CBSE 2022 Maths Standard (Term 2) — Set 3

English Medium

Time Allowed: 3 Hours | Maximum Marks: 80

General Instructions:

1. This question paper contains 38 questions. All questions are compulsory.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 6 questions carrying 2 marks each.
4. Section C has 6 questions carrying 3 marks each.
5. Section D has 4 questions carrying 5 marks each.
6. Section E has 3 case-study based questions carrying 4 marks each.
7. Draw neat figures wherever required.

Section A

Multiple Choice Questions (1 mark each)

Q.1 [1 mark]

Solve the quadratic equation for x: $x^2 - 2ax - (4b^2 - a^2) = 0$

Q.2 [1 mark]

Find the sum of first 20 terms of an AP in which d = 5 and $a_{20} = 135$.

Q.3 [1 mark]

Find the mode of the given frequency distribution:

Class: 15-25, 25-35, 35-45, 45-55, 55-65, 65-75

Frequency: 6, 11, 22, 23, 14, 5

Q.4 [1 mark]

150 spherical marbles, each of diameter 1.4 cm, are dropped in a cylindrical vessel of diameter 7 cm containing some water, and are completely immersed in water. Find the rise in the level of water in the cylindrical vessel.

OR

Q.4 [1 mark]

Three cubes of side 6 cm each, are joined end to end as shown. Find the total surface area of the resulting cuboid.

Q.5 [1 mark]

For what value of 'n', are the nth terms of the APs: 9, 7, 5, ... and 15, 12, 9, ... the same?

Q.8 [1 mark]

The tops of two poles of heights 20 m and 28 m are connected with a wire.

The wire is inclined to the horizontal at an angle of 30°. Find the length of the wire and the distance between the two poles.

Q.9 [1 mark]

The weights (in kg) of 50 wild animals of a National Park were recorded and the following data was obtained:

Weight (kg): 100-110, 110-120, 120-130, 130-140, 140-150
Number of animals: 4, 12, 23, 8, 3

Find the mean weight (in kg) of animals, using assumed mean method.

Q.10 [1 mark]

For the following frequency distribution, find the median:

Class: 1400-1550, 1550-1700, 1700-1850, 1850-2000
Frequency: 6, 13, 25, 10

Q.12 [1 mark]

A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Ten seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.

Q.13(a) [1 mark]

Case Study: A rectangular in-ground swimming pool is installed by a family in their backyard. There is a concrete sidewalk around the pool of width x m. The outside edges of the sidewalk measure 7 m and 12 m. The area of the pool is 36 sq m.

(a) Based on the information, form a quadratic equation in terms of x.

Q.13(b) [1 mark]

Case Study: A rectangular in-ground swimming pool is installed by a family in their backyard. There is a concrete sidewalk around the pool of width x m. The outside edges of the sidewalk measure 7 m and 12 m. The area of the pool is 36 sq m.

(b) Find the width of the sidewalk around the pool.

Q.14(a) [1 mark]

Case Study: John planned a birthday party for his younger sister with his friends. They decided to make some birthday caps and to buy a cake from a bakery shop. The dimensions are:
Cake: Cylindrical shape with diameter 24 cm and height 14 cm.
Cap: Conical shape with base circumference 44 cm and height 24 cm.

(a) How many square cm paper would be used to make 4 such caps?

Q.14(b) [1 mark]

Case Study: John planned a birthday party for his younger sister with his friends. They decided to make some birthday caps and to buy a cake from a bakery shop. The dimensions are:
Cake: Cylindrical shape with diameter 24 cm and height 14 cm.
Cap: Conical shape with base circumference 44 cm and height 24 cm.

The bakery shop sells cakes by weight (0.5 kg, 1 kg, 1.5 kg, etc.). To have the required dimensions, how much cake should they order, if 650 cm^3 equals 100 g of cake?