

5062

8

- (c) Why is Encryption essential for better IoT security? What are the different methods of encryption used in IoT. (6)

(200)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5062

J

Unique Paper Code : 2513012004

Name of the Paper : Internet of Things

Name of the Course : **B.Sc. (H) Electronics (GE)**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question 1 is compulsory.
3. Attempt Any 5 questions including question 1.

P.T.O.

1. (a) What is 'Internet of Things' and what are its major characteristics? (3)
- (b) What is Software Defined Network (SDN)?
How is it better than traditional networking architecture? (3)
- (c) What are the various components of an IoT system? (3)
- (d) Briefly explain how advancement in Big Data analytics has contributed to growth in IoT Technology? (3)
- (e) Explain the different stages of IoT Security Life Cycle? (3)
- (f) Explain how IoT can improve efficiency and resource utilization while also posing security and privacy concerns. (3)

6. (a) What are the various stages involved in IoT system design methodology? (6)
- (b) What is Cloud Computing and what is the importance of using cloud services in designing an IoT system? (6)
- (c) Explain briefly the following cloud deployment models,
 - (i) Public Cloud,
 - (ii) Private Cloud and
 - (iii) Hybrid Cloud. (6)
7. (a) Briefly describe the need for special data storage and data integration techniques in designing an IoT system. Differentiate between Structured and Unstructured data highlighting the pros and cons of each.
- (b) What is the importance of IoT Authentication?
List the various techniques used for it. (6)

Mention some of the major features and specifications of Raspberry Pi board which has emerged as one of versatile platform for designing an IoT system. Draw a circuit diagram illustrating interfacing of RGB LED with Raspberry Pi. Also, write the program to send commands from smartphone (connected through Bluetooth) to generate different colors of RGB LED.

- (b) Explain in detail the role of Transport Layer in an IOT protocol stack.

Also, mention the different protocols which form the part of Transport layer? (6)

- (c) Differentiate between the following :- (6)

(i) IP Addressing and Port Addressing

(ii) TCP and UDP

2. (a) Briefly explain the physical design of an IoT system with the help of a block diagram. (6)

- (b) Describe the role of various functional blocks which form the part of the logical design of an IoT system? (6)

- (c) Distinguish between the following : (6)

(i) Request-Response model and Push-Pull Model.

(ii) REST-Based API and WebSocket Based API.

3. (a) How does an IoT Level 2 (Single Node with Local Processing and Cloud Storage) system work? Describe the deployment of IoT Level 2 system for designing a Smart Irrigation System? (6)

- (b) What are the key differences between M2M communication and IoT? Explain the architecture of M2M system with the help of a block diagram. (6)
- (c) An IoT based Smart Lighting System for energy-efficient buildings have to be designed. Explain how sensors, microcontrollers, and cloud computing can be utilized to automate and optimize energy consumption. (6)
4. (a) A smart door opening system has to be designed in which the door automatically opens when a person approaches the door. Briefly explain how an ultrasonic sensor can be used for this purpose. Can we add an additional security feature in which door opens only for authorised people? If yes, then how? (6)

- (b) What is SNMP? What are the limitations of SNMP? (6)
- (c) Explain how better IoT Network management can be achieved with NETCONF-YANG using a suitable diagram. (6)
5. (a) Mention some of the major features and specifications of Arduino which has emerged as one of the most popular and easy to use microcontroller board for designing an IoT system. Draw a circuit diagram illustrating interfacing of RGB LED with Arduino. Also, write the program to send commands from smartphone (connected through Bluetooth) to generate different colors of RGB LED. (6)

OR