LILAVATIBAI PODAR HIGH SCHOOL (ISC)

Preliminary Examination 2018 - 19

Subject: Mathematics **Points:80**
Std. X **Duration:2hrs.30m**
Instructions :

Answers to this Paper must be written on the paper provided separately.
The time given at the head of this Paper is the time allowed for writing the answers.
Section A is compulsory. Answer any four questions from section B.
The intended marks for questions or parts of questions are given in brackets [ ].

Section A (answer all questions)

Question 1.

a) $\begin{bmatrix} 2 & -1 \\ 0 & 3 \end{bmatrix}\begin{bmatrix} 0 & 2 \\ 1 & -4 \end{bmatrix} = A + 7I$ Find matrix A if I is a unit matrix of the order 2 x 2 [3]

b) If Rs. 15,000 is earned as interest on a monthly deposit of Rs. 5000 for 2 yrs. find the rate of interest on the recurring deposit. [3]

c) The expression $x^3 + ax^2 + bx + 6$, has $(x - 2)$ as a factor, and leaves a remainder 3 when divided by $(x - 3)$. Find 'a' and 'b'. [4]

Question 2.

a) An investment of Rs. 8800 is made on Rs. 100 shares at 10% premium, paying 22% dividend, find the return percent on the investment, and the dividend earned in one year. [3]

b) Find 'x' from the marks obtained by 9 pupils, if the mean mark is equal to the median. 5,7,9,10, x, 15, 21, 26, 27, are marks arranged in ascending order. [3]

c) A solid metallic cone of slant height 13 cm. and radius 5 cm. is melted and recast into solid spheres each of radius 1 cm, find the number of spheres recast. [4]

This paper consists of 4 printed sides.

Question 3.

a) Solve the quadratic equation $3x^2 - 12x - 1 = 0$, upto 3 significant figures. [3]

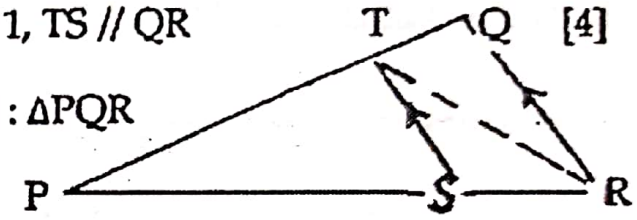
b) Solve the inequation and represent on a numberline. [3]

$$-3(x-7) \geq 15 - 7x > \left(\frac{x+1}{3}\right),\ x \in R$$

c) Given the ratio of area $\Delta PTS : \Delta TSR = 3:1$, TS // QR [4]

Find i) PS : SR ii) TS : QR iii) area $\Delta PTS : \Delta PQR$

iv) Area of $\Delta PTS : TQRS$



Question 4.

a) Construct ΔPQR, QR = 5 cm. angle Q = 45^0, PQ = 6.5 cm. Find by construction, the locus of points X and Y, equidistant from Q and R, and 4 cm. from Q. [4]

b) Plot a cumulative distribution curve for the following data. Estimate the median and the quartiles. If 50 kg is standard weight, find number of pupils that are over weight. [6]

Weight Kgs.	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 -80
Pupils	7	15	28	20	12	10	6	2

Section B (Attempt only 4 questions)

Question 5.

a) Use a graph paper and a scale of 1cm = 1 unit, on both axes. Plot point A (6, 6) reflect it in the line x = 0, to form A'. Plot point B (- 3, 3) and reflect it in the Y – axis to form B'. Plot point C (0, 3) and reflect it in the line y = - 1 to form C'. Join A, C, A', B, C', B' A to form a geometric figure, assign a name to the figure, and identify a point on the figure that is invariant on reflection in the line x = 0. [5]

b) Plot a Histogram to represent the following data, using the class marks given in cm. Estimate the mode, and list the modal class. [5]

Height	125	135	145	155	165	175	185
pupils	8	14	24	30	20	10	6

Question 6.

