



Grade: 10

Mathematics
Term-1 Examination

Time: 3 Hours
Max. Marks: 80

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case-based integrated units of assessment (04 marks each) with sub-parts of 1, 1, and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks, and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

Sl No.	SECTION A <i>(Section A consists of 20 questions of 1 mark each.)</i>	Marks:
1	If p and q are two prime numbers then what is the HCF of p and q? a) 1 b) 2 c) 3 d) 4	1
2	If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is a) 2 b) -4 c) -10 d) None of the above	1
3	The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have (A) a unique solution (B) exactly two solutions (C) infinitely many solutions (D) no solution	1
4	If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is (A) 2 (B) - 2 (C) $\frac{1}{4}$ (D) $\frac{1}{2}$	1
5	The first four terms of an AP, whose first term is -2 and the common difference is -2, are (A) - 2, 0, 2, 4 (B) - 2, 4, - 8, 16	1

	(C) - 2, - 4, - 6, - 8 (D) - 2, - 4, - 8, -16	
6	If the distance between the points (2, -2) and (-1, x) is 5, one of the values of x is (A) -2 (B) 2 (C) -1 (D) 1	1
7	The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is (A) 9 cm (B) 10 cm (C) 8 cm (D) 20 cm	1
8	What is the LCM of the smallest prime number and the smallest composite number? a) 1 b) 2 c)3 d) 4	1
9	The number of polynomials having zeroes as -2 and 5 is (A) 1 (B) 2 (C) 3 (D) more than 3	1
10	The pair of equations $x = a$ and $y = b$ graphically represents lines which are (A) parallel (B) intersecting at (b, a) (C) coincident (D) intersecting at (a, b)	1
11	Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is (A) 0 only (B) 4 (C) 8 only (D) 0, 8	1
12	Which term of the AP: 21, 42, 63, 84,... is 210? (A) 9th (B) 10th (C) 11th (D) 12th	1
13	The mid-point of the line segment joining the points A (-2, 8) and B (- 6, - 4) is A) (- 4, - 6) (B) (2, 6) (C) (- 4, 2) (D) (4, 2)	1
14	If in two triangles ABC and PQR, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$ then (A) $\Delta PQR \sim \Delta CAB$ (B) $\Delta PQR \sim \Delta ABC$ (C) $\Delta CBA \sim \Delta PQR$ (D) $\Delta BCA \sim \Delta PQR$	1
15	Find the LCM of 6, 72 and 120 a) 6 b) 360 c) 36 d) 1	1
16	One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be (A) $10x + 14y + 4 = 0$ (B) $-10x - 14y + 4 = 0$ (C) $-10x + 14y + 4 = 0$ (D) $10x - 14y = -4$	1
17	The quadratic equation $2x^2 - 5x + 1 = 0$ has (A) two distinct real roots (B) two equal real roots (C) no real roots (D) more than 2 real roots	1

18	The points $(-4, 0)$, $(4, 0)$, $(0, 3)$ are the vertices of a (A) right triangle (B) isosceles triangle C) equilateral triangle (D) scalene triangle	1
19	In triangles ABC and DEF, $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3 DE$. 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
20	It is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, the following is true: (A) $DE = 12$ cm, $\angle F = 50^\circ$ (B) $DE = 12$ cm, $\angle F = 100^\circ$ (C) $EF = 12$ cm, $\angle D = 100^\circ$ (D) $EF = 12$ cm, $\angle D = 30^\circ$	1
	SECTION B <i>(Section B consists of 5 questions of 2 marks each.)</i>	
21	Given that $\text{HCF}(306, 657) = 9$, find $\text{LCM}(306, 657)$.	2
22	Find a quadratic polynomial, the sum and product of whose zeroes are 4 and 1, respectively	2
23	Is the pair of equations $x + 2y - 3 = 0$ and $6y + 3x - 9 = 0$ consistent? Justify your answer.	2
24	Does $(x - 1)^2 + 2(x + 1) = 0$ have a real root? Justify your answer.	2
25	If the mid-point of the line segment joining the points A $(3, 4)$ and B $(k, 6)$ is P (x, y) and $x + y - 10 = 0$, find the value of k.	2
	SECTION C <i>(Section C consists of 6 questions of 3 marks each.)</i>	
26	Prove that $\sqrt{2}$ is an irrational number.	3
27	The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is	3
28	A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?	3
29	Is 0 a term of the AP: 31, 28, 25, ...? Justify your answer	3
30	Name the type of triangle formed by the points A $(-5, 6)$, B $(-4, -2)$ and C $(7, 5)$.	3
31	A 15 meters high tower casts a shadow 24 meters long at a	3

	certain time and at the same time a telephone pole casts a shadow 16 meters long. Find the height of the telephone pole.	
	SECTION D (Section D consists of 4 questions of 5 marks each.)	
32	Find the zeroes of the following polynomial and verify the relations between the zeroes and the coefficients. $3x^2 + 4x - 4$	5
33	A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days, and an additional charge for each day thereafter. Latika paid Rs 22 for a book kept for six days, while Anand paid Rs 16 for a book kept for four days. Find the fixed charges and the charge for each extra day.	5
34	Yasmeen saves Rs 32 during the first month, Rs 36 in the second month, and Rs 40 in the third month. If she continues to save in this manner, in how many months will she save Rs 2000?	5
35	State and prove the Basic Proportionality theorem.	5
	SECTION E	
36	Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km	
i)	What will be the distance covered by Ajay's car in two hours? a) $2(x + 5)$ km b) $(x - 5)$ km c) $2(x + 10)$ km d) $(2x + 5)$ km	1
ii)	Which of the following quadratic equation describe the speed of Raj's car? a) $x^2 - 5x - 500 = 0$ b) $x^2 + 4x - 400 = 0$ c) $x^2 + 5x - 500 = 0$ d) $x^2 - 4x + 400 = 0$	1
iii)	What is the speed of Raj's car? a) 20 km/hour b) 15 km/hour c) 25 km/hour d) 10 km/hour	1
iv)	How much time took Ajay to travel 400 km? a) 20 hour b) 40 hour c) 25 hour d) 16 hour	1
37	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.	



i)	Find the production during first year.	1
ii)	Find the production during 8th year.	1
iii)	Find the production during first 3 years.	1
iv)	In which year, the production is Rs 29,200.	1
38	<p>The class X students school in krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.</p>	
i)	Taking A as origin, find the coordinates of P a) (4,6) b) (6,4) c) (0,6) d) (4,0)	1
ii)	What will be the coordinates of R, if C is the origin? a) (8,6) b) (3,10) c) (10,3) d) (0,6)	1
iii)	What will be the coordinates of Q, if C is the origin? a) (6,13) b) (-6,13) c) (-13,6) d) (13,6)	1
iv)	Calculate the area of the triangles if A is the origin a) 4.5 b) 6 c) 8 d) 6.25	1