**PRE BOARD EXAMINATIONS**

**MAYO COLLEGE GIRLS’ SCHOOL**

 **MATHEMATICS M.M:80**

 **CLASS X TIME: 2HRS 30 Mins** **+15 Minutes**

INSTRUCTIONS: ATTEMPT ALL QUESTIONS FROM SECTION A AND ANY FOUR QUESTIONS FROM SECTION B. ALL WORKING INCLUDING ROUGH WORK MUST BE SHOWN CLEARLY.

TIE SECTION A AND SECTION B SEPARATELY.

 **SECTION A Marks-40**

ANSWER ALL THE QUESTIONS

1 (a) The compound interest on a certain sum of money for 2 years at 12% per annum is Rs.795. Find the Simple Interest on the same sum for the same time and same rate. (3)

(b) If $\frac{a}{b}$ = $\frac{c}{d }$. Prove that $\frac{3a+4b}{3a-4b}$ = $\frac{3c+4d}{3c-4d}$ (3)

(c) The expression x3 + x2 + ax + b is exactly divisible by (x-3) and leaves the remainder 14 when divided by (x-1). Find the values of a and b.(3)

2(a) Find the values of x which satisfy the inequation

-2 ≤ $\frac{1}{2}$ - $\frac{2x}{3}$ ≤ 1$\frac{5}{6}$ , x є N. Graph the solution on the number line. (4)

(b)In the figure, square OABC is drawn in the sector DOE. If the radius of the sector ABC is 20 cm, find the area of the shaded portion. (3)



(c) A shopkeeper buys an article at a discount of 40% and pays sales tax at the rate of 12%. The shopkeeper in turn sells it to the customer at 10% discount and charges sales tax at the same rate. If the Printed Price is Rs.3000. Find

(i) the price paid by the shopkeeper.

(ii) the price paid by the customer.

(iii) the VAT paid by the shopkeeper. (4)

3(a) Amar opened a recurring deposit account in a Bank and deposited Rs.350 per month for 2 years. If he receives Rs.8925 at the time of maturity. Find the rate of interest per annum. (3)

(b) If I is unit matrix of order 2 x 2. Find the matrix P such that

2P – 4I = 3$\left[\begin{matrix}1&-2\\-1&0\end{matrix}\right]$. (3)

(c) Use a graph paper for this question.

(i) The point P(5,3) is reflected in the origin to get the image P’. Write down the co-ordinates of P’.

(ii) If M is the foot of the perpendicular from P to the x axis. Find the co-ordinates of M.

(iii) If N is the foot of the perpendicular from P’ to x-axis. Find the co-ordinates of N.

(iv) Name the geometrical figure PMP’N.

(v) Find the area of the figure PMP’N. (4)

4(a) In the figure the tangent PT=8cm and PA=5cm. Find the length of the chord AB. (3)



4(b) without using trignometric tables evaluate

($\frac{\sin(47°)}{cos43°}$) + ($\frac{cos43°}{sin47°}$) – 2cos245° (3)

4(c) A man wants to buy 62 shares available at Rs.132 (par value being Rs.100).

(i)how much he will have to invest?

(ii)If the dividend is 7.5% what will be his annual income?

(iii)If he wants to increase his annual income by Rs.150, how many extra shares should he buy? (4)

 **SECTION B Marks - 40**

ATTEMPT ANY FOUR QUESTIONS

5(a) Prove that$ \frac{\cos(A)}{1-tanA}$ - $\frac{sin^{2}A}{\cos(A-\sin(A))}$ = $\cos(A)$ + $\sin(A)$ (3)

 (b) Solve the quadratic equation correct to 2 decimal places

 4x2 – 6x + 1 = 0. (4)

 (c) What sum of money will amount to Rs. 11576.25 in 3 years at

 5% p.a compound interest. (3)

