COMMON APEEJAY EXAMINATION(2021-22)

CLASS – IX

MATHEMATICS

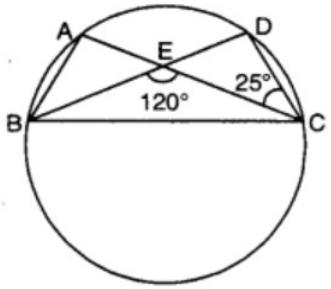
Term II

Time Allowed : 2 Hours **Maximum Marks : 40**

General Instructions :

i. The question paper consists of **14 questions** divided into **3 Sections A, B, C**.
ii. **Section A** comprises of **6 questions of 2 marks** each. Internal choice has been provided in two questions.
iii. **Section B** comprises of **4 questions of 3 marks** each. Internal choice has been provided in one question.
iv. **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
1	If $x = -\frac{1}{3}$ is a zero of a polynomial $p(x) = 27x^3 - ax^2 - x + 3$, then find the value of 'a'.	**2**
	OR	
	Factorise : $(x^2 + 4) - 2a - a^2 - 5$	
2	If one angle of a parallelogram is 36^0 less than twice its adjacent angle, then find all the angles of the parallelogram.	**2**
3	In the given figure, if $\angle BEC = 120°$, $\angle DCE = 25°$, then find $\angle BAC$. 	**2**
4	In a cylinder, if radius is halved and height is doubled, then what will be the new volume.	**2**

5 Probability of getting a blue ball is 2/3, from a bag containing 6 blue and 3 red balls. 12 red balls are added in the bag, then find the probability of getting **2**

(i) a blue ball (ii) a red ball

6 While working out a question on probability, it was found that there were 286 letters of English alphabet. The following was observation of occurrence of each letter: a: 70, b: 14, e: 26, r: 40 and i: 36. Others (not including vowels) = 100. Then, find the probability of **2**

(i) a vowel letters

(ii) non-vowel letters

OR

A recent survey found that the ages of workers in a factory is distributed as follows:

Age (in years)	20 - 29	30 - 39	40 - 49	50 - 59	60 and above
Number of workers	38	27	86	43	3

If a person is selected at random, find the probability that the person is:

(i) 40 years or more

(ii) under 40 years

SECTION - B

7 Find the zeroes of the polynomial: $p(x) = (x - 2)^2 - (x + 2)^2$. **3**

8 If x and y are the two positive real numbers such that $9x^2 + 4y^2 = 97$ and $xy = 6$, then find the value of $27x^3 + 8y^3$. **3**

OR

If $p(x) = x^2 - 4x + 3$, evaluate: $p(2) - p(-1) + p(1/2)$

9 Show that the bisectors of angles of a parallelogram form a rectangle. **3**

10 Sana has a piece of canvas whose area is 551 m^2. She use it to have a conical tent made, with a base radius of 7m. Assuming that all the stitching margins and the wastage incurred while cutting, amounts to approximately 1m^2, find the volume of the tent that can be made with it. **3**

SECTION - C

11 Construct a triangle ABC in which BC = 7cm, $\angle B = 75^0$ and AB + AC = 13 cm. **4**

12 If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal. **4**

OR

AB is a diameter of the circle, CD is a chord equal to the radius of the circle. AC and BD when extended intersect at a point E. Prove that $\angle AEB = 60^0$.

13 In a clubhouse of a residential society, four children Konark, Dhruv, Gary and Aman are playing a game using cards. They have prepared four cards and written the algebraic expression on their cards. They have shown the cards to each other. The card which Konark contain have the following expression $6x^3 + 4x^2 + 8x + 4$. When the expression is multiplied by 2 that information is written on Aman's card. Dhruv and Gary have written $(4a - 2b - 3c)^2$ and $6x^2 + 17x + 5$ on their cards respectively.

Konark Aman Dhruv Gary

Based on the above information answer the following questions :

(i) Write the expression for Aman's card and find its value at $x = \frac{1}{2}$. **2**

(ii) Factorise $6x^2 + 17x + 5$ and write the zeroes of the polynomial. **2**

14 Ram observes that a juice seller is having a cylindrical vessel of base radius 25 cm and height 40 cm and it is full of juice. He is selling the juice in small cylindrical glasses of diameter 10 cm and height 10 cm.

Based on the above information answer the following questions :

(i) If the bigger cylindrical vessel is closed, then find the total surface area of this vessel. **2**

(ii) Find the number of small glasses that can be filled with juice from the bigger vessel. **2**