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Please check that this question paper contains 38 pages and 7 printed pages

D.A.V. INSTITUTIONS, CHHATTISGARH
PRACTICE PAPER-9
CLASS: X
SUBJECT: MATHEMATICS (BASIC)

TIME: 3 HOURS

MAX MARKS: 80

General Instructions:

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

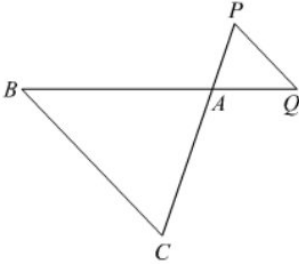
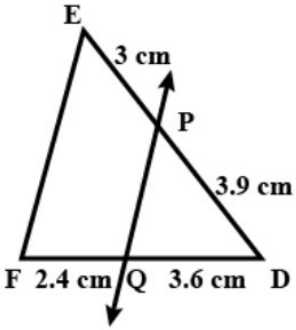
SECTION A

Section A consists of 20 questions of 1 mark each.

Q. No.		Marks
1	The distance between the points (0, 0) and (36, 15) is: (a) 38 (b) 39 (c) 40 (d) 41	1
2	If product of two numbers is 3691 and their LCM is 3691, then their HCF: (a) 2 (b) 3691 (c) 1 (d) 3	1

3	If α, β are the zeros of the polynomial $f(x) = x^2 + x + 1$ then $\frac{1}{\alpha} + \frac{1}{\beta}$ (a) 1 (b) -1 (c) 0 (d) None of these	1
4	For what value k, do the equations $3x - y + 8 = 0$ and $6x - ky + 16 = 0$ represent coincident lines? (a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 2 (d) -2	1
5	Which term of the A.P. 21, 42, 63, 84, ... is 210? (a) 9th (b) 10th (c) 11th (d) 12th	1
6	If the distance between the points (4, p) and (1, 0) is 5, then p = (a) ± 4 (b) 4 (c) -4 (d) 0	1
7	How many parallel tangents can a circle have? (a) 1 (b) 2 (c) infinite (d) none of these	1
8	If $x = 2 \sin^2 \theta$ and $y = 2 \cos^2 \theta + 1$, then $x + y$ is equal to (a) 3 (b) 2 (c) 1 (d) $\frac{1}{2}$	1
9	In triangles ABC and DEF, $\angle A = \angle E = 40^\circ$, $AB : ED = AC : EF$ and $\angle F = 65^\circ$ then $\angle B =$ (a) 35° (b) 65° (c) 75° (d) 85°	1
10	A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then the height of the wall is (a) $15\sqrt{3}$ m (b) $\frac{15\sqrt{3}}{2}$ m (c) $\frac{15}{2}$ m (d) 15 m	1
11	The volumes of two spheres are in the ratio 64:27. The ratio of their surface areas is (a) 1:2 (b) 2:3 (c) 9:16 (d) 16:9	1
12	The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3 . The ratio of its diameter to its height is (a) 3:7 (b) 7:3 (c) 6:7 (d) 7:6	1
13	Mode is (a) least frequent value (b) middle most value (c) most frequent value (d) none of these	1

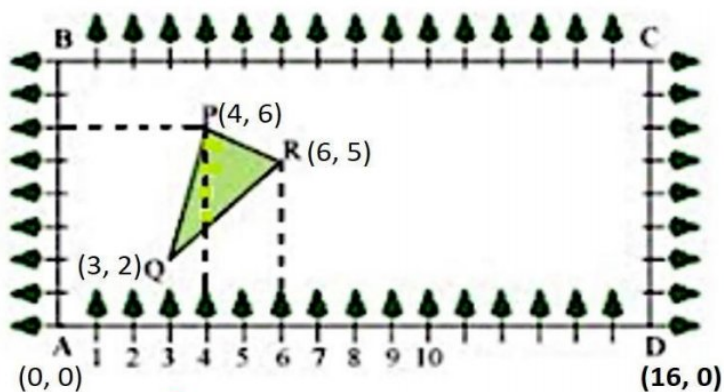
14	The probability that a number selected at random from the numbers 1, 2, 3,...,15 is a multiple of 4, is (a) $\frac{4}{15}$ (b) $\frac{2}{15}$ (c) $\frac{1}{5}$ (d) $\frac{1}{3}$	1
15	The probability that a non-leap year has 53 Sundays, is (a) $\frac{2}{7}$ (b) $\frac{5}{7}$ (c) $\frac{6}{7}$ (d) $\frac{1}{7}$	1
16	Zerues of a polynomial can be expressed graphically. Number of zerues of polynomial is equal to number of points where the graph of polynomial is (a) Intersects x-axis (b) Intersects y-axis (c) Intersects y-axis or x-axis (d) None of the above	1
17	The number of terms of the A.P. 3, 7, 11, 15, ... to be taken so that the sum is 406 is (a) 5 (b) 10 (c) 12 (d) 14	1
18	The distance of the point (4, 7) from the y-axis is (a) 4 (b) 7 (c) 11 (d) $\sqrt{65}$	1
19	Assertion (A): The polynomial $f(x) = x^2 - 2x + 2$ has two real zeros. Reason (R): A quadratic polynomial can have at most two real zeroes. 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.	1
20	Assertion (A): A tangent to a circle is perpendicular to the radius through the point of contact. Reason (R): The lengths of tangents drawn from an external point to a circle are equal. 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.	1
SECTION B		

