MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
Department of Computer Science and Engineering
II B.Tech I Sem II Mid Examination (MR20 Regulation)
Subject: DISCRETE MATHEMATICS

MODULE III

1a) Discuss about semi group, monoid, group, abelian group and subgroup.

b) Prove that the cubeth roots of unity $\{1, w, w^2\}$ is an abelian group with respect to multiplication(.)

2 a) Prove that $(Z, +_6)$ is an abelian group.

b) Prove that the fourth roots of unity $\{1, i, -i, -1\}$ is an abelian group with respect to multiplication(.)

3. Prove that the intersection of two sub groups is also a subgroup.

4. Define Algebraic structure? On the set Q of all rational numbers, the operation * is defined by a*b= a + b - ab. show that under this operation forms a commutative Group.

5 a) Explain about the Homomorphism and Isomorphism with one example.

b) Suppose the function $f:(R,+)\rightarrow(R^*,.)$ is defined by $f(x)=e^x$.Prove that f is isomorphism.

6 a) Prove that in a group G, there exits an unique identity element.

b) Suppose the function $f:(R,+)\rightarrow(R,.)$ is defined by $f(x)=2x$.Prove that f is not homomorphism.

MODULE IV

1(a) State and Prove Binomial Theorem.

(b)In how many ways can the letters {5.a, 4.b,3.c} be arranged so that all the letters of the same kind are not in a single block

2(a) State Multinomial Theorem. Find the coefficient of $x^5 y^2$ in the expansion of $(2x-3y)^7$

(b) Let X be the set of all three digit integers that is X={x is an integer / $100 \le x \le 999$} If A_i is the set of numbers in X whose i^{th} digit is i , compute the cardinality of the set $A_1 U A_2 U A_3$.

3(a) If there are 200 faculty members that speak French, 50 that speak Russian, 100 that speak Spanish, 20 that speak French and Russian, 60 that speak French and Spanish , 35 that speak Russian and Spanish , while only 10 speak French , Russian and Spanish, how many speak either French or Russian or Spanish.

(b) Find the coefficient of $x^3y^3z^2$ in the expansion of $(2x-3y+5z)^8$

4(a) Expand $(2x+3y-5z)^3$ using Multinomial Theorem

(b) Find the number of integer solutions of $x+y+z+w+t=30$ where $x\geq2$, $y\geq3$, $z\geq4$, $w\geq2$, $t\geq0$.

5(a) Find the mid term of $(2x - \frac{1}{3x})^{10}$

(b) Find the number of arrangements of the letters in TALLAHASSEE which have no adjacent A's

6(a) Find the number of permutations of the letters of the word MASSASAUGA. In how many of these All four A's are together. How many of them begin with S.

(b) Find the number of words that can be formed by scrambling the letters of the word SCRAMBLE

7(a) Find the number of integers ≤ 250 and divisible by 3 or 5 or 7.

(b) Write some applications of the Pigeonhole principle.

8(a) An identifier in a programming language consists of a letter followed by alphanumeric characters. Find the number of legal identifiers of length at most 10.

(b) Enumerate the number of non-negative integer solutions to the in-equality $x+y+z <15$

MODULE V

1. (a) Find the generating function for the Fibonacci Sequence $< F_n >$ and hence obtain an expression for F_n

(b) Solve $a_{n+3} = 3a_{n+2} + 4a_{n+1} - 12a_n$

2. (a) Solve the recurrence relation $a_{n+2} - 4a_{n+1} + 3a_n = -200$, $n \geq 0$ and $a_0 = 3000$, $a_1 = 3300$

(b) Solve the recurrence relation $a_n + a_{n-1} - 8a_{n-2} - 12a_{n-3} = 0$, $n \geq 3$

3. (a) Solve the recurrence relation $a_{n+2} + 3a_{n+1} + 2a_n = 3^n$ for $n \geq 0$ given $a_0 = 0$, $a_1 = 1$

(b) A bank pays a certain % of annual interest on deposits, compounding the interest once in 3 months If deposit doubles in 6 years and 6 months, What is the annual % of interest paid by the bank.

