St Aloysius College (Autonomous) Mangaluru

B.C.A. Semester V – Degree Examination
January - 2021
JAVA 2 ENTERPRISE EDITION

Time: 3 hrs.   Max Marks: 100

PART – A

Answer any TEN of the following.   (10x2=20)

1. a) What is the use of DriverManager? Explain.

   b) What is JDBC API?

   c) Explain Connection Interface.

   d) What is the use of ResultSet Inteface?

   e) What is a web server?

   f) What is a Servlet?

   g) Explain the use of a Deployment Descriptor.

   h) Which object is used to read the data submitted from a client to a servlet?

   i) Write a note on declaration tag used in a JSP.

   j) What is the use of a HttpSession?

   k) Explain page directive.

   l) Differentiate between GET and POST methods.

PART – B

Answer any FOUR of the following.   (4x5=20)

2. Briefly describe the three layered architecture.

3. Write a short note on J2EE Communication Technologies.

4. Describe the features of JDBC.

5. Briefly explain the use of ResultSet with a simple example.

6. With a suitable example describe how data is read from the client in a servlet?

7. Briefly describe the use of action tag in JSP with an example.

PART – C

Answer any ONE FULL question from each unit.   (4x15=60)

UNIT – I

8. a) Explain the 3- tier architecture in J2EE.   (5)

   b) Explain how reusability and modularity is supported in J2EE.   (5)

   c) Briefly explain the different J2EE technologies.   (5)

9. a) Briefly describe containers.   (5)

   b) Explain the J2EE Service Technologies.   (5)

   c) Explain the J2EE Enterprise architecture.   (5)

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UNIT – II

10.a) Briefly describe the Type-1 and Type-2 drivers in JDBC. **(5)**

b) Explain the JDBC architecture. **(5)**

c) With a simple example explain the use of Connection and Statement Interface. **(5)**

11.a) Explain the use of PreparedStatement with a suitable example. **(5)**

b) With a suitable example describe the method to query a database and display the results. **(5)**

c) Write a program to modify a content of a table in a database. **(5)**

UNIT – III

12.a) What are the advantages of using a servlet? **(5)**

b) Describe how request headers are read in a servlet with an example. **(5)**

c) Explain with a suitable example how to extract the names of all the parameters and their values in a servlet. **(5)**

13.a) Explain servlet life cycle. **(5)**

b) Explain with a suitable example how cookies are created and sent to the client. **(5)**

c) Briefly discuss how session tracking is achieved. **(5)**

UNIT – IV

14.a) Explain the JSP life cycle. **(5)**

b) Compare and contrast between JSP and servlet. **(5)**

c) Explain the basic JSP Tags. **(5)**

15.a) Differentiate between include directive and include action. **(5)**

b) What are Java Beans? What are their benefits? Explain. **(5)**

c) Explain any two implicit objects in Java. **(5)**

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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
January – 2021
COMPUTER GRAPHICS & MULTIMEDIA

Time: 3 hrs.   Max Marks: 100

PART – A

Answer any **TEN** of the following.   (10x2=20)

1. a) What is rasterization?

   b) Define scan conversion.

   c) Explain the basic concept in line drawing.

   d) What is clipping?

   e) Write the region out code for clipping a straight line against a clip window.

   f) Mention the two approaches to represent the polygons in graphics system.

   g) Define rotation transform.

   h) Write the 2D transform matrix for the following:

      i) Reflection about x-axis

      ii) Reflection about y-axis

   i) Write the diagram of conceptual model of 3D transformation process.

   j) Define projection.

   k) Describe ADC and DAC.

   l) Define data compression in multimedia.

PART – B

Answer any **FOUR** of the following.   (4x5=20)

2. Write midpoint line drawing algorithm.

3. Explain the architecture of Raster system.

4. Describe pattern filling.

5. Explain polygon clipping.

6. Write a note on

   (i) Reflection transformation.

   (ii) Shearing transformation.

