

CBCS SCHEME

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21CS61

Sixth Semester B.E. Degree Examination, June/July 2024 Software Engineering and Project Management

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define software process. Explain generic software process framework. (10 Marks)
b. Define process patterns. Explain the means of describing the patterns. (10 Marks)

OR

- 2 a. Explain the different types of evolutionary process models. (10 Marks)
b. Explain waterfall model. (10 Marks)

Module-2

- 3 a. Define requirements engineering. Explain its distinct tasks. (10 Marks)
b. Explain various approaches in requirements modeling. (10 Marks)

OR

- 4 a. Explain requirements elicitation. (10 Marks)
b. Explain preliminary use case diagram for the Safe Home system. (10 Marks)

Module-3

- 5 a. Explain principles of agility. (10 Marks)
b. Explain the process of extreme programming. (10 Marks)

OR

- 6 a. Explain scrum process model. (10 Marks)
b. Explain Feature Driven Development (FDD). (10 Marks)

Module-4

- 7 a. Explain the significance of efficient project management. (10 Marks)
b. Define project. Explain the characteristics of a project. (10 Marks)

OR

- 8 a. Explain the different ways of categorizing software projects. (10 Marks)
b. Explain the activities of management in doing management control. (10 Marks)

Module-5

- 9 a. Define software quality. Explain quality specification in detail. (10 Marks)
b. Why do we need software quality models? Explain Garvin's quality dimension. (10 Marks)

OR

- 10 a. Explain McCall's model. (10 Marks)
b. Explain ISO 9126's major external software quality characteristics. (10 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2024 Data Science & its Applications

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Describe dispersion and variance and write the python code to compute the variance. (07 Marks)
- b. Discuss random variables with an example in detail. (07 Marks)
- c. Explain standard deviation and interquartile range and write python code to compute standard deviation and interquartile range. (06 Marks)

OR

- 2 a. Explain Bar Chart, Line Chart and Histogram with help of diagram. (07 Marks)
- b. Discuss Conditional probability with an example in detail. (07 Marks)
- c. Explain Correlation and describe the impact of outlier on correlation. (06 Marks)

Module-2

- 3 a. Explain P-Values with an example. (07 Marks)
- b. Write Python program to plot Line chart by assuming your own data and explain the various attributes of line chart. (06 Marks)
- c. Describe A/B test with an example. (07 Marks)

OR

- 4 a. A certain disease affects 1% of the population. A test for the disease has a 99% sensitivity (true positive rate) and a 99% specificity (true negative rate). If a person tests positive, what is the probability that they actually have the disease? (07 Marks)
- b. Describe how data can be manipulated by considering an example. (06 Marks)
- c. Explain cleaning and munging of data with an example. (07 Marks)

Module-3

- 5 a. Explain support vector machines in detail. (07 Marks)
- b. Discuss digression in detail. (06 Marks)
- c. Discuss the need for fitting the model in multiple regressions. (07 Marks)

OR

- 6 a. Discuss Goodness of Fit in detail. (06 Marks)
- b. Write Python snippet for Accuracy, Precision, Recall and F_1 score. (07 Marks)
- c. Explain Feature Extraction and Feature selection. (07 Marks)

Module-4

- 7 a. Discuss perceptron neural network in detail. (10 Marks)
- b. Explain layer abstraction in deep learning. (10 Marks)

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OR

- 8 a. Write python program to compute loss and optimization in deep learning. (10 Marks)
b. Explain feed forward neural network in detail with a neat diagram. (10 Marks)

Module-5

- 9 a. Describe n-Gram language models in detail. (10 Marks)
b. Explain Eigen Vector centrality in detail. (10 Marks)

OR

- 10 a. Explain item based collaborative filtering. (10 Marks)
b. Discuss matrix factorization in detail. (10 Marks)

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CBCS SCHEME

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21AI63

Sixth Semester B.E. Degree Examination, June/July 2024 Machine Learning

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Illustrate the basic design issues and approaches to machine learning. (08 Marks)
- b. What is machine learning? Explain with an example why to use machine learning. (04 Marks)
- c. Explain the main challenges of machine learning that can arise when selecting a learning algorithm and training it on data. (08 Marks)

OR

- 2 a. Discuss the broad categories of machine learning system. (10 Marks)
- b. Write Find-S algorithm and apply the same for the given instance.

| Location | Price | Size | Condition | Buy House |
|-----------|-----------|--------|-----------|-----------|
| Urban | Expensive | Large | New | Yes |
| Sub urban | Moderate | Medium | Old | No |
| Urban | Moderate | Small | New | Yes |
| Urban | Moderate | Large | Old | Yes |

(10 Marks)

Module-2

- 3 a. Illustrate various methods to prepare the data for machine learning algorithms. (10 Marks)
- b. Explain multilabel classification and multi output classification with code snippet. (10 Marks)

OR

- 4 a. Explain the various performance measure to evaluate a classifier with an example:
 - (i) Measuring accuracy using cross-validation.
 - (ii) Confusion matrix
 - (iii) Precision
 - (iv) Recall
 - (v) The ROC curve. (10 Marks)
- b. Explain how do you frame the problem and choose an appropriate performance measures for a dataset in a machine learning project. (06 Marks)
- c. Explain Grid search method to fine-tune the model. (04 Marks)

