N. L. Dalmia²

High School

(A School of Excellence of N. L. Dalmia Educational Society)
ICSE-ISC Affiliated
ISO 9001:2008

PRE PRELIMINARY EXAMINATION

Class : X	MATH	Marks : 80 / Pgs 6
Date :17.11.2014		Time : 2 1/2 Hrs

Answer to this paper must be written on the paper provided separately
You will NOT be allowed to write in the first 15 minutes.
This time is 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 question from section A and any four questions from section B.
The intended marks for questions or part of questions are given in the bracket ().

Section A

Ques1.

a. Use the Remainder Theorem to factorise the following expression   (3)
$2x^3 + x^2 - 13x + 6$.

b. Let

$A = \begin{bmatrix} 4 & -2 \\ 6 & -3 \end{bmatrix}, B = \begin{bmatrix} 0 & 2 \\ 1 & -1 \end{bmatrix}, C = \begin{bmatrix} -2 & 3 \\ 1 & -3 \end{bmatrix}$ Find $A^2 - A + BC$ (3)

c. On a certain sum, the compound interest for 2 years is Rs 2172. If the rates of interest for successive years are 6 % and 8 % per year, then find the sum.   (4)

Ques 2

a. The king, queen and Jack of clubs are removed from a deck of 52 playing cards and then shuffled. A card is drawn from the remaining deck. Find the probability of getting

i). a heart (ii) a queen. (iii) a club   (3)

b. Solve the following quadratic equation and give the answer correct to two significant figures.
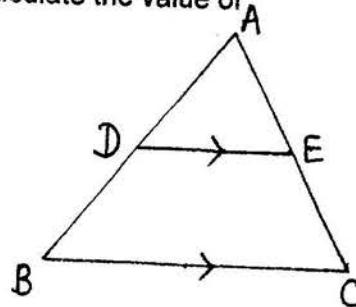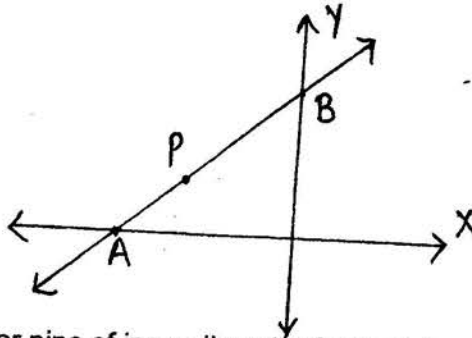
$4x^2 - 7x + 2 = 0$ (3)

c. In the adjoining figure, DE‖ BC and $\frac{AD}{DB} = \frac{2}{3}$, Calculate the value of   (4)

(i) $\frac{\text{Area of } \Delta \text{ ADE}}{\text{Area of } \Delta \text{ ABC}}$

(ii) $\frac{\text{Area of trapezium DBCE}}{\text{Area of } \Delta \text{ABC}}$

Ques 3

a. In the following figure, line APB meets the x-axis at A and Y-axis at B. P is the point (–4, 2) and AP : PB = 1 : 2. Write down the co-ordinates of A and B .   (3)

b. A hollow copper pipe of inner diameter 6 cm and outer diameter 10 cm is melted and changed into a solid circular cylinder of the same height as that of the pipe. Find the diameter of the solid cylinder.   (3)

c. Mrs. Kapoor opened a saving bank account in State Bank Of India on 9th Jan 2008. Her pass book entries for the year 2008 are given below.   (4)

Date (year 2008)	Particulars	Withdrawals (in Rs)	Deposits(in Rs)	Balance (in Rs)
Jan 9	By cash	-	10000	10000
Feb 12	By cash	-	15500	25500
April 6	To cheque	3500	-	22000
April 30	To self	2000	-	20000
July 16	To cheque	-	6500	26500
Aug 4	To self	5500	-	21000
Aug 20	To cheque	1200	-	19800
Dec 12	By cash	-	1700	21500

Mrs. Kapoor closes the account on 31st December, 2008. If the bank pays interest at 4% per annum, find the interest Mrs. Kapoor receives on closing the account, Give your answer to the nearest rupee.

Ques4.

