

(3 Hours)

[Total Marks: 80]

**Instructions:**

- 1) Attempt any **Four** question.
- 2) All question carries equal marks.
- 3) Figures to the right indicate full marks.
- 4) Illustrate your answers with neat sketches wherever necessary.
- 5) Assume suitable additional data, if necessary and clearly state it.



- Q.1 A) Discuss in details working of each layer in IOTWF Standardized Architecture. (10 Marks)
- Q.1 B) Explain Arduino Uno board with its pins and parts in detail. (10 Marks)
- Q.2 A) What are IOT software platform? Explain any five with examples. (10 Marks)
- Q.2 B) State the factors which are helping to select right protocol for a particular IoT application? Compare between COAP and MQTT? (10 Marks)
- Q.3 A) Give the classification of networks according to access technologies and distances considering in IoT based applications. (10 Marks)
- Q.3 B) Describe Zigbee protocol stack using IEEE 802.15.4 (10 Marks)
- Q.4 A) Explain Fog Computing and Edge computing with its advantages and disadvantages. State the difference between the Fog Computing and Edge computing. (10 Marks)
- Q.4 B) What are gateways and backhaul sub layers? (10 Marks)
- Q.5 A) Draw and explain neat diagram of Protocol Stack for Transporting Serial DNP3 SCADA over IP. Give meaning of a master/slave relationship in DNP3. (10 Marks)
- Q.5 B) Write in detail about working of Sensors and Actuators. Differentiate between Sensors and actuators with neat diagram. Explain any five types of sensors and actuators with appropriate area of application where they are useful. (10 Marks)
- Q.6 A) What is meaning of Smart object? Explain the characteristics of Smart object. Give the trends in smart objects. (10 Marks)
- Q. 6 B) Write short note on –
- i) Health & lifestyle domain specific IOT. (10 Marks)
  - ii) Data Analytics Versus Business Benefits