

CBCS SCHEME

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17CS81

Eighth Semester B.E. Degree Examination, July/August 2021 Internet of Things and Applications

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. What does IOT and digitization mean? Elaborate. (08 Marks)
b. Explain with neat diagram, the one M2M IOT standardized architecture. (06 Marks)
c. What are the different challenges in IOT? (06 Marks)
- 2 a. Discuss IOT World Forum (IOTWF) standardized architecture. (08 Marks)
b. Explain IOT Data Management and compute stack. (06 Marks)
c. Define IOT. Explain the evolutionary phases of Internet. (06 Marks)
- 3 a. List and explain the characteristics and attributes concerned when selecting and dealing with connecting smart object. (10 Marks)
b. What is Zigbee? Explain 802.15.4 physical layer, MAC layer and security. (10 Marks)
- 4 a. Explain in detail wireless sensors network, communication protocol and its limitations. (08 Marks)
b. List and explain different types of sensors. (06 Marks)
c. Write a note on LoRaWAN security. (06 Marks)
- 5 a. Discuss various IOT application transport methods. (10 Marks)
b. Explain 6TiSCH in detail. (10 Marks)
- 6 a. Discuss the need for optimization. (08 Marks)
b. Explain CoAP IOT application layer protocol. (06 Marks)
c. What are the key advantages of Internet protocol? (06 Marks)
- 7 a. Explain the challenges in IOT security. (10 Marks)
b. Explain different components of flexible Net Flow Architecture (FNF). (10 Marks)
- 8 a. Discuss Hadoop Eco-System-Lambda architecture. (08 Marks)
b. Discuss OCTAVE and FAIR formal Risk Analysis. (06 Marks)
c. Compare Big Data and Edge Analytics. (06 Marks)
- 9 a. Explain the following with respect to Arduino programming:
(i) Structure (ii) Function.
(iii) Variables and Data types. (iv) Digital I/O. (10 Marks)
b. Explain different layers of Smart City IOT architecture. (10 Marks)
- 10 a. Explain Smart City security architecture. (08 Marks)
b. Explain Smart City Traffic control architecture. (06 Marks)
c. Write short note on Raspberry Pi operating system. (06 Marks)

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8=50, will be treated as malpractice.

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17CS82

Eighth Semester B.E. Degree Examination, July/August 2021 Big Data Analytics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. What is HDFS? Explain its components with a neat diagram. (10 Marks)
b. Explain HDFS safemode and rack awareness, with neat diagram. (10 Marks)
- 2 a. What is MapReduce Program? Explain MapReduce parallel data flow, with neat functional diagram. (10 Marks)
b. What is Nano node federation? Explain NaneNode high availability design with diagram. (10 Marks)
- 3 a. Explain Apache Sqoop Import and Export methods, with neat diagram. (10 Marks)
b. How do you run MapReduce and message passing interface on Yarn architecture? (10 Marks)
- 4 a. Explain with a neat diagram, the Apache Oozie work flow for Hadoop architecture. (10 Marks)
b. What is YARN? Explain Yarn application frame work. (10 Marks)
- 5 a. What is Business Intelligence? List the different BI applications and explain in detail any four applications. (10 Marks)
b. Draw and explain flow of BIDM cycle. Explain the Strategic and Operational decisions. (10 Marks)
- 6 a. Explain CRISP DM cycle, with neat diagram. (10 Marks)
b. Define Data warehouse and illustrate design considerations for data warehouse. (10 Marks)
- 7 a. What is Association Rule? Explain below given rules with suitable examples :
i) Support ii) Confidence iii) Lift. (10 Marks)
b. What is Unsupervised Machine Learning concept? Explain K – Means clustering techniques, with suitable example. (10 Marks)
- 8 a. Write and explain Apriori Algorithm with example. (10 Marks)
b. List and explain the steps for developing an ANN (Artificial Neural Network). (10 Marks)
- 9 a. Discuss the application and practical consideration of Social network Analysis. (10 Marks)
b. Explain the 3 types of Web mining. Use appropriate flow diagrams to represent the same. (10 Marks)
- 10 a. Explain the Text Mining process and the architecture. (10 Marks)
b. Briefly explain the Data Mining. Compare text mining and data mining. (10 Marks)

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17CS834

Eighth Semester B.E. Degree Examination, July/August 2021 System Modeling and Simulation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. What are the advantages and disadvantages of simulating a system? (10 Marks)
 b. A grocery store has one checkout counter. The interarrival time and service times are given in the table below. Prepare a simulation table with a stopping event at time 20 and show the checkout line and FEL. Calculate maximum queue length, average system time and utilization of the server.