4.(a) Solve the recurrence relation $a_{n+3} - 3a_{n+2} + 3a_{n+1} - a_n = 3+5n$ for $n \geq 0$

(b) Solve the recurrence relation $a_n - 7a_{n-1} + 16a_{n-2} - 12a_{n-3} = 0$ for $n \geq 3$ with $a_0 = 1$, $a_1 = 4$, $a_2 = 8$.

5. (a) Using the generating function method, Solve the recurrence relation $a_n - 3a_{n-1} = n$, $n \geq 1$ given $a_0 = 1$.

(b) Find the generating function of the sequence $a_n = n$

6.(a) Solve the recurrence relation $a_{n+2} - 2a_{n+1} + a_n = 2^n$, $n \geq 0$ and $a_0 = 1$, $a_1 = 2$ by the method of generating function.

(b) Solve the recurrence relation $a_n - a_{n-1} = 3n^2$, $n \geq 1$, $a_0 = 7$.

7(a). Solve $a_n = 3a_{n-1} + 2a_{n-2} + (n+3)\, 3^n$

(b). Find the coefficient of x^{2005} in the generating function $\frac{1}{(1+5x)^2}$

8(a). Find the general solution of the recurrence relation $a_n = a_{n-1} + 6a_{n-2} + (n+1)3^n$

(b). Find the general solution of the recurrence relation $a_n - 7a_{n-2} + 10a_{n-4} = 0$, $n \geq 4$.

	Question and Options	Answer
1	In a Group (G,.) The identity element is	A
	Unique	
	One	
	Two	
	Three	
2	If (G, .) is a group such that $a^2 = e$ ∀ a ∈ G, then G is	B
	semi group	
	abelian group	
	non-abelian group	
	none of these	
3	If (G, .) is a group such that $(ab)^{-1} = b^{-1}a^{-1}$, ∀ a, b ∈ G, then G is a/an	B
	commutative semi group	
	abelian group	
	non-abelian group	
	None of these	
4	The inverse of - i in the multiplicative group,{1, - 1,i,- i } is	C
	1	
	-1	
	I	
	-i	
5	The set of integers Z with the binary operation "1" defined as a*b =a +b+1 for a, b ∈ Z, is a group. The identity element of this group is	C
	0	
	1	
	-1	
	12	
6	If (G, .) is a group, such that $(ab)^2 = a^2b^2$ ∀ a, b ∈ G, then G is a/an	B
	commutative semi group	
	non-abelian group	
	abelian group	
	All the above	
7	(Z,*) is a group with a*b = a+b+1 ∀ a,b ∈ Z. The inverse of a is	D
	0	
	-2	
	a-2	
	-a-2	
8	If a, b are positive integers, define a * b = α where ab = α (modulo 7), with this * operation, then inverse of 3 in group G (1, 2, 3, 4, 5, 6) is	C
	3	
	1	
	5	
	4	
9	The set of all nth roots of unity under multiplication of complex numbers form a/an	D
	semi group with identity	
	commutative semigroups with identity	
	Group	
	abelian group	
10	In the group G = {2, 4, 6, 8) under multiplication modulo 10, the identity element is	A
	6	
	8	

