

KENDRIYA VIDYALAYA SANGATHAN, LUCKNOW REGION

PRE- BOARD QUESTION PAPER

Class X.

Session 2024-25 MATHEMATICS BASIC (Code No.241)

TIME: 3 hours.

MAX.MARKS: 80

General Instructions:

Read the following instructions carefully and follow them:

- ☐ This question paper contains 38 questions.
- ☐ This Question Paper is divided into 5 Sections A, B, C, D and E.

In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.

In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.

In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.

In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.

In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

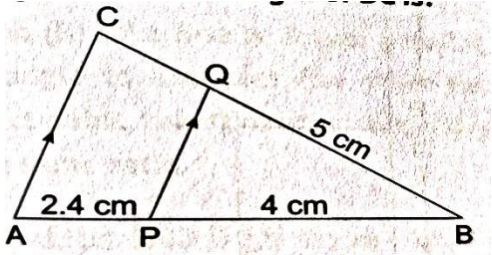
All Questions are compulsory. However, an internal choice in 2 Questions of section B, 2

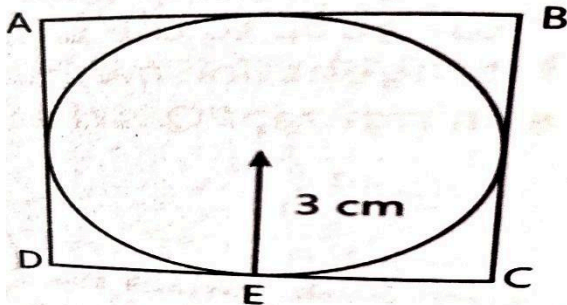
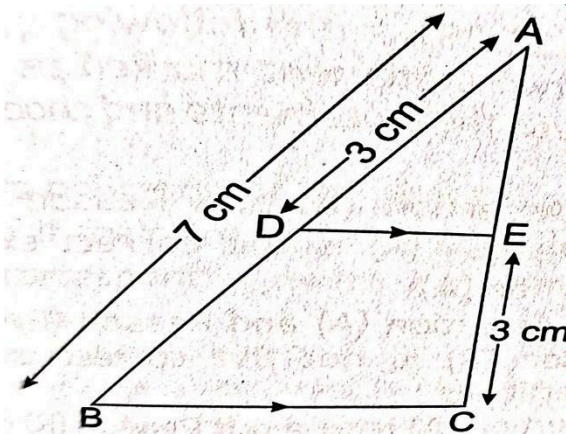
Questions of section C and 2 Questions of section D has been provided. And internal choice has been provided in all the 2 marks questions of Section E.

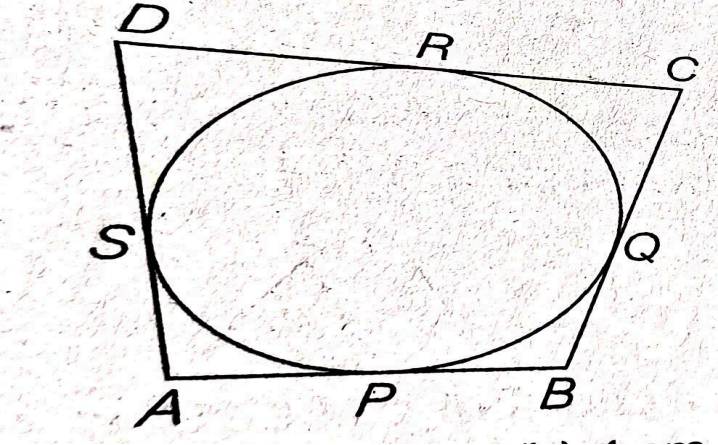
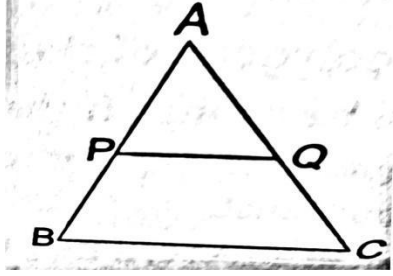
Draw neat and clean figures wherever required.

Take $\pi = 22/7$ wherever required if not stated.

Use of calculators is not allowed.

