S.NO	MCQ(1 Mark Each)
	## Choose and write the correct option in the following questions:-
1	If B⊆A then n(A∩B) is equal to a) n (A) (b) n (B) (c) n (A) + n(B) (d) n(A). n(B)
2	The set of first elements of ordered pairs in a relation is called its a) Domain (b) Range (c) Co- domain (d) Relation
3	If $\dfrac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is the AM between a and b ,then n is equal to a) 0 (b) 1 (c) -1 (d) 2
4	The factorial form of 12.11.10 is a) $\dfrac{12!}{9!}$ (b) 12! (c) 9! (d)(12!).(9!)
5	Different signals of 5 flags of different colours,using 3 at a time is a) 60 (b) 5 (c) 120 (d) 10
6	Three dice are rolled simultaneously ,then n(S) is equal to a) 36 (b) 18 (c) 216 (d) 6
7	The general term of the binomial expansion $(a + x)^n$ is a) $nC_r a^r x^r$ (b) $nC_r a^{n-r} x^r$ (c)$nC_r a^n r^{n-r}$ (d) $nC_r a x^{n-r}$
8	Relation between the length of an arc of a circle and the circular measure of its central angle is (a) $l =\dfrac{r}{\theta}$ (b)$\theta = lr$ (c) $\theta =\dfrac{l}{r}$ (d) $l =\dfrac{1}{2}r^2\theta$
9	Sin(2π-θ) is equal to (a)cos θ (b) –cos θ (c) sinθ (d) –sin θ
10	Solution of the equation 2 sinx + √3 = 0 in fourth quadrant is (a)$\dfrac{\pi}{3}$ (b) $\dfrac{-\pi}{3}$ (c) $\dfrac{-\pi}{6}$ (d)$\dfrac{11\pi}{6}$
	## Solve the following questions:-
11	Describe the set in Roster form $\{x : x$ is a two digit number such that the sum of its digit is 8 $\}$
12	Write down all the subsets of the set {1,2,3}
13	Let $f(x)$ = - | x |then, find the Range of function.
14	Find the value of sin $\dfrac{31\pi}{3}$
15	Evaluate i^{-39}
16	Solve 3x +8 > 2when x is a real number.
17	If nC_a= nC_b,find n.
18	What is the middle term in the expansion of $(1 + x)^{2n+1}$
19	Write the equation of the line through the points (1,-1) and (3,5)
20	Find the coordinates of the foci of the ellipse $x^2 + 4y^2$ = 100
	### SA –SHORT ANSWER TYPE QUESTIONS (2 Marks Each)
21	Given that P (3, 2,-4), Q (5, 4,-6) and R (9, 8,-10) are collinear. Find the ratio inwhich Q divides PR.
22	Find the locus of the point which is equidistant from the point A(0,2,3) andB(2,-2,1)

22	Prove that $\lim_{x \to 0} \frac{e^x - 1}{x} = 1$
23	Differentiate $e^{\sqrt{cotx}}$
24	Write the negation of the following statements (i) Chennai is the capital of Tamil Nadu. (ii) Every natural number is an integer.
25	Check whether the following pair of statements are negations of each other Give reasons for your answer. (i) $x + y = y + x$ is true for every real numbers x and y . (ii) There exists real numbers x and y for which $x + y = y + x$.
26	The mean of 2,7,4,6,8 and p is 7. Find the mean deviation about the median of these observations
27	Find the median for the following data.

x_i	5	7	9	10	12	15
f_i	8	6	2	2	2	6

28	A coin is tossed three times.Consider the following events A: No head appears B: Exactly one head appears and C: At least two heads appears.Do they forma set of mutually exclusive and exhaustive events?
30	A book contains 100 pages. A page is chosen at random. What is the chancethat the sum of the digit on the page is equal to9?
31	If A, B, and C, are three sets and U is the universal set such that n(U) = 1000, n(A) = 300, n (B)= 300 and n(A∩B) = 200 find n $\left(A' \cap B'\right)$.
32	Let A, B and C be three sets such that A ∪ B = A ∪ C and A ∩ B = A ∩ C show that B = C
33	Let $R = \left\{(x, y): x, y \in W, 2x + y = 8\right\}$ then (i) Find the domain and the range of R (ii) Write R as a set of ordered pairs.
34	Let $f(x) = x + 1$ and $g(x) = 2x - 3$ be two real functions. Find the following functions. (i)$\frac{f}{g}$ (iii) $f^2 - 3g$
35	Show that: - tan 3x. tan 2x. tan x = tan 3x – tan 2x – tan x
36	Prove that:- $Sin3x + Sin2x - Sinx = 4Sinx.Cos\frac{x}{2}.cos\frac{3x}{2}$
37	Prove that $n(n+1)(n+5)$ is multiple of 3.
38	Find the modulus of $\frac{(1+i)(2+i)}{(3+i)}$
39	If $x + i\,y = \frac{a+ib}{a-ib}$.Prove that $x^2 + y^2 = 1$
40	Raju obtained 70 and 75 mark in first and second unit test. Find the minimum marks heshould get in the third test to have an average of at least 60 marks.
	LA-I LONG ANSWER TYPE QUESTIONS(4 Marks Each)
41	There are 210 members in a club. 100 of them drink tea and 65 drink tea but not coffee, each member drinks tea or coffee. Find (i) how many drink coffee (ii) How many drink coffee, but not tea.
42	For any two sets A and B prove by using properties of sets that: $(A \cap B) \cup (A - B) = A$
43	Find the domain and the range of the function $f(x) = \sqrt{x-1}$
44	The Cartesian product $A \times A$ has 9 elements among which are found $(-1, 0)$ and $(0, 1)$.Find the set A and the remaining elements of $Ax\, A$.
45	Let $A = \left\{1,2,3, 4,5,6\right\}$ define a relation R from A to A by $R = \left\{(x, y): y = x + 1, x, y \in A\right\}$.