	4	
	2	
11	Match the following A. Groups I. Associativity B. Semi groups II. Identity C. Monoids III. Commutative D. Abelian Groups IV Left inverse	A
	A B C D IV I II III	
	A B C D III I IV II	
	A B C D II III I IV	
	A B C D I II III IV	
12	Let (Z, *) be an algebraic structure, where Z is the set of integers and the operation * is defined by n * m = maximum (n, m). Which of the following statements is TRUE for (Z, *) ?	D
	(Z, *) is a monoid	
	(Z, *) is an abelian group	
	(Z, *) is a group	
	None of these	
13	If the binary operation * is deined on a set of ordered pairs of real numbers as (a,b)*(c, d) = (ad + bc, bd) and is associative, then (1, 2) * (3, 5) * (3, 4) equals	A
	(74,40)	
	(32,40)	
	(23,11)	
	(27,11)	
14	Boolean algebra is also called	A
	switching algebra	
	arithmetic algebra	
	linear algebra	
	Algebra	
15	Boolean algebra theorem 6b gives $x(x+y)$ equal to	C
	x'	
	1	
	X	
	0	
16	$e*x=x*e=x$ is the	D
	commutative property	
	inverse property	
	associative property	
	identity element	
17	A Boolean function may be transformed into	A
	logical diagram	
	logical graph	
	Map	
	Matrix	
18	$x+xy=y$ is known as	D
	inverse law	
	commutative law	
	distributive law	
	absorption law	
19	A two valued Boolean algebra is defined as a set of	B
	three values	

	two values	
	four values	
	five values	
20	Another way of expressing Boolean algebra is	D
	graphical form	
	plot form	
	non standard form	
	standard form	
21	One that is not postulate of Boolean algebra	B
	Commutative	
	Duality	
	Associative	
	identity element	
22	Boolean algebra is an algebraic structure with two arithmetic operations	C
	addition and subtraction	
	subtraction and multiplication	
	addition and multiplication	
	addition and division	
23	Is it possible to find two algebraic expressions that specify same function	B
	No	
	Yes	
	Maybe	
	Never	
24	$x+y=y+x$ is the	A
	commutative property	
	inverse property	
	associative property	
	identity element	
25	Boolean algebra is collection of objects having	C
	positive properties	
	negative properties	
	common properties	
	different properties	
26	According to combination rule, if total number of outcomes are 'r' and distinct outcome collection is 'n' then combinations are calculated as	A
	$\frac{n!}{r!(n-r)!}$	
	$\frac{n!}{r!(n+r)!}$	
	$\frac{r!}{n!(n-r)!}$	
	$\frac{r!}{n!(n+r)!}$	
27	Method of counting outcomes in which number of outcomes are determined while considering ordering is classified as	D
	intersection combinations	
	union combinations	
	listed combination	
	Permutations	
28	Method of counting outcomes in which number of outcomes are determined without taking care of arrangement order is classified as	C
	listed combinations	
	union combinations	

	intersection combination	
	unlisted combinations	
29	Considering combination rule of counting outcome, value of 5! Is	B
	5	
	120	
	24	
	20	
30	If a brown sack consists of 4 white balls and 3 black balls then probability of one randomly drawn ball will be white is	A
	$\frac{4}{7}$	
	$\frac{1}{7}$	
	$\frac{4}{4}$	
	$\frac{4}{3}$	
31	From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?	D
	564	
	645	
	735	
	756	
32	In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?	C
	360	
	480	
	720	
	5040	
33	In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?	D
	810	
	1440	
	2880	
	50400	
34	Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?	C
	210	
	1050	
	25200	
	21400	
35	In how many ways can the letters of the word 'LEADER' be arranged?	C
	72	
	144	
	360	
	720	
36	In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?	D
	159	
	194	
	205	
	209	

37	How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?	D
	5	
	10	
	15	
	20	
38	In how many ways a committee, consisting of 5 men and 6 women can be formed from 8 men and 10 women?	C
	266	
	5040	
	11760	
	86400	
39	A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?	C
	32	
	48	
	64	
	96	
40	In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?	C
	32	
	48	
	36	
	60	
41	In how many ways can a group of 5 men and 2 women be made out of a total of 7 men and 3 women?	A
	63	
	120	
	98	
	49	
42	In how many different ways can the letters of the word 'MATHEMATICS' be arranged so that the vowels always come together?	C
	10080	
	4989600	
	120960	
	198560	
43	In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?	B
	120	
	720	
	5040	
	None	
45	In the equation $x^2 + x = 0$, one root is **x** equal to	A
	$5x^2 + 3x – 2 = 0$	
	$2x^2 + 3x – 5 = 0$	
	$3x^2 – 3x +2 = 0$	
	$2x^2 + 5x – 3 = 0$	
46	In the equation $x^2 + x = 0$, one root is **x** equal to	D
	1	
	5	
	¼	
	none of these	
47	Solve for the value of "**a**" in the equation $a^8 – 17a^4 + 16 = 9$	A
	± 2	
	± 3	

