Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 20871

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fourth Semester

Computer Science and Engineering

CS 3491 – ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

(Common to : Computer and Communication Engineering and
Information Technology)

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   List the characteristics of AI.

2.   What are agents for AI and software doing?

3.   Differentiate logical and probabilistic assertions.

4.   Why a hybrid Bayesian network is called as such?

5.   What is the niche of machine learning?

6.   State the logic behind Gaussian processes.

7.   When does an algorithm become unstable?

8.   Why is the smoothing parameter h need to be optimal?

9.   Differentiate computer and human brain.

10.   Show the perceptron that calculates parity of it's three inputs.

PART B — (5 × 13 = 65 marks)

11. (a) Explain iterative deepening search algorithm with an example.

Or

(b) Discuss in detail about hill climbing algorithm by using 8-queens problem.

12. (a) Demonstrate the use of Bayes' rule with an example in a doctor finding the probability P (disease / symptoms) before and after the decease becomes epidemic.

Or

(b) Briefly explain about how the sustainability of enumeration algorithm can be improved.

13. (a) Describe the general procedure of random forest algorithm.

Or

(b) With a suitable example explain knowledge extraction in detail.

14. (a) Assume an image has pixel size 240 × 180. Elaborate how K means clustering can be used to achieve lossy data compression of that image.

Or

(b) Explain in detail about combining multiple classifiers by voting.

15. (a) Elaborate the process of training hidden layers by ReLU in deep networks.

Or

(b) Briefly explain hints and the different ways it can be used.

PART C — (1 × 15 = 15 marks)

16. (a) Consider the statement "Stocks rallied on Monday, with major indexes gaining 1% as optimism persisted over the first quarter earnings season". Taken from a news article. Design a naïve Bayes model to classify the statement into appropriate category.

Or

(b) Construct a training dataset. By using it, demonstrate the AdaBoost algorithm that makes an ensemble classifier.