Time Allowed: 3 Hrs.   **Maximum Marks : 80**
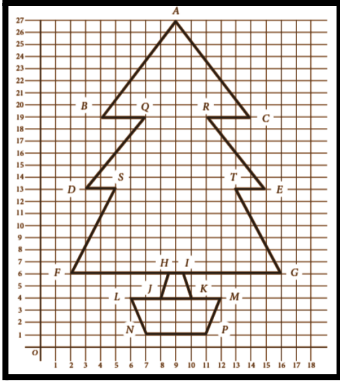
General Instructions:

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 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 the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2Qs 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 2 marks questions of Section E
58. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

S. NO	SECTION A **Section A consists of 20 questions of 1 mark each.**	MARKS
1	If a = HCF (24,72), find a.	1
2	Check if $5 \times 7 \times 11 + 7$ is a prime or a composite number ?	1
3	Write the quadratic polynomial whose zeros are $\frac{3}{5}$ and $\frac{-1}{2}$?	1
4	If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then find the value of p	1
5	If one of the zero of the polynomial $f(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of the other then find k	1
6	The lengths of the diagonals of a rhombus are 24cm and 32cm, then find the length of the altitude of the rhombus	1
7	If $cosec\theta - cot\theta = \frac{1}{3}$ find the value of $cosec\theta + cot\theta$?	1
8	Find the area of a quadrant of a circle whose circumference is 22 cm	1
9	If the length of arc of a circle is 22 cm ,radius is 28cm then find the angle of the sector .	1
10	Find the area swept by 7 cm long hand of a clock in 10 minutes.	1
11	If the mean of 5 observations $x, x + 2, x + 4, x + 6, x + 8$ is 11.Find x.	1
12	For the following distribution :	1

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

Find the sum of the lower limits of the median class and the modal class.

13	Two dice are thrown together .Find the probability of getting no prime on both the dice.	1
14	If two coins are tossed together then find the probability of getting head on one coin and tail on the other .	1
15	A box contains cards numbered 6 to 70 .If one card is drawn at random ,find the probability that it bears a composite number between 50 and 70 ?	1
16	One equation of a pair of dependent linear equations is $-5x + 7y = 2$, write the second equation .	1
17	If 217x + 131y = 913, 131x + 217y = 827, then find x + y .	1
18	For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines ?	1
	DIRECTION: In question number 19 and 20, a statement of **assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option	
19	***Statement A (Assertion):*** The point $(0, -3)$ lies on y −axis. ***Statement R(Reason) :*** The $y -$ coordinate of the point on $y -$ axis is zero. (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	***Statement A (Assertion):*** The value of each of the trigonometric ratios of an angle do not vary with the lengths of the sides of the triangle, if the angle remains the same. ***Statement R(Reason) :*** In right ΔABC, right angled at B, sinA<1, cosA<1 as hypotenuse is the longest side (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 for (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false.	1

	(d) Assertion (A) is false but reason (R) is true.	
	SECTION B **Section B consists of 5 questions of 2 marks each.**	
21	If α and β are the zeroes of the quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, find a quadratic polynomial having α and β as its zeroes.	2
22	Find the value of p for which one zero of the polynomial $px^2 - 144x + 8$ is 11 times the other root? OR If $\alpha \ and \ \beta$ are zeros of the polynomial $2x^2 - 4x + 5$,then find the value of $\alpha^2 + \beta^2$.	2
23	Find the value of k, so that the following system of equations has a unique solution: $\qquad kx + 3y = (k - 3)$ $\qquad 12x + ky = k$	2
24	If $a \cos \theta + b \sin \theta = m \ and \ a \sin \theta - b \cos\theta = n$, prove that $a^2 + b^2 = m^2 + n^2$ OR If $7 \sin^2\theta + 3 \cos^2\theta = 4$, then prove that $\sec \theta + cosec \ \theta = 2 + \dfrac{2}{\sqrt{3}}$	2
25	A chord of a circle of radius 10 cm subtends a right angle at the center .Find the area of the corresponding minor segment ?	2
	SECTION C **Section C consists of 6 questions of 3 marks each.**	
26	One morning three boys step off together and their steps measure 40 cm ,42 cm and 45 cm respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps ?	3
27	Find the values of *a* and *b* so that $x^4 + x^3 + 8x^2 + ax - b$ is divisible by $x^2 + 1$	3
28	If $tan\theta = \dfrac{1}{\sqrt{7}}$, show that $\dfrac{\left(cosec^2\theta - sec^2\theta\right)}{\left(cosec^2\theta + sec^2\theta\right)} = \dfrac{3}{4}$	3

