

G 601.5

(2019 & 2020 batch)

Reg. No.

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**St Aloysius College (Autonomous)**

**Mangaluru**

**B.C.A. Semester V – Degree Examination  
December - 2022**

**JAVA 2 ENTERPRISE EDITION**

**Time: 3 hrs.**

**Max Marks: 100**

**PART – A**

**Answer any TEN of the following.**

**(10x2=20)**

1. a) List any four advantages of n tier architecture.
- b) List various kinds of HTTP requests.
- c) What are J2EE container services?
- d) What is JDBC API?
- e) What are JDBC statements?
- f) What is BLOB and CLOB?
- g) Why servlets are better than CGI?
- h) What is the use of deployment descriptor?
- i) What is servlet Session?
- j) List any two benefits of JSP.
- k) What is use of expression tag in JSP? Give example.
- l) What is JavaBean?

**PART – B**

**Answer any FOUR of the following.**

**(4x5=20)**

2. What is need for enterprise programming? Explain.
3. Briefly explain three layered architecture of J2EE.
4. Explain features of JDBC.
5. Explain how to create table using JDBC with example?
6. Explain how to process get and post methods in servlet?
7. Write a note on implicit objects in JSP.

**PART – C**

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

**(15x4=60)**

**UNIT – I**

8. a) Explain the advantages of J2EE. (5)
- b) Briefly explain J2EE components. (5)
- c) Explain J2EE communication technologies. (5)
9. a) Explain how reusability and modularity is supported in J2EE? (5)
- b) Explain J2EE service technologies. (5)
- c) Explain any two API's available for J2EE. (5)

**Contd...2**

**UNIT – II**

10. a) Explain with example, how to create simple application using JDBC? (5)  
b) With suitable example, explain how to query a database and display the result? (5)  
c) Explain major classes and interface of JDBC. (5)
11. a) Explain type1 and type2 drivers in JDBC. (5)  
b) Explain the use of prepared statement with example. (5)  
c) Write a note on resultSet interface. (5)

**UNIT – III**

12. a) Explain servlet life cycle in detail. (5)  
b) Describe how cookies are created and send to client? (5)  
c) Write a note on session tracking. (5)
13. a) Explain any two methods used to set the HttpServletResponse headers on a servlet page. (5)  
b) With example explain how to extract names of all parameters and values in servlet? (5)  
c) Write a servlet program that demonstrate getParameter() method. (5)

**UNIT – IV**

14. a) Compare and contrast between JSP and servlet. (5)  
b) Differentiate between include directive and include action tag. (5)  
c) What are benefits of Java Beans? Explain. (5)
15. a) Explain basic JSP tags. (5)  
b) Explain JSP life cycle methods with example. (5)  
c) Demonstrate use of <JSP: useBean> action tag with example. (5)

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**St Aloysius College (Autonomous)**

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**B.C.A. Semester V – Degree Examination**

**December - 2022**

**COMPUTER GRAPHICS & MULTIMEDIA**

**Time: 3 hrs.**

**Max Marks: 100**

**PART – A**

**Answer any TEN of the following.**

**(10x2=20)**

1. a) Define pixel and rasterization.
- b) Define horizontal and vertical retrace.
- c) Write two drawbacks of DDA.
- d) What is 4 connected pixel method?
- e) What is clipping?
- f) List any four line attributes.
- g) Define window and viewport.
- h) What is transformation?
- i) Define projection.
- j) Define data compression in multimedia.
- k) Write 2D transform matrix for the following for Shear about x axis.
- l) Write the diagram of conceptual model of 3D transformation process.

**PART – B**

**Answer any FOUR of the following.**

**(4x5=20)**

2. Explain the conceptual framework for interactive graphics.
3. Explain the thick primitives.
4. Explain window to viewport transformation. Derive the matrix for the same.
5. Discuss various reflection transformations with suitable diagram.
6. Write a note on viewing in 3D.
7. Explain traditional data stream characteristics of multimedia.

