Jahangirnagar University

Department/Institute: of Information Technology

Masters/Honours ___1st___ **year Final Examination-2019____**

Course No.# ICT – 1207
Course Title# Discrete Mathematics

Examination Roll No. # | 19 23 40 |

Registration No. # | 2019 36 50 28 3 |

Academic Session # | **2018- 2019** |

Total no of written pages in the script # 6

Date: , 2021, 07, 01

Instructions:

1. Examinee must write his/her exam roll no. and page no. at the top of every page of the script.
2. Do not write your name or any identification mark anywhere of the script.
3. Total time for exam is 45 minutes. You will get 15 additional minutes for submission.
4. Delay in submission is not acceptable.
5. You have to submit your exam script in PDF format.
6. The examinee must submit the examination script **through online (Google classroom/email/google form etc.)** as prescribed by the examiner.
7. You must use **your EXAM ID** only for naming your submitted file.
8. After completing the exam, you must write the total number of pages used for the exam in the top sheet.

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Answer to the question no - 1

(a) Given that

$$A = \{ a_1, a_2, a_3 \}$$

$$B = \{ b_1, b_2, b_3, b_4, b_5 \}$$

$$M_R = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{bmatrix}$$

∴ Order Pair $= \{ (a_1, b_2) (a_2, b_1), (a_2, b_3) (a_2, b_4)$

$(a_3, b_1) (a_3, b_3), (a_3, b_5) \}$

(6)

(c) Difference between tree and graph.

Graph	Tree
1. Graph is a non-linear data structure.	1. Tree is a non-linear data structure
2. It is a collection of ventices and edges.	2. It is a collection of nodes and edges.
3. There is no unique node called root in graph.	3. There is a unique node called root in trees.

Answer to the question no - 3

(a) (i)

(ii) The Parentheses are used to avoid ambiguity concerning the Pronity of the logical Connectives.

P : You stay at the hotel.

Q : You watch TV

P : You go to the museum

S : You spend some time in the museum

Translation: $(P \wedge Q) \vee (R \wedge S)$

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(b)

(i) "if we are on vacation we go fishing".

let

P: we are on vacation

Q: we go fishing

the logical expression for the above sentence

is : $P \rightarrow Q$

(ii) negation : $P \wedge \neg Q$

" we are on vacation and we do not go
fishing".

(iii) Converse : $Q \rightarrow P$

" If we go fishing. we are on vacation."

(iv) inverse : $\neg P \rightarrow \neg Q$

" If we are not on vacation. we don't go
fishing.".

(c) Given that

$$(p \rightarrow q) \rightarrow (q \rightarrow p)$$

P	q	$P \rightarrow q$	$q \rightarrow P$	$(p \rightarrow q) \rightarrow (q \rightarrow P)$
T	T	T	T	t
T	F	F	T	T
F	T	T	F	F
F	F	T	t	T