29	Find the unknown entries *a*, *b*, *c*, *d*, *e* and *f* in the following distribution and hence find their mode.	3

Height (in cm)	Frequency	Cumulative frequency
150-155	12	a
155-160	b	25
160-165	10	c
165-170	d	43
170-175	e	48
175-180	2	f
Total	50	

30	Find the mode of the following distribution. If mean is 53, find the the median using empirical relationship	3

Marks	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Number of students	15	18	21	29	17

OR

Find the missing frequencies in the following distribution table, if the total frequency is 70 and median is 35.

MARKS	0-10	10-20	20-30	30-40	40-50	50-60
Number of students	6	9	x	y	19	10

31	From a pack of 52 playing cards, 4cards-Jack , Queen , King and Ace of heart are removed. From the remaining, a card is drawn at random. Find the probability that the card drawn is (i) a face card (ii) a red card (iii) either a queen or an ace OR A bag contains 15 white and some black balls. If the probability of drawing a black ball is thrice that of drawing a white ball, find the number of black balls in the bag?	3

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SECTION D

Section D consists of 4 questions of 5 marks each

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32	For what value of k the equations $2x + 3y = 9$ and $6x + (k - 2)y = 3k - 2$ has no solution ?	5

	OR Solve $3^{x+y} = 243$, $243^{x-y} = 3$	1
33	Find the coordinates of points which divide the line segment joining $A(2, -3)$ and $B(-4, -6)$ into three equal parts . **OR** If the point $C(-1, 2)$ divides internally the line segment joining the points $A(2, 5)$ and $B(x, y)$ in the ratio of $3:4$,then find the coordinates of B .	5
34	Prove that $\quad \dfrac{1+sec\theta - tan\theta}{1+sec\theta + tan\theta} = \dfrac{1-sin\theta}{cos\theta}$	5
35	Show that $\sqrt{7}$ is an irrational number. Hence show that $5 + 2\sqrt{7}$ is an irrational number	5
	SECTION E **Case study based questions are compulsory.**	
36	A design of a christmas tree is given below: Based on the information from the graph, answer the following questions: (i) Find the distance of point A(9, 27) from x −axis. (ii) Find the area of its trunk LMPN where coordinates are L(6,4), M(12,4), N(7,1) and P(11,1). **OR** Find the point which divides line segment A(9,27) and F(2,6) in the ratio 3 : 4. (iii) Find the midpoint of the line segment joining F(2,6) and G(16,6).	1 2 1
37	The weights (in kg) of 50 wrestlers are recorded in the following table: | Weight (in kg)	100-110	110-120	120-130	130-140	140-150
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No. of wrestlers	4	14	21	8	3 | (i) How many wrestlers have weight less than 130kg? (ii) What is the Class mark of the class 120-130? (iii) Find the difference between the upper limit of the median class and the lower limit of the modal class? **OR**	1 1 2
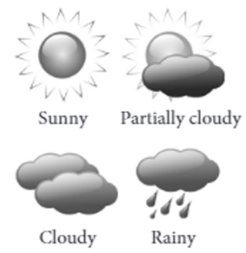
	Find the mean weight of the 50 wrestlers	
38	In the month of May, the weather forecast department gives the prediction of weather for the month of June The given table shows the probabilities of forecast of different days : | Days	Sunny	Cloudy	Partially cloudy	Rainy
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Probability	1/2	x	1/5	y | Consider the forecast is 100% correct for June. Use the above information to answer the questions that follow: (i) Find the number of sunny days in June. (ii) If the number of cloudy days in June is 5 , then find the value of x. (iii) If the number of rainy days in June is 6 and the sum of x and y is 3/10, then find the number of cloudy days in June. OR If the number of cloudy days in June is 3 , then find the probability that the day is not rainy.	1 1 2