Qn. Set Code-1

Semester: 5th
Programme: B.Tech
Branch/Specialization: IT, CSSE

AUTUMN END SEMESTER EXAMINATION-2023

5th Semester B.Tech

INTERNET OF THINGS

IT 3007

(For 2022 (L.E), 2021 & Previous Admitted Batches)

Time: 3 Hours Full Marks: 50

Answer any SIX questions.
Question paper consists of four SECTIONS i.e. A, B, C and D.
Section A is compulsory.
Attempt minimum one question each from Sections B, C, D.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

SECTION-A

1. Answer the following questions. [1 × 10]

(a) In a smart city application of IoT, what are some of the sub-applications possible and considerations necessary?

(b) What is the difference between a sensor and an actuator in an IoT ecosystem?

(c) Define some of the application areas where NoSql can be used in IoT.

(d) What is the importance of the network in IoT?

(e) Enlist a few IoT friendly databases that can be used for an IoT project.

(f) Describe the key components of Raspberry Pi.

(g) "Big Data and Internet of Things are tightly coupled." Justify this statement.

(h) What is the use of the digital pins with a "~" symbol next to it in Arduino?

(i) Describe the best practices while connecting physical hardware components for an IoT project.

(j) Enlist the various security concerns in Internet of Things.

SECTION-B

2. (a) Outline the different parts of the Arduino Uno learning board and explain the function of each pin. [4]

   (b) Discuss the different types of Cloud Storage Models. Explain the working of WAMP, as a medium between Cloud Storage and IoT. [4]

3. (a) Implement an Arduino Program to read value from the potentiometer. The program should include the necessary setup and loop functions. Specify the pin number to which the Potentiometer is connected, and provide other explanations relevant to the code. [4]

   (b) With the help of a diagram, explain the IoT architecture along with the stages of solutions for the IoT ecosystem. [4]

SECTION-C

4. (a) Explain and show the need of IoT Application Platform for various implementation in IoT, with the help of an example. [4]

   (b) Classify the various database models available for IoT. What are the major challenges in implementing NoSql for IoT infrastructure and mention the types of NoSql databases? [4]

5. (a) With the help of a diagram, explain the MVC architecture with an example. [4]

(b) Indicate how can the security challenges in IoT be addressed? Mention some of the best practices in IoT security. [4]

6. (a) Implement an Arduino Program to make an LED light fade in and out, with a switch interfacing. The program should include the necessary setup and loop functions. Specify the pin number to which the LED & the switch are connected, and provide other explanations relevant to the code. [4]

(b) Discuss why Non Relational Databases are the best choice for handling the Big Data generated in an IoT ecosystem. [4]

SECTION-D

7. (a) Categorize the various Amazon Web Services, that can be utilized for a Traffic Surveillance System. [4]

(b) With the help of necessary diagram, explain the working of the following - [4]

I. IoT Gateway Platform

II. IoT Cloud Platform

8. (a) Implement an Arduino Program to detect motion using a motion sensor. There should be an LED interfacing which blinks every time a motion is detected in the coverage area. The program should include the necessary setup and loop functions. Specify the pin number to which the Motion Sensor & LED are connected, and provide other explanations relevant to the code. [4]

(b) Differentiate the functionality of Arduino and Raspberry Pi on the basis of various factors. [4]

*****