Reg. No. : | | | | | | | | | | |

Question Paper Code: 59B21

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Elective

Biomedical Engineering

15UBM921– ROBOTICS AND AUTOMATION IN MEDICINE

(Regulation 2015)

Duration: One hours Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Industrial Robots are generally designed to carry which of the following coordinate systems CO1- R
   (a) Cartesian coordinate systems (b) Polar coordinate systems
   (c) Cylindrical coordinate system (d) All of the above
2. The Robot designed with Cartesian coordinate systems has CO1- U
   (a) Three rotational movements
   (b) Three linear movements
   (c) Two linear and one rotational movement
   (d) Two rotational and one linear movement
3. In peritoneal dialysis (PD), draining out the dirty fluid and putting in the clean fluid is called CO2-R
   (a) A replacement (b) A hemo cleaning (c) An exchange (d) A dialysate
4. The number of moveable joints in the base, the arm, and the end effectors of the robot determines_____ CO2- R
   (a) DOF (b) Payload capacity (c) Operational limits (d) Flexibility
5. Which part of the robot provides motion to the manipulator and end effectors CO3- U
   (a) Controller (b) Sensors (c) Actuator (d) None of the above
6. The kinematic part of the robot or manipulators is called CO3- U
   (a) Joints (b) Sensors (c) Links (d) End effectors

7. In which of the following operations Continuous Path System is used CO4- U

(a) Continuous welding (b) Pick & Place

(c) Loading and Unloading (d) None of the above

8. Which of the following sensors determines the relationship of the robot and its environment and the objects handled by it CO4- R

(a) External (b) Internal (c) Both (a) & (b) (d) None of the above

9. Robotic surgery may be used for a number of different procedures CO5- U

(a) Hip replacement (b) Kidney removal

(c) Kidney transplant (d) All of the above

10. The most commonly known surgical robot is the CO5- U

(a) Da Vinci surgical systems (b) ZEUS

(c) Both (a) & (b) (d) None of the above

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11.	Explain the different types of robot configuration.	CO1- U	(8)
12.	Explain the Hydraulic and Pneumatic actuators system with neat sketch.	CO2-U	(8)
13.	Discuss in detail about the construction of a manipulator.	CO3- Ana	(8)
14.	List the uses of sensors in robot and Briefly explain any two sensors with necessary examples.	CO4- U	(8)
15.	Discuss and detail about robotic Cardiac surgery system.	CO5- Ana	(8)