7. Bring out the difference between perspective and parallel projections.

PART – C

Answer any ONE FULL question from each unit. (4x15=60)

UNIT – I

8. a) Discuss the applications of Computer graphics. **(8)**
   b) Write the difference between Vector scan display system and Raster scan display system. **(7)**

9. a) Explain midpoint Circle drawing algorithm **(9)**
   b) Explain the conceptual framework for interactive graphics. **(6)**

UNIT – II

10. a) Explain boundary filling and flood filling algorithm. **(9)**
    b) Discuss the different thick primitives of computer graphics. **(6)**

11. a) Explain the Cohen Sutherland algorithm for line clipping. **(9)**
    b) Discuss any two methods for generating characters. **(6)**

UNIT – III

12. a) Find a transformation of a triangle A (1,0), B(0,1), C(1,1) by rotating 45^0 about the origin and then translating one unit in x and y direction. **(8)**
    b) Show that two successive reflections about either of the coordinates axes is equivalent to a single rotation about the coordinate origin. **(7)**

13. a) How are perspective projections being categorized? Explain briefly with example. **(8)**
    b) Prove that successive 2D rotations are additive. **(7)**

UNIT – IV

14. a) Explain the fundamentals of optical storage media. **(8)**
    b) Write a note on digital image representation. **(7)**

15. a) Explain computer animation. Write the basic steps of computer animation. **(8)**
    b) Discuss the traditional data streams characteristics of multimedia **(7)**

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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
January - 2021
OBJECT ORIENTED ANALYSIS & DESIGN

Max Marks: 100

Time: 3 hrs.

PART – A

(10x2=20)

Answer any **TEN** of the following.

1.a) Define Synergy?

b) Define Activity Model.

c) What is Error Handling?

d) What is multiplicity?

e) Differentiate event and state.

f) Define frameworks?

g) What is object orientation?

h) What is the roll of Actors in Usecase Models?

i) List various software development stages in order.

j) Define the term "Pseudocode".

k) What is meant by bottleneck?

l) Define delegation.

PART – B

(4x5=20)

Answer any **FOUR** of the following.

2. Explain operations and methods?

3. Explain the concept "Adding redundant associations" in class design with the help of diagram.

4. Explain the different kinds of Global resources?

5. Explain the concept of "Refactoring" in class design.

6. Explain the concept of Sending Signals?

7. Explain the benefits of OOAD.

PART – C

(4x15=60)

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

UNIT – I

8. a) Differentiate class diagrams and object diagram with an example. (10)

b) Explain the stages of object oriented methodology? (5)

9. a) Design use case and class diagram for student registration system. (10)
(Identify links, association name, multiplicity and generalization)

b) Explain the naming convention for class with an example. (5)

UNIT – II

(10)

10. a) Explain the following terms:
   a) Association name   b) Qualified association
   c)Generalization   d) Bags and Sequences
   e) Actors in use case.

(5)

   b) What is Activity effects?

(10)

11. a) Explain the following terms
   a)Concurrent Activities   b)Executable Activity Diagrams

(5)

   b) Explain completion transition.

UNIT – III

(10)

12. a) Explain in detail how to choose software control strategy?

(5)

   b) How you will estimate the software performances?

(10)

13. a) Explain "Breaking a System into Subsystems" in detail?

(5)

   b) Explain with the help of the diagram Batch Transformation.

UNIT-IV

(10)

14. a) Explain in detail recursing downward in detail.

(5)

   b) How do you decide what class owns an operation?

(10)

15. a) What is inheritance? Explain in detail adjustment of inheritance in class design.

(5)

   b) Explain in detail unit testing.

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St Aloysius College (Autonomous) Mangaluru

B.C.A. Semester V – Degree Examination

January - 2021

SOFTWARE ENGINEERING

Time: 3 hrs.

Max Marks: 100

PART – A

Answer any TEN of the following.

