

MOCK TEST PAPER

Class – X

Session -2021-22 (TERM-2)

Time Allowed: 120 minutes

Subject- Mathematics (Basic)

Maximum Marks: 40

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
5. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

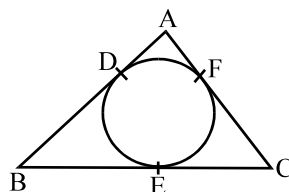
SECTION-A

1. Find the value of $a_{25} - a_{15}$ for the AP: 6, 9, 12, 15,

OR

If 7 times the seventh term of the AP is equal to 5 times the fifth term, then find the value of its 12th term.

2. Find the value of m so that the quadratic equation $mx(5x-6) = 0$ has two equal roots.
3. A circle is inscribed in a $\triangle ABC$ having $AB = 10$ cm, $BC = 12$ cm and $CA = 8$ cm and touching these sides at D, E, F respectively, as shown in the figure. Find AD, BE and CF.



4. The curved surface area of a right circular cone is 12320 cm^2 . If the radius of its base is 56 cm, then find its height.
5. Mrs. Garg recorded the marks obtained by her students in the following table. She calculated the modal marks of the students of the class as 45. While printing the data, a blank was left. Find the missing frequency in the table given below.

Marks Obtained	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Number of Students	5	10	–	6	3

6. If Ritu were younger by 5 years than what she really is, then the square of her age would have been 11 more than five times her present age. What is her present age?

OR

Solve for x : $9x^2 - 6px + (p^2 - q^2) = 0$

SECTION – B

7. Following is the distribution of the long jump competition in which 250 students participated. Find the median distance jumped by the students. Interpret the median

Distance (in m)	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5
Number of Students	40	80	62	38	30

8. Construct a pair of tangents to a circle of radius 4 cm, which are inclined to each other at an angle of 60° .
9. The distribution given below shows the runs scored by batsmen in one-day cricket matches. Find the mean number of runs.

Runs scored	0 - 40	40 - 80	80 - 120	120 - 160	160 - 200
Number of batsmen	12	20	35	30	23

10. Two vertical poles of different heights are standing 20m away from each other on the level ground. The angle of elevation of the top of the first pole from the foot of the second pole is 60° and angle of elevation of the top of the second pole from the foot of the first pole is 30° . Find the difference between the heights of two poles. (Take $\sqrt{3} = 1.73$)

OR

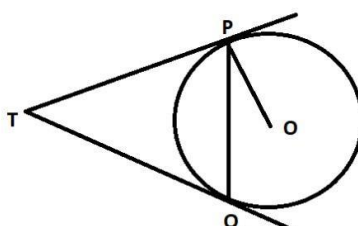
A boy 1.7 m tall is standing on a horizontal ground, 50 m away from a building. The angle of elevation of the top of the building from his eye is 60° . Calculate the height of the building. (Take $\sqrt{3} = 1.73$)

SECTION – C

11. The internal and external radii of a spherical shell are 3cm and 5cm respectively. It is melted and recast into a solid cylinder of diameter 14cm, find the height of the cylinder. Also find the total surface area of the cylinder. (Take $\pi = \frac{22}{7}$)
12. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact to the centre.

OR

Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$



13. Case Study – 1

From the top of a building 60 m high, the angles of depression of the top and bottom of a vertical lamp post are observed to be 30° and 60° respectively. ($\sqrt{3} = 1.732$)

- (i) Find the horizontal distance between the building and the lamp post :
(1) 34.64 m (2) 35.64 m (3) 36.64 m (4) 38.64 m
- (ii) Find the height of the lamp post :
(1) 36 m (2) 42 m (3) 38 m (4) 40 m

14. Case Study – 2

Push-ups are a fast and effective exercise for building strength. These are helpful in almost all sports including athletics. While the push-up primarily targets the muscles of the chest, arms, and shoulders, support required from other muscles helps in toning up the whole body.



Nitesh wants to participate in the push-up challenge. He can currently make 3000 push-ups in one hour. But he wants to achieve a target of 3900 push-ups in 1 hour for which he practices regularly. With each day of practice, he is able to make 5 more push-ups in one hour as compared to the previous day. If on first day of practice he makes 3000 push-ups and continues to practice regularly till his target is achieved. Keeping the above situation in mind answer the following questions:

- (i) Form an A.P representing the number of push-ups per day and hence find the minimum number of days he needs to practice before the day his goal is accomplished?
- (ii) Find the total number of push-ups performed by Nitesh up to the day his goal is achieved.