



Grade: 10

Mathematics
Term-1 Examination

Time: 3 Hours
Max. Marks: 80


Answer Key

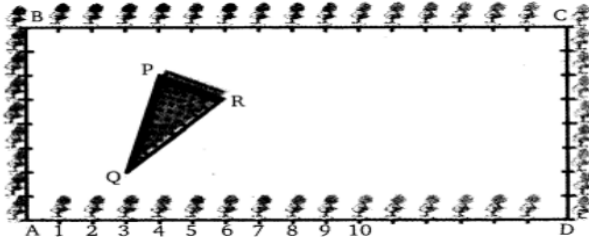
Sl No.	SECTION A (Section A consists of 20 questions of 1 mark each.)	Marks:
1	If p and q are two prime numbers then what is the HCF of p and q? A. 1	1
2	If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is C. -10	1
3	The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have (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	1
5	The first four terms of an AP, whose first term is -2 and the common difference is -2, are (C) - 2, - 4, - 6, - 8	1
6	If the distance between the points (2, -2) and (-1, x) is 5, one of the values of x is (B) 2	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 (B) 10 cm	1
8	What is the LCM of the smallest prime number and the smallest composite number? (D) 4	1
9	The number of polynomials having zeroes as -2 and 5 is (D) more than 3	1

10	The pair of equations $x = a$ and $y = b$ graphically represents lines which are (D) intersecting at (a, b)	1
11	Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is (D) 0, 8	1
12	Which term of the AP: 21, 42, 63, 84,... is 210? (B) 10th	1
13	The mid-point of the line segment joining the points A $(-2, 8)$ and B $(-6, -4)$ is (C) $(-4, 2)$	1
14	If in two triangles ABC and PQR, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$ then (A) $\Delta PQR \sim \Delta CAB$	1
15	Find the LCM of 6, 72 and 120 b) 360	1
16	One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be (D) $10x - 14y = -4$	1
17	The quadratic equation $2x^2 - 5x + 1 = 0$ has (A) two distinct real roots	1
18	The points $(-4, 0)$, $(4, 0)$, $(0, 3)$ are the vertices of a (B) isosceles 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: (B) similar but not congruent	1
20	It is given that $\Delta ABC \sim \Delta DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, the following is true: (B) $DE = 12$ cm, $\angle F = 100^\circ$	1
	SECTION B (Section B consists of 5 questions of 2 marks each.)	
21	Given that $HCF(306, 657) = 9$, find $LCM(306, 657)$. HCF x LCM = Product of the numbers So, $LCM = (306 \times 657) / 9 = 22338$	1 1
22	Find a quadratic polynomial, the sum and product of whose zeroes are 4 and 1, respectively $= x^2 - (\alpha + \beta)x + \alpha\beta$	1

	$= x^2 - 4x + 1$	1
23	<p>Is the pair of equations $x + 2y - 3 = 0$ and $6y + 3x - 9 = 0$ consistent? Justify your answer.</p> <p>Yes consistent, and dependent. By comparing coefficients, we get $\frac{1}{2} = \frac{2}{6} = \frac{-3}{-9}$</p>	1 1
24	<p>Does $(x - 1)^2 + 2(x + 1) = 0$ have a real root? Justify your answer.</p> <p>No, while finding discriminant, We get $D < 0$</p>	1 1
25	<p>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.</p> <p>Use the midpoint formula, & And apply the values of x&y to $x+y-10=0$ We get, $k=7$</p>	0.5 0.5 1
	<p>SECTION C (Section C consists of 6 questions of 3 marks each.)</p>	
26	<p>Prove that $\sqrt{2}$ is an irrational number.</p> <p>Ref the proof.</p>	3 Marks for the full proof
27	<p>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</p> <p>Let the digits be x & y Form relations $x+y=9$(1) $10x+y +27 = 10y+x$ (∵ digit reversed).....(2) Solve (1)&(2) $x=3, y=6$ And the number is 36</p>	1 1 1
28	<p>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?</p> <p>Use Speed= Distance/Time. Ie, Time =D/S Total time taken: $3 = (63/x)+(72/(x+6))$ Solve, $x = 42\text{km/h}$</p>	1 1 1

29	<p>Is 0 a term of the AP: 31, 28, 25, ...? Justify your answer</p> <p>$a=31, d=-3$ Use relation $0=a+(n-1)d$ and solve n, n is not getting as a integer, hence 0 is not a term in this AP</p>	<p>1 1 1</p>
30	<p>Name the type of triangle formed by the points A (-5, 6), B (-4, -2) and C (7, 5).</p> <p>Use Distance formula $AB \neq BC \neq AC$ Scalane Triangle.</p>	<p>1 1 1</p>
31	<p>A 15 meters high tower casts a shadow of 24 meters long at a certain time and at the same time, a telephone pole casts a shadow of 16 meters long. Find the height of the telephone pole.</p> <p>Draw Figure, Use similarity criterion of triangles, solve $x=10m$</p>	<p>1 2</p>
<p>SECTION D (Section D consists of 4 questions of 5 marks each.)</p>		
32	<p>Find the zeroes of the following polynomial and verify the relations between the zeroes and the coefficients.</p> <p>$3x^2 + 4x - 4$</p> <p>Zeroes are $\frac{2}{3}$ and -2 Verify the relations</p>	<p>3 2</p>
33	<p>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.</p> <p>Form the following equations $x+4y=22$ $x+2y=16$ Solve x and y as $x=10, y=3$</p>	<p>1.5 1.5 2</p>
34	<p>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?</p> <p>Sum of n terms of 32,26,40.... Is taken as 2000 Solve n as 25</p>	<p>3 2</p>
35	<p>State and prove the Basic Proportionality theorem.</p>	

	(Ref Proof) Write statement Draw the diagram Explain the construction in the diagram Give proof	1 0.5 0.5 3
	<u>SECTION E</u>	
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

	Find first term 'a', $a=5000$	
ii)	Find the production during 8th year. Find 8th term of the AP, is 20400	1
iii)	Find the production during first 3 years. Find the sum of first 3 terms of the AP 21600	1
iv)	In which year, the production is 29,200. Take 29200 as nth term and solve the value of n as, $n=12$	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 the 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)	1.5
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)	1.5
iv)	Calculate the area of the triangles if A is the origin a) 4.5 b) 6 c) 8 d) 6.25	Q delete d