BRAINWARE UNIVERSITY

Term End Examination 2022
Programme – M.Tech.-RA-2022
Course Name – Fundamental of Robotics: Robot Installation and Economics
Course Code - PCC-MIRA101
(Semester I)

Full Marks : 60   **Time : 2:30 Hours**
[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)   1 x 15=15
1.   *Choose the correct alternative from the following :*

(i)   A Robot is a

a) Programmable   b) Multi functional manipulator
c) Both (A) and (B)   d) None of the above
(ii)   The main objective(s) of Industrial robot is to

a) To minimise the labour requirement   b) To increase productivity
c) To enhance the life of production machines   d) All of the above
(iii) The following is true for a Robot and NC Machine

a) Similar power drive technology is used in both   b) Different feedback systems are used in both
c) Programming is same for both   d) All of the above
(iv)   From the following in which coding method supplementary code and form code are used?

a) KK3 system   b) The MICLASS system
c) OPITZ coding system   d) The DICLASS system
(v)   Which of the following is not a programming language for computer controlled robot?

a) AMU   b) VAL
c) RAIL   d) HELP
(vi)   From the following in which FMS layout robots are used as material handling system

a) Ladder layout   b) Open field layout
c) Loop layout   d) Robot centered layout
(vii) From which of the following is not the main element of Flexible manufacturing system

a) Work handling system   b) Material handling system
c) Tool handling system   d) Main frame computer
(viii) The application/applications of Artificial Intelligence is/are

a) Expert Systems   b) Gaming

c) Vision Systems   d) All of the above

(ix) From the following in which FMS layout machine tools are kept along a straight line.

    a) Loop layout   b) In line layout
    c) Ladder layout   d) Open field layout

(x) From the following in which FMS layout workstations are arranged in a loop

    a) Ladder layout   b) In line layout
    c) Loop layout   d) None of the above

(xi) A model of language consists of the categories which does not include?

    a) Language units   b) Role structure of units
    c) System constraints   d) Structural units

(xii) _____ grippers are used to pick up light weight materials such as paper, cloth etc

    a) Mechanical grippers   b) Adhesive grippers
    c) Vacuum cup grippers   d) Magnetic grippers

(xiii) From the following which is the types of Automated Guided Vehicle (AGV).

    a) Driver less train   b) Pallet trucks
    c) Unit load carriers   d) All of the above

(xiv) Sensors which are come in contact with some surface to measured desired physical variable are known as_____

    a) Non-contact sensors   b) Proximity sensors
    c) Contact sensors   d) None of the above

(xv) From which of the following is known as contact sensor.

    a) Tactile sensor   b) Proximity sensor
    c) Visual sensor   d) Range detector

Group-B
(Short Answer Type Questions)   3 x 5=15

2. What do you mean by Arc Welding?   (3)
3. What is end effector?   (3)
4. Explain the application of robot for material handling   (3)
5. Why is Automating spot welding advantageous?   (3)
6. Explain to perform the economic analysis o robot.   (3)

OR

   The company uses a 30% MARR as a criterion for selecting its investment projects. The robot   (3)
   project is expected to have a 5-year service life and that is what we shall use in determining
   the values for any interest factors required in our calculations.

Group-C
(Long Answer Type Questions)   5 x 6=30

7. Briefly describe the technological development of robotics from 2001 onwards up to the   (5)
   present time.
8. Explain how Inverse kinematics is important to game programming and 3D animation.   (5)
9. Explain clearly the TUG: an autonomous mobile robot   (5)
10. Explain how the major role of rescue operation is done by robot.   (5)
11. Write technical notes on: (a) Robotic Insects and (b) Exoskeletons.   (5)
12. Evaluate the TUG: an autonomous mobile robot.   (5)

OR

   Evaluate the integration level and Pin usage of the system choosing a motor controller.   (5)

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