	± 4	
	All the above	
48	Solve for x that satisfies the equation $6x^2 - 7x - 5 = 0$	A
	5/3 or -1/2	
	3/2 or 3/8	
	7/5 or -7/15	
	3/5or ¾	
49	Find the values of **x** in the equation $24x^2 + 5x - 1 = 0$	D
	(1/6,1)	
	(1/6,1/5)	
	(1/2,1/5)	
	(1/8,-1/3)	
50	Determine k so that the equation $4x^2 + kx + 1 = 0$ will have just one real solution.	B
	3	
	4	
	5	
	6	
51	Solve for x: $10x^2 + 10x + 1 = 0$	A
	-0.113, -0.887	
	-0.331, -0.788	
	-0.113, -0.788	
	All the above	
52	If 1/3 and -3/2 are roots of a quadratic equation, then the equation is	A
	$6x^2 + 7x - 3 = 0$	
	$6x^2 - 7x + 3 = 0$	
	$6x^2 - 7x - 3 = 0$	
	$6x^2 - 7x + 1 = 0$	
53	Which of the following is a root of this quadratic equation $30x^2 + 49x + 20 = 0$	C
	0.6	
	-0.6	
	-0.8	
	0.75	
54	What is the discriminant of the equation **$4x^2 = 8x - 5$**?	B
	8	
	-16	
	16	
	-8	
55	Given the equation $3x^2 + Bx + 12 = 0$. What is the value of B so that the roots of the equation are equal?	D
	4	
	8	
	10	
	-12	
56	Find the 5^{th} term of expansion of $\left(x^2 + \frac{1}{x}\right)^{10}$.	C
	$260\ x^8$	
	$5040\ x^8$	
	$210\ x^8$	
	$420\ x^8$	
57	In the expression of $(x + 4y)^{12}$, the numerical coefficient of the 5^{th} term is,	B
	63,360	
	126,720	

	506,880	
	253,440	
58	What is the fourth term of the expansion of $(x + x^2)^{100}$?	B
	1650 x^{103}	
	161700 x^{103}	
	167100 x^{103}	
	167100 x^{100}	
59	What is the numerical coefficient of the term next to $495x^8y^4$?	B
	660	
	792	
	990	
	1100	
60	What is the coefficient of the term free of x of the expansion of $(2x – 5y)^4$?	D
	256	
	526	
	265	
	625	
61	A partial ordered relation is transitive, reflexive and	D
	-148,288 x^3y^5	
	-548 x^2y^5	
	-154,288 x^3y^5	
	-1,548,288 x^3y^5	
62	Given $\log_b y = 2x + \log_b x$. Which of the following is true?	D
	$y=b^{2x}$	
	y=2xb	
	y=2x/b	
	$y=xb^{2x}$	
63	What expression is equivalent to log (x) – log (y + z)?	B
	log x + log y + log z	
	log [x/(y + z)]	
	log x – log y – log z	
	log y + log (x +z)	
64	Which of the following is correct?	C
	-2 log 7 = 1/49	
	$\log_7$ (-2) = 1/49	
	$\log_7$ (1/49) = -2	
	$\log_7$ (1/49) = 2	
65	If $\log_x 2 + \log^2 x = 2$, then the value of x is	A
	1	
	2	
	3	
	4	
66	Log_6 845 =?	D
	4.348	
	6.348	
	5.912	
	3.761	
67	The logarithm of negative number is:	D
	irrational number	
	real number	
	imaginary number	
	complex number	
68	The middle term in the expansion of $(x^2 – 3)^8$ is:	D
	$-70x^8$	
	$70x^8$	

