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Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University
M.Sc.-I Semester: III
Subject: Computer Applications
Paper Title: Full Stack
Paper Code: (CSA5307)
2019 Pattern (4 Credits)

[Time: 3 Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

Q1) Answer the following questions (Any Five).

[5 x 2 = 10 M]

- a) What is HTML element
- b) How to resize an image with html.
- c) Explain Display property in CSS
- d) What are JavaScript Data Types?
- e) Explain use of link tag with suitable example
- f) Explain any two features of Boot strap

Q2) Answer the following questions (Any Four).

[4 x 3 = 12 M]

- a) What are differences between DIV and SPAN? Explain with suitable example.
- b) How to insert Java script code into HTML document?
- c) What is an internal CSS style ?
- d) What are Pseudo-classes? What it its use?
- e) What are advantages of boot strap?

Q3) Answer the following questions (Any Three).

[3 x 3 = 9 M]

- a) What is JQuery Event?
- b) What is NoSQL Database?
- c) What does Bootstrap Package includes ?
- d) Explain why to choose Bootstrap for building the websites?

Q4) Answer the following questions (Any Two).

[2 x 3 = 6 M]

- a) Write a Note on REST API.
- b) Explain id and class selector in CSS with suitable example.
- c) Explain why to choose Bootstrap for building the websites?

Q5) Answer the following questions (Any Two).

[2 x 4 = 8 M]

- a) Explain different types of NoSQL Databases
- b) What is Box-model?
- c) What is Dialog box?

Q6) Answer the following questions (Any One).

[1 x 5 = 5 M]

- a) Write Note on REST API
- b) Define JQuery. State the advantages of jQuery.

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Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University

M.Sc.-II (Semester:III)
Subject: Computer Applications
Paper Title: Advanced Web Technologies
Paper Code:CSA5303
2019 Pattern (4 Credits)

[Time: 3Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

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|-----|---|-------------------------|-------------|
| Q1) | Answer the following questions (Any Five). | Two Marks Each | 10 M |
| | <ol style="list-style-type: none">a) Define Local and Global Events in AJAX with example.b) State the syntax rule used for JSON.c) State the different features of Drupal.d) State the advantages of using AJAX in web development.e) What are the different data types of DTD?f) Define functions of web service. | | |
| Q2) | Answer the following questions (Any Four). | Three Marks Each | 12 M |
| | <ol style="list-style-type: none">a) Describe the method used to include JSON in PHP with an example.b) Write a note of web service security.c) Write a note on jsonValidation Interceptor used in AJAX.d) State the advantages and features provided by XQuery.e) What are the different steps to be followed to define a new entity type in Drupal? | | |
| Q3) | Answer the following questions (Any Three) | Three Marks Each | 9 M |
| | <ol style="list-style-type: none">a) State and define the following<ol style="list-style-type: none">i. XSLT <xsl:value of> Elementii. XSLT <xsl:if> Elementiii. XSLT <xsl:sort> Elementb) Write a note on SOAP Intermediaries.c) State the different layers of Drupal Architecture.d) Describe the process of sending an AJAX request in JavaScript | | |
| Q4) | Answer the following questions (Any Two). | Three Marks Each | 6 M |
| | <ol style="list-style-type: none">a) How do you identify the completion of AJAX request? State with an example.b) Write a note on XQuery.c) Define the following with an example<ol style="list-style-type: none">a. Parse()b. Stringify() | | |

Q5)

Answer the following questions (Any Two)

Four Marks Each

8 M

- a) Describe the methods used to store and retrieve a data using JSON.
- b) Describe SOAP Envelope in detail.
- c) Explain AJAX web application model in detail.

Q6)

Answer the following questions (Any One)

Five Marks Each

5 M

- a) Explain the architecture of Web Services.
- b) State the advantages and disadvantages of Drupal in detail.

17 DEC 2022

3/1

Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University
M.Sc.-II (Semester: III)
Subject: Computer Applications
Paper Title: Software Engineering and UML
Paper Code: CSA5302
2019 Pattern (4 Credits)

[Time: 3 Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

Q1) **Answer the following questions (Any Five).**

[5 x 2 = 10 M]

- a) Label the following notations with the name of a notation and the name of the diagram where it is used.



- b) Define Technical Feasibility.
- c) List any 4 notations used in State Diagram.
- d) Describe about Functional requirement.
- e) Tell what Feature Driven Development is.
- f) Define Event.

Q2) **Answer the following questions (Any Four).**

[4 x 3 = 12 M]

- a) Give one example of ordered association and OR association.
- b) Discuss the role of system analysis in SDLC.
- c) Explain advantages of using Sequence Diagram.
- d) Distinguish between Collaboration and Activity Diagram.
- e) Discuss the IEEE standard format of Software requirement specification.