	Section A	
	Section A consists of 20 question of 1 mark each	
1.	If the HCF of 35 and 45 is 5, LCM of 35 and 45 is $(63 \times a)$, then the value of 'a' is : a) 10 b) 6 c) 5 d) 12	1
2.	The pair of equations, $x + 3y + 5 = 0$ and $-3x - 9y + 2 = 0$ has : a) A unique solution b) Exactly two solutions c) Infinitely many solutions d) No solution	1
3.	The roots of the equation $x^2 + 3x - 10 = 0$ are : a. 2, -5 b) -2, 5 c) 2, 5. d) -2, -5	1
4.	The 7th from the end of the AP: 17, 14, 11,, -40 is : a) -18 b) -22 c) -25. d) -20	1
5.	The distance of the point $(-6, 8)$ from X- axis is: a) 6 units b) -6 units. c) 8 units. d) 10 units	1
6.	In the given figure, $PQ \parallel AC$, If $BP = 4$ cm, $AP = 2.4$ cm and $BQ = 5$ cm, then the length of BC is:  A) 8cm. B) 3 cm. C) 0.3 cm. D) $25/3$ cm	1
7.	$\sin 2A = 2 \sin A$ is true when A is : a) 0° b) 30° c) 45° d) 60°	1
8.	If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x and y are prime numbers, then HCF(a, b) is : a) xy. b) xy^2 c) x^3y^3 d) x^2y^2	1
9.	The value of 'a' if $x+a$ is a factor (zero) of the polynomial $2x^2 + 2ax + 5x + 10$ is : a) -2. b) 2. c) 3. d) -3	1
10.	A circle is inscribed in a square. The radius of the inscribed circle is 3 cm, then the length of the tangent is :	1

	 a) 3 cm. B) 9 cm. C) 6 cm. D) can't be determined	
11.	Construction of a cumulative frequency table is useful in determining the: a) Mean. b) Mode. c) Median. d) all of these	1
12.	In the given figure, $DE \parallel BC$, if $AD = 3$ cm, $AB = 7$ cm, and $EC = 3$ cm, then the length of AE is :  a) 2 cm b) 2.25 cm. C) 3.5 cm. D) 4 cm	1
13.	$(\sec A + \tan A)(1 - \sin A) =$ a) $\sec A$. b) $\sin A$. c) $\operatorname{cosec} A$. d) $\cos A$	1
14.	If two cubes of edge 3 cm each are joined end to end, then the surface area of the resulting cuboid is : a) 90 cm^2 b) 95 cm^2 c) 92 cm^2 d) 94 cm^2	1
15.	A card is drawn at random from a well shuffled deck of 52 playing cards. The probability of getting a face card is: a) $1/2$ b) $3/13$. C) $4/13$. D) $1/13$	1
16.	In the given figure, a circle touches all the four sides of a quadrilateral ABCD with $AB = 6$ cm, $BC = 7$ cm and $CD = 4$ cm, then the length of AD is :	1

	 a) 3 cm. B) 4 cm. C) 5 cm. D) 6 cm	
17.	Write the nature of roots of the quadratic equation $9x^2 - 6x - 2 = 0$ a) No real roots. b) 2 equal real roots. c) 2 distinct real roots. d) more than 2 real roots	1
18.	In triangle ABC, PQ BC, If PB = 6 cm, AP = 4 cm, AQ = 8 cm, then the length of AC is:  a) 12 cm. B) 20 cm. C) 6 cm. D) 14 cm	1

DIRECTIONS : In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).

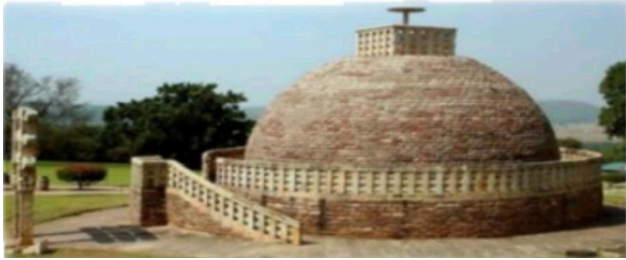
Choose the correct option

- A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
 B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
 C) Assertion (A) is true but reason (R) is false
 D) Assertion (A) is false but reason (R) is true.

