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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
November - 2024
DESIGN AND ANALYSIS OF ALGORITHMS

Time : 2 ½ Hours

Max. Marks : 60

PART A

Answer any **SIX** of the following

(6x2=12)

- 1.a) What do you mean by non-recursive algorithms?
- b) Write any two characteristics of Greedy algorithm.
- c) How the Travelling Salesman Problem can be solved?
- d) What is Knapsack problem?.
- e) How do you perform backtracking?
- f) What is a back edge? Give an example.
- g) What is the purpose of single source shortest problem ?
- h) What do you mean by job sequencing?

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PART - B

Answer any **ONE** full question from each unit.

(4x12=48)

Unit I

2. a. Write an algorithm to find GCD of 2 numbers and Explain the working. (6)
- b. Explain the fundamentals of the Analysis of Algorithm Efficiency. (6)
3. a. Let $f(n)=10n^3+8$. Express $f(n)$ using Big-Oh , Big-Omega and Big Theta notations. (6)
- b. Define asymptotic notation used for best, worst and averages case analysis of an algorithm. (6)

Unit -II

4. a. Write a C program to perform sequential search and analyse its time complexity. (6)
- b. A list contains the elements [4, 8, 15, 16, 23, 42]. Perform a bubble sort algorithm and show the steps involved. (6)
5. a. Find an optimal solution for the knapsack instance $n=4$, $m=60$, $(P_1, P_2, P_3, P_4) = (280,100,120,120)$, $(W_1, W_2, W_3, W_4)=(40,10,20,24)$ using balanced strategy. (6)
- b. Explain Brute force String matching using an example. (6)

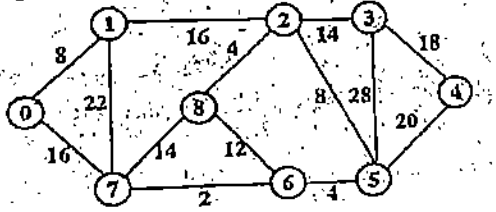
Unit- III

6. a. Write the pseudo-codes of Inorder, Preorder and Postorder Binary tree traversals. (6)
- b. Write an algorithm for Insertion sort using Decrease and conquer. Give the time complexity and efficiencies. (6)
7. a. Explain Topological sorting using DFS method for the graph given below (6)
- b. Explain the Starseen's matrix with an example? Compare the complexity of an algorithm. (6)

Unit-IV

- 8. a. Define NP and NP hard problems .Give example for each (6)
- b. What is Numeric Algorithm? What are the challenges of numerical algorithms? (6)

- 9. a. Write and explain the Prim's algorithm and write the time complexity. (6)
- b. Find the minimum spanning tree for the following graph using Kruskals algorithm. (6)



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(2021 Batch onwards)

G 601 DC2.5

Reg No :

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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
November - 2024
STATISTICAL COMPUTING AND R PROGRAMMING

Time : 2 ½ Hours

Max. Marks : 60

PART A

Answer any **SIX** of the following

(6x2=12)

1. a) List the different data types available in R Language.
- b) Write the syntax to define a function. Give an example.
- c) Differentiate between positive and negative correlation.
- d) How do you extract a portion of the data from a data frame based on some condition?
- e) Write R code to perform the uniform distribution of $P(x > 230)$ between 200 and 240
- f) Write the R code to find the largest element and smallest element among. 12, 22, 4, 67, 100, 4
- g) What is the significance of α (alpha) and p-value in hypothesis testing.
- h) Define skewness. How does positive and negative skewness differ?

PART - B

Answer any **ONE** full question from each unit.

(4x12=48)

Unit I

2. a. Explain arithmetic, relational and logical operators in R with examples. (6)
- b. Explain with example, the different ways of accessing and adding elements from and to an existing dataframe. (6)
3. a. What is the significance of factor? How do you create a factor in R Language? How to add a level to an existing factor? (6)
- b. What is the significance of cbind() and rbind() functions? Give suitable example. (6)

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Unit -II

4. a. Explain the definition and calling of functions with example. (6)
- b. How to handle exception in R script? Explain with an example. (6)
5. a. Explain the different conditional statements in R Language. (6)
- b. How do you read data from the files? Explain with examples. (6)

Unit- III

6. a. With a neat diagram, explain normal distribution graph. What is the R code to obtain normal distribution probability mass function? (6)
- b. A problem in mathematics is given to two students A and B whose chances of solving it are 1/2 and 1/4 respectively. What is the probability that the problem will be solved, if both of them try independently. (6)
7. a. Write a R - script to find (6)
 - i. Which of the two cricketers is a better scorer on an average?
 - ii. Which of them is more consistent?The cricketers whose runs made in 10 innings is given as follows.
innings : 1 2 3 4 5 6 7 8 9 10
Cricketer A: 31 48 13 51 38 43 50 36 47 82
Cricketer B: 51 5 12 83 37 112 42 18 79 20
- b. Define binomial distribution. Write the formula to find the probability mass function of binomial distribution. Write the R code to implement the formula without using direct built in function. Which of the R language function replaces the same? (6)

Contd...2

Unit-IV

8. a. Find the correlation coefficient for the following data and the type of correlation between X and Y. (6)
 X: 19 24 12 23 19 16 Y: 9 22 20 14 22 18 Write a R code to implement the same.

- b. 440 voters polled in a simple random sample to find out which political party they prefer. The results of the survey are shown in the table below: (6)

Republican Democrat Independent Total		
Male	Female	Total
100	140	240
70	60	130
30	20	50
200	220	420

To see if gender is linked to political party preference, perform a Chi-Square test of independence.