**PART – C**

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

**(15x4=60)**

**UNIT – I**

8. a) Derive the mid-point circle algorithm. **(9)**
- b) Explain ellipse drawing algorithm. **(6)**
9. a) Explain the DDA line drawing algorithm. **(5)**
- b) Explain the architecture of Raster display system with neat diagram. **(5)**
- c) Explain 4-way symmetry and 8-way symmetry of a circle with function. **(5)**

**Contd...2**

**UNIT – II**

- 10.a) Explain boundary fill algorithm. (5)  
b) Which are the different ways of generating characters? Explain. (5)  
c) Explain polygon clipping. (5)
- 11.a) Explain Cohen-Sutherland Line clipping algorithm. (9)  
b) Write a note on pattern filling. (6)

**UNIT – III**

- 12.a) Explain general pivot point rotation with suitable diagram. (5)  
b) Prove that successive scaling are multiplicative. (5)  
c) Write the translation, scaling and rotation matrices in 3D homogeneous coordinate system. (5)
- 13.a) What is the purpose of homogeneous coordinates? Explain composition of 2D transformations. (7)  
b) Find a transformation of a triangle A(1,0), B(0,1), C(1,1) by rotating 45° about the origin and then translating one unit in x and y direction. (8)

**UNIT – IV**

- 14.a) What is medium? List and explain the different types of media. (5)  
b) Write a note on data compression. (5)  
c) What are the different ways of representing sound data? Explain. (5)
- 15.a) Explain computer animation. Write the basic steps of computer animation. (9)  
b) Explain digital image representation. (6)

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(2019 & 2020 batch)

G 603.5

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**B.C.A. Semester V – Degree Examination**

**December - 2022**

**OBJECT ORIENTED ANALYSIS & DESIGN**

**Time: 3 hrs.**

**Max Marks: 100**

**PART – A**

**Answer any TEN of the following.**

**(10x2=20)**

1. a) What are the three kinds of models to describe a system from different viewpoints?
- b) What is meant by link?
- c) What is Concurrent Control?
- d) Define Events and States.
- e) What is Error Handling?
- f) What is multiplicity?
- g) What is object orientation?
- h) What is the role of Actors in Usecase Models?
- i) List various software development stages in order.
- j) Define Abstraction.
- k) Define the data structure.
- l) What is "fan-out" along a path through the model?

**PART – B**

**Answer any FOUR of the following.**

**(4x5=20)**

2. Explain the different kinds of Global resources.
3. Explain the naming conventions for a class with example.
4. Explain the concept "Adding redundant associations "in class design with the help of diagram.
5. Explain with the help of diagram Batch Transformation.
6. Draw Use case diagram for Vending machine.
7. Explain the include, extend and generalization relationship with an example.

**PART – C**

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

**(15x4=60)**

**UNIT – I**

8. a) Explain different types of multiplicities with suitable example. **(7)**  
b) State and explain in detail about the elements of the object model. **(8)**
9. a) Mention and explain different object oriented themes. **(7)**  
b) Define Association and explain the types of association with example. **(8)**

**Contd...2**

**UNIT – II**

- 10. a) Explain sequence diagram with passive and transient object. **(7)**
- b) Explain in detail State diagram behavior. **(8)**

- 11. a) Explain the following terms:
  - a) Association name
  - b) Qualified association
  - c) Generalization
  - d) Bags and Sequences
  - e) Actors in use case.**(10)**
- b) Explain completion transition. **(5)**

**UNIT – III**

- 12. a) Explain in detail how to choose software control strategy. **(10)**
- b) Differentiate between pattern and framework. **(5)**

- 13. a) Explain "Breaking a System into Subsystems" in detail. **(10)**
- b) How you will estimate the software performances? **(5)**

**UNIT – IV**

- 14. a) Write and explain the different types Recursing downward in class design. **(7)**
- b) Explain the different steps involved in designing algorithms. **(8)**

- 15. a) Explain the steps involved in adjustment of inheritance in class design. **(10)**
- b) Explain system testing in detail. **(5)**

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**B.C.A. Semester V - Degree Examination**

**December - 2022**

**SOFTWARE ENGINEERING**

**Time: 3 hrs.**

**Max Marks: 100**

**PART - A**

**Answer any TEN of the following.**

**(10x2=20)**

1. a) Define Software Engineering in detail.
- b) Define COCOMO model.
- c) How functional requirement is different from non functional requirement?
- d) Elaborate on information hiding.
- e) What is risk management?
- f) Explain the use of data flow diagram.
- g) What is software maintenance?
- h) Differentiate between black box testing and white box testing.
- i) What is POC? Explain its use.
- j) Compare failure, fault and error.
- k) Mention any two advantages of spiral model.
- l) Differentiate between verification and validation.

