



Kafrelsheikh University
Faculty of Artificial Intelligence
Final Exam 2019/2020



Subject code: CS102 Level:1
Time:2 H Date:19/1/2020
Subject: Mathematics For
Computer Science
No. of questions: 7
Total marks: 60marks

Question 1: Complete the following truth table: (10 M)

A	B	C	$A \wedge B \wedge C$	$A \vee B \vee C$	$A \rightarrow C$	$B \leftrightarrow C$	$\overline{B \oplus C}$	$A \oplus B$
T	T	T						
T	T	F						
T	F	T						
T	F	F						
F	T	T						
F	T	F						
F	F	T						
F	F	F						

Question 2: Prove that the following using truth table(10 M)

- $A \wedge (B \vee C) = (A \wedge B) \vee (A \wedge C)$
- $\neg(A \vee B \vee C) = \neg A \wedge \neg B \wedge \neg C$
- $p \rightarrow \neg q = \neg p \vee q$.
- $\neg((\alpha \rightarrow \beta) \rightarrow \neg(\beta \rightarrow \alpha)) = (\alpha \leftrightarrow \beta)$

$$\alpha \rightarrow \beta$$

$$5. \frac{\neg \beta}{\neg \alpha}$$

Question 3: Using direct deduction to find $\neg P$ such that: (5 M)

- $P \rightarrow Q$ Premise
- $P \rightarrow (Q \rightarrow \neg P)$ Premise
- P Assumption

Question 4: Find the GCD and LCM for the following: (10 M)

- 72, 16
- 180, 360, 480
- 540, 315

Question 5:(5 M)

Show by mathematical induction that for all $n \geq 1$,

$$1+2+3+\dots+n = \frac{n(n+1)}{2}$$

Question 6: (10 M)

For 120 language students: French(F), German(G), and Russian(R)

65 study French (F), 45 study German (G), 42 study Russian (R)

20 study F & G

25 study F & R

15 study G & R

8 study all the three languages.

It is required to

- I. Sketch the Venn diagram for the problem,
- II. What is the probability of there is no students studying of these courses,
- III. What is the probability of studying F and R.
- IV. What is the probability of studying F given G

Question 7: (10 M)

For a dice cub with 6 sides assume there are two events as follows:

$A = \{2,4,6\}$, $B = \{1,3,5\}$ it is required to:-

- I. Check the mutually exclusive of the two events
- II. The probability $P(A \cup B)$
- III. If we tossed two dice, what is the probability of the resulting summation is 8.

*All my best wishes
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