	$-5760x^8$	
	$5760x^8$	
69	Find the sum of the coefficients in the expansion of $(x + 2y – z)^8$.	A
	256	
	1024	
	1	
	6	
70	If the roots of $ax^2 + bx + c = 0$, are u and v, then the roots of $cx^2 + bx + a = 0$ are:	C
	u and v	
	–u and v	
	1/u and 1/v	
	-1/u and -1/v	
71	The only root of the equation $x^2 – 6x + k = 0$ is:	A
	3	
	2	
	6	
	1	
72	A family of 121 crows move into a new neighborhood which has 12 identical birdhouses. What is the minimum number of crows that each birdhouse must be able to hold, in order for all the birds to fit?	B
	21	
	11	
	12	
	16	
73	5 integers are randomly chosen from 1 to 2015. What is the probability that there is a pair of integers whose difference is a multiple of 4?	D
	½	
	¼	
	2/5	
	1	
74	Find k so that the expression $kx^2 – 3kx + 9$ is a perfect square.	B
	3	
	4	
	12	
	6	
75	The equation whose roots are the reciprocals of the roots of $2x^2 – 3x – 5 = 0$ is:	A
	$5x^2 + 3x – 2 = 0$	
	$3x^2 – 5x – 3 = 0$	
	$5x^2 – 2x – 3 = 0$	
	$2x^2 – 5x – 3 = 0$	
76	$f(x)=(1+x)^{-1}$ is a generating function for the sequence	B
	1,1,1,1,…….	
	1,-1,1,-1,1,-1,……	
	1,2,3,4,……	
	None	
77	$f(x)=(1+x)^n$ is a generating function for the sequence	C
	1, n/1!, n.(n+1)/2!, n.(n+1)(n+2)/3!, ……	
	1, n/1!, n.(n-1)/2!, n.(n-2)(n-3)/3!, ……	
	1, n/1!, n.(n-1)/2!, n.(n-1)(n-2)/3!, ……	
	All the above	
78	f(x)=(3+x)3 is a generating function for the sequence	A
	27,27,9,1,0,0,0…..	
	27,27,9,3,0,0,0…..	
	27,9,3,1,0,0,0…..	

	27,9,9,1,0,0,0…..	
79	e^{2x} generating function for the sequence	B
	1,2, 2^2/1!,2^2/2!,……..	
	1,2/1!, 2^2/2!,2^3/3!,……..	
	2/1!, 2^2/2!,2^3/3!,……..	
	1,2, 2,2^2/2!,……..	
80	Find the generating function of the following sequence 1,2,3,4	A
	$(1-x)^{-2}$	
	$(1-x)^2$	
	$(1-x)^2$	
	$(1-x)^n$	
81	Find the generating function of the following sequence 1,-2,3,-4	B
	$(1+x)^2$	
	$(1+x)^{-2}$	
	$(1+x)^{-1}$	
	$(1+x)^n$	
82	Find the generating function of the following sequence 0,1,2,3,4,…	B
	$x(1-x)^2$	
	$x(1-x)^{-2}$	
	$x(1-x)^{-1}$	
	$x(1-x)^n$	
83	First order Recurrence relation form	A
	$a_n = ca_{n-1} + f(n)$	
	$a_n = ca_{n-1} + c_n a_0$	
	$a_n = ca_{n-1}$	
	None	
84	First order Recurrence relation form $a_n = ca_{n-1} + f(n)$ if $f(n) = 0$ is called	B
	Non homogeneous	
	Homogeneous	
	Both	
	None	
85	First order Recurrence relation form $a_n = ca_{n-1} + f(n)$ if $f(n) \neq 0$ is called	A
	Non homogeneous	
	Homogeneous	
	Both	
	None	
86	Solve the recurrence relation $a_{n+1} = 4a_n$ for $n \geq 0$, $a_0 = 3$	A
	$a_n = 4^n(3)$	
	$a_n = 4^{n+1} a_n$	
	$a_{n+1} = 4^n a_1$	
	$a_n = 4^n a_1$	
87	First order Recurrence relation form $a_{n+1} = ca_n + f(n+1)$ if $f(n+1) \neq 0$ the general solution is	A
	$a_n = c_n a_0 + \sum_{k=1}^{n} c^{n-k} f(k)$	
	$a_n = c_n a_0$	
	Both	
	None	