Section B consists of 5 questions of 2 marks each.		
21	What is the smallest number that, when divided by 35, 56 and 91, leaves remainder of 7 in each case.	2
22	If α, β are the zeros of the polynomial $2y^2 + 7y + 5$ write the value of $\alpha + \beta + \alpha\beta$.	2
23	In the given figure, $\Delta ACB \sim \Delta APQ$. If $BC=8$ cm, $PQ=4$ cm, $BA = 6.5$ cm and $AP=2.8$ cm, find CA and AQ .	2
		
OR		
D and E are respectively the points on the sides AB and AC of a ΔABC such that $AD = 1.4$ cm $AC = 7.2$ cm and $AE = 1.8$ cm, show that $DE \parallel BC$.		
24	$\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$	2.
OR		
If $3\cot \theta = 2$, find the value of $\frac{4\sin\theta - 3\cos\theta}{2\sin\theta + 6\cos\theta}$		
25	In the given figure, state $PQ \parallel EF$	2
		
SECTION C		
Section C consists of 6 questions of 3 marks each.		
26	Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at the point O. Using similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$.	3

27	Find the sum of all integers between 50 and 500, which are divisible by 7.	3
28	Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers. OR Prove that $\sqrt{2}$ is an irrational number.	3
29	If $\sin A = \frac{2}{3}$, find the values of other trigonometric ratios.	3
30	A solid toy is in the form of a right circular cylinder with a hemispherical shape at one end and a cone at the other end. Their common diameter is 4.2 cm and the height of the cylindrical and conical portions are 12 cm and 7 cm respectively. Find the volume of the solid toy. (Use $\pi = \frac{22}{7}$) OR A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity (Take $\pi = \frac{22}{7}$)	3
31	One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting: (i) a king of red suit (ii) a face card (iii) a red face card	3
SECTION D		
Section D consists of 4 questions of 5 marks each.		
32	The sum of the squares of two positive integers is 208. If the square of the larger number is 18 times the smaller number, find the numbers. OR The sum of the ages of a father and his son is 45 years. 5 years ago, the product of their ages was 124. Determine their present ages.	5
33	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 that 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. OR Find the area of the sector of a circle with radius 4 cm and of angle 30° . Also, find the area of the corresponding major sector.	5
34	The following table gives the distribution of the life time of 400 neon lamps :	5

	Life time (in hour)	Number of lamps	
	1500-2000	14	
	2000-2500	56	
	2500-3000	60	
	3000-3500	86	
	3500-4000	74	
	4000-4500	62	
	4500-5000	48	
	Find the median life time of a lamp.		
35	Prove that the lengths of tangents drawn from an external point to a circle are equal. Using the above theorem, if a quadrilateral ABCD is drawn to circumscribe a circle, then prove that $AB+CD = AD+BC$.		5
SECTION E			
Section E consists of 3 questions of 4 marks each.			
36	Teachers and students of class X of a school had gone to Nandan Kannan for a study tour. After visiting different places of Nandan Kannan, lastly, they visited bird's sanctuary and deer park. Rohan is a clever boy and keen observer. He put the question "How many birds are there and how many deers are there (at particular time) in Nandankanan?" Rahul's friend, Nishith gave the correct answer as follows: Nishith answered that total animals have 1000 eyes and 1400 legs." (a) If x and y are the number of birds and deers respectively, what is the equation of total number of eyes? (b) What is the equation for the total number of legs? (c) How many birds are there in the zoo? <p style="text-align: center;">OR</p> What is the total number of animals in the zoo.		1 1 2
37	Class X students of a secondary school in Krish Nagar have been allotted a rectangular plot of land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is a triangular grassy lawn in the plot as shown in the Fig. The		

students are to sow seeds of flowering plants on the remaining area of the plot. Considering A as origin, AD along x-axis and AB along y-axis answer questions:



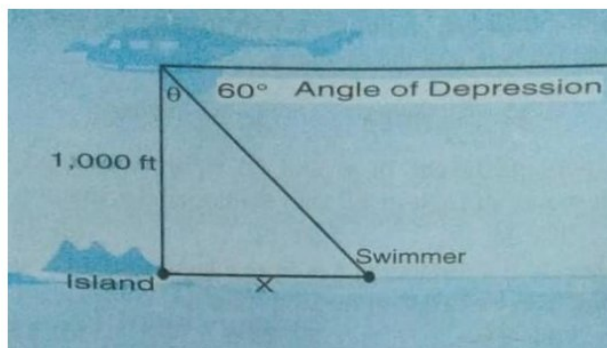
- (a) What are the coordinates of A and P?
- (b) What are the coordinates of Q and R?
- (c) What is the distance between Q and R?

1
1
2

OR

What is the distance between A and P?

- 38 A helicopter lifts up 1000 feet over an island and spots a swimmer that needs to be rescued. Using a distant land mark, the helicopter pilot determines the angle of depression.



- (a) What is the distance of the swimmer from Island?
- (b) What is the distance between helicopter and swimmer?
- (c) If the angle of depression decreases by 15° , then what will be the distance between Island and the swimmer?

1
1
2

OR

If the helicopter lifts up 200 feet moreover the island and angle of depression remains same, then what will be the distance between helicopter and swimmer?