Model Question Paper  
B.Sc 4th Semseter  
data Acquisition and Analysis  

SECTION-A (5 X 5 = 25 Marks)  
Answer any FIVE of the following:

1. How a secondary name node differs from the name node in HDFS.  
2. What are the methods for acquiring network data?  
3. Write a PIG script for word count.  
4. Write at least two differences between pig and hive.  
5. What do you mean by HiveQL Data Definition Language?  
6. Draw and explain Architecture of APACHE HIVE?  
7. What are the limitations of HBase?  
8. List the characteristics of Big Data.  

SECTION-B (10 X 5 = 50 Marks)  
Answer the following

9. a. Explain the basic building blocks of Hadoop with a neat sketch.  
   OR  
   b. Explain the various operational modes of Hadoop cluster configuration.  

10. a. What is the difference between Structured and unstructured data?  
    b. Difference between ETL vs ELT?  
    OR  
    b. Explain  
      a. Wireshark  
      b. Winnetcap  
      c. Smartsniff  

11. a. Discuss in brief about running a pig script in local and distributed mode.  
    OR  
    b. Discuss Pig Latin Application Flow.  

12. Explain briefly about different Hive Data Types Explain in detail with example.  
    OR  
    b. How to creating and Managing Databases and Tables in hive?  

13. a. Differentiate between Hbase vs RDBMS.  
    OR  
    b. a. What are the applications of BigData.  
    b. Explain data masking in detail?  

Prof. S. Pallamsetty,  
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Model Question Paper
B.Sc 4th Semester
DATA MINING AND DATA ANALYSIS

Max marks: 75

Time: 3hrs

SECTION-A (5 x 5 = 25 Marks)
Answer any FIVE of the following

1. How does KDD differ with data mining? Describe the stages of data mining.
2. Explain the primitives of data mining query language?
3. What is Bayes theorem? Show how is it used for classification.
4. Discuss the methods for estimating predictive accuracy of classification method.
5. What is Rule-Bases classifier? Explain how a Rule-Based classifier works?
6. What are the features of cluster analysis?
7. Explain the cluster analysis methods briefly?
8. What are the objectives and Assumptions of Factor Analysis?

SECTION-B (10 x 5 = 50 Marks)
Answer the following

9. a. Discuss the tasks of data mining with suitable examples.
   OR
   b. Explain shortly any five data preprocessing approaches.

10. a. Explain in detail about Logistic Regression with an Example?
    OR
    b. What is Tree Pruning. Explain the Decision Tree construction Algorithm.

11. a. List some issues of multimedia mining. Describe how back propagation is used in classification.
    OR
    b. Give any two types of association rules with example. Trace the results of using the Apriori algorithm on the grocery store example with support threshold 2 and confidence threshold 60%. Show the candidate and frequent itemsets for each database scan. Enumerate all the final frequent itemsets. Also indicate the association rules that are generated.

<table>
<thead>
<tr>
<th>Transaction ID</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>HotDogs, Buns, Ketchup</td>
</tr>
<tr>
<td>T2</td>
<td>HotDogs, Buns</td>
</tr>
<tr>
<td>T3</td>
<td>HotDogs, Coke, Chips</td>
</tr>
<tr>
<td>T4</td>
<td>Chips, Coke</td>
</tr>
<tr>
<td>T5</td>
<td>Chips, Ketchup</td>
</tr>
<tr>
<td>T6</td>
<td>HotDogs, Coke, Chips</td>
</tr>
</tbody>
</table>

12. What do you mean by representative object based clustering technique? Explain in detail with example.
   OR
   b. What is the purpose of cluster analysis in data mining? Explain.

13. a. What are the analysis of factor based data mining techniques.
   OR
Model Question Paper
B.Sc 4th Semester
Implementing IoT with Raspberry Pi

Max marks:75

SECTION-A (5 X 5 = 25 Marks)
Answer any FIVE of the following

1. What are the applications of Raspberry Pi?
2. What are the steps of implementation of IoT with Raspberry Pi?
3. What are the steps to install an operating system on a Raspberry Pi?
4. Write in brief about List in python.
5. What is the use of GPIO pins in a IoT device?
6. Explain IoT cloud-based services using the Xively (Pachube/COSM).
7. Explain the LAMP Web-server?
8. What is MQTT? Explain.

SECTION-B (10 X 5 = 50 Marks)
Answer the following

9. a. Mention the flavors of Linux OS supported by Raspberry Pi device.
   b. Justify how Raspberry Pi is different from a desktop computer.
   OR
   a. Describe various features of a Raspberry Pi device.
   b. List out various versions of raspberry pi devices till date.

