University of Mumbai

Examination 2020 under cluster ___ (Lead College Short name)

Program: Computer Engineering

Curriculum Scheme: Rev2016

Examination: Second Year Semester III

Course Code: **CSC303** and Course Name: **Discrete Mathematics**

Time: 1 hour Max. Marks: 50

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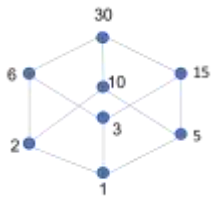
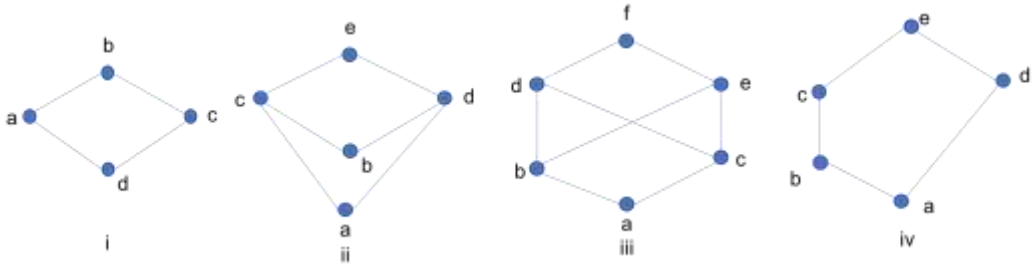
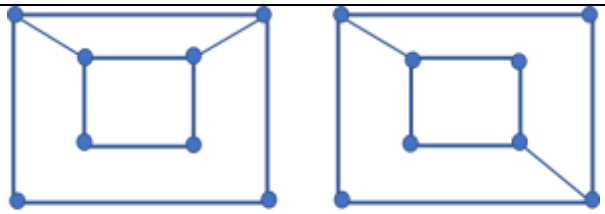
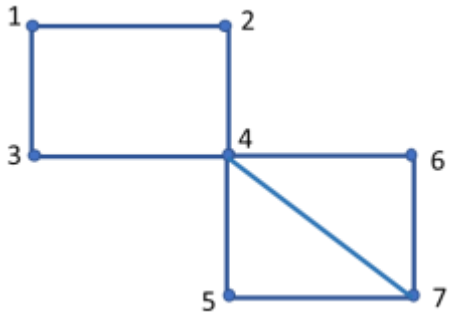
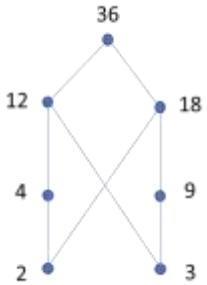
For the students:- All the Questions are compulsory and carry equal marks .

Q1.	The relation R is said to be an equivalence relation if it is
Option A:	Reflexive, asymmetric and transitive
Option B:	Reflexive, asymmetric
Option C:	Reflexive, antisymmetric and transitive
Option D:	Reflexive, symmetric and transitive
Q2.	If A={1,2,3} and R={(1,1),(2,2)} then R is,
Option A:	Reflexive and transitive
Option B:	Reflexive and symmetric
Option C:	Antisymmetric and transitive
Option D:	Symmetric but not transitive
Q3.	Let f(x) = x+3, g(x) = x-4 and h(x) = 2x find gofoh(x) and hogof(x).
Option A:	gofoh(x) = 2x-1 and hogof(x) = 2x-2
Option B:	gofoh(x) = 2x-3 and hogof(x) = 2x-1
Option C:	gofoh(x) = 2x+6 and hogof(x) = 2x-4
Option D:	gofoh(x) = 2x+3 and hogof(x) = 2x+6
Q4.	Which of the following is most appropriate formula to represent statement? “Gold and silver ornaments are precious.” The following notations are used. G(x) : x is gold ornament S(x) : x is silver ornament P(x) : x is precious
Option A:	$\forall x\ (P(x) \rightarrow (G(x) \wedge S(x)))$
Option B:	$\forall x\ (G(x) \wedge (S(x)) \rightarrow P(x)$
Option C:	$\exists x\ ((G(x) \wedge (S(x)) \rightarrow P(x))$
Option D:	$\forall x\ ((G(x) \vee (S(x)) \rightarrow P(x)$
Q5.	The complement of 2 in the given lattice is 
Option A:	30
Option B:	5
Option C:	15

