MM 80   **Full Syllabus Paper/Mock Test**   **Time 3h**

GENERAL INSTRUCTIONS:-

1. All questions are compulsory.
2. The question paper consists of thirty questions divided into 4 sections A, B, C and D. Section A comprises of 10 questions of 01 mark each. Section B comprises of 05 questions of 02 marks each, Section C comprises of 10 questions of 03 marks each and Section D comprises of 05 questions of 06 marks each.
3. There is no overall choice. However, internal choice has been provided in one question of Sec: B, three questions of Sec: C and two questions of Sec: D. You have to attempt only one of the alternatives in all such questions.
4. In question on construction, drawing should be neat and exactly as per the given measurements.
5. Use of calculators is not permitted.

Section A 1 mark each

1) State 'Euclid's division' Lemma?

2) The graph of a polynomial f (x) is shown. Write the number of real zeros of f (x)
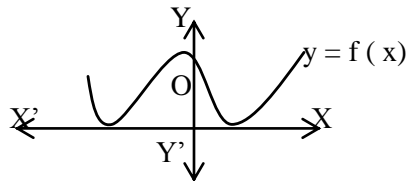
3) Obtain the condition for the following system of linear equations to have a unique solution:-

$$a\,x\ +\ b\,y\ =\ c$$
$$l\,x\ +\ m\,y\ =\ n$$

4) Find the sum of first n natural numbers?

5) What is the value of $\cot\Theta + \operatorname{Cosec}\Theta$

if $\sin\Theta\ =\ \dfrac{4}{5}$

6) It is known that a box of 600 electric bulbs contain 12 defective bulbs. One bulb is taken out at random from this box. What is the probability that it is a non- defective bulb?

7) In figure $\angle A = \angle CED$, $\Delta\, CAB \sim \Delta\, CED$, find 'x ' where DC = 8 cm
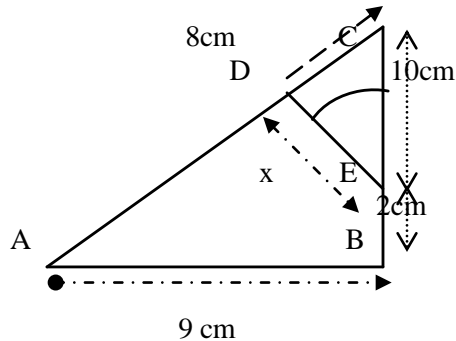
8) The circumference of a circle exceeds the diameter by 16. 8 cm, find its radius of the circle?

9) A line through the centre O of a circle of radius 7 cm cuts the tangent, at a point P on
The circle, at Q such that PQ = 24 cm. Find OQ?

10) Write the empirical relation between mean, mode & median?

Section B 2 marks each

11) If the sum of the zeros of the quadratic polynomial f (x) = k x^2 – 3x + 5 is 1, write
the value of k?

12) Evaluate: $\cos(40^0 - \theta) - \sin(50^0 + \theta) + \dfrac{\cos^2 40^0 + \cos^2 50^0}{\sin^2 40^0 + \sin^2 50^0}$

13) A bag contains 12 balls out which   x are white.
i) If one ball is drawn at random, what is the probability that it will be a white ball?

ii) If 6 more white balls are put in the bag, the probability of drawing a white ball will
Be double than in (!), find x?

14) Prove that the area of the Δ BCE described on one side BC of a square ABCD as base is one half the area of the similar Δ ACF described on the diagonal AC as base?

(OR)

In the figure given below, PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PB = 10 cm and CQ = 2 cm, what is the length PC?
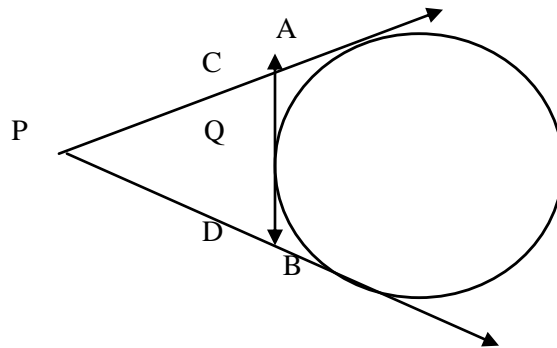
15) If the points (-2 , 1) , (1, 0) , (x , 3) & (1 , y) form a parallelogram , find the values of x & y ?