a) A map is drawn to a scale of 1 : 4000 Find the length on map in cm. that represents 5 km of ground length. Find area on the ground in sq. m. that is represented by 4 sq.cm.on this map . [3]

b) The first term of a GP is 27 and the 8th term is $\frac{1}{81}$ find the sum of the first 5 terms . [3]

c) Find the equation of line PQ passing points, (5 , 0) and (0 , - 6), also find the equation of another line AB intersecting PQ at right angles and passing through point (6 , 1) [4]

Question 7.

a) Find the sum of the first 51 terms of an AP , whose 2nd and 3rd terms are 14 and 18 resp. [3]

b) Find the ratio in which the line , x = 0 divides line AB , A (- 4 , 4) , B (2 , 8). Also find the co ordinates of the point , where A B is divided by the Y – axis . [3]

c) From the top of a building 60 m high , angles of elevation and depression were observed to the top and base of tower to be 30^0 and 60^0 resp. Find the height of the tower , given both structures are on the same level ground and opposite each other . [4]

Question 8.

a) If $\frac{4m+3n}{4m-3n} = \frac{7}{4}$, Find i) m : n ii) $\frac{2m^2+11n^2}{2m^2-11n^2}$ [3]

b) An angle of elevation is observed from ground to the top a building 60 m high to be 30^0, on walking 'x' m. towards the building , the angle of elevation to the top now changes to 60^0 . Find 'x' to the nearest metre. [3]

c) Find the mean of the following distribution of marks obtained , using step deviation only. [4]

Marks	30 - 40	40 - 50	50 - 60	60 -70	70 - 80	80 - 90	90 -100
pupils	8	12	24	16	9	7	4

Question 9.

a) The fourth term of an AP is 11 and the 8th term exceeds twice the 4th term by 5. Find the sum of the first 50 terms of the AP. [3]

Question 9.

b) Find the sum of $2 + 6 + 18 + 54 + \ldots\ldots\ldots + 4374$ [3]

c) In a pack of playing cards all black Kings and black Queens are removed . If a card is drawn out , at random find the probability of getting a , i) Face card ii) a black card iii) a red card or a face card .iv) a black card or a face card . [4]

Question 10

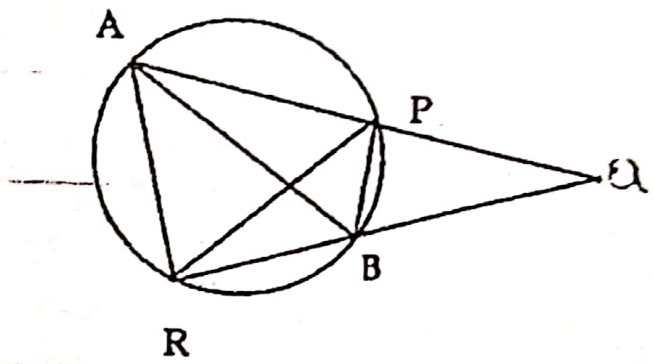
a) Find two numbers such that the mean proportion between them is 14 and the third proportion to them is 112 . [3]

b) Given AB is diameter , angle PAB = 35° , angle PQB =25 °. [3]

Find i) angle PRA

ii) angle ARB

iii) angle PRB



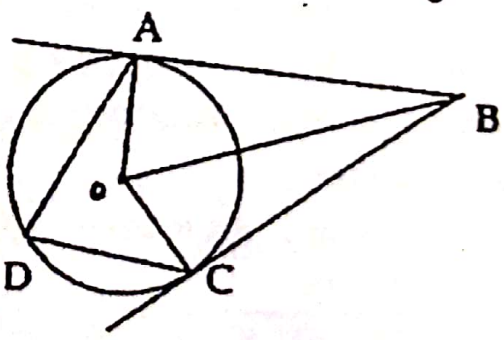
c) Construct a regular hexagon of side 5.5 cm , with an inscribed circle measure the radius of the incircle . [4]

Question 11.

a) Tangents BA and BC to the given circle with centre O . Angle AOB = 65° .Find i) angle ADC

ii) angle AOC

iii) angle ABC



[3]

b) A journey of 300 km. would take 2 hrs less if the speed was increased by 5 km per hr. Find the original speed [3]

c) Divide 207 into 3 parts ,such that these parts are in AP . The product of the two smaller parts is 4623 . [4]