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| **DIT UNIVERSITY, DEHRADUN**   |  |  | | --- | --- | | **BCA(Regular/Back)** | **: END TERM EXAMINATION, ODD SEM 2023-24 (SEM V)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Artificial Intelligence** | | | | | | | | | | | | |

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| **Time: 3 Hours** | **Total Marks: 100** |
| **Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the exam.**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  |  | | --- | --- | --- | | **Q.1)** | **Attempt all Parts :** | | |  | (a) | How Machine learning can be used to develop an Artificial intelligence? | |  | (b) | What is an artificial neural network, and how is it inspired by biological neural networks? | |  | (c) | Explain Rational Agents with the help of real time example. | |  | (d) | Describe five real time example of machine learning in detail. | |  |  | **[4 x 5= 20]** | |  | | | | **Q.2)** | **Attempt all Parts :** | | |  | (a) | Describe the differences between supervised and unsupervised. Provide examples of each. | |  | (b) | Illustrate the working of Decision tree algorithm with the help of suitable example. | |  | (c) | There are three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1 : 2 : 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C. | |  | (d) | Explain artificial intelligence with suitable example along with its application. | |  |  | **[4 x 5= 20]** | |  | | | | **Q.3)** | **Attempt any two parts :** | | |  | (a) | Explain any four relationship in prolog with help of example and also, create a database for showing a relationship. | |  | (b) | If two fuzzy sets A and B are given with membership functions  µ𝐴(𝑥) = {0.2, 0.4, 0.8, 0.5, 0.1}  µ𝐵(𝑥) = {0.1, 0.3, 0.6, 0.3, 0.2}  Then show the value of union, intersection and compliment? | |  | (c) | Solve this statement with FOL using quantifier  1. All birds fly. 2. Every man respects his parent. 3. Some boys play cricket. 4. Not all students like both Mathematics and Science. | |  |  | **[2 x 10= 20]** | |  | | | | **Q.4)** | **Attempt any two parts :** | | |  | (a) | Describe the truth tables for logical AND, OR, NOT, and implication (→). How are these truth tables used to evaluate propositional statements? | |  | (b) | Define any five components of a reinforcement learning problem. | |  | (c) | What is Heuristic search? Explain A\* algorithm for the shortest path using an example. | |  |  | **[2 x 10= 20]** | |  | | | | **Q.5)** | **Attempt any two parts :** | | |  | (a) | Explain Semantic Networks? Draw the semantic network that represents the data given below:  Tom is a cat.  Tom caught a bird.  Tom is owned by John.  Tom is ginger in colour.  Cats like cream.  The cat sat on the mat.  A cat is a mammal.  A bird is an animal.  All mammals are animals.  Mammals have fur | |  | (b) | Describe the process of selection in a genetic algorithm and its role in determining which individuals will be chosen as parents for the next generation. | |  | (c) | Write a short note on the following  i)Semantic networks  ii)Unification  iii)Inference logic  iv)Knowledge representation | |  |  | **[2 x 10= 20]** | | -----END OF PAPER ---- | | | | |