

Reg. No.

--	--	--	--	--	--	--	--	--	--	--



**BCACAEN 501**

**Fifth Semester B.C.A. Degree Examination, December 2023/January 2024  
(NEP-2020) (2023-2024 Batch Onwards)  
CLOUD COMPUTING (DSE – E1)**

Time : 2 Hours

Max. Marks : 60

**Note :** Answer *any six* questions from Part – A and *one full* question from each Unit in Part – B.

**PART – A**

1. a) Define cloud computing. (6×2=12)
- b) Differentiate cluster computing and grid computing.
- c) List the different layers of cloud computing architecture.
- d) What are hypervisors ? List three modules of it.
- e) List the services installed in the Aneka container.
- f) What are Aneka daemon and Aneka repository ?
- g) What is AWS ? List any two types of services provided by AWS.
- h) What is AppFabric ? List the services it provides.

**PART – B**

**UNIT – I**

2. a) Explain in brief any three different computing paradigms.
- b) Explain various applications of cloud computing. (6+6)
3. a) Explain the features of cloud computing.
- b) Explain in brief the advantages and disadvantages of cloud computing. (6+6)

P.T.O.



UNIT – II

- 4. a) Write a note on PaaS.
- b) Explain different characteristics of virtualization. **(6+6)**
- 5. a) Write a note on IaaS.
- b) Explain different types of clouds. **(6+6)**

UNIT – III

- 6. a) Explain in brief the logical organization of Aneka clouds.
- b) Explain public cloud deployment mode. **(6+6)**
- 7. a) Explain different components of the Aneka framework.
- b) Explain the service life cycle of the Aneka service model. **(6+6)**

UNIT – IV

- 8. a) What is an EC2 Instance ? Explain different categories of EC2.
  - b) Write a note on the Application life cycle in Google AppEngine. **(6+6)**
  - 9. a) What are storage services ? Explain S3 key concepts in storage services.
  - b) Explain different storage services of Microsoft Azure. **(6+6)**
-

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**BCACAVN 501**

**Fifth Semester B.C.A. Degree Examination, December 2023/January 2024  
(NEP-2020) (2023 – 24 Batch Onwards)  
DIGITAL MARKETING (Voc – 1)**

Time : 2 Hours

Max. Marks : 60

**Note : Answer any six questions from Part – A and any one full question from each Unit in Part – B.**

**PART – A**

**(6×2=12)**

1. a) What is digital marketing ?
- b) Expand PPC and ROI.
- c) Define CRM analytics.
- d) List any four features of Facebook and Instagram.
- e) What is email segmentation ?
- f) Name four important Email marketing metrics.
- g) What is KPI ? Give example.
- h) Name any 4 tools for data visualization.

**PART – B**

**Unit – I**

2. a) Write a note on history and evolution of digital marketing.
- b) Explain the difference between traditional and digital marketing. **(6+6)**
3. a) Explain characteristic of digital marketing.
- b) Explain digital marketing strategy. **(6+6)**

**P.T.O.**



**Unit – II**

- 4. a) List and explain basic features that are commonly available in most of social media apps.
- b) Write the benefits of social media marketing. **(6+6)**
- 5. a) Write an elaborative note on social media advertising.
- b) Explain social media analytics work flow with diagram. **(6+6)**

**Unit – III**

- 6. a) Explain how to build email list.
- b) Explain the benefits of Email automation. **(6+6)**
- 7. a) Explain the ways to deliver a Successful Email Marketing Campaign.
- b) Explain the types of data that can be analyzed in email marketing. **(6+6)**

**Unit – IV**

- 8. a) Explain any 4 mobile advertising strategies.
  - b) Explain how does Mobile App Marketing Work. **(6+6)**
  - 9. a) Write a note on Power BI and Tableau.
  - b) Explain any six key concepts involved in analytics and reporting. **(6+6)**
-

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**BCACACN 503**

**Fifth Semester B.C.A. Degree Examination, Dec. 2023/Jan. 2024  
(NEP 2020) (2023-2024 Batch Onwards)  
SOFTWARE ENGINEERING  
(DSCC)**

Time : 2 Hours

Max. Marks : 60

**Note :** Answer any six questions from Part – A and one full question from each Unit in Part – B.

**PART – A**

1. a) Define Software Engineering. (6×2=12)
- b) Give any two advantages of Incremental Development Process.
- c) Define the term stakeholder. Mention the different categories of stakeholders.
- d) Differentiate Validity checks and Consistency checks.
- e) Name the four elements of design patterns.
- f) What is architectural design ?
- g) What is Integration testing ?
- h) Describe Junit.

**PART – B**

**Unit – I**

2. a) Explain waterfall model with a neat diagram.
- b) Explain four phases of requirement Engineering Process. (6+6)
3. a) Write a note on professional and ethical responsibilities of Software Engineer.
- b) Explain different attributes of good software. (6+6)

P.T.O.