Q3) **Answer the following questions (Any Three).**

[3 x 3 = 9 M]

- a) Classify the SRS as per its structure and its contents.
- b) Illustrate the actors and type of actors in ATM System.
- c) Illustrate the advantages of UML.
- d) Apply SDLC view to Movie Ticket Booking System.

Q4) **Answer the following questions (Any Two).**

[2 x 3 = 6 M]

- a) Explain RAD model with its disadvantages.
- b) Identify the risks in Scrum.
- c) Explain Deployment diagram with example.

Q5)

Answer the following questions (Any Two).

[2 x 4 = 8 M]

- a) Criticize on Object diagram against Class diagram.
- b) Select the following case study and draw a Component diagram for the same. The "Medicine Shop" has to manage inventory of the medicine. The patients or customer can purchase the medicine and pay bill to the shop. The owner has to manage the order to the distributor of medicine in shop. The expired medicine stocks should also be managed and send the expired medicine back to the distributor.
- c) Justify all the notations used in Class Diagram and validate it with example.

Q6)

Answer the following questions (Any One).

[1 x 5 = 5 M]

- a) A book shopkeeper has various books for selling in his shop, he has to manage the stock management of different books such as books from KG to PG, Competitive books and other books. The customer can demand books, select books to purchase, buy books and pay the bill for the same. Construct a use case diagram for the same.
- b) Movers and packers provide an interactive platform between client and packers & movers consultancy. Client can book the services through web portal. This portal provides useful information about the process of relocating their house. Packers and Movers work according to the needs and requirement of the customers and provide them the desirable results. The packers and mover's agencies use best quality material to pack the goods in such way that all goods remain in safe condition during transits and moving services assure the safe delivery of our goods at our destination. Construct a Sequence Diagram for the same.

03 JAN 2023

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Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University
M.Sc.-I (Semester: I)
Subject: Computer Applications
Paper Title: Operating Systems
Paper Code: CSA4102
2019 Pattern (4 Credits)

[Time: 3 Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

Q1) **Answer the following questions (Any Five).**

[5 x 2 = 10 M]

- a) Define operating system
- b) Define Process.
- c) What is critical section problem?
- d) Define Hard real and soft real system
- e) Define virtual memory
- f) Define deadlock

Q2) **Answer the following questions (Any Four).**

[4 x 3 = 12 M]

- a) What is safe state and unsafe state of the system?
- b) Explain different edges in resource allocation graph.
- c) Define file. List out file operations.
- d) Explain any two benefits of thread
- e) What is logical address and physical address?

Q3) **Answer the following questions (Any Three).**

[3 x 3 = 9 M]

- a) What is paging? State the contents of page table
- b) Explain Deadlock Avoidance Mechanism
- c) Write note on segmentation
- d) Discuss different types of schedulers

Q4) **Answer the following questions (Any Two).**

[2 x 3 = 6 M]

- a) Explain different types of Queues in Operating system
- b) What is Internal and external fragmentation
- c) Explain content of PCB

Q5) **Answer the following questions (Any Two).**

[2 x 4 = 8 M]

- a) Describe difference types of operating system
- b) Consider the following page reference string:

2, 3, 4, 5, 3, 4, 1, 6, 1, 3, 5, 8, 9, 6, 7, 8

How many page faults would occur for the following page replacement algorithms: OPT and FIFO Assume number of frames = 3.

- c) Explain best fit and worst fit algorithm with example.

Q6)

Answer the following questions (Any One).

[1 x 5 = 5 M]

- a) Consider the set of 5 processes whose arrival time and burst time are given below calculate Waiting time, Response time and Turnaround time for each process for RR4 algorithm

PId Arrival time Burst time

P1	0	7
P2	1	3
P3	2	10
P4	8	5
P5	4	2

- b) A disk system has 100 cylinders, numbered 0 to 99. Assume that the read / write head is at cylinder 54 and determine the order of head movement for SCAN and LOOK algorithm to satisfy the following stream of requests.

40, 12, 22, 66, 67, 33, 80, 75, 85, 65, 8, 90, 78

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05 JAN 2023

Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4

M.Sc.-I (Semester: I)
Subject: Computer Science
Paper Title: Database Management System
Paper Code: CSA4104
2019 Pattern (4 Credits)

[Time: 3 Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

- Q1) **Answer the following questions (Any Five). Two Marks Each** **10 M**
- a) Define 2NF with an example.
 - b) Name the commands of DCL and DML.
 - c) State the purpose of the union all operation in relational algebra.
 - d) Write the syntax of the Nested If statement.
 - e) Define the view with an example.
 - f) Define Checkpoint with an example.
- Q2) **Answer the following questions (Any Four). Three Marks Each** **12 M**
- a) Discuss the following commands with an example –
 - i) Drop
 - ii) Delete
 - b) Explain data abstraction in detail.
 - c) Discuss the following with suitable example –
 - i) One-to-Many relationship
 - ii) Ternary relationship
 - d) Discuss 2PL in detail.
 - e) What is a function? Explain with an example.
- Q3) **Answer the following questions (Any Three) Three Marks Each** **9 M**
- a) Compare primary key and unique key.
 - b) Consider the following relations –
Product(productid, pname, rate)
Supplier(suppid, supplname, saddr)
Product and supplier related to M: M relationship. Create RDB for the above and solve the following queries in SQL.
 - i) Select the supplier names living in Pune city.
 - ii) Select the total number of products whose rate is less than Rs. 100/-
 - c) Illustrate 2PL protocol with example.
 - d) Explain Union and Intersection operations in relational algebra.