88	Second order Recurrence relation form	A
	$c_n a_n + c_{n-1} a_{n-1} + c_{n-2} a_{n-2} = 0$ for $n \ge 2$	
	$a_n = c_n a_0$	
	$a_n = c_n a_0 + f(n)$	
	None	
89	Solution for the Second order Recurrence relation when the roots are real and distinct	B
	$a_n = r^n \left(A\cos n\phi + B\sin n\phi\right)$	
	$a_n = A(k_1)^n + B(k_2)^n$	
	$a_n = (A + Bn)k^n$	
	$a_n = A(k_1)^n + B(k_2)^n + C$	
90	Solution for the Second order Recurrence relation when the roots are real and equal	C
	$a_n = r^n \left(A\cos n\phi + B\sin n\phi\right)$	
	$a_n = A(k_1)^n + B(k_2)^n$	
	$a_n = (A + Bn)k^n$	
	$a_n = A(k_1)^n + B(k_2)^n + C$	
91	Solution for the Second order Recurrence relation when the roots are complex	A
	$a_n = r^n \left(A\cos n\phi + B\sin n\phi\right)$	
	$a_n = A(k_1)^n + B(k_2)^n$	
	$a_n = (A + Bn)k^n$	
	$a_n = A(k_1)^n + B(k_2)^n + C$	
92	Second order Recurrence relation when the roots are complex Solution r=	C
	$\sqrt{p^2 - q^2}$	
	$\sqrt{p + q^2}$	
	$\sqrt{p^2 + q^2}$	
	$\sqrt{p^2 + q}$	
93	Second order Recurrence relation when the roots are complex Solution ø=	A
	$\tan^{-1}(q/p)$	
	$\tan^{-1}(q*p)$	
	$\tan^{-1}(p/q)$	
	None	
94	Third order Recurrence relation form	A
	$c_n a_n + c_{n-1} a_{n-1} + ... + c_{n-k} a_{n-k} = 0$ for $n \ge k \ge 3$	
	$c_{n-1} a_{n-1} + ... + c_{n-k} a_{n-k} = 0$ for $n \ge k \ge 0$	
	$c_n a_n + c_{n-1} a_{n-1} + ... + c_{n-k} a_{n-k} = 0$ for $n \ge k \ge 1$	
	$c_{n-1} a_{n-1} + ... + c_{n-k} a_{n-k} = 0$ for $n \ge k \ge 2$	
95	Non homogenous Recurrence relations of second and higher orders form	B
	$c_n a_n + c_{n-1} a_{n-1} + \ldots\ldots\ldots.. + c_{n-k} a_{n-k} = 0$ for $n \ge K \ge 2$	
	$c_n a_n + c_{n-1} a_{n-1} + \ldots\ldots\ldots.. + c_{n-k} a_{n-k} = f(n)$ for $n \ge K \ge 2$	
	$c_{n-1} a_{n-1} + \ldots\ldots\ldots.. + c_{n-k} a_{n-k} = 0$ for $n \ge K \ge 2$	
	$c_{n-1} a_{n-1} + \ldots\ldots\ldots.. + c_{n-k} a_{n-k} = 0$ for $n \ge K \ge 2$	
96	General solution for the Non homogenous Recurrence relations of second and higher orders form	A