(a) Solve the following inequation and represent the solution set on the number line $-2\frac{1}{2} + 2x \le \frac{4x}{3} \le \frac{4}{3} + 2x; x \epsilon w$ (3)

(b) Evaluate without using trigonometric table   (3)

$$2\left(\frac{tan35°}{cot55°}\right)^2 + \left(\frac{cot55°}{tan35°}\right)^2 - 3\left(\frac{sec40°}{cosec50°}\right)$$

(c) Draw a histogram from the following distribution and find the mode from graph   (4)

Class Int.	80-90	90-100	100-110	110-120	120-130	130-140
Frequency	6	9	16	13	4	2

Section B

Ques 5

a. Prove that $(1 + cot\theta - cosec\theta)(1 + tan\theta + sec\theta) = 2$ (3)

b. Dinesh bought an article for Rs 374, which included a discount of 15% on the marked price and a sales tax of 10% on the reduced price. Find the marked price of the article.   (3)

c. Find the equation of the line perpendicular to the line joining the points A (1,2) and B (6,7) and passing through the point which divides the line segment AB in the ratio 3:2.   (4)

Ques 6

a. A manufacturer marks an article for Rs 5000. He sells it to a wholesaler at a discount of 25% on the marked price and the wholesaler sells it to a retailer at a discount of 15% on the marked price . The retailer sells it to a consumer at the marked price and at each stage the VAT is 8%. Calculate the amount of VAT received by Government from   (3)
(i)   the wholesaler
(ii) the retailer

b. The population of a village 2 years ago was 6250, Due to migration to cities, it decreases at the rate of 8% every year. Find the decrease in its population in the last 2 years. (3)

c. Use ruler and compass only for this question (4)

(i) Contruct ΔABC, where AB= 3.5cm , BC = 6cm and ∟ABC = 60° .

(ii) Construct the locus of points inside the triangle which are equidistant from AB and BC.

(iii) Construct the locus of points inside the triangle which are equidistant from B and C.

(iv) Mark the point P which is equidistant from AB, BC and also equidistant from B and C. Measure and record the length of PB.

Ques-7

a. Given $x = \dfrac{\sqrt{a^2+b^2}+\sqrt{a^2-b^2}}{\sqrt{a^2+b^2}-\sqrt{a^2-b^2}}$ (3)

Use componendo and dividendo to prove that $b^2 = \dfrac{2a^2x}{x^2+1}$

b. The volume of a conical tent is 1232 m³ and the area of the base floor is 154 m², Calculate (3)

(i) the radius of the floor

(ii) the height of the tent

c. Use graph paper for this question (4)

(i) Plot the points A (3, 5) and B (-2, -4)

(ii) A′ is the image of A when reflected in the x-axis. Write down the co-ordinates of A′ and plot it on the graph paper.

(iii) B′ is the image of B when reflected in the y-axis, followed by reflection in the origin. Write down the co-ordinates of B′ and plot it on the graph.

(iv) Write down the geometrical name of figure AA′ BB′.

Ques-8

a. If b is the mean proportional between a and c, prove that (3)

$\dfrac{a^2-b^2+c^2}{a^{-2}-b^{-2}+c^{-2}} = b^4$

b. Sameer has a recurring deposit account in a bank for 5 years at 9% p. a. simple interest .If he gets Rs 51607.50 at the time of maturity, find the monthly instalment. (3)

C. Using step- deviation method, calculate the mean of the following distribution   (4)

Class interval	45-50	50-55	55-60	60-65	65-70	70-75	75-80
Frequency	5	8	30	25	14	12	6

Ques 9

a. Given $\begin{bmatrix} 2 & 1 \\ -3 & 4 \end{bmatrix} X = \begin{bmatrix} 7 \\ 6 \end{bmatrix}$, Write   (3)

(i) the order of the matrix X

(ii) the matrix X.

b. Ramesh invests Rs 4500 in 8%, Rs 10 shares at Rs 15, He sells the shares when the price rises to Rs 30 and invests the proceeds in 12% Rs 100 shares at Rs 125. Calculate   (3)

(i) The sale Proceeds

(ii) the number of Rs 125 shares he buys

(iii) the change in his annual income from dividend.

c. As observed from the top of a 80 m tall light house, the angle of depression of two ships on the same side of the light house in horizontal line with its base are 30° and 40° respectively. Find the distance between the two ships. Give your answer correct to nearest metre.   (4)

Ques 10

a. Find the point on the x-axis whose distance from the points (2 ,3) and (3½, -1) are in the ratio 2 :1.   (3)

b. Using ruler and compass only, Construct   (3)

(i) A triangle ABC, given AB=6cm, AC= 5.2cm and L CAB = 60°

(ii) In the same diagram, draw a circle which passes through the points A, B and C and mark its center O.

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

Ques 11.

a. Find the equation of the line passing through the intersection of the lines
$4x + 3y = 1$ and $5x + 4Y = 2$ and   (4)

(i) parallel to the line $x + 2y - 5 = 0$

(ii) perpendicular to the x – axis .

b. The marks obtained by 200 students in an examination are given below   (6)

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No of Students	05	10	11	20	27	38	40	29	14	06

Using a graph paper, draw an ogive for the above distribution. Use your ogive to estimate

(i) the median

(ii) the lower quartile

(iii) the number of students who obtained more than 80% marks in the examination.

(iv) the number of students who did not pass, if the pass percentage was 35.

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