**Unit – II**

- 4. a) Explain the general process model of the elicitation and analysis process with the diagram.
- b) Explain the dataflow diagram of order processing. **(6+6)**
- 5. a) Write a note on :
  - i) State-machine model
  - ii) Object model
- b) Explain the components of a CASE tool for structured method support with a diagram. **(6+6)**

**Unit – III**

- 6. a) What is shared repository model ? Write the advantages and disadvantages.
- b) Explain architectural design with an example. **(6+6)**
- 7. a) Explain client-server model with an example diagram.
- b) List and explain four essential elements of design patterns. **(6+6)**

**Unit – IV**

- 8. a) Explain V model (planning Verification and Validation) with diagram.
  - b) Explain the various approaches involved in test case design. **(6+6)**
  - 9. a) What are the different components that are tested in unit testing ?
  - b) Explain steps involved in bottom-up integration testing.
  - c) Explain structural testing. **(4+4+4)**
-

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**BCACACN 502**

**Fifth Semester B.C.A. Degree Examination, December 2023/January 2024  
(NEP 2020) (2023 – 24 Batch Onwards)  
STATISTICAL COMPUTING AND R PROGRAMMING (DSCC)**

Time : 2 Hours

Max. Marks : 60

- Note :** 1) Answer any six questions from Part – A and one full question from each Unit of Part – B.  
2) Scientific calculator is allowed.  
3) Statistical chart will be provided by the college.

**PART – A**

**(6×2=12)**

1. a) If  $baz < -c(1, -1, 0.5, -0.5)$  and  $qux < -3$ , find the value of  $baz+quax$ .
- b) How do you count the number of individual characters in a string ? Give an example.
- c) What is purpose of `switch ()` function in R ? Give example.
- d) Define median. Determine the median for the numbers 2, 4, 8, 4, 6, 2, 7, 8, 4, 3, 8, 9, 4, 3, 5.
- e) What is an experiment and event ? Give example.
- f) List the characteristics of normal distribution.
- g) What is hypothesis ? Give an example.
- h) What are the uses of Regression analysis ?

**PART – B**

**Unit – I**

2. a) Explain `rep` and `length` functions on vectors with example.
- b) How do you create arrays in R ? Explain with suitable example.
- c) Explain `Is-Dot` Object-Checking functions with an example. **(4+4+4)**

P.T.O.

3. a) How do you create matrix in R ? Explain with its necessary attributes ?  
Give an example.
- b) Explain sub and gsub functions on strings with an example.
- c) Explain any four graphical parameters used in plot function in R with example. (4+4+4)

### Unit – II

4. a) How do you read external data files into R ? Explain any two types of files with necessary commands to read their characters into R, with example.
- b) Explain while loop in R with syntax and example.
- c) How do you draw barplot and pie chart in R ? Explain with example. (4+4+4)
5. a) What do you mean by argument matching to function in R programming ? Explain any three of them.
- b) What is exception handling ? How do you catch errors with try statements ? Explain with example.
- c) What is “masking” in R ? Explain two most common masking situations in R, with example. (4+4+4)

### Unit – III

6. a) Explain four types of Data and Measurement Scales with example.
- b) Determine the mean, the variance and the standard deviation of the following discrete distribution.

x    P(x)

1    .238

2    .290

3    .177

4    .158

5    .137

- c) Compute the 35<sup>th</sup> percentile, the 55<sup>th</sup> percentile, Q1, Q2 and Q3 for the following data.

16 28 29 13 17 20 11 34 32 27 25 30 19 18 33.

(4+4+4)





7. a) A data set contains the following seven values. 6, 2, 4, 9, 1, 3, 5. Find the range, population variance, population standard deviation and z score for the element 9.

b) The following data represent the costs (in dollars) of a sample of 30 postal mailings by a company.

3.67	2.75	9.15	5.11	3.32	2.09
1.83	10.94	1.93	3.89	7.20	2.78
6.72	7.80	5.47	4.15	3.55	3.53
3.34	4.95	5.42	8.64	4.84	4.10
5.10	6.45	4.65	1.97	2.84	3.21

Using dollars as a stem and cents as a leaf, construct a stem-and-leaf plot of the data.

c) A Gallup survey found that 65% of all financial consumers were very satisfied with their primary financial institution. Suppose that 25 financial consumers are sampled and if the Gallup survey result still holds true today, what is the probability that exactly 19 are very satisfied with their primary financial institution ? (Using Binomial Distribution). **(4+4+4)**

#### Unit – IV

8. a) A random of sample size 20 is taken resulting in sample mean of 25.51 and a sample standard deviation of 2.1933. Assume data is normally distributed use this information and  $\alpha = 0.05$  to test the following hypothesis.

$$H_0 : \mu = 25 \text{ pounds}$$

$$H_a : \mu \neq 25 \text{ pounds}$$

b) Explain types of Correlation with example. **(6+6)**



9. a) Suppose a stock market investor is interested in determining whether there is a significant difference in the P/E (price to earnings) ratio for companies from one year to the next. Assume  $\alpha = .01$ . Assume that differences in P/E ratios are normally distributed in the population. ( $n = 9$ )