(10x2=20)

1. a) What is Software Engineering?

   b) Define Corrective maintenance and Adaptive maintenance.

   c) Name and draw any four symbols used in DFD.

   d) Define Verification.

   e) What do you mean by software quality assurance?

   f) Mention any 2 objectives of architectural design.

   g) Define the term "software testing".

   h) What do you mean by the term "Test Oracles"?

   i) Define Review.

   j) What is software maintenance?

   k) Mention the categories of risk management.

   l) What do you understand by the terms change control and version control?

PART – B

Answer any FOUR of the following.

(4x5=20)

2. Comment on the statement "Software does not wear out".

3. What are the major phases in the spiral model of Software Development? Explain.

4. Explain in detail the capability maturity model.

5. Differentiate between Top-Down and Bottom–Up approach.

6. Explain the basic COCOMO model in detail.

7. Explain the different categories of Black-box testing.

PART – C

Answer any ONE FULL question from each unit.

(4x15=60)

UNIT – I

(8)

8. a) Explain the characteristics of Software.

   b) Write a short notes on: **(7)**

      (i) E-R Diagram

      (ii) Decision table

9. a) Draw the schematic diagram of the waterfall model in software **(8)** development. Also discuss the phases in brief.

   b) Write a short notes on: **(7)**

      (i) Components of SRS

      (ii) Characteristics of SRS

UNIT – II

10. a) Explain the Software Design Principles. **(8)**

   b) Explain the different types of cohesion that a module might exhibit. **(7)**

11. a) Define software quality. Explain the different software quality **(8)** attributes in detail.

   b) Write a note on reliability metrices and explain the terms MTTF, **(7)** MTBF, MTTR, POFOD and ROCOF.

UNIT – III

12. a) Differentiate between integration testing and system testing. **(5)**

   b) What is meant by code walkthrough? List the important types of **(5)** errors checked during code walkthrough.

   c) Define the term "Debugging". Explain various debugging techniques **(5)** available.

13. a) Write a short note on various principles of testing. **(5)**

   b) What is the difference between code walkthrough and code **(5)** inspection?

   c) Differentiate between Black-Box testing and White box testing. **(5)**

UNIT – IV

14. a) Write a note on **(8)**

      i) Configuration Identification

      ii) Configuration Accounting.

   b) Write a short note on Belady and Lehman model for the calculation **(7)** of maintenance effort.

15. a) Explain the categories of Software maintenance. **(8)**

   b) Explain the major sources of risk? Explain the types of risks that a **(7)** software project might suffer from.

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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V– Degree Examination
January -2021
E-COMMERCE

Time: 3 hrs.   Max Marks: 100

PART – A

Answer any <u>TEN</u> of the following.   (10x2=20)

1. a) Define electronic commerce.

   b) What is B2C commerce?

   c) What is SET?

   d) Define Digital Signature.

   e) What is debit card?

   f) Write two drawback of B2C E-Commerce.

   g) Define ACH with its functions.

   h) What is conventional trading process.

   i) What is cryptography?

   j) Define FTP application.

   k) Define an M-Commerce.

   l) What is E-cycle of Internet marketing.

PART – B

Answer any <u>FOUR</u> of the following.   (4x5=20)

2. Explain Classification of electronic commerce.

3. Explain layered architecture of e-commerce.

4. Illustrate properties of E-cash with examples.

5. Explain firewall concept.

6. Discuss the mechanisms available for internet security.

7. Write a note on M-Commerce frameworks.

PART – C

Answer any <u>ONE</u> FULL question from each unit.   (4x15=60)

UNIT – I

8. a) Explain B2C E-Commerce with advantages and disadvantages.   **(9)**

   b) Explain benefits and impact of E-commerce.   **(6)**

9. a) Describe application of Electronic Commerce technologies.   **(9)**

   b) Write a note on types of E-Commerce Models.   **(6)**

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UNIT – II
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(9)

10.a)   Briefly describe protocols for secure messaging.   (6)

b)   Write a note on Virtual Private Network   (9)

11. a)   Explain   i) Symmetric Cryptography

ii) Asymmetric Cryptography   (6)

b)   What is EFT? Explain the security issues involved in this.