10. a. List the various frequently used commands during operation of Linux OS.
    b. Write a short note on various raspberry pi interfaces used for data transfer.
    OR
    a. What is a module in python? Explain with an example.
    b. Explain the characteristics of Python programming language

11. a. Design an automatic refrigerator light system with LED, switch & raspberry pi
    and write a python program to support the working of that design.
    OR
    b. Discuss the role of communication protocols and embedded systems in IoT.

12. a. Explain how cloud computing is playing key role in IoT.
    b. Describe an example of IoT service that uses Web socket-based communication.
    OR
    a. Design a weather monitoring IoT system using REST based?
    b. Design a smart home automation system using IoT With mode REST service.

    OR
    b. What are the steps to install NODE-RED in Raspberry Pi?
Model Question Paper
B.Sc 4th Semester
Object Oriented Programming using Java
Max marks: 75

SECTION-A (5 X 5 = 25 Marks)
Answer any FIVE of the following

1. Define OOP. Explain features of Object Oriented programming Language.
2. what are the characteristics of Java.
3. Explain different types of control statements used in java.
4. Define Abstract Class. Explain different types of Access controls available in java.
5. What is Polymorphism? Explain.
6. Define multithreading. Write a java program to show the inter-thread communication.
7. Write an Applet program that displays "Welcome to Andhra University".
8. Explain the JDBC Architecture with neat Sketch.

SECTION-B (10 X 5 = 50 Marks)
Answer the following

9. a. Describe the benefits and applications of object-oriented programming?

OR

b. Difference between OOP and Procedure Oriented Programming?

10. a. Define Abstract Class. Explain different types of Access controls available in java?

OR

b. What is the use of super keyword. Write a java Program using super keyword?

11. a. What are advantages of using Exception handling mechanism in a program?

b. Write a java program that demonstrates how certain exception types are not allowed to be thrown?

OR

b. What is Type Casting. Write a java program for Type Casting?

12. a. What are the different ways that are possible to create multiple threaded programs in java? Discuss the differences between them.

b. Write a program to create four threads using Runnable interface.?

OR

b. What is Serialization and De-Serialization. Explain in Detail?

13. Explain JDBC architecture with an example?

OR

b. Write an applet code to demonstrate parameter passing to applet?
Model Question Paper
B.Sc 4th Semester
RFID and Wireless Sensor Networks

Max marks: 75

Time: 3hrs

SECTION-A (5 X 5 = 25 Marks)
Answer any FIVE of the following

1. What is RFID. What are the components of RFID system?
2. What are the different types of attacks on RFID system?
3. What are the Challenges and Constraints of WSN?
4. What are the Characteristic of MAC protocols in Sensor networks?
5. Explain the Zigbee Architecture in detail?
6. Discuss in detail how communication is established between WSN and Internet?
7. What are the features of RFID System?
8. Explain
   a. Frequency
   b. Range and Coupling
   c. Transponder.

SECTION-B (10 X 5 = 50 Marks)
Answer the following

9. a. With the help of block diagram explain the various elements of an RFID system?
   OR
   b. In the view of RFID explain the antennas and radio characteristics. Describe the band,
      frequency, wavelength and classical usage.

10. What are the advantages and disadvantages of using RFID technology for public and
    private sectors?
    OR
    b. Explain briefly understanding RFID’s privacy threats and What are the current state of RFID policy?

11. a. Discuss in brief the difference between Ad hoc networks and wireless sensor
    networks.
    OR
    b. Explain in detail the application of Wireless Sensor Networks.

12. a. What are the different Contention based protocols, write about CSMA Protocol.
    OR
    b. Explain the Various Routing Protocols in WSN?

13. a. What are the different Contention based protocols, write about CSMA Protocol.
    OR
    b. Explain the IEEE 802.15.4 architecture in detail?
Model Question Paper  
BCA 4th Semester  
Data Analytics using R

Max marks: 75  
Time: 3 hrs

SECTION-A (5 X 5 = 25 Marks)  
Answer any FIVE of the following

1. List the differences between vector and list.  
2. Write about vectors in R.  
3. List some of R packages. Explain.  
4. What are the applications of Data Analytics?  
5. What is meant by Correlation Analysis? Explain.  
6. Write the differences between histogram and bar graph.  
7. What is anova test? Explain.  

SECTION-B (10 X 5 = 50 Marks)  
Answer the following

9.a. What is a vector in R? Explain operations on vectors.  
   OR  
   b. Explain in detail about dataframe and arrays with example R code.

