Aliah University

Odd (Autumn)-Semester Examination - 2023

(For 4th Year 7th Semester B.TechProgramme)

Paper Name: Professional Elective – II (Internet of Things) **Full Marks:80**

Paper Code: CSEUGPE12 **Time: 3 Hrs**

Group – A **(Answer any 6 questions)** **(6X5=30)**

1. Describe the key aspects of activity monitoring in IoT.
2. What is Industrial IoT (IIoT)? How does it differ from consumer IoT?
3. Explain the role of sensors and actuators in IoT through an example.
4. Describe the Zig Bee Network with a diagram.
5. What is interoperability? Why is it important in IoT?
6. What is fog computing? How does it differ from cloud computing?
7. Write an Arduino code to design a smoke detector with proper comments and output.

Group – B **(Answer any 5 questions) (10X5=50)**

1. How data gathered from IoT devices is used for improving agriculture, healthcare, and activity monitoring? **3+3+4**
2. Describe and differentiate IoT, IoMT, WSN, WBAN and WBSN. **2+2+2+2+2**
3. What are the challenges in implementing IoT in connected vehicles, smart grids, and Industrial IoT? **3+3+4**
4. Draw a diagram with all the key components in each of the tiers in a smart city. **10**
5. How does M2M communication differ from human-to-human communication? What role does M2M communication play in IoT?Discuss some applications of M2M communication. **3+4+3**
6. Write an Arduino code to design a smart home climate control having a heater and fan control. The fan will switch on if the humidity goes above 85 percent and the heater will switch on when the temperature goes below 20 degrees Celsius. Give proper commenting in the code and output along with a pin diagram in an Arduino uno board. **10**

Odd (Autumn) Semester Examination 2023

Paper Code: MBAUGHU01; Paper name: Industrial Economics and Management

MEN/EEN/CEN/CSE/ECE VIIth Semester

Full Marks: 80; Time: 3Hrs.

(The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as possible)

GROUP: A (Answer *all* the questions) **(1 x 10 = 10)**

1. **I. A situation, wherein a perceiver tends to see in others the traits he himself possesses, is called _____.**
(a) Repetition (b) Contrast (c) Rejection (d) Projection

II. A written summary of content & context of job is called _____.
(a) Job description (b) Job specification (c) Resume (d) Job posting

III. Inspection, scrap, and repair are examples of _____.
(a) Internal costs (b) External costs (c) Societal costs (d) Costs of dissatisfaction

IV. OB helps to understand behaviour of human in _____.
(a) Work place only (b) Society only (c) Department only (d) Work place and Society

V. Which of the following could be a strength?
(a) Weather (c) A new international market
(b) A price that is too high (d) The location of a business

VI. Which of the following is the relation that the law of demand defines?
(a) Income and price of a commodity (c) Price and quantity of a commodity
(b) Income and quantity demanded (d) Quantity demanded and quantity supplied

VII. Numerous forms of short-term incentives to promote trial or buying of a service of product is
(a) Sales promotion (b) Direct marketing (c) Advertising (d) Events and experiences

VIII. _____ is the task of buying goods of the right quality, in the right quantities, at the right time and at the right price.
(a) Supplying (b) Purchasing (c) Scrutinizing (d) None of the above

IX. _____ is the set of forces that energize, direct, and sustain behaviour.
(a) Motivation (b) Expectancy (c) Empowerment (d) Socialization

X. Raju believes that men perform better in oral presentations than women. What shortcut has been used in this case?
(a) The halo effect (b) Projection (c) The contrast effect (d) Stereotyping

GROUP: B (Answer *any five* questions) **(5 x 5 = 25)**

2. What is quality management? Describe the Cycle of 'TQM (Total Quality Management)'.
3. Describe the process of communication.
4. Elaborate the importance of economics in business world.
5. What do you mean by marketing research? What are the various steps in the marketing research process?
6. What is elasticity of demand? Consider the demand for a good. At price Rs 4, the demand for the good is 25 units. Suppose price of the good increases to Rs 5, and as a result, the demand for the good falls to 20 units. Calculate the price elasticity?