**PART - B**

**Answer any FOUR of the following.**

**(4x5=20)**

2. Explain the working of the capability maturity model.
3. What is control based testing? Explain.
4. Explain the different components of SRS.
5. What is data flow diagram? Explain with an example.
6. Mention and explain any 4 categories of software maintenance.
7. Write a note on test case design.

**PART - C**

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

**(15x4=60)**

**UNIT - I**

8. a) What is evolutionary development model? Explain with diagram. **(8)**
- b) Explain about the users of a requirement document. **(7)**
9. a) Explain the working of waterfall model with diagram. **(8)**
- b) Explain various characteristics of a software. **(7)**

**UNIT - II**

10. a) What is cohesion? Explain different types cohesion. **(8)**

**Contd...2**

- b) What is software quality? Explain the different types of software quality in detail. (7)
11. a) Write a note on: MTTF, MTBF, MTTR, POFOD, ROCOF. (8)
- b) Write a note on software quality attributes. (7)

**UNIT - III**

12. a) Explain the working of integration testing. (8)
- b) Explain various debugging techniques. (7)
13. a) What is low-level testing? Explain. (8)
- b) What is walk-through? Explain the features of this method. (7)

**UNIT - IV**

14. a) Explain Belady and Lehman model for calculation of maintenance effort. (8)
- b) What is Configuration management? Explain its working. (7)
15. a) What is software maintenance? Explain the need for software maintenance. (8)
- b) How to estimate the project software? Explain. (7)

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**PYTHON PROGRAMMING**

Time: 3 hrs.

Max Marks: 100

**PART – A**

Answer any **TEN** of the following.

(10x2=20)

1. a) Write a program to find the smallest divisor of an integer other than 1.
- b) Why indentation is required in python?
- c) What do you mean by Python type casting?
- d) List the different ways of importing modules.
- e) How to make a method to return multiple values?
- f) What is the difference between an thread and a process?
- g) What is the difference between a checkbox and a radiobutton?
- h) Write a note on *except* Clause.
- i) How to sort elements of a list and a tuple?
- j) What are the different types of databases used in python?
- k) How to clone a list?
- l) Compare List and tuple.

**PART – B**

Answer any **FOUR** of the following.

(4x5=20)

2. Explain the following methods with respect to strings with an example.  
i) split() ii) map()
3. How to create empty list, tuple, set and a dictionary? Explain with example.
4. How classes and objects are created and used in python?
5. How to handle multiple exceptions in python? Explain with example.
6. With a programming example, explain the process of using the widget canvas in python.
7. Write a python program to multiply two matrices.

**PART – C**

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

(15x4=60)

**UNIT – I**

8. a) Write a note on special operators of python. (5)
- b) Write a note on assertion. (5)
- c) Explain indexing and slicing with respect to multidimensional arrays (5)
9. a) Explain the input and output statements of python with syntax and example. (5)
- b) What is the use of numpy? Give an example. (5)

Contd...2

- c) Differentiate C, Java and Python.

**(5)**

**UNIT – II**

- 10. a) Write a program to add all characters in second string at the end of first string.

**(5)**

- b) Write short notes on

- i. Creating tuple with one element      ii. Nested tuple

**(5)**

- c) Explain the following with an example:

- i. Named Arguments                      ii. Arbitrary Arguments

**(5)**

- 11. a) Write a program to remove all characters in second string which are not present in the first string.

**(5)**

- b) Describe dictionary comprehension with suitable example.

**(5)**

- c) Write the python program to implement the following set operations

- i) Union      ii) Intersection      iii) Difference

**(5)**

**UNIT – III**

- 12. a) How the constructors and destructors are created and used in Python? Explain with example.

**(5)**

- b) How do you implement interfaces and abstract method in python program? Give an example.

**(5)**

- c) How to create threads? Explain with example.

**(5)**

- 13. a) List the difference between method overloading and overriding.