19.	Assertion (A): $11 \times 4 \times 3 \times 2 + 4$ is a composite number. Reason (R) : Every composite number can be expressed as product of primes.	1
20.	Assertion (A): -5, -5/2, 0, 5/2, is in Arithmetic Progression.	1

	Reason (R) : The terms of an AP can't have both positive and negative rational numbers.											
	Section B											
	Section B consists of 5 questions of 2 marks each.											
21.	Find the 31st term of an AP, whose 11th term is 38 and the 16th term is 73. OR How many three digit numbers are divisible by 7 ?	2										
22.	Evaluate the following, $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$	2										
23.	In two concentric circles, a chord of length 8 cm of the larger circle touches the smaller circle. If the radius of the larger circle is 5 cm, then find the radius of the smaller circle.	2										
24.	Check whether (5,-2), (6,4) and (7,-2) are the vertices of an isosceles triangle. OR If the point P(x, y) is equidistant from the point A(5,1) and B(1,5) , then prove that x = y	2										
25.	Find the mode of the given data : <table border="1"><tr><td>Marks</td><td>0-20</td><td>20-40</td><td>40-60</td><td>60-80</td></tr><tr><td>Frequency</td><td>15</td><td>6</td><td>18</td><td>10</td></tr></table>	Marks	0-20	20-40	40-60	60-80	Frequency	15	6	18	10	2
Marks	0-20	20-40	40-60	60-80								
Frequency	15	6	18	10								
	Section C											
	Section C consists of 6 questions of 3 marks each											
26.	Prove that $\sqrt{3}$ is an irrational number.	3										
27.	Prove that the lengths drawn from an external point to a circle are equal. OR Prove that the parallelogram circumscribing a circle is a rhombus.	3										
28.	Prove that, $(\operatorname{Cosec} A - \cot A)^2 = (1 - \cos A) / (1 + \cos A)$	3										
29.	The difference of two natural numbers is 3 and difference of their reciprocal is $3/28$. Find the numbers.	3										
30.	In what ratio, does the point(4,-6) divide the line segment joining the points A(-6,10) and B(3,-8) ? OR Find the coordinates of the points of trisection of the line segment joining the points (2,-3) and (4,-1)	3										
31.	Find the mean using assumed mean method: <table border="1"><tr><td>Class</td><td>2-8</td><td>8-14</td><td>14-20</td><td>20-26</td><td>26-30</td></tr></table>	Class	2-8	8-14	14-20	20-26	26-30	3				
Class	2-8	8-14	14-20	20-26	26-30							

	Frequency	6	3	12	11	8	
	Section -D						
	This Section consists of 4 questions of 5 marks each						
32.	The coach of a cricket team buys 7 bats and 6 balls for Rs. 3800. Later, he buys 3 bats and 5 balls for Rs. 1750. Find the cost of each bat and each ball. OR For which values of 'a' and 'b' will the following pair of linear equations have an infinite number of solutions? $2x + 3y = 7, \text{ and } (a - b)x + (a + b)y = 3a + b - 2$						5
33.	State and prove Basic Proportionality Theorem.						5
34.	From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower. OR The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 50 m high, then find the height of the building.						5
35.	A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find (i) the area of the part of the field in which the horse can graze. (ii) the increase in the grazing area if the rope were 10 m long instead of 5 m.						5
	Section -E (This Section consists of 3 questions of 4 mark each)						
36.	Tushara took a pack of 52 cards. She kept aside all the black face cards and shuffled the remaining cards well Based on the above information answer the following questions  i) Write the number of total possible outcomes. ii) She draws a card from the well-shuffled pack of remaining cards. What is the probability that the card is a face card? iii) Write the probability of drawing a black card. OR What is the probability of getting neither a black card nor an ace card?						1 1 2
37.	Read the passage and Answer the following questions. 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. (Take $\pi = 22/7$) Based on the above information answer the following questions.  i) Write the formula for volume of hemisphere. ii) Calculate the volume of the hemispherical dome if the height of the dome is 21 m. iii) How much cloth is required to cover the hemispherical dome if the radius of its base is 14m? OR Find the total surface area of the combined figure i.e. hemispherical dome with radius 14m and cuboidal shaped top with dimensions are 8m, 6m and 4m.	1 1 2
38.	A group of school friends went on an expedition to see caves. One person remarked that the entrance of the caves resemble a parabola and can be represented by quadratic polynomial $f(x) = ax^2 + bx + c$, a is not equal to zero, where a, b and c are real number  Based on the above information, answer the following questions: (i) If one of the zero of quadratic polynomial $(p-1)x^2 + px + 1$ is 4. Find the value of p. (ii) Find the quadratic polynomial whose zeroes are 5 and -12. (iii) If one zero of the polynomial $f(x) = 5x^2 + 13x + m$ is reciprocal of the other, then find the value of m. OR Find a quadratic polynomial whose zeroes are -5 and -2.	1 1 2

