SUBJECT: MATHEMATICS BASIC (241)
SAMPLE QUESTION PAPER
CLASS - X (2026 - 27)

Maximum Marks: 80 **Time Allowed: 3 hours**

General Instructions

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions. All questions are compulsory.
2. This question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 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.
8. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all 2 marks questions of Section E.
9. Draw neat and clean figures wherever required. Take $\boldsymbol{\pi} = \frac{22}{7}$ wherever required if not stated.
10. Use of calculators is not allowed.

SECTION – A **(20 × 1 = 20)** **This section comprises of 18 multiple choice questions and two assertion and reason type questions of 1 mark each.**		
Q.No.	**Question**	**Marks**
Q1.	If HCF (2520, 6600) = 40 and LCM (2520, 6600) = 252 × k, then the value of k is (A) 165 (B) 1600 (C)1625 (D)1650	**1**
Q2.	If α and β are the Zeroes of the polynomial $2x^2 - 4x - 5$, the value of $(\alpha - \beta)^2$ is (A) 4 (B) 6 (C) 14 (D) 56	**1**
Q3.	For what value of p does the pair of Linear equations $4x + py + 8 = 0$ and $2x + 2y + 2 = 0$ has a unique solution (A) $p = 4$ only (B) $p = 2$ only (C) $p \neq 4$ (D) $p \neq 2$	**1**

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Q4.	The sum of the numerator and denominator of a fraction is 11. If the denominator is increased by 1, the fraction becomes $\frac{1}{2}$, then the fraction is (A) $\frac{2}{9}$ (B) $\frac{3}{8}$ (C) $\frac{4}{7}$ (D) $\frac{5}{6}$	**1**
Q5.	If one root of the quadratic equation $ax^2 + bx + c = 0$ is the reciprocal of the other, then (A) $b = c$ (B) $a = b$ (C) $ac = 1$ (D) $a = c$	**1**
Q6.	The first term of AP is p and the common difference is q , then its 10th term is (A) $q + 10p$ (B) $p - 9q$ (C) $p + 9q$ (D) $p + 10\text{q}$	**1**
Q7.	Which term of the AP: 21, 42, 63, 84 ... is 210? (A) 9**th** (B) 10**th** (C) 11**th** (D) 12**th**	**1**
Q8.	If the point P (5, 2) divides the line segment joining A(8, 5) and B(4, $\boldsymbol{y}$) in the ratio 3 : 1, then the value of $\boldsymbol{y}$ is (A) 4 (B) 3 (C) 2 (D) 1	**1**
Q9.	A letter from the word INDEPENDENCE is selected at random. What is the probability that the letter selected is a vowel which occurs the maximum number of times in the given word? (A) $\frac{1}{12}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{5}{12}$	**1**
Q10.	For the following distribution **Class**: 0-5, 5-10, 10-15, 15-20, 20-25 **Frequency**: 10, 15, 12, 20, 9 The lower limit of the median class is (A) 5 (B) 10 (C) 15 (D) 20	**1**
Q11.	The length of a tangent drawn from a point at a distance of 10 cm from the centre of the circle is 8 cm. The radius of the circle is (A) 4 cm (B) 5 cm (C) 6 cm (D) 7 cm	**1**
Q12.	Mean and median of certain data are 32 and 30 respectively. Using empirical formula, the value of mode is (A) 36 (B) 26 (C) 30 (D) 20	**1**
Q13.	A ladder 15 m long reaches a window 12 m above the ground. The distance of the foot of the ladder from the base of the wall is (A) 8 m (B) 9 m (C) 10 m (D) 13 m	**1**

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Q14.	The value of $\sin^2 60° - 2\tan^2 45° - \cos^2 30°$ is (A) −2 (B) −1 (C) 1 (D) 2	**1**
Q15.	The perimeter of two similar triangles is 28 cm and 35 cm respectively. If one side of the first triangle is 8cm, then the corresponding side of the second triangle is (A) 10 cm (B) 12cm (C) 14cm (D) 16cm	**1**
Q16.	If in ΔABC and ΔPQR , ∠B = ∠Q, ∠R = ∠C and AB = 2PQ, then the two triangles are (A) Congruent but not similar (B) Similar but not congruent (C)Neither congruent nor similar (D) Congruent as well as similar	**1**
Q17.	If tangents PA and PB from a point P to a circle with centre O and respective point of contacts as A and B, are inclined to each other at angle of 80°, then ∠AOB is equal to (A) 60° (B) 70° (C) 80° (D)100°	**1**
Q18.	Two cubes each of volume $64cm^3$ are joined end to end to form a cuboid. The total surface area of the resulting cuboid is (A) 128 cm^2 (B) 160 cm^2 (C) 176 cm^2 (D) 192 cm^2	**1**
	Assertion-Reason Based Questions **Directions: Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled Assertion (A) and the other labelled Reason (R).** **Select the correct answer from the options (A), (B), (C) and (D) as given below:** (A) Both Assertion (A) and Reason (R) are true and (R) is the correct explanation of Assertion (A). (B) Both Assertion (A) and Reason (R) are true but (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.	
Q19.	**ASSERTION (A)**: The probability of getting number 8 on rolling a die is zero (0) **REASON (R)**: The probability of an impossible event is zero (0)	**1**
Q20.	**ASSERTION (A)**: If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side. **REASON (R)**: Line drawn from midpoint of one side of triangle parallel to another will bisect the third side.	**1**