**(5)**

- b) Write a program to handle user defined exception in the following situations

- i. Handle " AgeOutOfRangeException" if the entered age is > 25

- ii. Handle " LowGpaException" if entered gpa is <2.5

If No exception is generated then display the message "Your application is accepted and is under study."

**(5)**

- c) List and describe the methods provided by the Thread class.

**(5)**

**UNIT – IV**

- 14. a) Explain the following methods with respect to python database connectivity.

- i. fetchone()      ii. fetchall()

**(5)**

- b) Explain the process of adding and deleting records to and from python table with example.

**(5)**

- c) Differentiate between spinbox and listbox.

**(5)**

- 15. a) Explain the process of using text, entry widget in python.

**(5)**

- b) Write python GUI program to create and use Menu widget.

**(5)**

- c) Write python program to demonstrate update and retrieve operations in the database.

**(5)**

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**DESIGN AND ANALYSIS OF ALGORITHMS**

**Time: 3 hrs.**

**Max Marks: 100**

**PART – A**

**Answer any TEN of the following.**

**(10x2=20)**

1. a) Write any two characteristics of algorithm.
- b) Define Time Complexity and Space Complexity of an algorithm.
- c) List any two types of asymptotic notations.
- d) What is backtracking?
- e) Differentiate Feasible and optimal solution.
- f) Define spanning tree of a graph.
- g) Write the constraint of binary search algorithm.
- h) Write the time complexity of Strassen's matrix multiplication.
- i) What is the advantages of dynamic programming over greedy method?
- j) What is greedy method?
- k) Define Hamiltonian path and Hamiltonian Cycle.
- l) Write any one application of tree vertex splitting.

**PART – B**

**Answer any FOUR of the following.**

**(4x5=20)**

2. Write the general method of divide and conquer approach.
3. Write an algorithm for selection sort. Give the time complexity of selection sort.
4. Differentiate back tracking and branch and bound. Give example for each.
5. Write a note on prim's algorithm.
6. Write a note on string editing.
7. Write a note on graph coloring using backtracking.

**PART – C**

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

**(15x4=60)**

**UNIT – I**

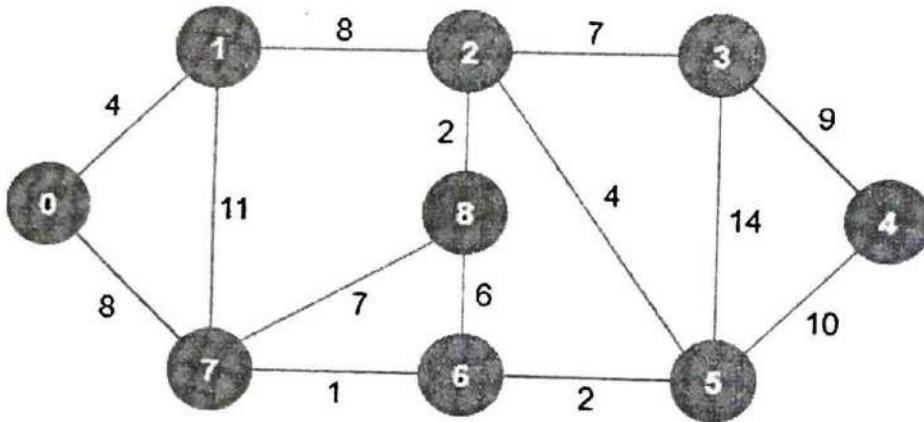
8. a) Explain in detail the different asymptotic notations. **(8)**
- b) Explain Merge sort algorithm with an example. Write its time complexity. **(7)**
9. a) Write the algorithm of binary search. Explain with an example. **(8)**
- b) Explain quick sort algorithm to sort the numbers 10,80,30,90,40,50,70 using quick sort method. **(7)**

**Contd...2**

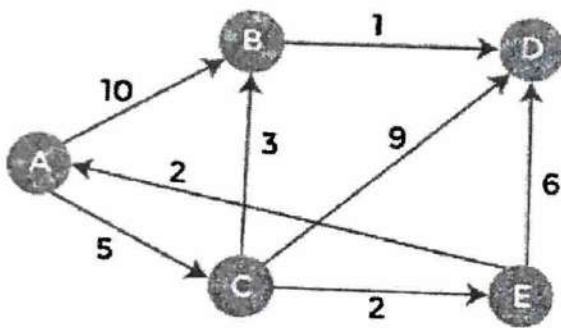
UNIT - II

10.a) Consider Knapsack capacity  $W=50$ ,  $w(10,20,30)$  and  $p(60,80,100)$   
Find the maximum profit using greedy approach. (8)

b) Write the minimum spanning tree for the following graph using Kruskal's Algorithm. (7)