Interarrival times	3	5	4	6	2	7
Service time	5	2	7	4	3	5

(10 Marks)

- 2 a. Simulate a single server queueing system for 10 customers and find (i) Average waiting time (ii) Probability that a customer has to wait (iii) Average service time (iv) Server Utilization (v) Average time a customer spends in the system. The probability distributions of inter arrival time and service time are as given below.

Inter arrival time	Probability
1	0.3
3	0.4
5	0.3
Random numbers to be used : 9, 3, 2, 1, 0, 5, 8, 7, 4	

Service time	Probability
1	0.2
2	0.25
3	0.35
4	0.2
Random numbers to be used : 85, 10, 54, 76, 23, 12, 69, 06, 98, 35	

(10 Marks)

- b. Write the event scheduling algorithm and illustrate the execution of arrival event and departure event in event scheduling approach using flowchart. (10 Marks)
- 3 a. 30% of the assembled ink-jet printers are rejected at the inspection station. Find the probability that the first acceptable ink-jet is the third one inspected considering each inspection as a Bernoulli trial. Also find the probability that the fifth printer inspected in the second acceptable printer. (05 Marks)
 b. Explain the concepts of normal distribution. (05 Marks)
 c. Explain the characteristics of queueing system. (10 Marks)
- 4 a. A computer repair person is beeped each time there is a call for service. The number of beeps per hour is known to occur in accordance with a Poisson distribution with a mean $\alpha = 3$ per hour. Find the (i) Probability of 3 beeps in the next hour (ii) Probability of two or more beeps in a 1-hour period (iii) Probability of number of beeps between 1 and 3. (10 Marks)
 b. Explain the long-run measures of performance of queueing systems with an example. (10 Marks)

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- 5 a. Explain the linear congruential generator and the rules for selecting the values of the parameters. Generate three random numbers given $X_0 = 37$, $a = 07$, $C = 29$, $m = 100$. (10 Marks)
- b. Explain Acceptance-Rejection Technique using Poisson distribution. Generate three Poisson variates with mean $\alpha = 0.6$, Random numbers are 0.8311, 0.6437, 0.9963, 0.8582, 0.4321 and 0.5032. (10 Marks)
- 6 a. Test whether 3rd, 7th, 11th and so on numbers are autocorrelated at $\alpha = 0.05$ in the following sequence $Z_{0.025} = -1.96, 0.594, 0.928, 0.515, 0.055, 0.507, 0.351, 0.262, 0.797, 0.788, 0.442, 0.097, 0.798, 0.227, 0.127, 0.474, 0.825, 0.007, 0.182, 0.929, 0.852$ (10 Marks)
- b. Explain the procedure for inverse transform technique using exponential distribution. Given the random numbers 0.2414, 0.8210, 0.4756, 0.7354. Compute the exponential variates X_i with value of $\lambda = 2$. (10 Marks)
- 7 a. How do you estimate the parameters of the following distributions:
 (i) Poisson distribution (ii) Exponential distribution (iii) Gamma distribution
 (iv) Normal distribution (v) Lognormal distribution (10 Marks)
- b. Highlight the features of types of simulations with respect to output analysis with examples for each. (10 Marks)
- 8 a. List the properties using physical basis of the distributions for any ten distributions. (10 Marks)
- b. Which are the measures of performance of a simulated system? How do you estimate them? (10 Marks)
- 9 a. Define verification of simulation model and suggest techniques for verifying a simulation model. (10 Marks)
- b. Explain model building verification and validation with respect to simulation models. (10 Marks)
- 10 a. Illustrate the calibration technique for simulation model. (10 Marks)
- b. Explain Naylor and Finger 3-step approach to aid in the validation process. (10 Marks)

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