- Q4) **Answer the following questions (Any Two). Three Marks Each** 6 M
- Explain conflict serializability in detail.
 - Explain any 3 aggregate functions with an example.
 - Explain any two extended ER features with an example.

- Q5) **Answer the following questions (Any Two) Four Marks Each** 8 M
- Consider the following transactions. Give two non-serial schedules that are serializable to a serial schedule $\langle T1, T2 \rangle$.

T1	T2
Read (M)	Read(X)
M:=M-200	Read (M)
Write(M)	M:=M-100
Read(X)	Write (M)
Write (X)	Read (N)
Write(B)	N:=N+200
Read (N)	Write (N)
N:=N+100	Write(X)
Write(N)	

- In a nursery, the plants are sold to the customers. These plants are flowering and non-flowering only. Nutrients are given to the plant with some quantity. Nutrients includes pesticides, watering and manure. Prepare an Entity Relationship diagram for the above.
- What is a Transaction? Explain different states of transaction.

- Q6) **Answer the following questions (Any One) Five Marks Each** 5 M

- Construct recovery procedure for the following log entries at the time of system crash if deferred update with checkpoint is used.
 [Start_transaction, T1]
 [Write_item, T1, A, 50]
 [Commit, T1]
 [Start_Transaction, T2]
 [Write_item, T2, D, 150]
 [Commit, T2]
 [Checkpoint]
 [Start_Transaction, T3]
 [Write_item, T3, B, 200]
 [Start_Transaction, T4]
 [Write_Item, T4, C, 100] ← System Crash

- b) Construct a wait-for graph according to the following request. Is there a deadlock? Justify.

Time	Transaction	Code
t1	T0	Lock(A,X)
t2	T1	Lock(B,S)
t3	T2	Lock(A,S)
t4	T0	Lock(C,X)
t5	T1	Lock(D,X)
t6	T0	Lock(D,S)
t7	T1	Lock(C,S)
t8	T2	Lock(B,S)

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10 JAN 2023

Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University

M.Sc.-I (Semester: I)
Subject: Computer Applications
Paper Title: Python Programming
Paper Code: CSA 4103
2019 Pattern (4 Credits)

[Time: 3 Hours]

[Max. Marks: 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

Q1) **Answer the following questions (Any Five).** [5 x 2 = 10 M]

- a) List the function/methods required for following operation
 - i) To check if string contains only uppercase letters
 - ii) To trim whitespaces from the string object.
 - iii) To find the lowest index where the specified substring is found.
 - iv) To count the number of occurrences of a substring in the given string.

- b) Can a Python function return multiple values? If yes, how it works?

- c) Write a python code to get the following output:

{1:1, 3:9, 5:25, 7:49, 9:81}

- d) Observe the following program and answer the questions that follow:

```
import random
x=3
n=random.randint(1,x)
for i in range(n):
    print(i, '#', i+1)
```

What is the minimum and maximum number of times the loop will execute?

- e) Write any two methods of Dictionary datatype.
- f) What is the role of indentation in python code? Provide an example to support your answer.

Q2) **Answer the following questions (Any Four).** [4 x 3 = 12 M]

- a) Predict the output of the following code:

```
L= ["20","50","30","40"]
```

```
cnt = 3
```

```
Sum = 0
```

```
for i in [7,5,4,6]:
```

```
    t = L[cnt]
```

```
    Sum = float(t) + i
```

```
    print(Sum)
```

```
    cnt=cnt-1
```

- b) Write a short note on file pointers.

- c) Explain the two strategies employed by Python for memory allocation.
- d) What are polymorphic functions with suitable example.
- e) Illustrate the use of range() along with an example

Q3)

Answer the following questions (Any Three).

[3 x 3 = 9 M]

- a) Write a function Find_Index(L), where L is the list of elements passed as argument to the function. The function returns another list named 'indexList' that stores the indices of all Non-Zero Elements of the list L.

For example: If the list L contains [12,4,0,11,0,56]

The indexList will have - [0,1,3,5]

- b) How filter can be used in Python program? Explain with a suitable example.
- c) Write a python program to retrieve strings starting with m and having 5 characters.
- d) Write a program that reads a file name. The program should handle the cases where user enters bad file names

Q4)

Answer the following questions (Any Two).

