

# Question Paper

Exam Date & Time: 31-Dec-2022 (02:30 PM - 05:30 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SEVEN SEMESTER B.TECH END SEMESTER MAKEUP EXAMINATIONS, DEC 2022

**Industrial Internet of Things [ICE 4071]**

**Marks: 50**

**Duration: 180 mins.**

**A**

**Answer all the questions.**

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) List the similarities and dissimilarities between IoT and IIoT. (3)  
[CO:1, PO:1, BL:1]
  - A)
  - B) Draw the ISO - OSI reference model structure and explain the function of each layers. (4)  
[CO:1, PO:1, BL:2]
  - C) Find the propagation delay for a signal traversing the following networks at a speed of  $2.3 \times 10^8$  m/sec in cable; (3)
    - A circuit board: 10 cm
    - A campus: 1km
    - Up and down to a geostationary satellite:  $2 \times 36,000$  kms[CO:2, PO:1, BL:2]
- 2) Draw the generic block diagram of an IoT device and explain the working of all the blocks. (3)  
[CO:2, PO:5, BL:2]
  - A)
  - B) Draw the Level 5 structure of IoT and discuss its features. (3)  
[CO:3, PO:4, BL:2]
  - C) Discuss any four communication models in detail. (4)  
[CO:3, PO:4, BL:2]
- 3) Consider a transmitter with an output range of 0 - 5V. The required minimum detectable voltage is 1mV. Calculate the resolution of ADC to achieve this. Also calculate the minimum detectable voltage of the ADC with designed resolution. (3)  
[CO:3, PO:6, BL:3]
  - A)
  - B) What is frequency hopping? Explain. (3)  
[CO:3, PO:5, BL:1]
  - C) Write a note on WSN and its applications (4)  
[CO:4, PO:5, BL:1]
- 4) List the features of Node.js. (3)  
[CO:4, PO:1, BL:3]
  - A)
  - B) Compare the features of a Raspberry Pi with Arduino. (4)  
[CO:4, PO:1, BL:2]
  - C) Discuss about Lists, Tuple and Dictionaries in Python. (3)  
[CO:5, PO:1, BL:2]

- 5) Write a note on .json object syntax rule. (3)  
[CO:5, PO:1, BL:2]
- A)
- B) Compare .json file format with .xml file format with an example. (3)  
[CO:5, PO:1, BL:2]
- C) Write a note on SaaS, PaaS and IaaS with necessary figure. (4)  
[CO:5, PO:1, BL:2]

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