Company	Year 1 P/E Ratio	Year 2 P/E Ratio
1	8.9	12.7
2	38.1	45.4
3	43.0	10.0
4	34.0	27.2
5	34.5	22.8
6	15.2	24.1
7	20.3	32.3
8	19.9	40.1
9	61.9	106.5

- b) Compute the regression equation of  $y$  on  $x$  from the following data. (6+6)

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**BCACACN 501**

**Fifth Semester B.C.A. Degree Examination, December 2023/January 2024  
(NEP 2020) (2023 – 2024 Batch Onwards)  
DESIGN AND ANALYSIS OF ALGORITHMS  
(DSCC)**

Time : 2 Hours

Max. Marks : 60

*Note : Answer any six questions from Part – A and any one full question in each Unit from Part – B.*

**PART – A**

1. a) What are double linked list and queue data structures ? (6×2=12)
- b) Define sets and dictionaries.
- c) List any two importance of Brute force approach.
- d) Define convex and convex hull.
- e) Define decrease and conquer technique and list any two of its variations.
- f) Write an algorithm to find height of Binary tree.
- g) What is Greedy problem ? List requirements of the solution at each step in Greedy approach.
- h) What is NP complete problem ? Write example.

**PART – B**

**Unit – I**

2. a) Explain Algorithm design and analysis process with flow diagram.
- b) Write an algorithm to find the factorial of a number using recursion and also perform mathematical analysis. (6+6)
3. a) Explain the following :
  - i) Graph problem
  - ii) Combinatorial problems
  - iii) Geometrical problems.
- b) Explain asymptotic notations Big O and Big  $\theta$  that are used to compare the order of growth of an algorithm with example. (6+6)

P.T.O.

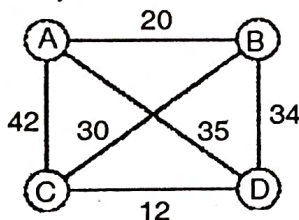


**Unit – II**

4. a) Write an algorithm to sort N numbers using selection sort. Derive the number of operations and time complexity.
- b) Write and explain the algorithm for Closest-Pair Problem. Derive its complexity.
- c) Consider the Knapsack problem with the following inputs. Solve the problem using exhaustive search. Enumerate all possibilities and indicate unfeasible solutions and optimal solution. Knapsack total capacity  $W = 15$  kg. (4+4+4)

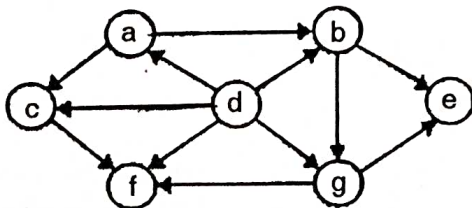
Items	A	B	C	D
Weight (kg)	3	5	4	6
Value	36	25	41	34

5. a) Write an algorithm to sort N numbers by applying Bubble sort. Derive the number of operations and time complexity.
- b) Write and describe Brute force String Matching Algorithm.
- c) Find the optimal solution for the Travelling Salesman problem using exhaustive search method by considering 'A' as the starting city. (4+4+4)



**Unit – III**

6. a) Write and explain Depth-First Search Algorithm with its time complexity.
- b) Apply the source-removal (Decrease by one) algorithm to solve the topological sorting problem for the digraph given.



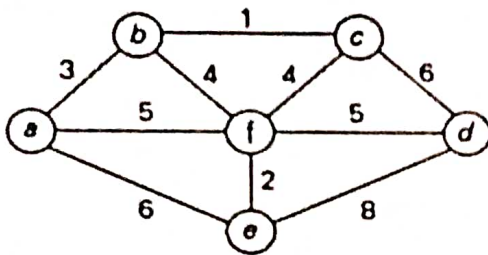
- c) Compute  $34 \times 26$  using divide and conquer approach for the multiplication of two large numbers. (4+4+4)



- 7. a) Write an algorithm to sort N numbers using merge sort. Derive the time complexity.
- b) Explain the Strassen's algorithm of matrix multiplication and derive the time complexity. (6+6)

**Unit – IV**

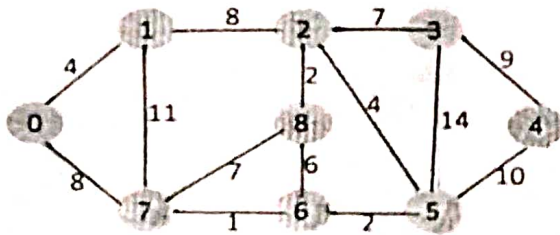
- 8. a) Write the Prim's algorithm and find Minimum Spanning tree for the given graph.



- b) Construct Huffman tree and write the Huffman code for given data. (6+6)

Character	A	B	C	D	E
Probability	0.35	0.1	0.2	0.2	0.15

- 9. a) Write the Kruskal's algorithms and apply Kruskal's algorithm to find a minimum spanning tree of the given graph.



- b) Draw the decision tree for the following :
  - i) Minimum of three numbers.
  - ii) Binary search in a four-element array. (6+6)

---