

**Mathematics-Standard (041)**  
**Class- X, Session: 2021-22**  
**TERM II**

*Time Allowed : 2 hours*

*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. A point  $P$  is 10 cm from the centre of the circle. The length of the tangent drawn from  $P$  to the circle is 8 cm, then find the radius of circle.

**OR**

$O$  is the centre of two concentric circles of radii 12 cm and 13 cm.  $AB$  is a chord of outer circle which touches the inner circle. What is the length of chord  $AB$ .

2. A solid sphere of radius  $r$  is melted and recast into the shape of a solid cone of height  $r$ , find the radius of the base of the cone.
3. A sum of ₹ 2000 is invested at 6% simple interest per annum.  
(i) Calculate the interests at the end of 1, 2, 3,... years.  
(ii) Does the sequence of interests forms an A.P.?
4. If the mean of the following distribution is 6, then find the value of  $p$ .

$x :$	2	4	6	10	$p + 5$
$f :$	3	2	3	1	2

5. The product of two consecutive even integers is 528. Represent the situation in the form of a quadratic equation.

**OR**

Find the value of  $a$  and  $b$ , if  $x = 7$  and 5 are the solutions of the equation  $ax^2 - bx + 35 = 0$ .

6. Find the median of the collection of first seven whole numbers. If 9 is also included in the collection, find the difference of the median in two cases.

**SECTION - B**

7. In an A.P, the first term is 25,  $n^{\text{th}}$  term is  $-17$  and sum of first  $n$  terms is 60. Find  $n$  and  $d$ , the common difference.

OR

Which term of the A.P.:  $-2, -7, -12, \dots$  will be  $-77$ ? Find the sum of this A.P. upto the term  $-77$ .

8. In a class test, the sum of the marks obtained by Ankur in Mathematics and Science is 28. If he had got 3 more marks in Mathematics and 4 marks less in Science, then product of marks obtained in the two subjects would have been 180. Find the marks obtained in the two subjects separately.
9. Draw a circle of radius 5 cm. From a point  $P$ , 8 cm away from its centre, construct a pair of tangents to the circle. Measure the length of each one of the tangents.
10. The angle of elevation of the top of a chimney from the top of a tower is  $60^\circ$  and the angle of depression of the foot of the chimney from the top of the tower is  $30^\circ$ . If the height of the tower is 40 m, then find the height of the chimney.

### SECTION - C

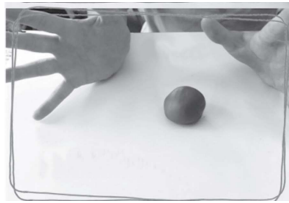
11. Two circles with centres  $A$  and  $B$  of radii 6 cm and 8 cm respectively intersect at two points  $C$  and  $D$  such that  $AC$  and  $BC$  are tangents to the two circles. Find the length of common chord  $CD$ .
12. The angles of elevation of the top of a rock from the top and foot of 100 m high tower are  $30^\circ$  and  $45^\circ$  respectively. Find the height of the rock.

OR

Mr Anna Hazare Padyatra party wanted to go from Delhi to Dehradun. The walkers travelled 150 km straight and then took a  $45^\circ$  turn towards Varanasi and walked straight for another 120 km. Approximately how far was the party from the starting point? (Use  $\sqrt{2} = 1.414$ )

### Case Study - 1

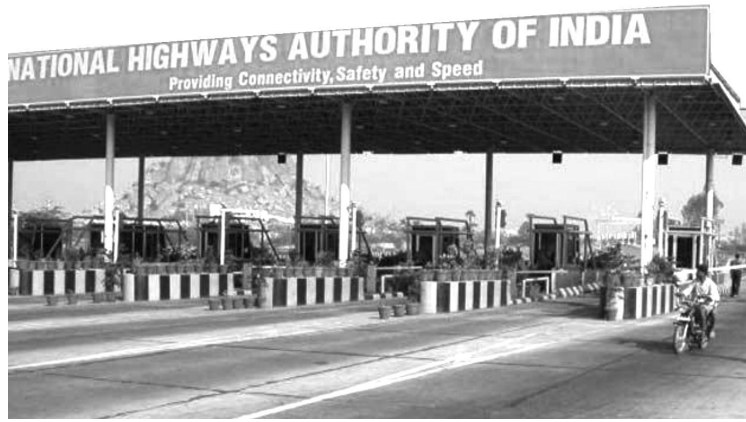
13. To make the learning process more interesting, creative and innovative, Amayra's class teacher brings clay in the classroom, to teach the topic - Surface Areas and Volumes. With clay, she forms a cylinder of radius 6 cm and height 8 cm. Then she moulds the cylinder into a sphere and asks some questions to students.



- (i) Find the radius of the sphere so formed.
- (ii) Find the ratio of the volume of sphere to the volume of cylinder.

### Case Study - 2

14. On a particular day, National Highway Authority of India (NHAI) checked the toll tax collection of a particular toll plaza in Rajasthan.



The following table shows the toll tax paid by drivers and the number of vehicles on that particular day.

Toll tax (in ₹)	30-40	40-50	50-60	60-70	70-80
Number of vehicles	80	110	120	70	40

Based on the above information, answer the following questions.

- (i) If  $x_i$ 's denotes the class marks and  $d_i$ 's denotes the deviation of assumed mean ( $A$ ) from  $x_i$ 's, then find the minimum value of  $|d_i|$ .
- (ii) Find the mean of toll tax received by NHAI by assumed mean method.

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