6(a) Komal has a Savings Account in State Bank of India. Her passbook entries are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Particulars | Withdrawals (Rs) | Deposits (Rs) | Balance (Rs) |
| Jan5 2008 | By cash |  | 2000 | 2000 |
| Jan15 2008 | By cheque |  | 1500 | 3500 |
| Feb8 2008 | By cash |  | 1000 | 4500 |
| Feb20 2008 | To cheque | 1300 |  | 3200 |
| March8 2008 | By cash |  | 3000 | 6200 |
| May 16 2008 | By cash |  | 2000 | 8200 |
| June 4 2008 | By cash |  | 1800 | 10000 |
| Aug19 2008 | To cheque | 2000 |  | 8000 |

Rate of interest is paid by the bank at 4.5% p.a. Komal closes her account on 30th October 2008. Find the interest paid by the bank and the amount received from the bank. (6)

(b)In what ratio is the line joining the points (4,2) and (3,-5) divided by the x –axis? Also, find the co-ordinates of the point of intersection. (4)

7(a) The marks obtained by 120 students in an English test are given below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| Students | 5 | 9 | 16 | 22 | 26 | 18 | 11 |

|  |  |  |
| --- | --- | --- |
| 70-80 | 80-90 | 90-100 |
| 6 | 4 | 3 |

Draw an ogive for the information given above on the graph sheet. Take a suitable scale for the ogive. Use the ogive drawn to estimate

(i)Median

 (ii) the number of students who obtained more than 75% marks in the test

(iii) the number of students who did not pass in the test if the pass percentage was 40. (6)

(b)The dimension of the model of a multistoried building was 1mby 60cm by 1.20m. If scalar factor is 1:50, find the actual dimensions of the building. Also find

(i)the floor area of a room of the building if the floor area corresponding room in the model is 50 sq.cm.

(ii)the space (volume) inside a room of the model if the space inside the corresponding room of the building is 90m3. (4)

8(a)An observer on the top of the cliff 200m above the sea-level, observes the angles of depression of the two ships to be 45° and 30° respectively. Find the distance between the ship if

(i)on the same side of the cliff

(ii)on the opposite sides of the cliff. (4)

(b) Using the properties of proportion, solve for x;

 $\frac{\sqrt{X+5}+\sqrt{X-16}}{\sqrt{X+5}-\sqrt{X-16}}$= $\frac{7}{3}$ (3)

(c)The given figure shown is a circle with centre O. Chord ED is parallel to diameter AC. Angle CBE = 64°. Find angle CED. (3)



9(a)Mr.Sharma has 60 shares of nominal value of Rs.100 and he decides to sell them when they are at a premium of 60%.He invests the proceeds in shares of nominal value of Rs.50, quoted at 4% discount, paying 18% dividend annually. Calculate

(i)sale proceeds

(ii)the number of shares he buys.

(iii)his annual dividend from the shares. (4)

(b)Find the value of ‘m’, if the roots of the roots of the quadratic equation are equal. (4+m)x2  + (m+1)x + 1 = 0 (3)

(c)The sum of two numbers is 15. The sum of their reciprocals is $\frac{3}{10}$.

Find the numbers. (3)

10(a)A toy is in the form of a cone mounted on a hemisphere with the same radius. The diameter of the base of the conical portion is 12cm and height is 8cm. Determine the surface area and the volume of the toy. (take π = 3.14). (4)

(b)In the given figure DE II BC , AD: DB = 2:5 (3)

Find (i)$\frac{area of ∆ADE}{area of ∆ABC}$ (ii) $\frac{area of ∆ABC}{area of trapezium DBCE}$

 A

 D E

 B C

(c) The line joining A(-4,6) and B(-1,-3) is perpendicular to the line joining C(0,-4) and D(3,x). find x. (3)

11(a) A = $\left[\begin{matrix}a&0\\0&2\end{matrix}\right]$ , B=$\left[\begin{matrix}0&-b\\1&0\end{matrix}\right]$, M=$\left[\begin{matrix}1&-1\\1&1\end{matrix}\right]$ and BA=M2. Find the values a and b. (3)

(b) Construct a ΔABC. AB=4cm, BC=5cm and angle ABC =120°.

(i)locate the point P such that angle BAP = 90° and BP = CP

(ii) Measure the length BP. (4)

(c) A die is thrown once. Find the probability of getting:

(i)an odd number (ii)a number between 2 and 6.

 (iii)a number greater than 4. (3)