VIT
Vellore Institute of Technology

Final Assessment Test (FAT) – May 2022

Programme	B.Tech	Semester	Winter Semester 2021-22
Course Title	FUNDAMENTALS OF AUTONOMOUS SYSTEMS	Course Code	CSE2038
Faculty Name	Prof. Ganala Santoshi	Slot	D1+TD1
		Class Nbr	CH2021225000994
Time	3 Hours	Max. Marks	100

Part A (10 X 10 Marks)
Answer All questions

1. Outline the four important aspects to differentiate Autonomous Systems from Automation Systems. Apply real world examples in differentiating them. [10]

2. Consider a scenario in which multiple drones are deployed to capture the traffic images of busiest roads of the smart city. For every drone multiple target locations are set. The drones are expected to transmit the captured images to central station, so that the traffic can be diverted and regulated. Explain the weak notion of agent and strong notion of agent for the above scenario. [10]

3. An autonomous robot is deployed to act as a faculty to teach students. The robot is assigned to teach "Fundamentals of Autonomous Systems". Due to unavailability of proper text books and materials, the robot also finds difficulty in acquiring knowledge. [10]
Highlight any two types of pro-activity and the notion of artificial organ for the given autonomous robot.

4. In a self-driving car, GPS supported devices are fixed to estimate the location of the vehicle. The self-driving car is moved only through obstacle free and predefined path. The vehicle needs to increase speed to a certain level, maintain a constant speed and reduce the speed to zero before stopping at the destination. [10]
Elaborate the three layers of strongly autonomous systems considering the given self-driving car.

5. Consider a scenario of semi-autonomous drones, which are remotely piloted. All simulations are carried and the weather conditions, source, destination and path on which it has to travel, etc., are stored in its structural storage. Appraise the three layers of conceptual agentification and the role of control taking the above scenario as a reference. [10]

6. Multiple unmanned aerial vehicles with strong autonomy is flying in sky. In case of accidents on the roads, unmanned aerial vehicles can be called for support. Primary objective of the unmanned aerial vehicle is to supply emergency medical services. [10]
Justify the given sentence "This is the most difficult part of the system design, because it requires artificially re-creating a memorized and usable life experience, out of nothing real." for the given scenario.

7. An autonomous robot of VIT regularly visits the library and reads the text books and other magazines. The autonomous robot has become intelligent and it has gained the knowledge of all the engineering branches within four years and is ready to participate in exams along with the students. [10]
Elaborate the three general types of states of conception or evaluation organizations.

8. An artificial tendency is a general emphasis that alters and leads the organizing action of the conception agents. Demonstrate an algorithm to depict the action of a tendency once it gets activated by the system. Use relevant examples in appropriate places [10]

9. Consider an autonomous car moving in the roads of a city with heavy traffic. During the movement functional substratum always triggers the various component / sub systems states on the display board. It is observed that, few components / sub systems are identified as functioning abnormal, which may further lead to malfunction of the sub systems / entire system. Suggest various classes of tendencies that can fit for the above scenario. [10]

10. Consider a scenario in which you and your team have designed driver less car to move along with the traditional cars. Explain the deployment phases of the autonomous systems for the above scenario. [10]