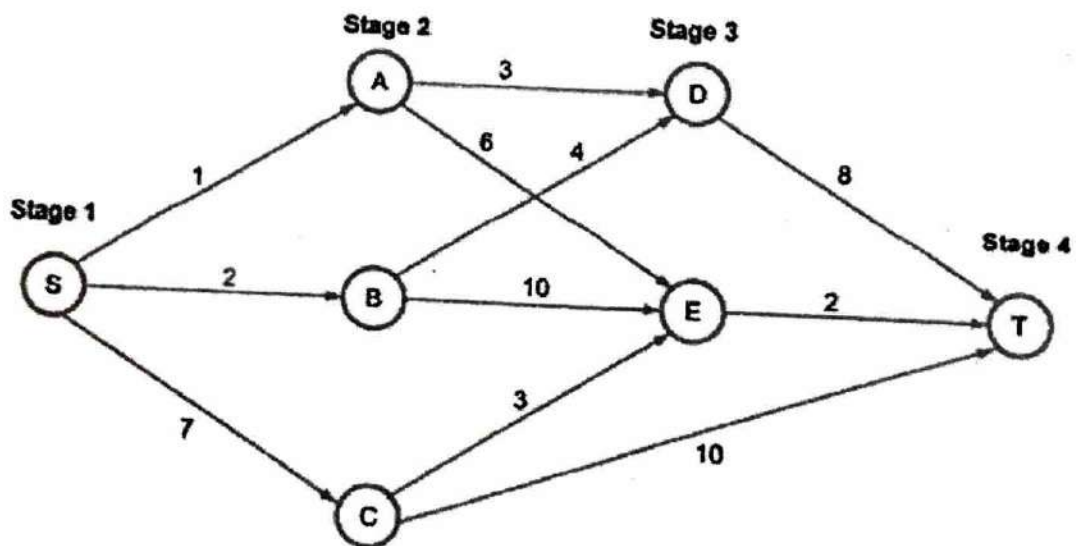
11.a) What is the use of Dijkstra's Algorithm? Solve the given graph using Dijkstra's Algorithm. (8)



b) Explain optimal storage on tapes for the given set of programs  $(F1, F2, F3) = (5, 10, 3)$  (7)

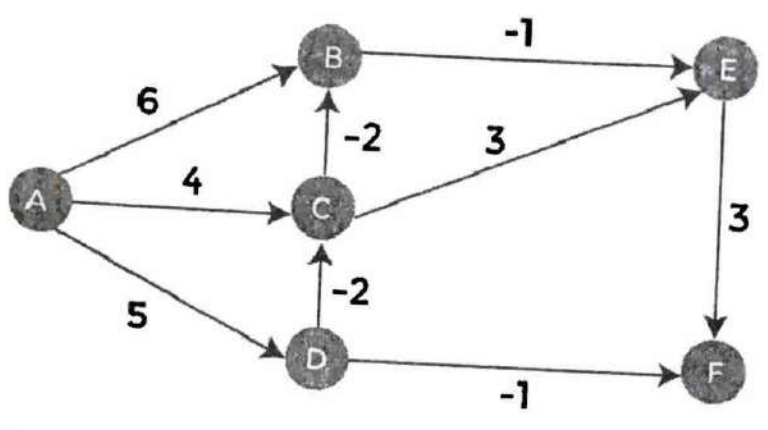
UNIT - III

12.a) Find the minimum cost for the following graph using multistage forward approach. (8)



b) State the purpose of Warshal's Algorithm. Explain with an example. (7)

13.a) Solve using Bellman and ford method (8)



b) With an example explain String editing using dynamic programming. (7)

UNIT - IV

14.a) With an example, Explain 8-queens problem. (8)

b) Write a note on sum of subsets using backtracking. (7)

15.a) Explain 8-puzzle problem. (8)

b) Write a note on non deterministic algorithms. (7)

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