INTERNET OF THINGS (IoT) AND APPLICATIONS
(ECEN 6132)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) In IoT, T stands for:
(a) Thing (b) Things (c) Total (d) Technology.

(ii) By 2020, the number of internet connected things are expected to reach between:
(a) 5 billion and 10 billion (b)10 billion and 20 billion
(c) 26 billion and 50 billion (d)10 billion and 26 billion.

(iii) Which layer is called a port layer in OSI model?
(a) Session (b)Application
(c) Presentation (d)Transport.

(iv) What is the standard length of MAC address?
(a)16 bits (b) 32 bits (c) 48 bits (d) 64 bits.

(v) Fuzzy logic is a form of:
(a) Hexa state logic (b) Two valued logic
(c) Binary set logic (d) Many valued logic.

(vi) Which is the simplest form of analytics?
(a) Predictive (b) Descriptive
(c) Prescriptive (d) None of these.

(vii) WPA is a security mechanism in :
(a)WiFi (b) Cloud (c) Bluetooth (d)Ethernet.

(viii) The network layer concerns:
(a)Bits (b) Frames (c) Packets (d) None of these.

(ix) In Wireless ad hoc network:
(a) Access point is not required
(b) Node number is limited
(c) Access point is a must
(d) Single hop communication is common.

(x) LTE stands for:
(a) Long Term errors (b) Long Term evolution
(c) Lengthy Terminal Estimation (d) Long Term Estimates

Group – B

2. (a) What is the concept behind IoT? How does IoT work? What are the enabling technologies for IoT? Describe them briefly.

(b) Gartner has identified four usage models for IoT? What are those? "IoT is a global concept" – explain.

(2 + 2) + 2 + (3 + 3) = 12

3. (a) Describe the fundamental characteristics of IoT and explain each of them. What is energy harvesting? How can energy be harvested for IoT devices from RF?

(b) Key Enabling Technologies group has identified a few critical technologies. Name at least three. What are "multicom" chips?

(4 + 3) + 5 = 12

Group – C

4. Why is it important that IoT should have a common architecture? What is "IoT – A" reference model? Draw the block diagram and explain the functions of the models.

2+ 2 + 8 = 12

5. What is the function of iCore architecture? Draw a block diagram. What are the functions of the Service Level and VO level?

2+ 4 + 6 = 12

Group – D

6. Define interoperability. Explain Technical, Syntactical and Semantic interoperability. Describe at least three IoT technical interoperability challenges and their rationale.

6 + 6 = 12

7. (a) Mention and explain at least 5 security challenges faced in IoT networks.

(b) Show the IoT security structure with a neat diagram. Explain the functions of Sensor domain, Fog domain and Cloud domain.

6 + 6 = 12

Group – E

8. IoT evolution calls for protocol testing and characteristics of various aspects. Can you explain the importance of

i) Linked-Data, ii) Scalability, iii) Performance and iv) Extensibility? If so, explain briefly all four.

12

9. (a) Explain how IoT is overcoming challenges to convert things to smart ones.

(b) Show how IoT can help immensely to make health sector smart.

6 + 6 = 12

Department & Section	Submission Link
ECE	https://classroom.google.com/w/MTM4NDQzNDE3NjU2/tc/MjkxMDEwMzM1Njky