BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2024)

CLASS: B.TECH **SEMESTER : IV**
BRANCH: AI/ML **SESSION : SP2024**

SUBJECT: AI205 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Write down the versions of AI definitions.	[2]	1	1,2
Q.1(b)	Give 1 example to explain Utility based Agents.	[3]	1	1,2
Q.2(a)	Differentiate between the different types of environment.	[2]	1	1
Q.2(b)	Illustrate architecture of a knowledge-based system with a neat diagram.	[3]	1	1,2
Q.3(a)	Explain why a knowledge base has domain-specific whereas inference engine uses domain-independent algorithms? Illustrate with an example.	[2]	2	1,2
Q.3(b)	Use the logical equivalences above to show that $\neg(p \vee \neg(p \wedge q))$ is a contradiction.	[3]	2	3,5
Q.4(a)	What are Horn Clauses. Explain with an example. Why are they Important?	[2]	1,2	2,3
Q4 (b)	Assume the following facts. Use resolution to answer the question: What course would steve like? 1. Steve only likes easy courses. 2. Science courses are hard. 3. All courses in the biology department are easy. 4. B101 is a biology course.	[3]	2	3,5,6
Q.5(a)	Let P(x) and Q(x) represent "x is a rational number" and "x is a real number," respectively. Symbolize the following sentences in predicate logic: (i) Every rational number is a real number. (ii) Some real numbers are rational numbers. (iii) Not every real number is a rational number	[3]	2	3,4,5
Q5 (b)	Obtain a prenex normal form for the formula $(\forall x)(\forall y)((\exists z)(P(x, y) \wedge P(y, z)) \rightarrow (\exists u) Q(x, y, u))$	[2]	3	3,4,5

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