Option D:	10
Q6.	Consider the Hasse diagram shown below, which of these diagrams represents lattice 
Option A:	i & iv only
Option B:	ii & iii only
Option C:	iii only
Option D:	i, iii & iv only
Q7.	What is the correct translation of the following statement into the mathematical logic "some real numbers are rational"
Option A:	∃x (real(x) ∨ rational(x))
Option B:	∀x (real(x) → rational(x))
Option C:	∃x (real(x) ∧ rational(x))
Option D:	∃x (rational(x) → real(x))
Q8.	Find the sequence of the following generating function as, $(1+X)^3$
Option A:	{1,3,3,1,0,0,0}
Option B:	{3,3,3,3,0,0,0}
Option C:	{1,1,1,1,0,0,0}
Option D:	{3,1,3,1,3,1,3}
Q9.	With reference to below graphs which statement is true. 
Option A:	Both graphs are isomorphic
Option B:	Graphs are not isomorphic
Option C:	Cannot determine
Option D:	Graph G1 is subgraph of Graph G2.
Q10.	With reference to below graph which statement is true

	
Option A:	Both graphs are isomorphic
Option B:	Graphs are not isomorphic
Option C:	Cannot determine
Option D:	Graph G1 is subgraph of G2
Q11.	with references to following graph which statement is true 
Option A:	Graph is Eulerian graph.
Option B:	Graph is not a Eulerian graph.
Option C:	Not connected graph.
Option D:	Bipartite graph
Q12.	which of the following statements is/are TRUE for undirected graphs? P: Number of odd degree vertices is even Q: Sum of degrees of all vertices is even
Option A:	P only
Option B:	Q only
Option C:	Both P and Q
Option D:	Neither P nor Q
Q13.	If 7 colours are used to paint 50 bicycles then at least how many bicycles will be of the same colour.
Option A:	57
Option B:	10
Option C:	9
Option D:	8
Q14.	Consider A= {1,2,3,4,5,6} is a finite Abelian group under multiplication modulo 7. Find the inverse of 5 and 2.
Option A:	3 and 4 respectively
Option B:	4 and 3 respectively
Option C:	3 and 6 respectively
Option D:	2 and 5 respectively

Q15.	Find the hamming distance between X and Y as **X=110110** and **Y=000101**
Option A:	4
Option B:	3
Option C:	5
Option D:	6
Q16.	Let A and B be two sets and let A^c and B^c denote the complements of the set A and B. The set (A-B) U (B - A) U (A ∩ B) is equal to
Option A:	A U B
Option B:	A^c U B^c
Option C:	A ∩ B
Option D:	A^c ∩ B^c
Q17.	Let A, B, C be the non-empty sets and let X= (A-B) -C and Y= (A-C) - (B-C) Which of the following is TRUE?
Option A:	X = Y
Option B:	X ⊂ Y
Option C:	Y ⊂ X
Option D:	X is not equal to Y
Q18.	Which of the following is not necessarily a property of a group?
Option A:	Commutativity
Option B:	Associativity
Option C:	Existence of inverse of every element.
Option D:	Existence of identity.
Q19.	Four fair coins are tossed simultaneously. The probability that at least one head and at least one tail turn up is
Option A:	1/16
Option B:	1/8
Option C:	7/8
Option D:	15/16
Q20.	If n(A)=5 , n(B)=8, and n(A ∩ B) = 3 then n(A U B) = ?
Option A:	16
Option B:	5
Option C:	8
Option D:	10
Q21.	Find then generating function corresponding to the given sequence as (1,1,1,1,1……..)
Option A:	1/(1-x)
Option B:	1/(1+x)
Option C:	x/(1+x)
Option D:	x/(1-x)

Q22.	From the given Hasse diagram find the Join and Meet of A= {12,18} 
Option A:	Join is 36 Meet is 2
Option B:	Join is 36 Meet is 3
Option C:	Join is 36 Meet and no meet exists
Option D:	Join is 18 Meet is 3
Q23.	Consider the set of positive rational numbers Q+ forms an Abelian group under composition defined by a*b=ab/2 Find the identity element of given structure.
Option A:	2
Option B:	3
Option C:	4
Option D:	6
Q24.	The output of the given logical equivalence is $(\neg P \wedge (P \vee Q)) \rightarrow Q$
Option A:	Tautology
Option B:	Contradiction
Option C:	Converse
Option D:	Inverse
Q25.	A box contains 6 white balls and 5 red balls. In how many ways, 4 balls can be drawn from the box if, two balls are to be white and two are red.
Option A:	180
Option B:	330
Option C:	150
Option D:	210