Register No.: .... Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2023

(2020 SCHEME)

Course Code: 20RBT381

Course Name: AI and Machine Learning for Robotics

Max. Marks: 100   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. Explain the importance of Artificial Intelligence in NLP
2. What are expert systems?
3. What is reinforcement-based learning?
4. Differentiate clustering with association.
5. Explain Deep Feed forward Networks with a sketch.
6. Explain any one application of CNN in detail.
7. Write the basic image processing operations in brief.
8. Explain the application of AI in crop monitoring.
9. Explain robotic perception and discuss the challenges faced in robotic perception.
10. What you mean by autonomy of robots?

PART B
(Answer one full question from each module, each question carries 14marks)

MODULE I

11. With neat diagrams explain the Turing test in detail. (14)

OR

12. Explain any two application areas of artificial intelligence in detail. (14)

MODULE II

13. Explain the supervised classification algorithms SVM and KNN in detail. (14)

OR

14. Explain the unsupervised classification algorithms k-means clustering and Hierarchical clustering. (14)

MODULE III

15. With a neat sketch explain the basic architecture of convolutional neural networks and explain the basic outline and functions of each layer.   (14)

OR

16. What is sequence Modeling? Explain the working of recurrent neural networks.   (14)

MODULE IV

17. Explain the method of image segmentation using multilevel threshold.   (14)

OR

18. Explain region splitting and merging algorithm for segmentation with relevant equations.   (14)

MODULE V

19. Explain the applications of robotics industry specifically in machine loading and unloading.   (14)

OR

20. Explain the Monte-Carlo localization algorithm using a range scan sensor model.   (14)

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