7. What is the importance of training & development?
8. What do you mean by the term performance appraisal? What are the advantages and disadvantages of performance appraisal?

GROUP: C (Answer *any three* questions) **(15 x 3 = 45)**

9. (a) What is marketing mix? Describe 4P's of marketing. (1+4)
   (b) Describe segmentation, targeting and positioning (STP) with the help of an example. (10)
10. What do you mean by law of demand? What are the factors that affect demand? What are the exceptions to law of demand? (2+5+8)
11. What are the various types of barriers to effective communication? Describe with the help of examples.
12. What is motivation? What is the process of motivation? Explain Maslow's need hierarchy theory and its limitation. (1+4+10)
13. **Differentiate between the following terms:** **(3*5=15)**
    i. Training and Development
    ii. Maslow's need hierarchy theory and Herzberg's two-factor theory
    iii. Projection and Stereotyping
    iv. Complementary and Supplementary Goods
    v. Selling and Marketing

Aliah University

Odd Semester Examination (Autumn Semester) 2023-24
(For 4th Year 7th Semester B.Tech CSE)

Paper Name: Professional Elective -III (Mobile Computing) **Full Marks: 80**
Paper Code: CSEUGPE16 **Time: 3 hours**

Group A

Answer all the questions **(10X1=10)**

1. Which of the following uses wireless as the mode of communication for transferring or exchanging data between various mobiles over a short-range?
   a. Ad hoc computing b. Mobile computing c. Bluetooth technology d. None of the above.

2. Which of the following can be considered as the advantage of using frequency reuse?
   a. The same spectrum can be allocated to the other networks
   b. Only a limited spectrum is required
   c. Increase capacity
   d. All of the above

3. In which one of the following, the slow and fast hopping is used?
   a. GSM b. GPRS c. FHSS d. None of the above

4. Mobile Computing allows transmission of data from one wireless-enabled device to another_
   a. Any device b. Wired device c. Wireless-enabled device d. one of the above

5. Which of the following is a fundamental principle of wireless communication?
   a. Electromagnetic waves b. Microwaves c. Both A and B d. None of the above

6. Which of the following statements is correct about the FHSS?
   a. FHSS is a type of narrowband signal
   b. It uses the 78 frequency in the 2.4 GHz
   c. It is referred as Frequency Hopping Spread Spectrum
   d. All of the above

7. Which of the following is required to transmit the digital information using a certain frequency by translating it into an analog signal?
   a. Demodulation b. Modulation c. QPSK d. BSPK

8. In which of the following, the single-channel has the ability to carry all transmissions simultaneously?
   a. CDMA b. TDMA c. FDMA d. None of the above

9. In which one of the following times is specifically divided into several time slots that are in the fixed patterns?
   a. CDMA b. TDMA c. FDMA d. All of the above .

10. The term _____ refers to transporting a mobile station from one base station to another base station.
   a. Roamer b. Forward channel c. Handoff or hand over d. MIN

Group B

Answer any 5 questions (5X6=30)

1. What is a signal? What are the different characteristics of signal? [3+3]
2. Explain non-persistant CSMA, persistant CSMA and p-persistant CSMA. [2x3]
3. Compare with diagram, infrastructure and adhoc networks. [3+3]
4. What are the parameters for controlling the waiting time of the medium?
5. State some advantages of using wireless LANs over wired LANs. What are the disadvantages of using wireless LANs? [3+3]
6. Explain the problem of hidden and exposed terminals. [3+3]

Group C

Answer any 4 questions (4X10=40)

1. What are the benefits of reservation schemes? How are collisions avoided during data transmission? Why is the probability of collisions lower compared to classical Aloha? What are the disadvantages of reservation systems? [2+3+3+2]
2. Why are antennas needed? Describe the different types of antennas. Is a directional antenna useful for mobile phones? Why? How can the gain of an antenna be improved? [2+3+2+3]
3. Describe the process of DFWMAC-DCF with an example. What is the advantage of using RTS/CTS extension with DFWMAC-DCF? [7+3]
4. What are the basic requisites for applying FDMA? How does this factor increase complexity compared to TDMA systems? [6+4]
5. Explain the term interference in the space, time, frequency and code domain. What are the countermeasures in SDMA, TDMA, FDMA and CDMA systems? [5+5]