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UNIT – III
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(9)

12. a)   Explain   a) VAN   b) FTP   (6)

b)   Describe Web Servers implementation

(9)

13. a)   Write benefits and application of EDI.   (6)

b)   What is architectural framework of e commerce?

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UNIT – IV
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(9)

14. a)   Write the PROS and CONS of online shopping.   (6)

b)   Explain   i) The E-cycle of Internet marketing

ii) Personalization e-commerce

(9)

15. a)   Write note on framework and models of M-Commerce.   (6)

b)   What   is   Mobile   Commerce?   Differentiate   E-commerce   and

M-commerce.

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PART – A   (10x2=20)

Answer any <u>TEN</u> of the following.

1. a) Define average case efficiency.

   b) Define Ω-notation.

   c) List out the steps to design an algorithm.

   d) What are the difference between dynamic programming and divide and conquer approaches.

   e) Define Multistage graphs. Give an example

   f) How dynamic programming is used to solve Knapsack problem.

   g) Define P and NP problems.

   h) What is backtracking? Give an example.

   i) Differentiate feasible solution and optimal solution.

   j) State the time complexity of bubble sort.

   k) Write the formula for decision tree for searching a sorted array.

   l) What do you mean by Hamiltonian cycle in an undirected graph?

PART – B   (4x5=20)

Answer any <u>FOUR</u> of the following.

2. Describe briefly the notations of complexity of an algorithm.

3. Explain the working of Merge sort algorithm with an example.

4. Explain the working of Prim's algorithm.

5. Explain the general procedure to solve a multistage graph problem using backward approach.

6. Give a detailed note on divide and conquer techniques.

7. Explain 4-Queen's problem using backtracking.

PART – C   (4x15=60)

Answer any <u>ONE</u> FULL question from each unit.

UNIT – I

8. a) Write the algorithm for selection sort. Provide a complete analysis of selection sort for the given set of numbers: 12,33,23,43,44,55,64,77 and 76.   (10)

   b) Write the algorithm for Binary search.   (5)
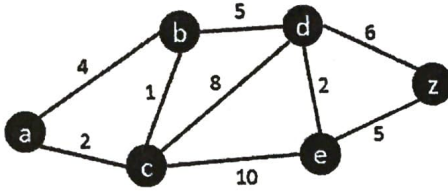
OR

9. a) With an example, explain a recursive algorithm to find the maximum and minimum element from a list.   (8)

   b) Apply quick sort to sort the following set of data:
      65, 25, 10, 18, 25, 11, 45, 20.   (7)

UNIT – II

10. a) Explain how greedy approach is used in Dijktra's algorithm for finding the single-source shortest paths for a given graph. **(8)**

   b) Explain kruskal's algorithm for finding the minimum spanning tree. **(7)**

OR

11. a) Solve the instance of 0/1 knapsack problem using dynamic programming: **(8)**

   $n=4$ $m=25$ $(p_1, p_2, p_3, p_4) = (10, 12, 14, 16)$

   $(w_1, w_2, w_3, w_4) = (9, 8, 12, 14)$

   b) Explain greedy strategy to the problem of optimal storage in tapes with an example of three tapes. (I_1, I_2, I_3) (5, 10, 13). **(7)**

UNIT – III

12. a) Solve the following instance of the 0/1, knapsack problem given the knapsack capacity with $W=5$, using dynamic programming and explain it. **(10)**

Items	Weight	Value
1	4	10
2	3	20
3	2	15
4	5	25

   b) Explain the general method of dynamic programming **(5)**

13. a) Explain all-pairs shortest path algorithm with example. **(8)**

   b) Describe the travelling salesman problem and discuss how to solve it using dynamic programming. **(7)**