	$a_n = a_n^h + a_n^p$	
	$a_n = a_n^h - a_n^p$	
	$a_n = a_n^h * a_n^p$	
	$a_n = a_n^h / a_n^p$	
97	$f(x)=(1-x)^{-1}$ is a generating function for the sequence	A
	1,1,1,1,…….	
	1,-1,1,-1,1,-1,……	
	1,2,3,4,……	
	None	
98	$2x^2(1-x)^{-1}$ sequence generated by the function is	B
	0,0,0,2,2,2,…	
	0,0,2,2,2,2,…	
	0,2,2,2,2,2,…	
	2,2,2,2,2,2,…	
99	$2x^3+(1-x)^{-1}$ sequence generated by the function is	B
	1,3,1,3,1,3,1,….	
	1,1,1,3,1,1,1,….	
	1,1,1,3,3,3,3,….	
	1,1,1,3,1,1,3,….	
100	Generating function for the following sequence $1^2, 2^2, 3^2$,…..	A
	$\frac{x(1+x)}{(1-x)^3}$	
	$\frac{x(1+x)}{(1+x)^3}$	
	$\frac{(1+x)}{(1+x)^3}$	
	$\frac{(1-x)}{(1-x)^3}$	
101	Generating function for the following sequence $0^2, 1^2, 2^2, 3^2$,…..	A
	$\frac{x(1+x)}{(1-x)^3}$	
	$\frac{x(1+x)}{(1+x)^3}$	
	$\frac{(1+x)}{(1+x)^3}$	
	$\frac{(1-x)}{(1-x)^3}$	
102	Generating function for the following sequence $0^3, 1^3, 2^3, 3^3$,…..	A
	$(x^2+4x+1)/(1-x)^4$	
	$(x^2+4x+1)/(1+x)^4$	
	$(x^2-4x-1)/(1-x)^4$	
	None	
103	Generating function for the following sequence $1^3, 2^3, 3^3$,…..	A
	$x(x^2+4x+1)/(1-x)^4$	
	$x(x^2+4x+1)/(1+x)^4$	
	$x(x^2-4x-1)/(1-x)^4$	
	None	
104	Generating function for the following sequence 1, 1, 0, 1, 1,……	A
	$(1-x)^{-1} - x^2$	

	$(1-x)^{-2} - x^2$	
	$(1-x)^{-2} - x$	
	None	
105	$({}^{n}C_r) =$	A
	$\frac{n!}{r!(n-r)!}$	
	$\frac{n!}{r!(n+r)!}$	
	$\frac{n!}{n!r!}$	
	None	
106	$({}^{-n}C_r) =$	B
	$(1)^r ({}^{n+r-1}C_r)$	
	$(-1)^r ({}^{n+r-1}C_r)$	
	$(-1)^r ({}^{n+r-1}C_{r-1})$	
	None	
107	$({}^{-n}C_r) =$	A
	$(-1)^r ({}^{n+r-1}C_{n-1})$	
	$(-1)^r ({}^{n+r-1}C_{r-1})$	
	$(1)^r ({}^{n+r-1}C_r)$	
	$(-1)^r ({}^{n+r-1}C_{n-1})$	
108	Find the coefficient of x^5 in $(1-2x)^{-7}$	A
	$2^5 \times ({}^{11}C_5)$	
	$2^5 \times ({}^{11}C_8)$	
	$2^5 \times ({}^{11}C_7)$	
	$2^5 \times ({}^{11}C_6)$	
109	Find the coefficient of x^{27} in $(x^4+x^5+x^6+\ldots\ldots)^5$	A
	330	
	320	
	360	
	340	
110	Find the coefficient of x^{27} in $(x^4+2x^5+3x^6+\ldots\ldots)^5$	A
	11,440	
	11,420	
	11,460	
	11,480	
111	Solve the recurrence relation $a_n = 7a_{n-1}$ where $n \geq 0$ $a_2=98$	A
	$a_n = 2 * 7^n$	
	$a_n = 8 * 7^n$	
	$a_n = 4 * 7^n$	
	None	
112	Solve the recurrence relation $a_n = na_{n-1}$ for $n \geq 1$ $a_0=1$	A
	$a_n = (n!)\ a_0$	
	$a_n = (n-1!)\ a_0$	
	$a_n = (n+1!)\ a_0$	
	None	
113	Solve the recurrence relation $a_n+a_{n-1}-6a_{n-2}=0$ $n \geq 2$ given that $a_0=-1, a_1=8$	A
	$a_n = -2\ (-3)^n + 2^n$	
	$a_n = -2\ (-3)^n - 2^n$	
	$a_n = -2\ (-2)^n + 2^n$	
	None	
114	Solve the recurrence relation $a_n=3a_{n-1}-2a_{n-2}=0$ $n \geq 2$ given that $a_1=5, a_2=3$	B
	$a_n = -2^n + 7^n$	
	$a_n = -2^n + 7$	
	$a_n = -2 + 7^n$	

