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15CS81

**Eighth Semester B.E. Degree Examination, June/July 2019**  
**Internet of Things Technology**

Time: 3 hrs.

Max. Marks: 80

**Note: Answer FIVE full questions, choosing one full question from each module.**

**Module-1**

- 1 a. What is IOT? Explain in detail on Genesis of IOT. (08 Marks)  
 b. What does IOT and digitization mean? Elaborate on this concept. (04 Marks)  
 c. Write a short note on "IOT impact in Real World". (04 Marks)

**OR**

- 2 a. Discuss IOT challenges. (08 Marks)  
 b. With a neat diagram, explain architecture of IOT. (04 Marks)  
 c. Explain Core IOT functional stack. (04 Marks)

**Module-2**

- 3 a. List and explain different types of sensors. (08 Marks)  
 b. Elaborate on small physical objects and small virtual objects. (04 Marks)  
 c. Explain "IOT Access Technologies". (04 Marks)

**OR**

- 4 a. Briefly explain protocol stack utilization IEEE 802.15.4. (08 Marks)  
 b. What is SANET? Explain some advantages and disadvantages that a wireless based solution offers. (08 Marks)

**Module-3**

- 5 a. Explain working of IP as the IOT network layer. (08 Marks)  
 b. Write note on Business case for IP. (04 Marks)  
 c. Discuss need for optimization. (04 Marks)

**OR**

- 6 a. Describe application protocols for IOT. (08 Marks)  
 b. Discuss the various methods used in IOT application transport. (08 Marks)

**Module-4**

- 7 a. What do you mean by data and analytics for IOT? Explain. (04 Marks)  
 b. Discuss Hightdata analytics tools and technology. (04 Marks)  
 c. With a case study relate the concept of securing IOT. (08 Marks)

**OR**

- 8 a. Explain in detail how IT and OT security practices and systems vary in real time. (08 Marks)  
 b. Discuss OCTAVE and FAIR formal risk analysis. (08 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.

**Module-5**

- 9 a. Give a brief note on Arduino UNO. (04 Marks)  
b. With a neat diagram, explain Raspberry Pi board. (04 Marks)  
c. With a neat diagram, explain wireless temperature monitoring system using Raspberry Pi. (08 Marks)

**OR**

- 10 a. Explain in detail smart city IOT architecture. (08 Marks)  
b. With the case study explain smart and connected cities using Raspberry Pi. (08 Marks)

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15CS82

## Eighth Semester B.E. Degree Examination, June/July 2019 Big Data Analytics

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. How does the Hadoop MapReduce Data flow work for a word count program? Give an example. (08 Marks)
- b. Briefly explain HDFS Name Node Federation, NFS Gateway, Snapshots, Checkpoint and Backups. (08 Marks)

OR

- 2 a. What do you understand by HDFS? Explain its components with a neat diagram. (10 Marks)
- b. Bring out the concepts of HDFS block replication, with an example. (06 Marks)

### Module-2

- 3 a. Explain Apache Squoop Import and Export method with neat diagrams. (10 Marks)
- b. Explain with a neat diagram, the Apache Oozie work flow for Hadoop architecture. (06 Marks)

OR

- 4 a. How do you run Map Reduce and Message Passing Interface (MPI) on YARN architecture? Discuss. (10 Marks)
- b. What do you understand by YARN Distributed-Shell? (06 Marks)

### Module-3

- 5 a. Write any four Business Intelligence Application for various sectors. (08 Marks)
- b. Explain the star schema design of Data Warehousing with an example. (06 Marks)
- c. What is Confusion Matrix? (02 Marks)

OR

- 6 a. Explain CRISP-DM cycle with a neat diagram. (08 Marks)
- b. What do you understand by the term Data Visualization? How is it important in Big data Analytics? (05 Marks)
- c. Differentiate between Data Mining and Data Warehousing. (03 Marks)

### Module-4

- 7 a. What is a splitting variable? Describe three criteria for choosing a splitting variable. (04 Marks)
- b. List some of the advantages and disadvantages of Regression Model. (04 Marks)
- c. Create a decision tree for the following data set.

Age	Job	House	Credit	Loan Approved
Young	False	No	Fair	No
Young	False	No	Good	No
Young	True	No	Good	Yes
Young	True	Yes	Fair	Yes
Young	False	No	Fair	No

Age	Job	House	Credit	Loan Approved
Middle	False	No	Fair	No
Middle	False	No	Good	No
Middle	True	Yes	Good	Yes
Middle	False	Yes	Excellent	Yes
Middle	False	Yes	Excellent	Yes
Old	False	Yes	Excellent	Yes
Old	False	Yes	Good	Yes
Old	True	No	Good	Yes
Old	True	No	Excellent	Yes
Old	False	No	Fair	No

Then solve the following problem using the model:

Age	Job	House	Credit	Loan Approved
Young	False	False	Good	???

(08 Marks)

OR

- 8 a. Explain the design principles of an Artificial Neural Network. (08 Marks)  
 b. How does the Apriori Algorithm work? Apply the same for the following example. (08 Marks)

T <sub>ID</sub>	List of Item-IDs
T <sub>100</sub>	I <sub>1</sub> , I <sub>2</sub> , I <sub>5</sub>
T <sub>200</sub>	I <sub>2</sub> , I <sub>4</sub>
T <sub>300</sub>	I <sub>2</sub> , I <sub>3</sub>
T <sub>400</sub>	I <sub>1</sub> , I <sub>2</sub> , I <sub>4</sub>
T <sub>500</sub>	I <sub>1</sub> , I <sub>3</sub>
T <sub>600</sub>	I <sub>2</sub> , I <sub>3</sub>
T <sub>700</sub>	I <sub>1</sub> , I <sub>3</sub>
T <sub>800</sub>	I <sub>1</sub> , I <sub>2</sub> , I <sub>3</sub> , I <sub>5</sub>
T <sub>900</sub>	I <sub>1</sub> , I <sub>2</sub> , I <sub>3</sub>

Assume the support count = 2.