UNIT – IV

14. a) Describe the backtracking solution to solve 8-Queen's problem. **(8)**

   b) Discuss the approaximation algorithm for NP-hard problems. **(7)**

15. a) Compare backtracking and Branch and Bound. **(8)**

   b) What is Hamiltonian circuit problem? What is the procedure to find the Hamiltonian circuit of a graph? **(7)**

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St Aloysius College (Autonomous) Mangaluru

B.C.A. Semester V– Degree Examination
January - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN

Time: 3 hrs.   Max Marks: 100

PART–A

1.   **Answer any TEN of the following:**   (10x2=20)

   a) Define data abstraction.

   b) What is Object Oriented Development?

   c) What is UML?

   d) What is signal event?

   e) Mention the purpose of state model.

   f) What are entry activities and exit activities? Give example.

   g) Define concurrent tasks

   h) What is maintenance?

   i) What is transaction manager?

   j) What is recursing download?

   k) What is information hiding?

   l) Define overriding.

PART–B

Answer any FOUR of the following: (4x5=20)

2.   List and explain three types of models.

3.   Explain Change event and Time Event with suitable examples.

4.   Explain activity diagram with example.

5.   Explain the role of layers and partitions in system design

6.   Write a note on information hiding and different ways used to hide information.

7.   Explain the naming conventions for a class with proper example.

PART–C

Answer any FOUR of the following: (4x15=60)

8. a) Explain links and association with suitable example.   (8)

   b) Write a note on Order of activities.   (7)

9. a) Explain 'One-Shot' state diagram with suitable example. **(8)**

   b) Explain different stages of software development process **(7)**

10.a) Write a note on batch transformation and continuous transformation. **(8)**

   b) What is multiplicity? Explain different types of multiplicities with suitable examples. **(7)**

11.a) What is inheritance? Explain adjustment of inheritance with example. **(8)**

   b) List and explain different Object-Oriented Themes. **(7)**

12.a) Explain different stages of Object-Oriented Methodology **(8)**

   b) Explain Use case diagram with suitable example **(7)**

13.a) Explain System boundary, and different types of relationships in use case diagram with suitable example. **(8)**

   b) Explain dynamic simulations in the system design **(7)**

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St Aloysius College (Autonomous)
Mangaluru
B.C.A. Semester V – Degree Examination
January - 2021
DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 hrs.   Max Marks: 100

PART – A

1.   Answer any **TEN** of the following   (10 x 2 = 20)

   a) Define the term algorithm and state criteria the algorithm should satisfy.

   b) What is pseudocode?

   c) Explain the general method of greedy technique.

   d) What is meant by divide and conquer? Give the recurrence relation for divide and conquer method.

   e) What is minimum cost spanning tree? Give example.

   f) Compare greedy method and dynamic programming

   g) Compare NP hard and NP completeness.

   h) Define branch and bound method.

   i) What are the features of dynamic programming?

   j) What are the requirements that are needed for performing backtracking?

   k) What is Hamiltonian cycle?

   l) Is insertion sort better than the merge sort? Why?

PART – B

Answer any **FOUR** of the following: (4 x 5 = 20)

2.   Explain briefly the time – Complexity estimation and space complexity estimation of an algorithm.

3.   Briefly explain strassen's matrix multiplication.

4.   Solve the following using the kruskal's algorithm.
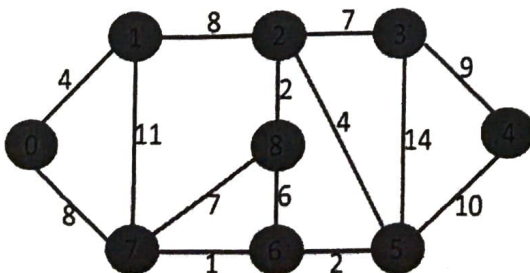
5.   Write a note on nondeterministic algorithm.

6.   Explain optimal binary search trees with help of an example.

7.   Compare backtracking and branch and bound technique.