AMITY UNIVERSITY

Fifth Semester Mid Term Examination

September 2016

Discrete Mathematics [MATH302]

Time: 1 Hour

Max Marks:20

Note: Attempt any four questions. Each question carries equal marks.

Q1. Solve the recurrence relation

$$a_r - 4\,a_{r-1} + 4\,a_{r-2} = (1+r)2^r$$

Q2. Check the validity of the argument:

'Every living thing is a human being or an animal. Mohan is alive and he is not an animal. All human being have hearts. Hence, Mohan has a heart.'

Q3. With and without using truth table obtain PCNF of

$$(p \wedge q) \vee (\sim p \wedge q) \vee (q \wedge r)$$

Q4. Show that truth value of $(p \wedge (p \overline{\rightarrow} q)) \rightarrow q$ is independent of their components.

Q5. Prove that $\frac{n^5}{5} + \frac{n^3}{3} + \frac{7n}{15}$, $\forall\, n \in \mathbb{N}$ is a natural number.

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