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9. a. Determine if there is a significant difference in the average scores between the two teams. The following data is given: (6)
 Team A: Score: 65, 68, 70, 63, 67
 Team B: Score: 62, 66, 69, 64, 68 Implement the R code for the same
- b. What is the significance of T-test analysis? Explain the different types and differentiate between them. (6)

(2021 - Batch onwards)

G 601 DE1.5

Reg No :

St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
November - 2024
CLOUD COMPUTING

Time : 2 ½ Hours

Max. Marks : 60

PART A

Answer any **SIX** of the following

(6x2=12)

- 1.a) What is virtualization in cloud computing?
- b) Differentiate between HTTP and HTTPS.
- c) Give any two examples for infrastructure as a service (SAAS) provider.
- d) Expand PCI-DSS.
- e) What is full system backup?
- f) Define cloud storage.
- g) Define composibility.
- h) Mention two applications of cloud computing in Health Care.

PART - B

Answer any **ONE** full question from each unit.

(4x12=48)

Unit 1

2. a. What is cloud computing? Explain different characteristics of cloud computing. (6)
- b. Explain Cloud Deployment model. (6)

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OR

3. a. Explain stateless and Modular in cloud Computing. (6)
- b. Explain IaaS and PaaS with an example. (6)

Unit -II

4. a. Explain Cloud management standards. (6)
- b. With a help of neat diagram explain security service boundary. (6)

OR

5. a. Explain the Identity protocol standards in cloud computing. (6)
- b. Explain term of the acronym FCAPS. (6)

Unit- III

6. a. Briefly explain Storage virtualization and Operating System virtualization. (6)
- b. Explain CDMI and OCCI. (6)

OR

7. a. Write a note on Managed and Unmanaged cloud storage. (6)
- b. Explain the advantages of virtualization in cloud computing. (6)

Unit-IV

8. a. Explain Amazon Compute services. (6)
- b. Discuss the application of cloud in Media Applications. (6)

OR

9. a. Discuss the applications of cloud in Social Networking. (6)
- b. Explain the life cycle of a GoogleAppEngine Application with respect to Java SDK. (6)

(2021 Batch onwards)

G 601 VO1.5

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**St Aloysius College (Autonomous)
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**B.C.A. Semester V – Degree Examination
November - 2024
DIGITAL MARKETING**

Time : 2 ½ Hours

Max. Marks : 60

PART A

Answer any **SIX** of the following

(6x2=12)

- 1.a) What is an electronic payment system? Give example.
- b) Which year is considered the beginning of the digital marketing era, and what major event triggered its rise?
- c) Differentiate between social media advertising and social media content.
- d) Mention two features of Instagram.
- e) Define Content marketing. Mention its two goals.
- f) What are the limitations of email marketing?
- g) What is meant by Off-page SEO?
- h) What is Campaign report generation?

PART - B

Answer any **ONE** full question from each unit.

(4x12=48)

Unit I

2. a. Differentiate between behavioral and psychographic marketing segmentaiton? (6)
- b. What is e-cash? How does it differ from physical cash? (6)

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3. a. Explain the steps to execute digital marketing plan. (6)
- b. Explain the different strategies of digiatal marketing. (6)

Unit -II

4. a. How can a content calendar help in maintaining posting consistency? (6)
- b. What is meant by Social media marketing? Explain its key features? (6)
5. a. Explain the factors affecting social media content strategy (6)
- b. What do you mean by social media platforms? Describe their influence on digital marketing . (6)

Unit- III

6. a. What is Location-based marketing? Explain the various types. (6)
- b. What is meant by mobile advertising? Explain different forms of mobile advertising. (6)
7. a. Explain the engagement metrics In content marketing. (6)
- b. What is Infographics? Explain its features. (6)

Unit-IV

8. a. Explain the importance of data visualization. (6)
- b. What is meant by buying models? Explain the types of buying models. (6)
9. a. Explain the different analytical metrics used for Email marketing. (6)
- b. What is Search Engine Marketing? Explain its features. (6)

(2021 Batch onwards)

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G 601 DC3.5

**St Aloysius College (Autonomous)
Mangaluru**

B.C.A. Semester V - Degree Examination

November - 2024

SOFTWARE ENGINEERING

Max. Marks : 60

Time : 2 ½ Hours

PART A

(6x2=12)

Answer any SIX of the following

- 1.a) What are the main objectives of software testing?
- b) Define Software Engineering.
- c) What is test oracle in context of software testing?
- d) Give the difference between verification and validation in software engineering.
- e) What is low-level design?
- f) Define static testing.
- g) What is context model? Give an example.
- h) List the different classes of software.

PART - B

(4x12=48)

Answer any ONE full question from each unit.

Unit -I

2. a. Explain the basic phases of software development life cycle. (6)
- b. Explain in detail various components of SRS. (6)
3. a. Explain spiral model with a neat diagram. (6)
- b. Explain in detail, requirement engineering task. (6)

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Unit -II

4. a. What is the importance of class diagram? Give an example. (6)
- b. Explain Software Reliability issues.Explain the reliability metrics MTTF, MTBF, MTTR and POFOD. (6)
5. a. Define data flow models and discuss how they help in understanding the flow of Information within a system. (6)
- b. Explain in detail Capability Maturity Model. (6)

Unit- III

6. a. Explain different types of system testing. (6)
- b. Explain the different levels of cohesion that a software module might exhibit. (6)
7. a. Differentiate the functional versus object-oriented approach to software design. (6)
- b. What do you mean by coupling? Explain different types of coupling. (6)

Unit-IV

8. a. Explain the different categories of software maintenance. (6)
- b. What is software version control? How does it benefit a software development team. (6)
9. a. Explain the importance of software maintenance. (6)
- b. Write a note on software configuration management activities. (6)
