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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - THEORY EXAMINATION DEC (2024 - 2025)

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. What connects IoT devices to the cloud in order to aggregate data, translate between protocols and process data before sending it on? (CO1, K1) 1
- (a) IoT sensors
 - (b) IoT standards
 - (c) IoT gateways
 - (d) IoT processors
- 1-b. A light bulb whose On / Off switch can be manipulated using a smartphone app is an IoT device of this following type. (CO1, K1) 1
- (a) Consumer IoT devices
 - (b) Enterprise IoT devices
 - (c) Industrial IoT devices
 - (d) None of these
- 1-c. The applications of sensors mainly include in nuclear as well as medical fields. (CO2, K1) 1
- (a) Low field
 - (b) Earth field
 - (c) Bias magnetic field
 - (d) None of these
- 1-d. Touch sensor is an example of: (CO2, K1) 1

- (a) Mechanical sensor
 - (b) Magnetic sensor
 - (c) Electric sensor
 - (d) None of these
- 1-e. Gateway uses a full-duplex mode of communication for. (CO3, K1) 1
- (a) Two way communication
 - (b) One way communication
 - (c) Both ways
 - (d) None of them
- 1-f. _____provides as interface between two dissimilar networks operating with different protocols. (CO3, K1) 1
- (a) Network gateway
 - (b) TCP
 - (c) IP
 - (d) None of them
- 1-g. Stream processing is capable for detecting patterns in _____. (CO4, K1) 1
- (a) Prime series data
 - (b) Time series data
 - (c) Both of above
 - (d) None of them
- 1-h. Predictive analytics and machine learning are the main work load of _____. (CO4, K1) 1
- (a) Small data solutions
 - (b) Big data solutions
 - (c) Both of above
 - (d) None of above
- 1-i. Which tool can be used for Threat Modeling? (CO5, K1) 1
- (a) Netbeans
 - (b) Spyder
 - (c) TMT 2016
 - (d) Eclipse
- 1-j. Which of the following is not a type or source of threat: (CO5, K1) 1
- (a) Operational threat
 - (b) Cultural threat
 - (c) Technical threat
 - (d) Social threat

2. Attempt all parts:-

- 2.a. Write the importance of Industrial IoT. (CO1, K1) 2

- 2.b. What do you mean by fundamental and derived unit? (CO2, K1) 2
- 2.c. Write any one application of Iot analytics. (CO3, K1) 2
- 2.d. What do you mean by descriptive analytics? (CO4, K1) 2
- 2.e. What do you mean by Future-Ready Industrial IoT Services? (CO5, K1) 2

SECTION-B

30

3. Answer any five of the following:-

- 3-a. Explain the role and importance of application and analytics component in IIoT architecture. (CO1, K2) 6
- 3-b. Differentiate between Information and Operational technology. (CO1, K2) 6
- 3-c. What do you mean by pressure sensor? Write the six primary pressure sensor technologies used to sense pressure. Explain any one. (CO2, K2) 6
- 3-d. Discuss the differences between fundamental and derived unit of measurement.(CO2, K2) 6
- 3.e. Describe the various advantages and disadvantages of using a gateway.(CO3, K2) 6
- 3.f. Describe the various features of prescriptive analytics.(CO4, K2) 6
- 3.g. Explain the role of consumer awareness in an IIoT security system?(CO5, K2) 6

SECTION-C

50

4. Answer any one of the following:-

- 4-a. What is the main objective of IIoT in manufacturing and other industrial process ?(CO1, K2) 10
- 4-b. What are the risks to IIoT systems? Explain the Threat Models used to omit them. (CO1, K2) 10

5. Answer any one of the following:-

- 5-a. With the help of neat sketch discuss the construction, operation and applications of a vacuum pressure sensor.(CO2, K2) 10
- 5-b. Explain the various steps for processing of measurement in an industrial system.(CO2, K2) 10

6. Answer any one of the following:-

- 6-a. How can the machine learning technology improve the accuracy of IoT video analytics? (CO3, K2) 10
- 6-b. With the help of suitable examples elaborate how connectivity and security both are the main challenges of edge computing?(CO3, K2) 10

7. Answer any one of the following:-

- 7-a. Elaborate with the help of suitable examples that Predictive analytics is a form of advanced analytics.(CO4, K2) 10
- 7-b. Describe the role and importance of 1– tier and 2- tier server architecture in industrial IoT. Use proper block diagram to explain. (CO4, K2) 10

8. Answer any one of the following:-

- 8-a. Elaborate the differences between the security of an IIoT device and IIoT cloud, with suitable examples.(CO5, K2) 10
- 8-b. Describe the various ways for improving security in industrial IoT. (CO5, K2) 10

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