NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 2023)

Subject: Applied Industrial IoT

Time: 3 Hours   Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A   20

1. Attempt all parts:-

1-a.   The main benefits of IoT are   [CO1]   1

                 (a) Efficient resource utilization

                 (b) Minimizing Human effort

                 (c) Saves time

                 (d) All of these

1-b.   Identify the challenge that comes under securing the information   [CO1]   1

                 (a) Security

                 (b) Power consumption

                 (c) Presence detection

                 (d) Signalling

1-c.   Sensor effectiveness depends on _____ parameter.   [CO2]   1

                 (a) Sensitivity

                 (b) Radiation

                 (c) Restively

(d) All the above

1-d.   The output of the piezo ceramic element is a voltage proportional to the instantaneous cross-stream component of the …………. field. [CO2]   1

         (a) Electric

         (b) Magnetic

         (c) Velocity

         (d) None of these

1-e.   Gateway software should be smart enough to handle _____ [CO3]   1

         (a) GPS

         (b) Message

         (c) Logging

         (d) Sensors

1-f.   ………….. is a technology that processes a digital video signal using a special algorithm to perform a security-related function. [CO3]   1

         (a) Data analytics

         (b) Video analytics

         (c) Big data analytics

         (d) None of these

1-g.   An object acting as a gateway for the client side is [CO4]   1

         (a) skeleton

         (b) stub

         (c) remote

         (d) server

1-h.   The framework of 3 Tier architecture is categorized into …….. layers [CO4]   1

         (a) one

         (b) two

         (c) three

         (d) four

1-i.   Process of keeping track of users activity [CO5]   1

         (a) Authentication

         (b) Authoring

         (c) Authorisation

(d) Accounting

1-j.   The kind of electronic document contains a public key is [CO5]   1

          (a) PIN

          (b) Digital certificate

          (c) PAN

          (d) Biometrics

2. Attempt all parts:-

2.a.   Draw the layered architecture of IIoT. [CO1]   2

2.b.   Define drift of a pressure sensor. [CO2]   2

2.c.   Define congestion in edge computing. [CO3]   2

2.d.   Define the role of business layer in three – tier server architecture. [CO4]   2

2.e.   Name any two services that need to be negotiated in service level agreements. [CO5]   2

<center>SECTION B</center>   30

3. Answer any <u>five</u> of the following:-

3-a.   "M bed operating system provides end to end security". Justify this statement. [CO1]   6

3-b.   Explain the role and importance of infrastructure component in IIoT architecture. [CO1]   6

3-c.   Discuss the differences between direct measurement and indirect measurement. [CO2]   6

3-d.   Describe the various sensor technologies which are used in industrial applications. [CO2]   6

3.e.   With the help of suitable example explain the working of unidirectional gateway. [CO3]   6

3.f.   Discuss the differences between batch processing and stream processing. [CO4]   6

3.g.   Explain the role of Data loss prevention (DLP) in cloud computing? [CO5]   6

<center>SECTION C</center>   50

4. Answer any <u>one</u> of the following:-

4-a.   Define IoT and Industrial IoT. Describe the differences between these two. Explain how can   10
          we apply IoT in an industry with the help of suitable examples. [CO1]

4-b.   "Automation and Control is the main advantage of an Industrial IoT". Justify this statement   10
          with the help of two examples. [CO1]

5. Answer any <u>one</u> of the following:-

5-a.   With the help of neat diagram discuss the construction, working principle and applications of   10
          barometer. [CO2]

5-b.   Elaborate a comparison between the various types of pressure sensor. [CO2]   10

6. Answer any <u>one</u> of the following:-

6-a.   Describe the various limitations and challenges of edge computing along with suitable   10
        examples. [CO3]

6-b.   With the help of suitable examples elaborate how latency and congestion both are the main   10
        benefits of edge computing? [CO3]

7. Answer any <u>one</u> of the following:-

7-a.   List the various types of storage technologies and explain any two of them. [CO4]   10

7-b.   Discuss the various types of workloads those are involved in Big data solutions. [CO4]   10

8. Answer any <u>one</u> of the following:-

8   Discuss the various types of solutions of cloud security. [CO5]   10

8   "Threat modelling process enables a deeper understanding and discovery of important   10
        aspects of the system". Justify this statement with the help of suitable examples. [CO5]