

END TERM EXAMINATION
(CBCS)(SUBJECTIVE TYPE) (OffLine)
Course Name: B.Tech. (CSE-AI), Semester: 3rd
(Nov-Dec., 2022)

Subject Code:BAI - 201

Subject: Artificial Intelligence

Time :3 Hours

Maximum Marks :60

Note: Q. 1 is compulsory. Attempt one question each from the Units I, II, III & IV.

Q1

(2.5*8=20)

- (a) Differentiate between Uninformed and Informed Search Techniques?
- (b) Indicate the role of Heuristics in guiding a search. Suggest any two heuristics for 8-puzzle problem.
- (c) What are the two quantifiers in predicate Calculus? Explain with example.
- (d) What is Skolemization?
- (e) What is a membership function of a fuzzy set? Can a fuzzy membership be True and False at the same time?
- (f) What is Multilayer perceptron?
- (g) What is an AI code of Ethics? Why AI Ethics important?
- (h) State and discuss any five real World Applications of AI.

UNIT-I

Q2

- (a) Give an example of a problem for which breadth first search would work better than depth first search? **(5,5)**
- (b) Explain water Jug problem using state space search. Generate production rules for this problem.

Q3

- (a) Explain briefly the architecture and characteristics of an Intelligent agent **(5,5)**
- (b) Explain the following search strategies
 - i) best first search
 - ii) A* search

UNIT-II

Q4

- (a) Determine whether the following PL formula is **(5,5)**
 - (i) Contradictory or (ii) Valid
 - $(p \wedge q) \rightarrow (r \vee \neg q)$
- (b) What is a bag-of-words model? How to fit a bag-of-words model using Python Sklearn?

Q5

- Consider the following sentences **(3,3,4)**
 - John likes all kinds of food
 - Apples are food
 - Chicken is food
 - Anything anyone eats and isn't killed by is food
 - Garima eats peanuts and is still alive
 - Praveen eats everything Garima eats
- i) Translate these sentences into formulas in predicate logic
- ii) Convert the formulas into clause form
- iii) Prove that John likes peanuts using resolution

UNIT-III

Q6

- (a) Define entropy of training set D. Define information gain of a training set D while splitting on an attribute A. Assume that A has m distinct values in D. **(5)**

PTO

(b) Where do we implement Fuzzy Logic?

(5)

Q7

Assume we wish to find whether play is possible or not on a particular day by building a decision tree. The properties to be considered are Temperature, Humidity and Wind. Use ID3 algorithm and find the best attribute to split at the first level

(10)

Temperature	Humidity	Windy	Play
Hot	High	False	No
Hot	Normal	True	No
Hot	Normal	False	Yes
Mild	High	False	Yes
Cool	Low	False	Yes
Cool	Normal	True	No
Cool	Normal	False	Yes
Mild	High	True	No
Cool	Normal	False	Yes
Mild	Low	False	Yes
Mild	Normal	True	Yes
Hot	Normal	True	No
Hot	Low	True	No

UNIT-IV

Q8

What is Natural Language processing (NLP) in AI ? Identify and Explain in details any five applications of NLP.

(10)

Q9

What is an Expert System? What are the characteristics of a good Expert System? Explain the MYCIN expert System.

(10)