Navodaya Vidyalaya Samiti
Pre-Board Exams 2021-22
Class – X
Subject – Mathematics Basic (241), 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. All questions are compulsory.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains two case study based questions.

Q. No.	**Section-A**	MARKS
1	Find the roots of the quadratic equation $6x^2 - x - 2 = 0$. **OR** Find the values of k for which the quadratic equation $2x^2 + kx + 3 = 0$ has real and equal roots.	2
2	A solid is in the shape of a cone standing on a hemisphere with both radii being equal to 01 cm. and height of the cone is equal to its radius. Find the volume of solid in terms of π.	2
3	A survey conducted on 20 households in a locality by a group of students resulted in following frequency table for the number of family members in a household. Find mode of this data.	2

Family Size	1-3	3-5	5-7	7-9	9-11
Number of Family	7	8	2	2	1

Q. No.		MARKS
4	Determine the A.P. whose 3rd term is 5 and 7th term is 9.	2

5	Find median of following frequency distribution.	2

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	20	15	7	5

6	Prove that the lengths of tangents drawn from an external point to a circle are equal. OR A circle is inscribed in the quadrilateral ABCD. Given AB = 6 cm, BC = 7cm and CD = 4 cm. Find AD.	2

	Section-B	

7	How many terms of the A.P. 24,21,18………… must be taken so that their sum is 78	3

8	A tree is broken due to the storm in such a way that the top of the tree touches the ground and makes an angle of 30^0 with the ground. Length of the broken upper part of the tree is 8 meters. Find the height of the tree before it was broken. **OR** Two poles of equal height are standing opposite each other on either side of the road 80m wide. From a point between them on the road the angles of elevation of the top of the two poles are respectively 60^0 and 30^0. Find the distance of the point from the two poles.	3

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

10	The difference of squares of two numbers is 180. The square of smaller number is 8 times the larger number. Find two numbers.	3

	Section-C	

11	Draw a circle of radius 6 cm. From a point 10 cm. away from its centre, construct the pair of tangents to the circle and measure their lengths. OR Draw a pair of tangents to a circle of radius 6cm. which are inclined to each other at angle of 60^0. Also find length of tangents.	3

12	The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure.	3

Daily expenditure	100-150	150-200	200-250	250-300	300-350
No of households	4	5	12	2	2

| 13 | A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height. | |

(i) What is the angle of elevation if they are standing at a distance of 42m away from the monument?

(ii) They want to see the tower at an angle of 60. So, they want to know the distance where they should stand and hence find the distance.

2

2

14	The Great Stupa at Sanchi is one of the oldest stone structures in India, and an important monument of Indian Architecture. It was originally commissioned by the emperor Ashoka in the 3rd century BCE. Its nucleus was a simple hemispherical brick structure built over the relics of the Buddha. .It is a perfect example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it.	

(i) Calculate the volume of the hemispherical dome if the height of the dome is 21m.

2

(ii) Find the area of the cloth require to cover the hemispherical dome if the radius of its base is 14m is

2