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FACULTY OF ENGINERRING AND TECHNOLOGY

B.Tech. (Data Science / AI & ML) VI-Semester (CBCS) Examination

Prof. Elective-II (c)

BI and Analytics

Time: 3 Hours] [Max Marks: 70

Answer all Questions

PART – A (Marks: 5x2=10)

1 a) Define Business Intelligence (BI)

b) What is meant by the Design Phase in DSS?

c) Name one application of sentiment analysis in business.

d) Define uncertainty in decision support systems.

e) State two key features of expert systems.

PART – B (Marks: 5x12=60)

2 a) Explain the architecture of Business Intelligence (BI) systems. Discuss the major components and their roles in supporting organizational decision-making.

OR

b) Analyze how Big Data Analytics is reshaping business decision-making processes. Illustrate your answer with real-world scenarios or case studies.

3 a) Compare and contrast human decision-making with computer-assisted decision-making. Highlight the advantages and limitations of each approach.

OR

b) Describe the architecture and core functions of a Decision Support System (DSS). Explain how each component contributes to effective decision-making.

4 a) Explain the architecture and operational mechanism of Artificial Neural Networks (ANN). Illustrate your answer with suitable examples.

OR

b) Describe the working principles of Support Vector Machines (SVM). Discuss their role in classification tasks within data analytics.

5 a) Explain the significance of modeling decisions under uncertainty. How do simulation techniques assist in handling unpredictable outcomes?

OR

b) Explore the application of Multi-Criteria Decision-Making (MCDM) methods in complex business scenarios. How do such methods improve prioritization and resource allocation?

6 a) Compare expert systems with traditional decision-making methods. Highlight their advantages and limitations in practical applications.

OR

b) Describe the architecture of an expert system. Explain the function of each component with suitable examples.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (CSE/IT/Data Science/AI & ML) VI-Semester (CBCS) Examination

COMPUTER NETWORKS

Time: 3 Hours] [Max. Marks: 70

Answer all questions

PART-A (Marks: 5x2=10)

1. a) List different un-guided media.
   b) What is channel allocation problem?
   c) What are datagrams?
   d) What is a service access point in transport layer?
   e) What are uri and url?

PART-B (Marks: 5x12= 60)

2. a) Discuss TCP/IP reference model with a neat diagram.

   OR

   b) What are switched and virtual circuit networks? Compare them.

3. a) Explain different framing techniques employed by data link layer.

   OR

   b) Write about IEEE Ethernet protocol.

4. a) Explain any two dynamic routing protocols employed by network layer.

   OR

   b) Discuss IPv4 address classification with exampies.

5. a) Write about different elements of transport layer.

   OR

   b) Discuss how is TCP connection establishment done?

6. a) Explain POP3 protocol in detail.

   OR

   b) Write a brief note on symmetric key algorithms.

FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Data Science / AI & ML) VI-Semester (CBCS) Examination

Introduction to Data Analytics and Visualization

Time: 3 Hours] [Max. Marks: 70

Answer all Questions

PART-A (Marks: 5x2=10)

1 a) Name any three tools commonly used in the Data Preparation phase and their purpose.

b) What is multiple linear regression and how is it different from simple linear regression?

c) Define the Box-Jenkins methodology in Time Series analysis.

d) Explain the concept of sentiment analysis in text mining.

e) What is the role of the ggplot2 package in R?

PART-B (Marks: 5x12=60)

2 a) Explain the entire Data Analytics Lifecycle in detail. Describe each phase with its key activities and importance.

OR

b) Discuss the importance of the Discovery and Data Preparation phases in the Data Analytics Lifecycle. What tools and methods are commonly used in these phases?

3 a) Compare Linear Regression and Logistic Regression. Explain their similarities and differences.

OR

b) What is Multiple Linear Regression? Discuss the importance of checking for multicollinearity and how to handle it.

4 a) What is the ARIMA model? Describe the components of ARIMA and how it is used for forecasting time series data.

OR

b) Explain the Box-Jenkins methodology used in time series analysis. Discuss the steps involved and the importance of each step.

5 a) Discuss the seven key practices of text analytics. Explain how each practice contributes to the success of text analysis.

OR

b) What is Term Frequency-Inverse Document Frequency (TF-IDF)? Discuss its importance and how it is used in text mining.

6 a) Explain the different types of visualizations that can be created in R for analyzing single and multiple variables with functions.

OR

b) Describe the process of importing and exporting data in R. What are the different functions used for reading and writing various file types? Give suitable examples.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Data Science) VI-Semester (CBCS) Examination

Machine Learning

Time: 3 Hours] [Max. Marks: 70

Answer all questions

PART – A (Marks: 5 x 2 = 10)

1 a) Define Batch Learning and Online Learning.

b) Define overfitting.

c) What is the role of entropy in Decision Trees?

d) State the function of a kernel in SVM.

e) Mention one application of dimensionality reduction

PART – B (Marks: 5 x 12 = 60)

2 a) Describe various applications of Machine Learning across domains.

OR

b) Differentiate between Supervised, Unsupervised, and Reinforcement Learning with examples.

3 a) Explain evaluation metrics: Precision, Recall, F1-score, and ROC curve in detail.

OR

b) Describe how Cross-validation works. Explain its importance in training classifiers.

4 a) Explain K-Nearest Neighbors algorithm with advantages and limitations.

OR

b) How is information gain calculated in the ID3 algorithm?

5 a) Describe Hard Margin and Soft Margin classification in SVM.

OR

b) What is the architecture of a Multilayer Perceptron? How is it trained using backpropagation?

6 a) Explain AdaBoost and Gradient Boosting with suitable examples.

OR

b) Describe Random Forests. How do they overcome the limitations of a single Decision Tree?

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Data Science / AI & ML) VI-Semester (CBCS) Examination

Open Elective-I (c)

Fundamentals of IOT

Time: 3 Hours] [Max. Marks: 70

Answer all questions

PART – A (Marks: 5 x 2 = 10)

1 a) Discuss the characteristics of IoT.
b) Explain the protocol used to link the devices in IoT.
c) What is an actuator?
d) What are advantages of Cloud?
e) What are the various components and business model patterns in the Internet of Things?

PART – B (Marks: 5 x 12 = 60)

2 a) What are the main challenges in Internet of Things (IoT)?

OR

b) What kind of information do Internet of Things (IoT) objects communicate?

3 a) Which protocol is used to link all the devices in the IoT? Explain in detail.

OR

b) Discuss about IoT functional blocks?

4 a) Explain clearly, the procedure to interface an analog sensor with Arduino programming.

OR

b) What are the distributions supported by Raspberry Pi?

5 a) Describe different Cloud Service Models.

OR

b) Explain the Cloud Platform for IoT/M2M Applications/Services.

6 a) Discuss the role of Data Analytics in Internet of Things (IoT).

OR

b) What is the use of Business Model canvas? Explain each template box.