	(i) Write *R* in the roaster form. (ii) Write down the domain co domain and range of *R.* (iii) Represent *R* by an arrow diagram.
46	Find the value of $\tan\dfrac{\pi}{8}$
47	Solve:- Sin2x-Sin4x+Sin6x=o
48	Prove that:-tan 4x = $\dfrac{4\tan x(1-\tan^2 x)}{1-6\tan^2 x+\tan^4 x}$
49	Show that :-$\sqrt{2+\sqrt{2+2\cos 4\theta}}$ =2cosθ
50	Prove by Mathematical induction that$(2n+7)<(n+3)^2$
51	Proveby Mathematical induction that $1.2+2.2^2+3.2^3+...+n.2^n= (n-1)2^{n+1}+2$
52	Find real θ such that $\dfrac{3+2i\sin\theta}{1-2i\sin\theta}$ is purely real.
53	If a + ib = $\dfrac{c+i}{c-i}$,where a, b ,c are real numbers .Prove that a²+b²= 1 and$\dfrac{b}{a}=\dfrac{2c}{c^2-1}$
54	Solve: $\sqrt{3}x^2$- $\sqrt{2}x$ + 3 $\sqrt{3}$ = 0
55	Find the modulus of $i^{25}+(1+3i)^3$
56	Solve the inequality$\dfrac{x}{4}<\dfrac{(5x-2)}{3}-\dfrac{(7x-3)}{5}$
57	Find all pairs of consecutive odd natural numbers both of which are larger than 10 such that their sum is less than 40.
58	How many words, with or without meaning can be made from the letters ofthe word MONDAY. Assuming that no. letter is repeated, if (i) 4 letters are used at a time (ii) All letters are used but first letter is a vowel?
59	Prove that: nC$_r$ +nC$_{r-1}$ =n+1C$_r$
60	Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements (i) do the words start with P (ii) do all the vowels always occur together
61	The English alphabet has 5 vowels and 21 consonants. How many words withtwo different vowels and 2 different consonants can be framed from thealphabet?
62	From a class of 25 students 10 are to be chosen for an excursion Party. There are 3 students who decide that either all of them will join or none of them will join. In how many ways can excursion party be chosen?
63	Find the 13thterm in the expansion of$\left(9x-\dfrac{1}{3\sqrt{x}}\right)^{18}$,x ≠ 0
64	Find the coefficient of x^5 in the expansion of the product$(1+2x)^6(1-x)^7$
65	Show that the sum of (m+n)thand (m-n)thterms of an A. P. is equal to twice themthterm.
66	If a$\left(\dfrac{1}{b}+\dfrac{1}{c}\right)$,b$\left(\dfrac{1}{c}+\dfrac{1}{a}\right)$,c $\left(\dfrac{1}{a}+\dfrac{1}{b}\right)$ are in AP.Prove that a,b,c are in AP.
67	Find the sum 0.6 + 0.66 + 0.666 + ---
68	If *p* is the length of the perpendicular from the origin on the line whose intercepts on the axes are *a* and *b*. show that $\dfrac{1}{p^2}$ $=\dfrac{1}{a^2}+\dfrac{1}{b^2}$
69	Find equation of the line passing through the point $(2, 2)$ and cutting offintercepts on the axes whose sum is 9.
70	The owner of a milk store finds that, he can sell 980 litres of milk each week at Rs 14 alitre and 1220 litres of milk each week at Rs 16 a litre. Assuming a linear relationshipbetween selling price and demand, how many litres could he sell weekly at Rs 17a litre?
71	Point *R(h, k)*divides a line segment between the axes in the ratio 1:2. Find equation of the line.

