

Note: “These are sample MCQs to indicate pattern, may or not appear in examination.”

Subject: Discrete Structure and graph theory

Time 40 min.

Marks:2X20=40

OBJECTIVE TYPE QUESTION

Attempt all question

Q1.	let we have 5 digit 2,3,4,4,5.Find the arrangement of numbers that are divisible by 2.
Option A:	$4!+(4!/2!)$
Option B:	$2*(4!/2!)$
Option C:	$2*4!$
Option D:	$(4!+4!)/2!$
Q2.	Let we can reach 3 ways from A to B and 2 ways from B to C.Then how many ways we can reach from A to C?
Option A:	5 ways
Option B:	6 ways.
Option C:	4 ways
Option D:	3 ways
Q3.	A simple graph having n vertices will have at most
Option A:	$(n(n-1))/2$ edges
Option B:	$n(n-1/2)$ edges
Option C:	$(n-1)/2$ edges
Option D:	$(n(n-1))$ edges
Q4.	A connected graph G is an Eulerian graph, if and only if all vertices of G are of
Option A:	even degree.
Option B:	odd degree
Option C:	any degree
Option D:	zero degree
Q5.	$K_{m,n}$ means
Option A:	Complete graph with m and n vertices.
Option B:	bipartite graph with one partition of m and another partition of n vertices.
Option C:	Regular graph with one partition of m and another partition of n vertices.
Option D:	bipartite graph with partition of mn vertices.
Q6.	Identity element e of a set A is represented as _____

Option A:	$a*e=a*e=a$
Option B:	$a*e=e*a=e$
Option C:	$a*e=e*a=a$
Option D:	$a*e=e*a=ae$
Q7.	How many ways you can arrange these 6 letters 'CINEMA' ,so that C,I and N will always be together.
Option A:	$4!*3!$
Option B:	$4!+3!$
Option C:	$4!*2!$
Option D:	$4!*4!$
Q8.	In a group of 120 students studying computer, 84 can program PASCAL, 66 can program in C, If 45 can program in both, how many of the student can not program either of these languages.
Option A:	20
Option B:	15
Option C:	25
Option D:	16
Q9.	Find how many integers between 1 and 60 are not divisible by 2 nor by 3 and nor by 5?
Option A:	20
Option B:	15
Option C:	25
Option D:	16
Q10.	Let $A=\{1,2,3,4\}$. Relation $R = \{(1,3),(1,1),(3,1)(1,2),(3,3),(4,4)\}$
Option A:	R is not reflexive, symmetric and transitive
Option B:	R is reflexive, not symmetric and transitive
Option C:	R is reflexive, symmetric and not transitive
Option D:	R is not reflexive, not symmetric and not transitive
Q11.	Let $S=\{2,3,4,16\}$, find poset of divisibility. Find maximal and minimal element.
Option A:	16 maximal 2 minimal
Option B:	16,2 maximal 3,2 minimal
Option C:	16,3 maximal 2,3 minimal
Option D:	16 maximal 3,2 minimal
Q12.	Let $A=\{a,b,c\},B=\{1,2,3\}$,where we have two function f1 and f2. f1 is

	defined as $f_1(a)=1, f_1(b)=3, f_1(c)=2$. f_2 is defined as $f_2(a)=1, f_2(b)=1, f_2(c)=2$.
Option A:	f_1 is one to one and onto and f_2 is not one to one and not onto.
Option B:	f_1 is not one to one and not onto but f_2 is not one to one and not onto.
Option C:	f_1 is not onto and not one to one.
Option D:	f_2 is one to one but not onto
Q13.	Let $f: X \rightarrow Y$. Suppose g is a function where $g: Y \rightarrow X$. Then g is called inverse of f when following criteria is satisfied.
Option A:	$(g \circ f)_y = y$ and $(f \circ g)_x = x$
Option B:	$(g \circ f)_x = x$ and $(f \circ g)_y = y$
Option C:	$(g \circ f)_x = y$ and $(f \circ g)_y = x$
Option D:	$(g \circ f)_y = x$ and $(f \circ g)_x = y$
Q14.	A function f has inverse, if following criteria is met.
Option A:	f is one to one and onto both.
Option B:	f is not one to one and onto.
Option C:	f is one to one but not onto.
Option D:	f is not one to one but onto.
Q15.	Let $A = \{a, b, c\}$. Find the transitive closure of the relation $R = \{(a, b), (b, a), (b, c)\}$ defined on $A \times A$.
Option A:	$\{(c, a), (a, b), (a, c), (b, a), (b, b), (b, c)\}$
Option B:	$\{(a, a), (a, b), (a, c), (b, a), (b, b), (b, c)\}$
Option C:	$\{(c, c), (a, b), (a, c), (b, a), (b, b), (b, c)\}$
Option D:	$\{(a, a), (c, b), (a, c), (b, a), (b, b), (b, c)\}$
Q16.	How many ways you can arrange these 6 letters 'CINEMA', so that C, I and N will always be together.
Option A:	$4! \cdot 3!$
Option B:	$4! + 3!$
Option C:	$4! \cdot 2!$
Option D:	$4! \cdot 4!$
Q17.	If a fair 15-sided dice is rolled, then is the probability that the roll is an odd number or prime number or both?
Option A:	$3/20$
Option B:	$4/19$
Option C:	$9/20$
Option D:	$17/20$

Q18.	What is the maximum number of edges in a bipartite graph on 14 vertices?
Option A:	78
Option B:	15
Option C:	214
Option D:	49
Q19.	A _____ is an ordered collection of objects.
Option A:	Relation
Option B:	Function
Option C:	Set
Option D:	Proposition
Q20.	Power set of empty set has exactly _____ subset.
Option A:	1
Option B:	2
Option C:	3
Option D:	0

Time 80 min.

Marks:2X20=40

SUBJECTIVE TYPE QUESTION

Attempt any two from Q2 and any two from Q3.

- Q2.A. What is the maximum number of edges in a bipartite graph on 14 vertices?
 B. How many ways you can arrange these 6 letters 'CINEMA' ,so that C,I and N will always be together.
 C. If a fair 15-sided dice is rolled, then is the probability that the roll is an odd number or prime number or both?
- Q3.A. let we have 5 digit 2,3,4,4,5.Find the arrangement of numbers that are divisible by 2.
 B. In a group of 120 students studying computer, 84 can program PASCAL, 66 can program in C, If 45 can program in both, how many of the student can not program either of these languages.
 C. Find how many integers between 1 and 60 are not divisible by 2 nor by 3 and nor by 5?