710401

Roll No. 18EBKCS042 Total No. of Pages: 2

710401

B. Tech. VII - Sem. (Main) Exam., (Academic Session 2021-2022)

Computer & Science Engineering

(7CS4-01) – Internet of Things

Time: 3 Hours **Maximum Marks: 120**

Min. Passing Marks:

Instructions to Candidates:

Part – A: *Short answer questions (up to 25 words) 10 × 2 marks = 20 marks. All **ten** questions are compulsory.*

Part – B: *Analytical/Problem solving questions 5 × 8 marks = 40 marks. Candidates have to answer **five** questions out of **seven**.*

Part – C: *Descriptive/Analytical/Problem Solving questions 4 × 15 marks = 60 marks. Candidates have to answer **four** questions out of **five**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

Q.1 What is the vision of IoT? [2]

Q.2 List out challenges for IoT technology. [2]

Q.3 How ML and AI can be associated with IoT? [2]

Q.4 What is the relation between WSN and IoT? [2]

Q.5 What is ZigBee protocol? [2]

Q.6 List out security challenges for IoT. [2]

Q.7 Define sketch with respect to Arduino programming. [2]

Q.8 Define: Software-Defined Networking. [2]

Q.9 Write down the functions of ultrasonic sensor. [2]

Q.10 List out the features of Contiki OS. [2]

PART – B

Q.1 Write an Arduino program to implement the concept of "Traffic Light Management System." [8]

Q.2 Write an Arduino program to interface temperature sensor with Arduino Board. If temperature is above 40°C; LED should be blink. [8]

Q.3 Describe NQTT framework and message format in detail. [8]

Q.4 Compare SDN and NFV for IoT. [8]

Q.5 With a neat sketch, explain IoT Layered architecture. [8]

Q.6 Explain security terms – Authentication, Integrity and Confidentiality for IoT. [8]

Q.7 Explain NFC and RFID in detail. [8]

PART – C

Q.1 Construct the design of smart Healthcare system by using appropriate sensors. Explain the workflow in detail. [15]

Q.2 Justify "IoT provides fertile ground to an intruder for launching various security threats." Explain different security-threats in detail. [15]

Q.3 Explain Arduino UNO and Raspberry Pi board architecture. [15]

Q.4 Explain differences and similarities between IoT and M2M. [15]

Q.5 Explain data visualization and its importance in IoT. [15]

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B. Tech. VII - Sem. (Main) Exam., (Academic Session 2021-2022)
Open Elective-I
(7PE6-60.2) – Water Pollution Control Engineering

Time: 3 Hours **Maximum Marks: 120**
Min. Passing Marks:

Instructions to Candidates:

Part – A: *Short answer questions (up to 25 words) 10 × 2 marks = 20 marks. All **ten** questions are compulsory.*

Part – B: *Analytical/Problem solving questions 5 × 8 marks = 40 marks. Candidates have to answer **five** questions out of **seven**.*

Part – C: *Descriptive/Analytical/Problem Solving questions 4 ×15 marks = 60 marks. Candidates have to answer **four** questions out of **five**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Graph (Centimetre) 2. NIL

PART – A

Q.1 Explain the term threshold odour number. [2]

Q.2 What do you understand by skimming tanks? [2]

Q.3 Define the Stokes law. [2]

Q.4 Define sludge volume index. [2]

Q.5 What do you understand by the term tertiary treatment of waste water? [2]

Q.6 What is the refractory organics? [2]

Q.7 Write down the use of Imhoff cone? [2]

Q.8 Enlist the type of reactors that are used in wastewater treatment. [2]

Q.9 What is membrane fouling? [2]

Q.10 Define the Hindered settling. [2]

PART – B

Q.1 Explain the motivational factors for recycling/reusing of wastewater. [8]

Q.2 Discuss about the packed tower aeration and write down the design steps for packed tower aeration unit. [8]

Q.3 Discuss various factors which control the adsorption process. [8]

Q.4 A wastewater stream A with 200 m^3/h of flow rate and BOD of 300 mg/l mixes with stream B having flow rate of 400 m^3/h and BOD 225 mg/l. A completely mixed activated sludge process is used to treat the mixture. BOD of effluent stream is 10 mg/l. Given Y = 0.5, k = 5 day-1, K_d = 0.06 day-1; K_s = 100 mg/l and MLVSS = 2000 mg/l. Find - [8]

(a) BOD and flow rate of mixture

(b) Mean residence time

Q.5 Differentiate between aerobic and anaerobic processes. [8]

Q.6 The sludge content per capita per day is 0.068 kg. The moisture of the sludge is 94%. The specific gravity of wet sludge is 1.02 and considering depth of spread is 22.5 cm. Calculate the area of land required for drying the sludge from the digestion tank for 40,000 population. Also design the dimensions of beds. [8]

Q.7 Explain the pollution characteristics for the effluent from paper and pulp industry and also give the suggestion for treatment. [8]

PART – C

Q.1 What do you understand by thermal pollution of water bodies due to industrial effluents? Explain in detail. [15]

Q.2 What is the Upflow Anaerobic Sludge Blanket (UASB) reactor? Explain the working of UASB reactor in detail along with neat sketch. [15]

Q.3 Determine the size of a high-rate trickling filter for the following data - [15]

(i) Sewage flow = 4.5 Mld;

(ii) Recirculation ratio = 1.5;

(iii) BOD of raw sewage = 250mg/l;

(iv) BOD removal in primary tank = 30%;

(v) Final effluent BOD desired = 30mg/l

Q.4 The 3 days 15°C BOD of a sample of sewage is 150 mg/l. Draw a graph of 5-day BOD as function of temperature in the range 10°C to 30°C in steps of 5°C. Assume K_D at 20°C = 0.10. [15]

Q.5 Discuss in detail about the membrane materials and their configuration that is used in wastewater treatment. [15]
