BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B.TECH **SEMESTER: IV**
BRANCH: MECH/PROD/CIVIL/BT/CHEM. ENGG./CEP&P **SESSION : SP/2020**

SUBJECT: IT201 BASICS OF INTELLIGENT COMPUTING

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates may attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.

				CO	BL
Q1	(a)	Distinguish between conventional computing and intelligent computing. Enlist the current trends in intelligent computing.	[2]	CO1	BTL4
Q1	(b)	Considering suitable assumptions develop the desired performance, environment, actuators and sensors (PEAS) measures for an automated washing machine.	[3]	CO1	BTL6
Q2	(a)	Explain how facts are represented in AI systems with suitable examples.	[2]	CO1	BTL5
Q2	(b)	Define soft computing paradigm. Discuss its properties with respect to hard computing which make it a better candidate for solving complex problems.	[3]	CO2, CO3	BTL1, BTL6
Q3	(a)	Explain with a suitable example how the use of fuzzy logic is better than probability in representing uncertainty.	[2]	CO2	BTL2
Q3	(b)	Consider two fuzzy sets given by $\widetilde{A} = \left\{\frac{1}{low} + \frac{0.2}{medium} + \frac{0.5}{high}\right\}$, $\widetilde{B} = \left\{\frac{0.9}{positive} + \frac{0.4}{zero} + \frac{0.9}{negative}\right\}$ i) Evaluate the fuzzy relation $\widetilde{R}$ for the Cartesian product of $\widetilde{A}$, $\widetilde{B}$. ii) Introduce a fuzzy set $\widetilde{\boldsymbol{C}} = \left\{\frac{\mathbf{1}}{\boldsymbol{low}} + \frac{\mathbf{0.2}}{\boldsymbol{medium}} + \frac{\mathbf{0.7}}{\boldsymbol{high}}\right\}$, and evaluate $\widetilde{\boldsymbol{C}}$ o $\widetilde{\boldsymbol{R}}$ using max-min composition.	[3]	CO2	BTL5
Q4	(a)	With a suitable block diagram, illustrate the working of a fuzzy inference system and enlist the different types of fuzzy models.	[2]	CO3	BTL2
Q4	(b)	With a neat flowchart, explain the steps of a simple genetic algorithm.	[3]	CO3	BTL5
Q5	(a)	Enlist the limitations of traditional optimization methods and explain how genetic algorithm addresses those limitations.	[2]	CO3	BTL5
Q5	(b)	Distinguish between crossover and mutation operation in genetic algorithm.	[3]	CO3	BTL4

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