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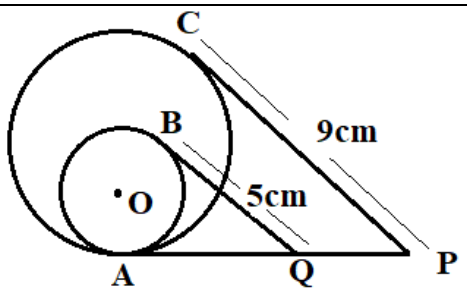
	SECTION – B (5 x 2 = 10) **This section comprises of 5 very short answer (VSA) type questions of 2 marks each.**	
Q21(A)	Find the smallest number which when increased by 17 is exactly divisible by both 520 and 468.	**2**
	OR	
Q21(B)	Show that $(25)^n$ will never end with digit zero for any natural number n.	
Q22.	If $3\sin\theta = 4\cos\theta$, find the value of $\sin\theta + \cos^2\theta - 1;\ 0° < \theta < 90°$	**2**
Q23.	If one zero of the quadratic polynomial $2x^2 - 3x + p$ is 3, find the value of p. Also, find the other zero.	**2**
Q24.	In the given figure, PA is a common tangent and QB and PC are the tangents from Q and P to the smaller and larger circle respectively. If QB = 5cm and PC = 9cm, then evaluate length of PQ.  	**2**
	For Visually Impaired Candidates Two concentric circles are of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle.	
Q25(A)	Points A (3,1), B (5, 1), C (a, b) and D (4, 3) are vertices of a parallelogram ABCD. Find the values of a and b.	**2**
	OR	
Q25(B)	Find a linear relation between x and y such that P (x, y) is equidistant from the points A (1, 4) and B (–1, 2).	
	SECTION – C (6 x 3 = 18) **This section comprises of 6 short answer (SA) type questions of 3 marks each.**	
Q26.	Given that $\sqrt{5}$ is irrational, prove that $2 + 3\sqrt{5}$ is irrational.	**3**
Q27. (A)	In the given figure, AX, AY and BC are tangents to the circle with P, R and Q respective point of contacts. Prove that AP = $\frac{1}{2}$ (AB + BC + CA)	

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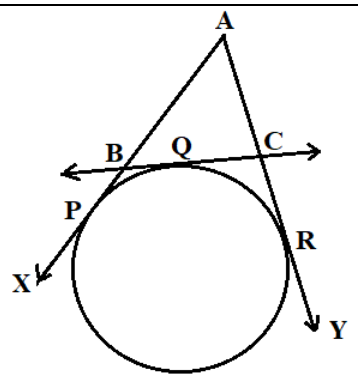

For Visually Impaired Candidates

Prove that a parallelogram circumscribing a circle is a rhombus. **3**

OR

Q27. (B) Two tangents PA and PB are drawn to a circle with centre O from an external point P. Prove that $\angle APB = 2\angle OAB$

Q28. Determine the ratio in which the point (– 6, y) divides the line segment joining the points A (–3, –1) and B (– 8, 9). Also, find the value of y. **3**

Q29. Consider Δ ACB, right-angled at C, in which AB = 29 units, BC = 21 units and $\angle ABC = \theta$. Determine the values of **3**

i. $1 + \tan^2\theta$

ii. $\cos^2\theta - \sin^2\theta$

Q30. (A) The mean of the following distribution is 48 and sum of all the frequencies is 50. Find the missing frequencies x and y. **3**

Class	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	8	6	**x**	11	**y**

OR

Q30. (B) The distribution below gives the weight of 50 students of class X. Find the Modal weight of the students.

