SEVEN STAR INTERNATIONL SCHOOL BANI

CLASS : X ------ MATHEMATICS

Time Allowed : 3hrs

Maximum 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 the values 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 Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated

QN NO:	SECTION A	MARKS
1	If the sum of zeroes of $P(x) = (k^2 - 14)x^2 - 2x - 4$ is 1,then the value of k is (a) $\pm\sqrt{8}$ (b) ± 4 (c) ± 2 (d) ± 9	1
2	Three coins are tossed simultaneously. The Probability of getting atmost 2 heads is (a) $\frac{2}{8}$ (b) $\frac{1}{8}$ (c) $\frac{6}{8}$ (d) $\frac{7}{8}$	1
3	For the following distribution, the sum of lower limits of the Median class & Modal class would be <table><tr><td>Class Interval</td><td>0 – 5</td><td>5 – 10</td><td>10 – 15</td><td>15 – 20</td><td>20 – 25</td></tr><tr><td>Frequency</td><td>10</td><td>5</td><td>12</td><td>20</td><td>9</td></tr></table> (a) 15 (b) 30 (c) 25 (d) 35	1
4	The Volume of the largest right circular cone that can be cut off from a cube of edge 4.2 cm is (a) 9.7 cm³ (b) 77.6 cm³ (c) 58.2 cm³ (d) 19,4 cm³	1
5	What would be the value of k for which the pair of Linear equations $2x + ky = 7$ & $3x - 9y - 12$ is consistent and independent ? (a) All real numbers except – 6 (b) All real numbers expect 6 (c) 6 (d) – 6	1

Abhinay

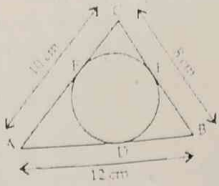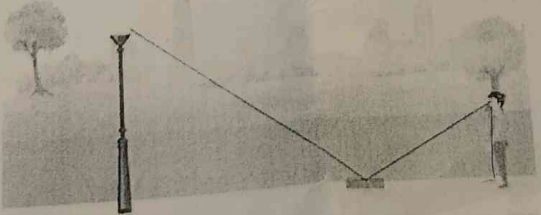|		
6	In the fig: a quadrilateral ABCD is drawn to circumscribe a circle . If BC = 7 cm , CR = 3 cm & AS = 5 cm ,the value of AB is (a) 10 cm (b) 7 cm (c) 8 cm (d) 9 cm	1
7	If P(2, x) is the mid-point of the line segment joining the points A(6, −5) and B(−2, 11) , the value of x is (a) 5 (b) 2 (c) 3 (d) 4	1
8	If $\tan \theta = \sqrt{3}$, then the value of $\sec^2 \theta + \csc^2 \theta$ is a) 1 b) $\frac{40}{9}$ (c) $\frac{38}{9}$ d) $5\frac{1}{3}$	
9	PA & PB are tangents to the circle with centre O , such that $\angle APB = 50^0$, then measure of $\angle OAB$ is (a) 25^0 (b) 30^0 (c) 40^0 (d) 50^0	1
10	If $u_i = \frac{x_i - 25}{10}$, $\sum f_i u_i = 20$ and $\sum f_i = 100$, then mean is (a) 25 (b) 27 (c) 20 (d) 5	1
11	The sum of the squares of zeroes of the Quadratic polynomial $P(x) = x^2 - 8x + k$ is 40. The value of k is (a) 15 (b) 10 (c) 12 (d) 64	1
12	The equation $x^2 - bx + 1 = 0$ does not possess real roots, then (a) $-3 < b \le +3$ (b) $-2 < b < +2$ (c) $b > 2$ (d) $b < -2$	1
13	A card is drawn at random from a pack of 52 cards. The Probability that the card is neither an ace nor a spade is (a) $\frac{35}{52}$ (b) $\frac{10}{13}$ (c) $\frac{9}{13}$ (d) $\frac{19}{26}$	1
14	A line intersects the Y-axis and X-axis at the points P and Q respectively. If $(2 , - 5)$ is the mid-point of PQ, then the coordinates of P and Q are respectively (a) $(0, - 5)$ and $(2, 0)$ (b) $(0, 10)$ and $(- 4 , 0)$ (c) $(0, 4)$ and $(- 10 , 0)$ (d) $(0, - 10)$ and $(4, 0)$	1
15	If 8, a, b, -3 are in AP, then value of a+b is (a) 15 (b)7 (c)11 (d)19	1
16	A marble of radius 2.1 cm is put into a cylindrical cup full of water whose radius is 5 cm & height is 6 cm . The volume of water that flows out of cylindrical cup would be (a) 19.4 cm³ (b) 55.4 cm³ (c) 38.8 cm³ (d) 471.4 cm³	1
17	APB is a tangent to a circle with centre O, at point P. If $\angle QPB = 50^0$,what would be the measure of $\angle POQ$? (a) 120^0 (b) 110^0 (c) 100^0 (d) 140^0	1
18	If $\sin \theta = \cos \theta$,then value of $\csc \theta$ is (a) 2 (b) 1 (c) $\frac{2}{\sqrt{3}}$ d) $\sqrt{2}$	1

In questions 19 & 20 a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

   (a) Both A and R are true, and R is the correct explanation of A
    (b) Both A and R are true, but R is not the correct explanation of A
    (c) A is true, R is false
    (d) A is false, R is true

19	Assertion (A): If product of 2 numbers is 5780 and their HCF is 17, then their LCM is 340 Reason (R): HCF is always a factor of LCM	1
20	Assertion (A): The area of the minor segment of a circle is always less than the area of the Corresponding sector of the circle Reason (R): The area of the major segment of a circle is always less than the area of the corresponding Sector of the circle	1