Module-3

- 5 a. What is gradient descent. Explain various types of gradient descent with necessary diagrams. (10 Marks)
- b. Show that how SVM make predictions using Quadratic programming and Kernelized SVM. (10 Marks)

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OR

- 6 a. Explain the following with respect to logistic regression :
- (i) Estimating probabilities. (10 Marks)
 - (ii) Training and cost functions. (10 Marks)
- b. Discuss non-linear SVM classification. How can you use Polynomial Kernel, Gaussian and RBF Kernel? (10 Marks)

Module-4

- 7 a. Explain how decision trees are trained, visualized and used in making predictions. (10 Marks)
- b. Explain Bagging and Pasting with an example. (10 Marks)

OR

- 8 a. Explain CART algorithm. Discuss regularization hyper parameters in Decision trees. (10 Marks)
- b. What is Boosting? Explain AdaBOOST and gradient Boosting. (10 Marks)

Module-5

- 9 a. What is Bayes theorem. Describe Brute-force Map learning algorithm. (08 Marks)
- b. Discuss the minimum description length algorithm. (08 Marks)
- c. Explain the steps of Gibbs algorithm. (04 Marks)

OR

- 10 a. Write EM algorithm and explain in details. (10 Marks)
- b. Explain Naïve Bayes classifier with an example. (10 Marks)

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21AI641

Sixth Semester B.E. Degree Examination, June/July 2024 Business Intelligence

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Describe the three major managerial roles and list some of the specific activities in each. (10 Marks)
b. What are the nine cells of the decision frame work? Explain what each is for. (10 Marks)

OR

- 2 a. Explain BI Architecture. (10 Marks)
b. Explain three types of analytics with diagram. (10 Marks)

Module-2

- 3 a. List and explain the classifications of DSS. (10 Marks)
b. Explain the structure of the Data Management Subsystem. (10 Marks)

OR

- 4 a. Explain the structure of the model management subsystem. (10 Marks)
b. Explain user interface subsystem and knowledge based management subsystem. (10 Marks)

Module-3

- 5 a. List and explain characteristics of Data Warehousing. (10 Marks)
b. Define: (i) Data mart (ii) ODS (iii) EDW (iv) Metadata (e) Data warehouse (10 Marks)

OR

- 6 a. Describe the three steps of ETL process with diagram. (10 Marks)
b. List the 10 most important factors that affect the architecture section decision and even list four measures to assess the success of the architecture. (10 Marks)

Module-4

- 7 a. Define knowledge management and describe its purpose. Distinguish between knowledge and data. (10 Marks)
b. Draw and explain comprehensive KM architecture designed around all inclusive knowledge repository. (10 Marks)

OR

- 8 a. List and explain the characteristics of knowledge. (10 Marks)
b. Describe the KMS cycle with diagram. (10 Marks)

Module-5

- 9 a. Explain why we need ES. What are the major features of ES? (10 Marks)
b. Explain the structure of an Expert System. (10 Marks)

OR

- 10 a. Explain the process of development of expert system. (10 Marks)
b. List and explain generic categories of expert system. (10 Marks)

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21CS642

Sixth Semester B.E. Degree Examination, June/July 2024 Advanced Java Programming

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What are enumerations? Explain compareTo(), equals() and values() method with example. (10 Marks)
- b. Explain how to obtain Annotation at Run Time by using Reflection. (10 Marks)

OR

- 2 a. Explain the following with examples: (i) wrappers (ii) autoboxing (iii) unboxing (10 Marks)
- b. Define annotations. Explain the following built in annotations: (i) override (ii) inherited (10 Marks)

Module-2

- 3 a. Define Generics. Explain the generic class with two type parameters. (10 Marks)
- b. Write a program to illustrate bounded wildcards with respect to generics. (10 Marks)

OR

- 4 a. Elaborate how raw type is created in generic class and list its disadvantages. (10 Marks)
- b. Describe the ambiguity of errors in generic class. (10 Marks)

Module-3

- 5 a. Define string. Write a program to demonstrate the use of constructors in string. (10 Marks)
- b. Explain how to modify a string by using following methods:
(i) Substring() (ii) Replace() (iii) Trim() (10 Marks)

OR

- 6 a. Illustrate any four character extraction method with examples. (10 Marks)
- b. What is StringBuffer? Explain any five StringBuffer methods with example. (10 Marks)

Module-4

- 7 a. Define cookie. List out methods defined by cookie. Write a Java program to add a cookie. (10 Marks)
- b. Write a Servlet program that read parameter names and values of print. (10 Marks)

OR

- 8 a. Define JSP. Explain different types of JSP tags with suitable examples. (10 Marks)
- b. Develop a Servlet program that illustrate how to use cookies. (10 Marks)

Module-5

- 9 a. List and explain JDBC Drivers types. (10 Marks)
- b. List and explain the various statements objects in JDBC. (10 Marks)

