box. What is the probability that it bears [4]

i) a two digit number?

ii) a number divisible 4 and 5?

iii) a perfect square number?

iv) a prime number?

Question 10

a) Draw a histogram of the following distribution and estimate the mode.[3]

No of apples	0-9	10-19	20-29	30-39	40-49	50-59
No of trees	5	8	10	7	3	2

b) A cone is surmounted on a hemisphere with common radius 12cm. If the total height of the solid formed is 37cm, find the volume of the solid. [3]

c) A straight line passes through the points A(2,-8) and B(10,-4). It intersects x-axis and y-axis at points E and F respectively. P is the midpoint of line segment EF. Find the: [4]

i) equation of EF.

ii) co-ordinates of point P.

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