72	$P(a,b)$ is the midpoint of a line segment between axes. Show that equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$
73	Find the equation of hyperbola whose length of latus rectum is 36 & foci are(0, ±12)
74	Find the coordinates of the focus & vertex, the equations of the directrix & the axis & length of latus rectum of the parabola $x = -8y$
75	Show that the equation $6x^2 + 6y^2 + 24x -36y +18 = 0$ represents a circle. Also findits centre & radius.
76	If the points $P(1, 0,-6)$, $Q(-3, P, q)$ and $R(-5, 9, 6)$ are collinear, find thevalues of P and q.
77	Find the ratio in which the join the $A(2, 1, 5)$ and$B(3, 4, 3)$ is divided by the plane $2x + 2y - 2z =1$.Also find the co- ordinate of the point of division.
78	Evaluate: - $\lim_{x \to 0} \frac{x\tan4x}{1-\cos4x}$
79	Differentiate :- $\sqrt{\frac{1-\tan x}{1+\tan x}}$
80.	Given below are two statements P: 25 is a multiple of 5. q: 25 is a multiple of 8 Write the compound statements connecting these two statements with "and" and "OR". In both cases check the validity of the compound statement.
81	Show that the statement P : "If x is a real number such that $x^3 + 4x = 0$, then x is 0" is true by (i) direct method, (ii) method of contradiction, (iii) method of contra-positive
82	The mean and standard deviation of 6 observations are 8 and 4 respectively. If each observation is multiplied by 3, find the new mean and new standard deviation ofthe resulting observations.
83	Find the mean deviation about median for the following data. <table><tr><td>Marks</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td></tr><tr><td>No.of girls</td><td>6</td><td>8</td><td>14</td><td>16</td><td>4</td><td>2</td></tr></table>
84	Find the mean and variance for the following frequency distribution. <table><tr><td>Class</td><td>0-30</td><td>30-60</td><td>60-90</td><td>90-120</td><td>120-150</td><td>150-180</td><td>180-200</td></tr><tr><td>Frequency</td><td>2</td><td>3</td><td>5</td><td>10</td><td>3</td><td>5</td><td>2</td></tr></table>
85	Find the probability that when a hand of 7 cards is drawn from a well shuffled deck of 52 cards, it contains (i) all king (ii) 3 kings (iii) at least 3 kings
86	In a class XI of a school 40% of the students study Mathematics and 30%study Biology. 10% of the class study both Mathematics and Biology. If astudent is selected at random from the class, find the probability that he will bestudying Mathematics or Biology.
	## LA-II LONG ANSWER TYPE QUESTIONS (6 Marks Each)
87	A bag contains 50 tickets no. 1,2,3,……,50 of which five are drawn at random and arranged in ascending order of magnitude($x_1 < x_2 < x_3 < x_4 < x_5$)find theprobabilitythat $x_3 = 30$
88	For the marks of 200 candidates the mean and standard deviation was found to be 10 and 15 respectively. After that it was found that the score 43 was misread as 34. Find the correct mean and correct S.D
89	Evaluate $\lim_{h \to 0} \frac{(a+h)^2 \sin(a+h)-a^2 \sin a}{h}$
90	Find derivative of (i)$\frac{x\sin x}{1+\cos x}$(ii) $(ax+b)(x + d)^2$
91	If A and B are the points $(-2,2,3)$ and$(-1,4,-3)$ respectively, then find thelocus of P such that

	$3|PA| = 2|PB|$
92	Find the equation of the ellipse with centre at the origin, major axis on the y –axis & passing through the points (3, 2) & (1,6)
93	Find the equations of the lines which pass through the point $(4, 5)$ and make equal angles with the lines 5x -12y + 6 = 0 and 3x - 4y - 7 = 0.
94	The Sum of two numbers is 6 times their geometric mean, show that numbers are in the ratio $\frac{3+2\sqrt{2}}{3-2\sqrt{2}}$
95	Between 1 and 31, 'm' numbers have been inserted in such a way that the resultingsequence is an A.P. and the ratio of 7th and (m-1)th numbers is 5:9 find the value of m.
96	If three successive coefficientsin the expansion of $(1 + x))^n$are 220,495 and 792 thenfind n.
97	How many four letter words can be formed using the letters of the word 'FAILURE' so that (i) F is included in each word. (ii) F is excluded in each word.
98	Solve graphically :- $x + 2y \leq 10$,$x + y \geq 1$, $x - y \leq 0$,$x \geq 0$, $y \geq 0$
99	Convert into polar form :- $z = \dfrac{i-1}{\cos\frac{\pi}{3}+i\sin\frac{\pi}{3}}$
100	Prove that Cos 20°. Cos 40^0. Cos 60^{0}Cos 80^0 = $\dfrac{1}{16}$
101	Prove that :- $Cos2x.Cos\frac{x}{2} - Cos3x.Cos\frac{9x}{2} = Sin 5x.Sin\frac{5x}{2}$
102	(a) If A,B are two sets such that $n(A \times B) = 6$ and some elements of $A \times B$ are$(-1,2),(2,3),(4,3)$, then find $A\times B$ and $B\times A$ (b)Find the domain of the function f(x) = $\dfrac{1}{\sqrt{x+[x]}}$
103	Find the domain and the range of the following functions: (i) f(x) = $\sqrt{x^2 - 4}$ (ii) f(x) = $\sqrt{16 - x^2}$ (iii) f(x) = $\dfrac{1}{\sqrt{9-x^2}}$
104	In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% of families buy newspaper B and 10% of families buy newspaper C. 5% of families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three papers. Find the number of families which buy (i) A only (ii) B only (iii) none of A, B, and C.