10.a. What is the use of packages in R? What are the R packages used in Data Visualization? Explain.  
   OR  
   b. How is R used in data analytics? Explain.

11.a. Compute the correlation coefficient for the following data  
      \[ \begin{array}{ccccccc}
          X & 68 & 64 & 75 & 50 & 64 & 80 \\
          y & 62 & 58 & 68 & 45 & 81 & 60
      \end{array} \]  
      OR  
      b. Explain chi-Square Test with example?

12.a. Explain logistic regression?  
   OR  
   b. What are the different types of Clustering Techniques? Explain?

13.a. What is Box plot? Explain importance of boxplot with example?  
   OR  
   b. Draw a pie chart for the following data  
      Section I, II, III, IV, V  
      No. of workers 220, 370, 190, 70, 250

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Model Question Paper
BCA 4th Semester
Design of Object Oriented Applications
Max marks:75

Time:3hrs

SECTION-A (5 X 5 = 25 Marks)
Answer any FIVE of the following

1. What are the elements of Object model?
2. What are the benefits of Object Oriented Development?
3. What is an Inception Phase? Explain with an Example?
4. What is an Elaboration Phase in Data Acquisition? Explain with an example?
5. What is Smalltalk? Explain.
6. What is Class Diagram with an Example?
7. What are the Software Quality Metrics?
8. What are the features of Object Oriented Programming Language?

SECTION-B (10 X 5 = 50 Marks)
Answer the following

9. a. What are the Phases of SDLC?
   OR
   b. Explain the level of abstraction in micro processors?

10. Explain about risk projection and risk management.
    OR
    b. Explain about risk projection and risk management

11. a. What are four Phases of Unified Process?
    OR
    b. Explain in detail about satellite-based navigation.

12. a. What are the Cryptanalysis Requirements for Inception? Explain with an example?
    OR
    b. What are the requirements for Weather monitoring Station? Draw a Deployment diagram for Weather monitoring System?

13. a. Differentiate between C and C++?
    OR
    b. Discuss about vacation tracking system.

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Model Question Paper  
BCA 4th Semester  
Data Mining and Data Warehousing  
Max marks: 75  
Time: 3hrs  

SECTION-A (5 X 5 = 25 Marks)  
Answer any FIVE of the following  

1. What are the steps involved in KDD process? State why data preprocessing is an important issue for data warehousing and data mining.  
2. What is data mining? Explain the differences between Knowledge discovery and data mining.  
3. What is data set? Describe different characteristics and types of data sets used in data mining.  
4. (a) What is a method used for classification that can be used even if some of the variables are categorical?  
   (b) What is the main idea of naïve Bayesian classification?  
5. What is data preprocessing? Explain in detail.  
6. What are OLAP operations in the multidimensional data model? Explain.  
7. Define KDD. Explain what are the Data Mining tasks.  

SECTION-B (10 X 5 = 50 Marks)  
Answer the following  

9. (a) What is data mining functionality? Explain different types of data mining functionality with examples.  
   OR  
   b. Explain the various data reduction techniques in the preprocessing step of data mining?  

10. (a) Differentiate OLAP and OLTP.  
    OR  
    b. Explain how data mining system integrated with database/data warehouse?  

11. (a) Discuss Apriori Algorithm with a suitable example and explain how its efficiency can be improved?  
    OR  
    b. Write the algorithm to discover frequent item sets without candidate generation and explain it with an example.  

12. (a) Explain different classification Techniques.  
    OR  
    b. Explain Baye"s theorem. Develop an algorithm for classification using Bayesian classification.  

13. (a) Describe K means clustering with an example.  
    OR  
    b. (a) What are the requirements for cluster analysis? Explain briefly.  
        (b) What is an outlier? Explain the types of outliers.
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Model Question Paper
BCA 4th Semester
Object Oriented Software Engineering

Max marks: 75

Time: 3 hrs

SECTION-A (5 X 5 = 25 Marks)
Answer any FIVE of the following

1. What is an agile process? Explain.
2. Explain different levels of Capability Maturity model and list the
   KPA's of each level.
3. "Data Modeling can be viewed as a subset of OOA." Comment on this
   statement and justify your comments.
4. What is the goal of requirements analysis phase? Give reasons why the
   requirements analysis phase is a difficult one.
5. What is the need of software testing? What are its main objectives and
   principles?
6. Explain the factors that affect software quality.
7. List the major risks in a software project. What are the major ways to
   abate the risk of cost and schedule overruns?
8. Explain spiral model with its merits and demerits.

