ConnectEd Sample Question Paper – 1

Mathematics (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		
Q. No.		**Marks**

<table>
<tr><td>1</td><td>Find whether 100 is a term of the AP 25,28,31,.....or not.

OR

Find 7^{th} term from the end of AP 7,10,13.....184.</td><td>2</td></tr>
<tr><td>2</td><td>Find K so that the quadratic equation $(k+1)x^2 - 2(k+1)x + 1 = 0$ has equal roots.</td><td>2</td></tr>
<tr><td>3</td><td>Prove that at the point of contact, the angle between radius and tangent to a circle is 90°</td><td>2</td></tr>
<tr><td>4</td><td>The radii of two cylinders are in the ratio 2:3 and their heights are in the ratio 5:3. Find the ratio of their volume.</td><td>2</td></tr>
<tr><td>5</td><td>Find the mean of data using empirical formula when it is given that mode is 50.5 and median is 45.5.</td><td>2</td></tr>
<tr><td>6</td><td>Find the roots of $x^2 - 4x - 8 = 0$ using quadratic formula.

OR

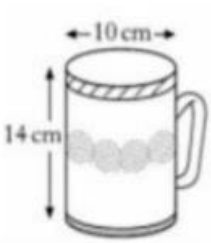
Find the roots of the quadratic equation $\sqrt{2}x^2+7x + 5\sqrt{2} = 0$.</td><td>2</td></tr>
<tr><td colspan="3">Section - B</td></tr>
<tr><td>7</td><td>Following frequency distribution shows the daily expenditure on milk of 30 householders in a locality. Find the mode of the data.

<table>
<tr><th>Daily expenditure of milk</th><th>No. of house holders</th></tr>
<tr><td>0 – 30</td><td>5</td></tr>
<tr><td>30 – 60</td><td>6</td></tr>
<tr><td>60 – 90</td><td>9</td></tr>
<tr><td>90 – 120</td><td>6</td></tr>
<tr><td>120 – 150</td><td>4</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>8</td><td>Draw a line segment of length 7 cm. Find a point P on it which divides it in the ratio 3 : 5. Also measure each part.</td><td>3</td></tr>
<tr><td>9</td><td>The mean of the following distribution is 31.4. Determine the missing frequency ‘x’ from the table.

<table>
<tr><td>Class</td><td>0 – 10</td><td>10 – 20</td><td>20 – 30</td><td>30 – 40</td><td>40 – 50</td><td>50 – 60</td></tr>
<tr><td>Frequency</td><td>5</td><td>x</td><td>10</td><td>12</td><td>7</td><td>8</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>10</td><td>A farmer connects a pipe of internal diameter 20cm from a canal into a cylindrical tank in her field, which is 10m in diameter and</td><td>3</td></tr>
</table>

	2m deep. If water flows through the pipe at the rate of 3km/ hr, in how much time will the tank been filled? **OR** A vessel is in the form of an inverted cone. Its height is 8cm and radius of its top, which is open, is 5cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one - fourth of the water flows out. Find the number of lead shots dropped into the vessel.	
	Section - C	
11	Two tangents TP and TQ are drawn to a circle with centre 'O' from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.	**4**
12	The angle of depression of the top and the bottom of an 8m tall building from the top of a multi - storeyed building are 30° and 45° respectively. Find the height of the multi - storeyed building and the distance between the two buildings. **OR** A 1.5 m tall boy is standing at some distance from a 30m 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.	**4**
13	**Case study I** Birthdays are important for each one of us. Smriti is celebrating her birthday. She invited her friends for a party. She arranged a number card game. In this game, number cards are distributed among her friends such that they are following an Arithmetic progression. Smriti made sure that each of her friends who stood in a row gets a card. The first three cards marked 2x, x+10 and 3x+2 is given to Rahul, Sonu and Sanjay respectively.	

	 Based on the above information answer the questions : 1. Sonu is a curious child. She wants to find the sum of the number cards obtained by her, Rahul, and Sanjay. From the above given information, help her to do so. 2. Smriti has called only a few of her close friends as the Covid pandemic is spreading. Ratan is her friend who gets the last card with the number 56. If so, find how many of Smriti's friends are attending the birthday party.	**2** **2**
14	**Case study II** During Covid times people prefer using homogenized milk, UHT Processed and aseptically packed in an exceptional six layer, tamper-proof Tetra Packaging with 0% bacteria and 100% pure health. This new six layer interfere proof, prevents air and freshness, light and bacteria from entering the pack. As an effect, the milk stays fresh and pure for a minimum of 180 days until opened, even without refrigeration.The 500ml milk is packed in cuboidal containers of dimensions 15 x 8 x 5 . These milk packets are then packed in cuboidal cartons of dimension 30x 32 x 15 (All dimensions are in cm)	

	  Based on the above given information answer the following questions : 1. How many litres of milk will a carton contain? 2. How much cardboard is needed to make the carton if 10% of wastage is taken into account?	**2** **2**