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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations –2025** |
| **Date:** 15- 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** B. Tech -MCM | |
| **Course Code :** MEC3076 | **Course Name :** Human Robot Interaction | |
| **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **08** | **24** | **40** | **28** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 2 marks. 10Q x 2M=20M** | | | | |
| **1** | Write all types of gestures involved in human robot non-verbal interaction. | **2 Marks** | **L1** | **CO1** |
| **2** | Write any 4 types of non-verbal interactions used in Human Robot Interaction. | **2 Marks** | **L1** | **CO1** |
| **3** | What sensors are used for audio in robots? | **2 Marks** | **L1** | **CO2** |
| **4** | What is voice detection activity in human robot interaction? | **2 Marks** | **L1** | **CO2** |
| **5** | What are the sensors used in robot interaction to measure distance between the object and robot? | **2 Marks** | **L1** | **CO3** |
| **6** | What is synchrony in non-verbal interaction of robots? | **2 Marks** | **L1** | **CO3** |
| **7** | Write few examples of applications of human robot interactions. | **2 Marks** | **L1** | **CO3** |
| **8** | Which robot was used by psychologists, anthropologists, and health researchers? | **2 Marks** | **L1** | **CO4** |
| **9** | Explain in brief about cleaning robots. | **2 Marks** | **L1** | **CO4** |
| **10** | What is rhythmicity in non-verbal interaction in robots? | **2 Marks** | **L1** | **CO4** |

**Part B**

**Answer ALL the Questions. Each question carries 20 marks. 4Q x 20M=80M**

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| **11.** | Verbal interactions in robots play a vital role in human-robot interaction.   1. Explain about human-human verbal interaction and how it is correlated to human robot verbal interaction. 2. Write components of speech, explain in detail about the speech recognition, speech production, voice detection in the robots**.** | **20 Marks** | **L3** | **CO1** |
| **OR** | | | | |
| **12.** | Many product-based companies are into the speech production in robots.   1. Explain in detail about the speech production used in robots. Also explain the technologies used in speech production in human robot interaction. 2. Explain in detail about the voice detection activity and dialogue management. | **20 Marks** | **L3** | **CO1** |
|  |  |  |  |  |
| **13.** | Human robot interaction has huge applications in several sectors. Explain in detail about applications of these robots in Human Robot Interaction  a) Service Robots,  b) Tour Guide Robots,  c) Reception Robots,  d) Personal Assistants Robots,  e) Security Robots. | **20 Marks** | **L3** | **CO2** |
| **OR** | | | | |
| **14.** | Robots are being used from medicine sector to manufacturing sector. Explain in detail about applications of human robot interactions when robots are used as  a) cleaning robots,  b) entertainment robots,  c) delivery robots,  d) robots for learning,  e) robots as secretaries. Also write the type of interaction involved in each case in detail. | **20 Marks** | **L3** | **CO2** |

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| **15.** | A robot may be designed to gesture through its arms and hands or other body parts, such as its head, ears, or tail. Explain in detail about gaze and eye movement, different types of gestures involved in interactions, poster and movement. | **20 Marks** | **L3** | **CO3** |
| **OR** | | | | |
| **16.** | Non-verbal interactions ae used to interpret the nuances of meaning, emotion and intention. List all the non-verbal interactions used in Human Robot Interaction and explain all of them in detail with applications of it. | **20 Marks** | **L3** | **CO3** |

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| **17.** | Non-verbal interaction has been using gestures. List all the non-verbal interactions used in Human Robot Interaction and explain any 5 of them in detail with applications of it. | **20 Marks** | **L3** | **CO4** |
| **OR** | | | | |
| **18.** | Gestures are normally used in non-verbal interaction between human and robot. Explain in detail about gaze and eye movement, different types of gestures involved in interactions, poster and movement. | **20 Marks** | **L3** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***