(08 Marks)

**Module-5**

- 9 a. What is Naïve Bayes Technique? Explain its model. (05 Marks)  
 b. What is a Support Vector Machine? Explain its model. (08 Marks)  
 c. Mention the 3-step process of Text Mining. (03 Marks)

OR

- 10 a. Explain briefly the three different types of web mining. (06 Marks)  
 b. Compute the rank values for the Nodes for the following network shown in Fig.Q10(b), which is the Highest ranked node. Solve the same with eight iterations.

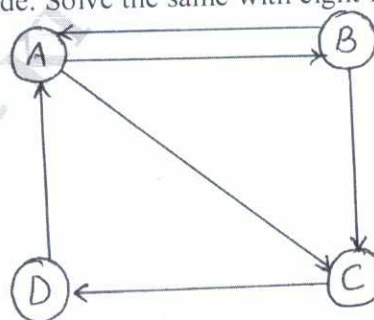


Fig.Q10(b)

(10 Marks)

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15CS834

## Eighth Semester B.E. Degree Examination, June/July 2019 System Modelling and Simulation

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. What is simulation? Explain with flowchart the steps involved in simulation study. (08 Marks)  
 b. A computer technical support centre is staffed by two people. Able and Baker, who take calls and try to answer questions and solve computer problems. The time between calls ranges from 1 to 4 minutes with the distribution as shown in table 1.1. Able is more experienced and can provide service faster than Baker, which mean that, when both are idle, Able takes the call. The distribution of their service times are show in table 1.2 and Table 1.3: Inter arrival time (IAT) distribution

Table 1.1 : Inter Arrival Time (IAT) distribution

IAT (mins)	1	2	3	4
Probability	0.25	0.40	0.20	0.15

Table 1.2 : Service Time (ST) Distribution of Able

Service time (mins)	2	3	4	5
Probability	0.30	0.28	0.25	0.17

Table 1.3 : Service time distribution of Baker

Service time (mins)	3	4	5	6
Probability	0.35	0.25	0.20	0.20

Random digits for inter arrival times are :

26, 98, 90, 26, 42, 74, 80, 68, 22, 48, 34, 45, 24, 34

Random digits for service time are :

95, 21, 51, 92, 89, 38, 13, 61, 50, 49, 39, 53, 88, 01, 81

Simulate this system for 10 customers by

- Finding (i) Average inter arrival time (ii) Average service time of Able  
 (iii) Average service time of Baker.

(08 Marks)

**OR**

- 2 a. List the various concept used in discrete event simulation and explain any four of these with examples. (08 Marks)  
 b. Consider a single server queuing system with inter arrival and service time details as shown below :

IAT	1	1	6	3	7	5	2	4	1
ST	4	2	5	4	1	5	4	1	4

Stop simulation when simulation clock reaches 23.

(08 Marks)

### Module-2

- 3 a. Explain binomial and Poisson distribution and give probability mass function, mean and variance. (06 Marks)  
 b. Explain the following continuous distributions :  
 i) Uniform distribution      ii) Exponential distribution      iii) Triangular distribution  
 iv) Normal distribution. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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OR

- 4 a. Explain the characteristics of a queuing system. (08 Marks)  
 b. Explain the various steady state parameters of M/G/1 queue. (08 Marks)

Module-3

- 5 a. Use the linear congruential method to generate a sequence of random numbers with  $X_0 = 27$ ,  $a = 17$ ,  $C = 43$  and  $m = 100$ . Write 3 ways of achieving maximal period. (08 Marks)  
 b. The sequence of random members 0.44, 0.81, 0.14, 0.05, 0.93 has been generated. Use Kolmogorav Smirnov test with  $\alpha = 0.05$  to determine if the hypothesis that the numbers are uniformly distributed on the interval  $[0, 1]$  can be rejected. Take  $D_\alpha = 0.565$ . (08 Marks)

OR

- 6 a. Suggest a step by step procedure to generate random variates using inverse transform technique for exponential distribution. (08 Marks)  
 b. What is acceptance rejection technique? Generate three Poisson variates with mean  $\alpha = 0.2$ . The random numbers are 0.4357, 0.4146, 0.8353, 0.9952, 0.8004, 0.7945, and 0.1530. (08 Marks)

Module-4

- 7 a. Explain the steps involved in the development of a useful model of input data. (08 Marks)  
 b. Apply chi – square goodness of fit test for Poisson distribution with  $\alpha = 3.64$ , data size = 100 and observed frequency  $O_i = 12, 10, 19, 17, 10, 8, 7, 5, 5, 3, 3, 1$  [ $\eta_{0.05, 5} = 11.1$ ]. (08 Marks)

OR

- 8 a. Explain the different ways of selecting input models when data is not available. (08 Marks)  
 b. Explain the types of simulation with respect to output analysis. Give examples. (08 Marks)

Module-5

- 9 a. Discuss output analysis for steady state simulation in detail. (08 Marks)  
 b. Discuss output analysis for terminating simulation in detail. (08 Marks)

OR

- 10 a. Explain with neat diagram, a model building verification and validation. (08 Marks)  
 b. Describe the 3 steps approach formulated by Naylor and Finger in the validation process. (08 Marks)

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