

Time: 3:0 Hours



BRAINWARE UNIVERSITY

Term End Examination 2023 Programme - BCA-2018 Course Name - Discrete Structures Course Code - BCA202 (Semester II)

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as

practicable.]

Full Marks: 70

(vi)

c) Both T and F

Choose the correct alternative from	Group-A (Multiple Choice Type Question) on the following :	1 x 15=15
of the following is true, v a) $f(A) = \{5,2,1\}$ c) $f(A) = \{5.8,10\}$	and $f: A \to R, f$ is defined as $f(x)$ where $f(A) = \{f(x): x \in A\}$. Selection $f(A) = \{5,2,1\}$ of $f(A) = \{7,8,1\}$ on $f(x) = log(x-1)$ is, Write to	0} .0}
x>1		
 a) 24 c) 4 (iv) The binary relation {(1,1), (2,1), (2,2), (b) 42 d) 22 p and q be two propositions if t	ite the correct option c and transitive mmetric the correct option

(vii) If $\phi(x-2) = 2x^2 + 3x - 5$ then $\phi(x) =$ Select the correct option

d) None of these

		b) $2x^2 - 11x + 9$			
	a) $2x^2 + 11x + 9$	d) None of these			
		None of the			
(viii)	c) $x^2 + 11x + 9$ If $f(x-2) = 2x^2 + 3x - 5$ then $f(-2)$	=, Write the correct of			
	a) -5	b) 1 d) 2			
(ix)	The degree of an isolated vertex is, Write the correct option	b) 1			
(x)	select the correct one, let p and q be two	propositions. If p and q are b	ooth false		
	then $p \leftrightarrow q$ is				
	a) T c) Both T and F	b) F d) None of these			
(xi)	A complete graph must be a, Write the correct option a) circuit	b) regular graph			
	c) non-simple graph	d) null-graph The properties of the distance	d q is true		
(xii)	c) non-simple graph Select the correct one, let p and q be two	propositions. If p 15			
	then $p \leftrightarrow q$ is				
	a) T	b) F d) None of these			
(xiii)	c) Both T and F Select the correct one, The truth table of the propositional for	mula of n variables will be number	er of rows.		
	a) 4	b) Z			
		d) None of these	1 ===1		
(xiv)	The function $f: R \to R$ defined by $f(x) = x^4$, where R is the set of all real				
	numbers. Then f is, Select the correct option				
	e, serjective	b) injective			
(xv)		d) None of these propositions if truth value of	p is T and		
	Select the correct one, let p and q be two propositions if truth value of p is T and truth value of q is T then $\sim p \land q$ be				
	•	b) F			
	- 1	d) None of these			
	Group-B (Short Answer Type		3 x 5=15		
	2. Establish that the function $f: R \to R$, $f(x) = 3x - 1$ is sur	jective.	(3)		
	3. Let H= {(a, b) ϵ G: b>0}. Show that H is a subgroup of G.		(3)		
	4. Examine $q \to p$ and $\sim p \lor q$ are logical equivalence		(3)		
	5. Describe Tautology, with an example		(3)		
	6. Illustrate that the left identity is also right identity		(3)		

Group-C

(Long Answer Type Questions)

5 x 8=40

Illustrate that

(5)

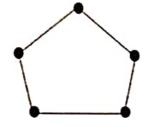
Let (G, \circ) be a group. A non – empty subset H of G forms a subgroup of (G, \circ) iff

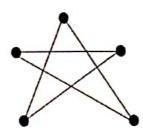
$$a, b \in H \Rightarrow a \circ b^{-1} \in H$$

- 8. There are 12 bulbs in a room each of which is operated independently by 12 different switches.

 Observe how many ways the room can be illuminated?

 (5)
- 9. Examine whether the following two graphs are isomorphic or not: (5)





10. Describe De Morgan's theorem in Boolean Algebra.

(5)

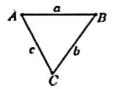
11. What is Tautology and visualize that $\sim (p \lor q)$ is not a tautology

(5)

12. What is Contradiction and visualize that $\sim p \vee q$ is not a contradiction

(5)

13.



(ii)



(5)

Examine these two graphs are bipartite or not

14. Illustrate that in a group (G, \circ) , for all a, b in G, each of equations $a \circ x = b$ and $y \circ a = b$ has a unique solution in G.

(5)