[2 x 3 = 6 M]

- a) What is mutable? Is tuple mutable? Demonstrate any two methods of tuple with suitable example.
- b) What is indexing and slicing explain with example.
- c) What is lambda function in python? Explain with any one example.

Q5)

Answer the following questions (Any Two).

[2 x 4 = 8 M]

- a) What are modules? How to use module in program? Also explain the concept of package in python
- b) Write short notes on:
 - i) Recursion versus iteration
 - ii) The finally block
- c) What is a short-circuit evaluation? Also discuss the associativity of operators.

Q6)

Answer the following questions (Any One).

[1 x 5 = 5 M]

- a) List out the merits of dictionary over lists. Write a python program that accepts username and the marks they have scored. Find the minimum, maximum marks of the students in the following range separately:
 - a. Range 100: 85
 - b. Range 85:75
 - c. Range 75: 60
 - d. Below 60
- b) Write a Python program that counts the number of occurrences of the character in the given string. Provide two implementations: recursive and iterative.

70 DEC 2022

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Deccan Education Society's
FERGUSON COLLEGE (Autonomous) Pune-4
Affiliated to Savitribai Phule Pune University
M.Sc.-II (Semester: III)
Subject: Computer Applications
Paper Title: Advanced Java
Paper Code: CSA5301
2019 Pattern (4 Credits)

[Time: 3 Hours]

Instructions to the candidates:

[Max. Marks: 50]

- 1) All questions are compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.

Q1) Answer the following questions (Any Five).

[5 x 2 = 10 M]

- a) Describe the concept of reserved sockets with example.
- b) State the output of the following two statements:
 - i) `Arrays.fill(array, 0);`
 - ii) `Arrays.fill(array, 1, 2, 1);`Where array is an integer array of size 5.
- c) Name the jar files to be added in CLASSPATH variable to perform all email operations.
- d) List the advantages of servlets over CGI.
- e) Describe the `errorPage` and `isErrorPage` attributes of `Page` directive in JSP.
- f) Name the components for JDBC and ODBC that
 - i. Loads database drivers and manages the connection between the application and the driver.
 - ii. Inform about returned data, the database, and the driver.
 - iii. Gives the logical set of columns and rows of data returned by executing a statement.
 - iv. Translate API calls into operation for a specific data source.

Q2) Answer the following questions (Any Four).

[4 x 3 = 12 M]

- a) Predict the output of the following JSP code lines:
 - i) `<%= 5+3 %>`
 - ii) `<%@ page import= "java.io.*" %>`
 - iii) `<% out.print ("Hello From JSP"); %>`
- b) Outline the sequence of lines required in web.xml file to execute a servlet application named `MyServlet.java`.
- c) Explain with suitable example, any three factory methods.
- d) Consider the declaration as: `Vector v1=new Vector(3,2);` and Elements stored in the `v1` are `[1, 2, 3, 4, 5]`. Predict the output of the following Java code statements:
 - i. `System.out.println(v1.size());`
 - ii. `System.out.println(v1.capacity());`
 - iii. `System.out.println(v1.firstElement());`
- e) Discuss the different forms of `createStatement()` method.

Q3) Answer the following questions (Any Three).

[3 x 3 = 9 M]

- a) Illustrate different forms of JSP page.
- b) Demonstrate the Java servlet code that will print the today's date on the web page.
- c) Interpret the use of finally block in database handling program using Java.
- d) Implement Java code for all the variables required to send an email along with their values.

- Q4) **Answer the following questions (Any Two).** [2 x 3 = 6 M]
- a) Explain the JDBC product components provided by JavaSoft Framework as a part of JDK.
 - b) Identify the folders of Apache Tomcat web server in the view of servlet-database connectivity program execution carried out using .html, database related jar file, and .class files.
 - c) Explain with syntax, any two directives of JSP.
- Q5) **Answer the following questions (Any Two).** [2 x 4 = 8 M]
- a) Determine the various ways of destroying sessions using JSP.
 - b) Select the exceptions from the followings that will be thrown by the methods of Collection interface and SortedSet interface.
 - i. UnsupportedOperationException
 - ii. ClassCastException
 - iii. NullPointerException
 - iv. IllegalArgumentException
 - v. IllegalStateException
 - vi. NoSuchElementException
 - c) Determine the steps to retrieve an email using JavaMail API.
- Q6) **Answer the following questions (Any One).** [1 x 5 = 5 M]
- a) Write a program to accept 'n' elements from the user and print all prime numbers. Use appropriate collection which does not accept duplicate elements.
 - b) Write a JSP page to print the details of employee having designation as manager. The fields of employee table are emp_no, emp_name, salary, designation.