Backoff time:

log-periodic

FAFF

CDFS carriers inter frame space

Aliah University

Autumn Semester Examination - 2023

B.Tech 4th year, 7th semester Examination

Paper Name: Machine Learning and Soft Computing **Full Marks: 80**

Paper Code: CSEUGPC24 **Time: 3 hrs**

Group-A **Answer any five** **(2x5=10)**

1. What is an artificial neuron? 2
2. Describe the multipoint crossover operation for a GA probelm. 2
3. Differentiate the fuzzy sets for the triangular, and trapezoidal membership functions. 2
4. Compare the fuzzifier and defuzzifier component of a Fuzzy inference system. 2
5. Write the basic steps for a Genetic Algorithm problem. 2
6. What is Reinforcement Training? 2

Group-B **Answer any four** **(5x4=20)**

7. Maximize the function $f(x) = 4x^2 + 9x + 1$, where x = 9, 11, 13, 15 with (Chromosome size = 4) such that (i) selection operation (Rank Selection), (ii) Uniform crossover, (iii) Up to two iterations. 5
8. Establish a mamdani fuzzy inference system with proper examples. 5
9. Explain the terms "Chromosome, Gene, Allele, Locus, Genotype, Phenotype" with proper examples for a GA problem. 5
10. Establish a minimum distance classifier (MDC) for a 3-class classification problem. 5
11. Calculate specificity and f1-score from the given confusion matrix. 5

		Actual			
Predicted	12	1	3	5
	7	45	4	6
	0	2	23	4
	1	5	7	6

Group-C **Answer any five** **(10x5=50)**

12. Consider the fuzzy sets *small={0/0 + 0/2 + 1/3 + 0/4}* and *negative={0/1 + 0.7/2 + 1/3 + 0.7/4 + 0/5}*, and the following fuzzy rule: "Rule 1: If x is small and y is negative Then z is low". Find the firing strength of Rule 1 when x = 3 and y = 2 where fuzzy "AND" operation is the minimum operator. What is ELITISM? 8+2=10

13. What is Gradient-Descent? Draw a very clear 4-3-2 ANN architecture with explaining all its components. What is a Self-organizing Feature Map? 3+5+2=10

14. What is clustering? What are the main parameters for a good clustering technique? What are Conventional and fuzzy sets theories? Define uniform crossover and single point crossover in Genetic Algorithm. 1+2+3+4=10

15. What is PCA and why is it important? Describe each step of PCA by considering a proper example. Give Some Real Time Applications of Neural Networks. 3+5+2=10

16. Describe Generative and Discriminative Machine Learning techniques. Suppose a genetic algorithm uses chromosomes of the form x = abcdefgh with a fixed length of eight genes. Each gene can be any digit between 0 and 9. Let the fitness of individual x be calculated as: f(x) = (a + b) * (c + d) + (e + f) − (g + h). Let the initial population consist of four individuals with the following chromosomes: x1 = 7 2 4 1 3 5 3 2; x2 = 9 7 1 2 1 6 0 1; x3 = 5 3 2 2 1 2 8 5; x4 = 7 1 8 5 2 4 9 4. Use the following (i) Evaluate the fitness of each individual, (ii) Cross the fittest two individuals using one–point crossover at the middle point, (iii) Evaluate the fitness of the new population with the best four chromosomes (two-old and two-new) (iv) Perform (ii) to (iii) up to three iterations. 3+7=10

17. (a) Why is naive Bayes so 'naive'? (b) You came to know that your model is suffering from low bias and high variance. Which algorithm should you use to tackle it? Why? (c) What do you understand about Type I & Type II errors? (d) What is non linear classification of supervised learning? Explain with an example. 2+3+2+3=10

mean
matrix
value time
sort the vecto
select x component

Feature selection
Extraction
Resolution
Reduction