Section C 3 marks each

16) Prove that $\sqrt{2} + \sqrt{5}$ is irrational?

17) Draw the graph of the equations : $2x - y - 2 = 0$, $4x + 3y - 24 = 0$, $y + 4 = 0$. Obtain the vertices of the triangle so obtained. Also, determine its area?

18) If p^{th} term of an AP is q and the qth term is p, prove that its nth term is (p + q – n).

(OR)

The ratio of the sum of n terms of two A.P's is (7 n + 1) **:** (4 n + 27) , find the ratio of their mth terms?

19) Solve the system of equations: $\dfrac{6}{x+y} = \dfrac{7}{x-y} + 3$, $\dfrac{1}{2(x+y)} = \dfrac{1}{3(x-y)}$

where $x + y \neq 0, x - y \neq 0$

(OR)

Solve the equation : $x^2 - (\sqrt{3} + 1)x + \sqrt{3} = 0$, by the method of completing the square ?

20) D is the mid- point of side BC of Δ ABC. AD is bisected at the point E & BE produced cuts AC at the point X. Prove that BE **:** EX = 3 **:** 1 ?

(OR)

A circle touches the side of a quadrilateral ABCD at P , Q , R , S respectively . Show that angles subtended at the centre by a pair of opposite sides are supplementary.

21) Find the coordinates of the circumcentre of triangle whose vertices are (8 , 6) , (8 , -2) and (2 , -2). Also find its circum- radius ?

22) Construct a Δ ABC with side AB = 5 cm , and B$\measuredangle$ 60° altitude CD = 3 cm . Construct Δ AQR similar to Δ ABC such that side of Δ AQR is 1.5 times that of the corresponding sides of Δ ACB ?

23) Prove **:** $(\text{Sin A} + \text{Sec A})^2 + (\text{Cos A} + \text{Cosec A})^2 = (1 + \text{Sec A Cosec A})^2$

24) The area of triangle is 5 . Two of its vertices are (2 , 1) & (3 , -2) . The third vertex lies on y = x + 3. find the third vertex. ?

25) It is proposed to add to a square lawn measuring 58 cm on a side , two circular ends. The centre of each circle being the point of intersection of the diagonals of square. Find the area of whole lawn ?
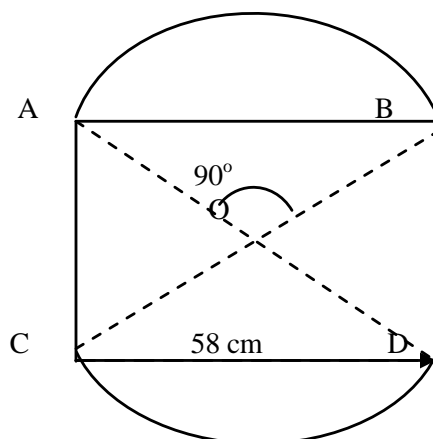
Section D 6 marks each

26) Two water taps together can fill a tank in $\dfrac{40}{3}$ minutes . If one pipe takes 3 minutes

more than the other to fill it , find its time in which each tap would fill the tank .?

(OR)

8 men and 12 women can finish a piece of work in 10 days while 6 men and 8 boys can
Finish it in 14 days . Find the time taken by one man alone and that by one boy alone to
Finish the work ?

27) At the foot of the mountain the elevation of its summit is 45°, after ascending 1000 m
towards the mountain up a slope of 30° inclination , the elevation is found to be 60° ,
find the height of the mountain ?

28) Prove that in a right angled triangle , the square of the hypotenuse is equal to the
sum of the squares of the other two sides
Use the above , prove the following :
A ladder 15 m long reaches a window which is 9 m above the ground on one side of a street.
Keeping its foot at the same point , the ladder is turned to other side of the street to reach
a window 12 m high , find the width of the street ?

29) The height of a cone is 30 cm . A small cone is cut off a t the top by a plane parallel to

base. If its volume be $\dfrac{1}{27}$ of volume of the given cone , at what height above the base
is the section made ?

(OR)

Water flows at the rate of 10 metre / minute through a cylindrical pipe having its diameter

as 5 mm . How much time will it take to fill a conical vessel whose diameter of base is

40 cm and depth 24 cm ?

30) During the medical check – up of 35 students of a class, their weights were recorded as,

Weight in (Kg)	Number of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than ogive for the given data. Hence obtain the median weight from the graph and verify the result by using the formula.