SECTION-B (10 X 5 = 50 Marks)
Answer the following

9.a. Explain software development life cycle. Discuss various activities
     during SDLC.
     OR
     b. Explain the following:
        a) Water fall model
        b) Spiral Model.

10.a. What are the Phase of unified Process? Explain.
      OR
      b. What do meant by Team Organization? Explain agile process in Team
         Organization?

11.a. What do you mean by the terms cohesion and coupling in the context
      of software engineering? How are these concepts useful in arriving at a good
      design of a system?
      OR
      b. What is Inheritance? What are the different types of Inheritance?

12.a. Who should be involved in a requirement review? Draw a process model
      showing how
      a requirements review might be organized.
      OR
      b. What are the challenges of the design workflow.

13.a. What is black box testing? What is boundary value Analysis? Explain
      the technique specifying rules and its usage with the help of an example.
      OR
      b. Define maintenance. What are the types of software maintenance? Explain.
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Model Question Paper  
BCA 4th Semester  
Web Programming  

Max marks: 75  
Time: 3hrs

SECTION-A (5 x 5 = 25 Marks)  
Answer any FIVE of the following  

1. Explain with examples using of variables and constants in PHP.  
2. Write a PHP script to open, close, read and write into a file.  
3. What is PHP session, how session is created and destroyed.  
4. How do we write java script with HTML programming?  
   write HTML code and script to validate a text box for checking blank entries.  
5. What are directives? Name some of the most commonly used directives in AngularJS application.  
6. What are the benefits of AngularJS?  
7. Write a PHP code to validate the form consisting of a username, password and email fields.  
8. Write a PHP script for uploading a file to the server and display the uploaded files details.  

SECTION-B (10 x 5 = 50 Marks)  
Answer the following  

9. a. Write a PHP script for accessing array elements.  
   OR  
   b. Explain with examples using of Data Types and Operators in PHP.  

10. Write a PHP program to demonstrate invoking functions.  
    OR  
    b. Explain the predefined and user defined functions in PHP with an example.  

11. a. Write a PHP program for Working with Cookies?  
    OR  
    b. Discuss the integration of PHP with HTML?  
12. Javascript is referred to as Object-based programming language. Justify with an example.  
    OR  
    b. Write a JAVA Script for Phone number validation.  

13. a. What are the key features of AngularJS?  
    OR  
    b. How can you integrate AngularJS with HTML?
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Model Question Paper  
B.Sc 4th Semester  
Operating Systems  
Max marks: 75  

SECTON-A (5 X 5 = 25 Marks)  
Answer any FIVE of the following  

1. Explain various advantages and disadvantages of an operating system?  
2. Discuss the concept of states of process.  
3. What is meant by CPU scheduling? Explain different scheduling algorithms with examples.  
4. How deadlock situation is handled by an operating system? Explain.  
5. Explain the concept of System call?  
6. Explain difference between internal and external fragmentation.  
7. Define concept of File Operations. Give the process of directory structures and File management.  
8. Discuss Resource-Request Algorithm with respect to deadlock?  

SECTON-B (10 X 5 = 50 Marks)  
Answer the following  

9.a. Explain the need and various services provided an operating system?  
   OR  
   b. What are the different types of Operating Systems? Explain.  

10.a. Consider the following set of processes with the length of CPU burst time given in milliseconds:  

<table>
<thead>
<tr>
<th>Process</th>
<th>Burst Time</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>P2</td>
<td>29</td>
<td>1</td>
</tr>
<tr>
<td>P3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>P4</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>P5</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.  
   (a) What is the turnaround time of each process for using FCFS, SJF, a non preemptive priority  
       (a smaller priority number implies a higher priority) and RR (quantum=10) scheduling.  
   (b) What is the waiting time of each process for each of the scheduling algorithm in part a.  
   OR  
   b. Explain typical elements of inter process communication models?  

11.a. What is deadlock? Explain how deadlock can be avoided and prevented?  
   OR  
   b. What is meant by critical section problem? How it is managed? Explain the roles of semaphores for process synchronization.  

12.a. Explain paging and Segmentation?  
   OR  
   b. What is the concept of virtual memory? Discuss the benefits of virtual memory and use of thrashing?
13. a. What is meant by a file system? Discuss the various file methods in detail?

OR

b. Differentiate record, file and directory?
   (a) What is indexed access?
   (b) What is purpose of system call?
   (c) How scheduler differ from dispatcher?

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