SECTION B

21	The LCM of two numbers is 6 times their HCF. The sum of LCM & HCF is 91. If one number is 26 ,find the other number OR Three alarm clocks ring their alarms at regular interval of 6 min ,9min & 15 min respectively. If they first beep together at 4 pm,what time will they next ring together?	2
22	Find the value of α and β if $\sin(\alpha + 2\beta) = \frac{\sqrt{3}}{2}$ and $\cos(\alpha + 4\beta) = 0$	2
23	Find the value of a , if the distance between the points $A(-3, -14)$ & $B(a, -5)$ is 9 units	2
24	Two dice are thrown simultaneously. What is the probability of getting (i) A Prime number on both the dice ? (ii) A total of 9 or 11 ? OR A jar contains marbles of blue , white & red colours. The probability of selecting a blue marble is $\frac{4}{15}$ & the probability of selecting a white marble is $\frac{2}{5}$. If the jar contains 10 red marbles,find the total number of marbles in the jar	2
25	Find the ratio in which the point $(-1, 6)$ divides the line segment joining the points $(-3, 10)$ and $(6, -8)$ 2 9 7	2

SECTION C

26	A chord of a circle of radius 15 cm subtends an angle of 60^0 at the centre Find area of the corresponding minor segment (use $\pi = 3.14$ & $\sqrt{3} = 1.73$) OR Find the area of the minor sector of a circle of radius 42 cm, if length of the corresponding arc is 44 cm	3
27	Prove that : $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$	3
28	If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, then find the value of k	3
29	Prove that $\sqrt{5}$ is Irrational	3
30	If sum of the squares of the zeroes of the quadratic polynomial $p(x) = x^2 - 8x + k$ is 40, find the value of k	3

31	State and prove Basic Proportionality theorem	3
	OR	
	In the given figure below, CB ‖ QR and CA ‖ PR Also AQ = 12 cm, AR = 20 cm, PB = CQ = 15 cm. Calculate PC and BR	

SECTION D

32	(a)If the median of the following frequency distribution is 32.5 , Find the missing frequencies f_1 and f_2	5

Class Interval	Frequency
0 – 10	f_1
10 – 20	5
20 – 30	9
30 – 40	12
40 – 50	f_2
50 – 60	3
60 - 70	2
Total	40

(b) Find Mode of the following data

Class Interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	8	12	10	11	9

OR

(a) The mean of the following distribution is 25 Find the missing frequency

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 –
Frequency	5	18	15	f	6

(b) Construct a frequency distribution table for the marks obtained by students & hence find Median

	Frequency
Less than 10	14
Less than 20	22
Less than 30	37
Less than 40	58
Less than 50	67
Less than 60	75

33	(a)Prove that Parallelogram circumscribing a circle is a Rhombus	5

(b)In the given figure, a circle inscribed in △ ABC touches its sides AB, BC and AC at points D, E & F respectively. If AB = 12 cm, BC = 8 cm and AC = 10 cm, then find the lengths of AD, BE and CF

No.	Question	Marks
34	The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then denominator becomes12 times the numerator. Determine the fraction OR A number consists of two digits. When the number is divided by the sum of its digits, the quotient is 7. If 27 is subtracted from the number, the digits interchange their places. Find the number	5
35	The angle of elevation of the top of a light house 60 m high ,from two points on the ground on its opposite sides are 45^0 & 60^0. What is the distance between the two points? (Take $\sqrt{3}$ as 1.732)	5

SECTION E   (CASE BASED)

| 36 | The great Stupa of Sanchi is one of the oldest stone structures in India , an important Monument of Indian Architecture. Its nucleus was a simple hemispherical brick structure built over the relics of Buddha. It is a perfect example of combination of solid figures. A big hemispherical dome with a cuboidal structure mounted on it. Based on the above information answer these questions

(i)What would be the volume of air contained in the hemispherical dome if the height of the dome is 21m ?
(ii) What would be the volume of the cuboidal shaped top of dimension 8m x 6m x 4m ?
(ii) Find the cloth material required to cover the dome if radius of base is 14 m?
OR
Find the total surface area of the combined structure of the dome | 4 |
| 37 | Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.5 m above the ground. The distance of Ramesh and the pole from the mirror are 1.8 m and 6 m respectively

(i)   What is the height of the pole? | 4 |

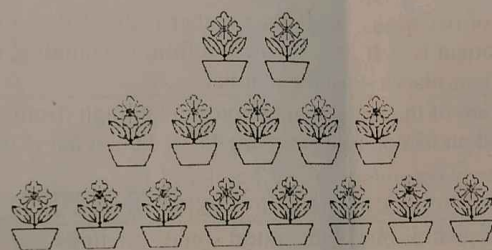|		
	(ii) Which criterion of similarity is applicable to similar triangles? (iii) Now Ramesh moves behind such that distance between pole and Ramesh is 13 meters. He places mirror between him and pole to see the reflection of light in right position. What is the distance between mirror and Ramesh? <center>OR</center> What is the distance between mirror and pole?	
38	Ashly being a plant lover decides to convert her balcony into beautiful garden full of plants. She bought few plants with pots for her balcony. She placed the pots in such a way that the number of pots in the first row is 2, second row is 5, third row is 8 and so on .Based on this information answer the questions (i) Find the number of pots placed in the 10th row (ii) Find the difference in the number of pots placed in 5th row and 2nd row. (iii) If Ashly wants to place 100 pots in total, then the find total no of rows formed in the arrangement. <center>OR</center> If Ashly has sufficient space for 12 rows, then how many total number of plants are placed by her with the same arrangement?	4