PRACTICE PAPER-1
Mathematics- Standard (041)
CLASS X
Session: 2021-22
TERM II

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 3, 8, 13, 18, … is 78?

    OR

    Find the 20th term from the last term of the AP 3, 8, 13, ……, 253

2. Find the roots of the following quadratic equation $x^2 - 3x - 10 = 0$ by factorisation

3. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.

4. Two cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboids.

5. A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0 – 2	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12	12 – 14
Number of houses	1	2	1	5	6	2	3

6. Find two numbers whose sum is 27 and product is 182.

OR

Find two consecutive positive integers, sum of whose squares is 365.

Section B

Q6 – Q10 are of 3 mark each.

7. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components:

Lifetimes (in hours)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	10	35	52	61	38	29

Determine the modal lifetimes of the components.

8. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

9. Find the following tables gives the distribution of the life time of 400 neon lamps:

Life time (in hours)	Number of lamps
1500 – 2000	14
2000 – 2500	56
2500 – 3000	60
3000 – 3500	86
3500 – 4000	74
4000 – 4500	62
4500 – 5000	48

Find the median life time of a lamp.

10. A contractor plans to install two slides for the children to play in a park. For the children below the age of 5 years, she prefers to have a slide whose top is at a height of 1.5 m, and is inclined at an angle of 30° to the ground, whereas for the elder children she wants to have a steep side at a height of 3 m, and inclined at an angle of 60° to the ground. What should be the length of the slide in each case?

OR

A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building.

Section C

Q11 – Q14 are of 4 mark each.

11. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that 1 cm³ of iron has approximately 8g mass. (Use $\pi = 3.14$)

**12.** In the given figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY and A and X'Y' at B. Prove that $\angle AOB=90°$.
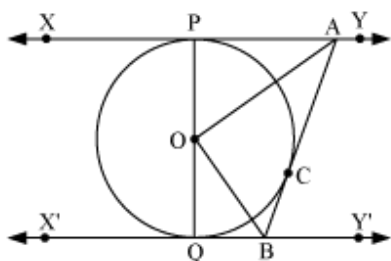
OR

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.

13. Sanjana took her students of class X to an educational trip where they saw Red Fort. She told them about the history of Red Fort where she narrated that Red Fort or Lal Qila is a historic fort located in Old Delhi, India that served as the main residence of the Mughal Emperors. Emperor Shah Jahan commissioned construction of the Red Fort on 12 May 1638, when he decided to shift his capital from Agra to Delhi. She also included that the Red Fort is about 18–33 m (59 – 108 ft) high.
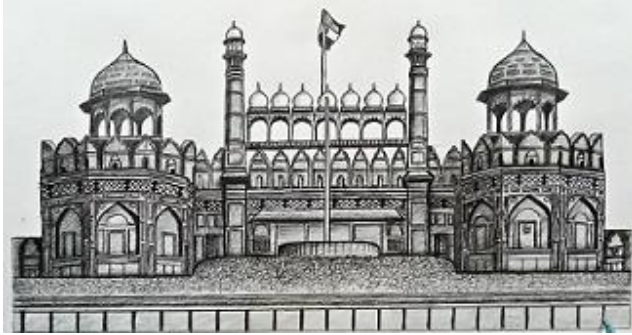
Then answer the following questions.

i) Draw a labelled figure on the basis of the given information and find the angle of elevation if the maximum height of Red fort is considered and the students are standing at a distance of 33m away from the Monument.

ii) Draw a labelled figure and find the height of the tower if it casts a shadow of 30 m and the rays of the Sun is inclined at 30°.

14. Nirvana's father starts a new footwear shop. To display the foot wears, he puts 3 pairs of sandals in 1st row and increases the number of pairs in subsequent rows by 2. Now based on the given information, answer the following questions.

i) Form an A.P representing the number of pairs of shoes and hence find the minimum number of rows required to store 120 pairs.

ii) If he is able to sell all the footwear accept for rows 14th and 7th. Then, find the total number of pairs available in the shop.