Weight (in kg)	35 – 45	45 – 55	55 – 65	65 – 75	75 – 85
Number of students	5	10	20	12	3

Q31. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number. **3**

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	SECTION – D (4 x 5 = 20) **This section comprises of 4 long answer (LA) type questions of 5 marks each.**	
Q32.	Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.	**5**
Q33. (A)	A train travels a distance of 360 km at a uniform speed. If the speed had been 5 km/h more, then it would have taken 1 hour less to cover the same distance. Find the speed of the train.	**5**
	OR	
Q33. (B)	John and Jivanti together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124. Find the number of marbles they had with them in the beginning.	
Q34.	The largest possible hemisphere is drilled out of a wooden cubical block of side 21cm such that the base of the hemisphere is on one of the faces of the cube. Then, find **i.** the volume of the wood left in the block. **ii.** the total surface area of the remaining solid.	**5**
Q35. (A)	To assist an ambulance, a drone is hovering over an accident site at a constant height on a highway. The angle of depression of the ambulance, approaching the accident site, observed from drone is 30°. Twelve minutes later, the angle of depression of the ambulance is found to be 60°. If the ambulance is moving at a constant speed then, find the total time taken by the ambulance to reach the site of accident.	**5**
	OR	
Q35. (B)	A statue standing on a pedestal, is 1.6 m tall. From a point on the ground, the angles of elevation of the top and bottom of the statue are 60° and 45° respectively. Find the height of the pedestal.	

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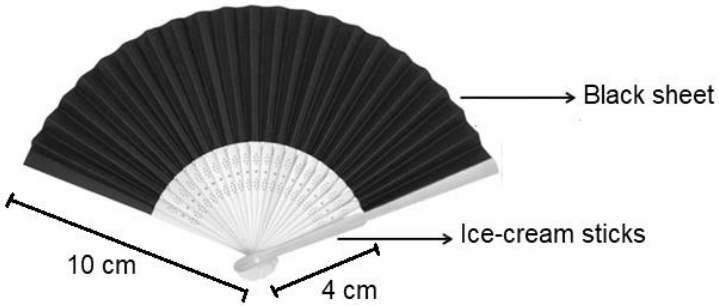
SECTION – E (3 x 4 = 12)

This section comprises of 3 case-study/passage-based questions of 4 marks each with sub parts. The first two case study questions have three sub parts (i), (ii), (iii) of marks 1, 1, 2 respectively.

Q36. An Art and craft teacher prepared a fan which looked like the sector of a circle



using ice-cream sticks and black sheet as shown in the given figure:

(i) The angle subtended at the centre of the sector is 60º. Find the area of one face of the fan. **1**

(ii) With the given sector angle of 60º at the centre, find area of black sheet used in the fan. **1**

(iii)(A) The boundary of the black sheet region on one face is to be covered by a designer tape. What length of tape is required? **2**

OR

(iii)(B) If 29.6 cm of designer tape is required to cover the boundary of the black sheet region on one face of the fan, then evaluate the central angle of the sector.

For Visually Impaired Candidates

A motion sensor (or motion detector) is an electronic device that is designed to detect and measure movement. The motion detector can detect movement over a sector of angle θ = 70° to a distance of 24m.

(i) Derive a relation between length of arc(l) and the area of the sector(A) enclosed by it? **1**

(ii) How much area is monitored by motion detector? **1**

(iii)(A) To increase the area to be monitored by 50% with same range of distance covered, what should be the angle? **2**

OR

(iii)(B) For θ = 91°**,** what range of distance is required for the detector to monitor 30% more area?

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Q37.	Delhi's pollution is a severe, often seasonal issue caused by a combination of factors like high vehicular and industrial emissions, dust from construction, and crop burning in surrounding states. In a school, students of classes I to XII thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees that each section of each class will plant be three more than the double of the class in which they are studying, e.g., a section of class IV will plant 11 trees. If in the given school, there are two sections of each class, then answer the following questions: **(i)** If number of trees planted by students class-wise follow arithmetic progression, then find the common difference. **(ii)** What is the number of trees planted by students of class VI? **(iii)** **(A)** What is the total number of trees planted by the students of given school? **OR** **(iii)** **(B)** Identify the class that planted 34 trees.	**1** **1** **2**
Q38.	A labourer prints 400 T-shirts in a day. The supervisor checked the T-shirts and found that 312 prints were good, 54 prints were with minor defects and rest of the prints were of major defects. Harish, a customer will buy a T-shirt only if it is good but a trader will buy, if it has no major defect. If a random T-shirt is picked, then **(i)** find the probability that Harish will buy a T-shirt. **(ii)** find the probability that a trader will buy the T-shirt. **(iii)** **(A)** find the probability that the T-shirt is not good. **OR** **(iii)** **(B)** find the probability that neither Harish nor trader buy the T-shirt.	**1** **1** **2**

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