CBSE Board

Class X Mathematics (Standard)

Sample Paper - 3

Term 2 – 2021- 22

Time: 2 hours   **Total 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

Q1 – Q6 are of 2 mark each.

1. Which term of the AP 121, 117, 113 … is its first negative term?

OR

A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs. 200 for the first day, Rs. 250 for the second day, Rs. 300 for the third day, etc., the penalty for each succeeding day being Rs. 50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work by 30 days.

2. The sum of the reciprocals of Rehman's ages, (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

3. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is

4. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

5. Consider the following distribution of daily wages of 50 worker of a factory.

Daily wages (in Rs)	100 – 120	120 – 140	140 –1 60	160 – 180	180 – 200
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

6. In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

OR

The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side, find the sides of the field.

Section B

Q7 – Q10 are of 3 mark each.

7. The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode.

Number of students per teacher	Number of states/U.T
15 – 20	3
20 – 25	8
25 – 30	9
30 – 35	10
35 – 40	3
40 – 45	0
45 – 50	0
50 – 55	2

8. 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 at the centre.

9. The lengths of 40 leaves of a plant are measured correct to the nearest millimeter, and the data obtained is represented in the following table:

Length (in mm)	Number or leaves f_i
118 – 126	3
127 – 135	5

136 – 144	9
145 – 153	12
154 – 162	5
163 – 171	4
172 – 180	2

Find the median length of the leaves.

10. Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30º, respectively. Find the height of poles and the distance of the point from the poles.
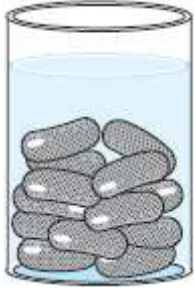
OR

A TV tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower the angle of elevation of the top of the tower is 60°. From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower and the width of the canal.
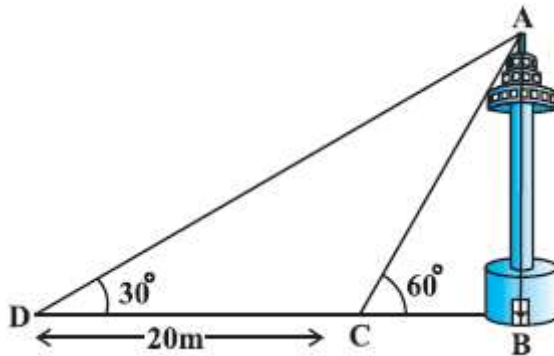
Section C

Q11 – Q14 are of 4 mark each.

11. A gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm (see the given figure).

Target Mathematics by- Dr.Agyat Gupta
Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
visit us: agyatgupta.com;Ph. :7000636110(O)   Mobile : 9425109601(P)

12. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

<div align="center">OR</div>

If tangents PA and PB from a point P to a circle with centre O are inclined to each other an angle of 80°, then find $\angle$ POA

13. There are two temples on each bank of a river. One temple is 70 m high. A man, who is standing on the top of 70 m high temple, observed that the angle of depression of the top and the foot of other temple are 30° and 60° respectively. (Take $\sqrt{3} = 1.732$)
   i) Draw a labelled figure on the basis of the given information and the approximate width of the river.
   ii) Find the approximate height of the other temple

14. Ajay has decided to visit different parts of his state, and to travel from one place to another, he will book a taxi each time. Now the taxi rates are fixed and it costs ₹ 15 for the first km and ₹8 for each additional km. Now using the given data answer the following questions.
   i) Form an AP using the given data and find the taxi fare for Ajay, if he travels for 4 km.
   ii) If the taxi fare comes out to be ₹63, then find the total kilometers travelled

Target Mathematics by Dr. Agyat Gupta