

SAMPLE PAPER TEST FOR TERM-2 EXAM (2021-22)

SUBJECT: MATHEMATICS

MAX. MARKS : 40

CLASS : X

DURATION: 2 HRS

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
 2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
 3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
 4. 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.
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SECTION-A

Questions 1 to 6 carry 2 marks each.

1. Find the discriminant of the quadratic equation $3x^2 - 2^2x - 2^3 = 0$.

OR

The sum of the squares of two consecutive natural numbers is 41. Represent this situation in the form of a quadratic equation.

2. Find the roots of the quadratic equation $x^2 + 4^2x + 6 = 0$.
3. XY and MN are the tangents drawn at the end points of the diameter DE of the circle with centre O. Prove that $XY \parallel MN$.
4. An inter house cricket match was organized by a school. Distribution of runs made by the students is given below. Find the median runs scored.

Runs scored	0-20	20-40	40-60	60-80	80-100
No. of Students	4	6	5	3	4

5. Find the common difference of the AP 4, 9, 14, ... If the first term changes to 6 and the common difference remains the same then write the new AP.
6. Three cubes each of volume 64cm^3 are joined end to end to form a cuboid. Find the total surface area of the cuboid so formed?

OR

The material of a cone is converted into the shape of a cylinder of equal radius. If height of the cylinder is 8 cm, then find the height of the cone.

SECTION-B

Questions 7 to 10 carry 3 marks each.

7. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°

OR

Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm.

8. Calculate the mode for the following frequency distribution:

Class	Less than 20	Less than 40	Less than 60	Less than 80	Less than 100
Frequency	15	37	56	87	115

9. An aeroplane flying at a height of 9000 m from the ground passes vertically above another aeroplane at an instant, when the angles of elevation of the two planes from the same point on the ground are 60° and 30° respectively. Find the vertical distance between the aeroplanes at that instant.

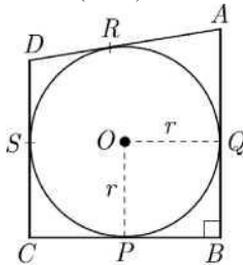
10. Find 'p' if the mean of the given data is 15.45.

Class Interval	0-6	6-12	12-18	18-24	24-30
Frequency	6	P	10	9	7

SECTION-C

Questions 11 to 14 carry 4 marks each.

11. A manufacturer of laptop produced 6000 units in 3rd year and 7000 units in the 7th year. Assuming that production increases uniformly by a fixed number every year, find
- the production in the 1st year,
 - the production in the 5th year,
 - the production in 6th year.
12. In the below figure, a circle with centre O is inscribed in a quadrilateral ABCD such that, it touches the sides BC, AB, AD and CD at points P, Q, R and S respectively. If AB = 29 cm, AD = 23 cm, $\angle B = 90^\circ$ and DS = 5 cm, then find the radius of the circle (in cm).



OR

Prove that tangent drawn at any point of a circle perpendicular to the radius through the point contact.

CASE STUDY QUESTION - 1

13. Mohan took 4 small spherical balls of silver of surface area 887.04 sq.cm each from a blacksmith. He wanted them to be made into cylindrical coins of radius one-fourth of that of the silver ball and height 4 cm.

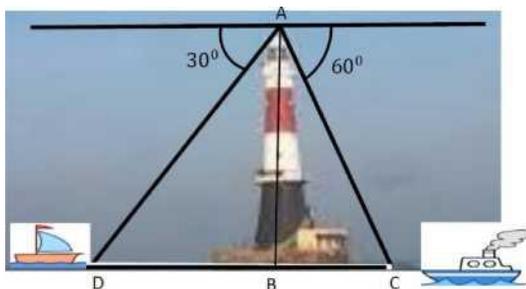


- Find the radius of each spherical ball.
- Find the curved surface area of each coin.

CASE STUDY QUESTION - 2

14. A lighthouse is a tall tower with light near the top. These are often built on islands, coasts or on cliffs. Lighthouses on water surface act as a navigational aid to the mariners and send warning to boats and ships for dangers. Initially wood, coal would be used as illuminators. Gradually it was replaced by candles, lanterns, electric lights. Nowadays they are run by machines and remote monitoring. Prongs Reef lighthouse of Mumbai was constructed in 1874-75. It is approximately 40 meters high and its beam can be

seen at a distance of 30 kilometres. A ship and a boat are coming towards the lighthouse from opposite directions. Angles of depression of flash light from the lighthouse to the boat and the ship are 30° and 60° respectively.



- (i) Which of the two, boat or the ship is nearer to the lighthouse. Find its distance from the lighthouse?
- (ii) Find the time taken by the boat to reach the lighthouse if it is moving at the rate of 2 km per hour.