



**Second Year B.Tech. (Computer Science & Engineering)  
MID SEMESTER EXAMINATION, SEPTEMBER 2018  
DISCRETE MATHEMATICAL STRUCTURE (UCSE0302)**

**Day and Date: Tuesday, 18 /09/2018  
Time: 9:30 AM to 11:30 AM**

PRN No. :

Max Marks- 50

**Instructions:**

**IMP: Verify that you have received question paper with correct course, code, branch etc.**

- i) All questions are compulsory.
- ii) Figure to the right indicates full marks.
- iii) Assume suitable data wherever necessary.

	Marks	CO's	Blooms Level	Po Level
<b>Q.1 Attempt any three</b>	<b>18</b>			
<b>A</b> Define with examples i) Well formed formula ii) Substitution Instance iii) Tautological Implications	<b>6</b>	CO1	L1	PO1
<b>B</b> Define indexed set. Given $S = \{a_1, a_2, \dots, a_8\}$ , what subsets are represented by $B_{19}$ and $B_{29}$ ? How will you designate subsets $\{a_6, a_7\}$ and $\{a_3\}$	<b>6</b>	CO1	L1	PO1
<b>C</b> Explain the properties of binary relations in a set with examples	<b>6</b>	CO1	L2	PO1
<b>D</b> Solve to obtain the Prefix & infix form of following formulas respectively i) $Q \wedge \neg(R \leftrightarrow P \vee Q)$ ii) $\rightarrow \rightarrow PQ \rightarrow \rightarrow QR \rightarrow PR$	<b>6</b>	CO2	L3	PO2
<b>Q.2 Attempt any two</b>	<b>16</b>			
<b>A</b> Solve to obtain PCNF and PDNF of $P \rightarrow ((P \rightarrow Q) \wedge \neg(\neg Q \vee \neg P))$	<b>8</b>	CO2	L3	PO2
<b>B</b> Explain Venn diagrams. Show the following with Venn diagram i) $A \cap B = A \cap C$ but $B \neq C$ ii) $A \cup B \subset A \cup C$ but $B \not\subset C$	<b>8</b>	CO2	L2	PO2
<b>C</b> Explain Semigroups and Monoids with their properties and examples.	<b>8</b>	CO1	L2	PO1
<b>Q.3 Attempt any two</b>	<b>16</b>			
<b>A</b> What is Relation matrix. Let $X = \{1, 2, 3, 4\}$ and $R = \{<x, y>   x > y\}$ . Draw the graph of relation R and give its matrix.	<b>8</b>	CO1	L1	PO1
<b>B</b> Define w. r. t. Algebra – i) Epimorphism ii) Monomorphism iii) Isomorphism iv) Endomorphism	<b>8</b>	CO1	L1	PO1
<b>C</b> Explain Partial ordering Relation with example. Illustrate with Hasse diagram, the following sets under partial ordering relation divides and indicate which are totally ordered i) $\{2, 6, 24\}$ ii) $\{3, 5, 15\}$	<b>8</b>	CO1	L2	PO1

\*\*\*\*\*