OR

- 10 a. Explain the three kinds of exceptions occurred in JDBC. (10 Marks)
- b. Explain transaction processing in JDBC. Write a program to execute a Database transaction. (10 Marks)

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21CS651

Sixth Semester B.E. Degree Examination, June/July 2024 Introduction to Data Structures

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define an array. How to declare and initialize one dimensional, two dimensional and multi-dimensional array? (10 Marks)
- b. Write a C program to multiply 2 matrix A and B and display the resultant matrix C. (10 Marks)

OR

- 2 a. Explain the nested structure with example. Give differences between Union and Structure. (10 Marks)
- b. List out the dynamic memory allocation function with its syntax. Write a C program to swap two numbers. (10 Marks)

Module-2

- 3 a. Define stack. Write a C program to implement the different operations of stack. (10 Marks)
- b. List out the applications of stack. Convert the following infix expression into its equivalent postfix expression.
 $((A + B) - C * (D / E)) + F$ (05 Marks)
- c. Deduce the contents of empty stack after the execution of following operations in sequence.
push(6), push(8), push(-1), pop(), push(7), pop(), pop() (05 Marks)

OR

- 4 a. What is Queue? Explain primitive operations and types of Queue using logical representation. (10 Marks)
- b. Write a C function to insert, delete and display an element in a Linear Queue. (10 Marks)

Module-3

- 5 a. Define self-referential structure. Give its C declaration. Explain the different types of linked list with logical representation. (10 Marks)
- b. Write a C function for the following operation on singly linked list:
i) Insert node ii) Delete node iii) Display node (10 Marks)

OR

- 6 a. What are the drawbacks of singly linked list? How to overcome it? List out the applications of linked list. (07 Marks)
- b. Write a C function for the following operations on circular linked list:
i) Insert node at front ii) Delete node at rear (08 Marks)
- c. Write a C function to count numbers of elements present in singly linked list. (05 Marks)

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Module-4

- 7 a. Explain the binary tree concepts with examples:
i) Strictly binary tree ii) Complete Binary tree
iii) Almost Complete Binary tree iv) Binary search tree (10 Marks)
- b. Construct a Binary Search Tree and find the 3 order traversal of tree.
15, 20, 8, 27, 11, 2, 12, 6, 3, 10, 7, 22, 30 (10 Marks)

OR

- 8 a. Write a C function to find the maximum item in Binary search tree. (05 Marks)
- b. Define Expression Tree. Construct the expression tree
 $((6 + (3 - 2) * 5) \wedge (2 + 3))$ (07 Marks)
- c. Write iterative functions for preorder, postorder and inorder traversals. (08 Marks)

Module-5

- 9 a. Write a C program to array numbers in ascending order using Bubble Sort. (10 Marks)
- b. Design an algorithm for insertion sort. Trace the sorting elements using insertion sort.
20, 10, 30, 15, 25, 5 (10 Marks)

OR

- 10 a. Write a C code to search an item using linear search. (10 Marks)
- b. Define searching. List out the advantages and disadvantages of Binary Search. Discuss the difference between Binary search and Linear search. (10 Marks)

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21CS653

Sixth Semester B.E. Degree Examination, June/July 2024

Introduction to Cyber Security

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Who are Cyber Criminals? Discuss the three groups of Cyber Criminals. (10 Marks)
b. Define Cyber Crime. Explain any four classifications of cyber crimes. (10 Marks)

OR

- 2 a. Write a short notes on :
i) Spamming ii) Cyber defamation iii) Salami Attacks
iv) Online Frauds v) Software piracy. (10 Marks)
b. Discuss the key provisions under the ITA2000 for cyber crimes. (10 Marks)

Module-2

- 3 a. With neat sample network, explain the categories of vulnerabilities that hackers typically search. (10 Marks)
b. What are the five phases involved in planning cyber crime and discuss. (10 Marks)

OR

- 4 a. What is social engineering? Discuss Human based social engineering with a suitable example. (10 Marks)
b. What are the different attacks launched with attack vector and explain in detail. (10 Marks)

Module-3

- 5 a. Discuss the proxy server and anonymizers in cyber security. (10 Marks)
b. How keyloggers can be used to commit a cybercrime? (10 Marks)

OR

- 6 a. Define Dos Attack. Discuss the types of Dos attacks. (10 Marks)
b. How to secure the wireless Networks in the cyber security? (10 Marks)

Module-4

- 7 a. What is criminal profiling? Explain its types of profiling methods. (10 Marks)
b. List any five common categories victims of cyber crime. (10 Marks)

OR

- 8 a. Explain the characteristics or qualities of Good Cyber investigator. (10 Marks)
b. List and explain three securing data with cryptographic algorithms. (10 Marks)

Module-5

- 9 a. What is IDS? Explain the monitoring techniques of IDS. (10 Marks)
b. Write a short notes on :
i) Alarms ii) Alerts iii) Firewall logs iv) Reports. (10 Marks)

OR

- 10 a. How are the role of understanding of Evidence in a criminal case. (10 Marks)
b. Briefly explain the document Evidence in the cyber crime cases. (10 Marks)

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