	None	
115	Solve the recurrence relation a_n-6a_{n-1}+9a_{n-2}=0 n≥2 given that a_0=3,a_1=12	A
	$a_n = (5-n)3^n$	
	$a_n = (5-2n)3^n$	
	$a_n = (5+n)3^n$	
	None	
116	A non homogenous recurrence relations of second and higher orders general solution is	B
	$a_n = a_n^{\ h} + a_n$	
	$a_n = a_n^{\ h} + a_n^{\ p}$	
	$a_n = a_n + a_n^{\ p}$	
	None	
117	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. $a_n^{\ h}$ is called as	A
	Complemenary solution	
	Particular solution	
	Both	
	None	
118	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. $a_n^{\ p}$ is called as	B
	General solution	
	Particular solution	
	Both	
	None	
119	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. suppose f(n) is a polynomial of degree q and 1 is not a root. in case of a_n^p is taken part as	A
	$A_0+A_1n+A_2n^2+$………………..A_qn^q	
	n^m{ $A_0+A_1n+A_2n^2+$………………..A_qn^q }	
	A_0b^n	
	$A_0n^mb^n$	
120	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. suppose f(n) is a polynomial of degree q and 1 is a root of multiplicity of m. in case of a_n^p is taken part as	B
	$A_0+A_1n+A_2n^2+$………………..A_qn^q	
	n^m{ $A_0+A_1n+A_2n^2+$………………..A_qn^q }	
	A_0b^n	
	$A_0n^mb^n$	
121	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. suppose f(n) = α b_n. α is constant and b is not a root of the characteristics of equation of homogenous part. in case of a_n^p is taken part as	C
	$A_0+A_1n+A_2n^2+$………………..A_qn^q	
	n^m{ $A_0+A_1n+A_2n^2+$………………..A_qn^q }	
	A_0b^n	
	$A_0n^mb^n$	
122	A non homogenous recurrence relations of second and higher orders general solution is $a_n = a_n^{\ h} + a_n^{\ p}$. suppose f(n) = α b_n. α is constant and b is a root of multiplicity m of equation of homogenous par. in case of a_n^p is taken part as	D
	$A_0+A_1n+A_2n^2+$………………..A_qn^q	
	n^m{ $A_0+A_1n+A_2n^2+$………………..A_qn^q }	
	A_0b^n	
	$A_0n^mb^n$	

123	$a_n = ca_{n-1}$ +f(n) generating function for the first order recurrence relation is f(x)=	B
	a_0 +xg(x)/1+c(x)	
	a_0 +xg(x)/1-c(x)	
	a_0 -xg(x)/1-c(x)	
	None	
124	$a_n + Aa_{n-1} + Ba_{n-2}$ =f(n) generating function for the second order recurrence relation is f(x)=	A
	$a_0 + (a_1 + a_0A)x + x^2g(x) / 1 + Ax + Bx^2$	
	$a_0 + (a_1 + a_0A)x - x^2g(x) / 1 + Ax + Bx^2$	
	$a_0 +-(a_1 + a_0A)x - x^2g(x) / 1 + Ax + Bx^2$	
	None	
125	$a_{n+2} - 10a_{n+1} + 21a_n = 3n^2 + 2$ find the a_n^h =	A
	$A \times 3^n + B \times 7^n$	
	$A \times 3^n - B \times 7^n$	
	$A + 3^n \times B + 7^n$	
	None	