

SVKM'S  
Mithibai College of Arts, Chauhan Institute of Science &  
Amrutben Jivanlal College of Commerce and Economics (Autonomous)  
Academic Year (2021-22)  
Class: Second Year Semester: IV

Program: Bachelor of Science  
Subject: Computer Science/Fundamentals of Algorithms  
Date:  
Course Name: Fundamentals of Algorithms

Max. Marks: 50  
Time: 7:30 am to 9:15 am  
Duration: 1 hr 45 minutes  
Course code: USMACS401

REGULAR EXAMINATION

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

- 1) This question paper contains 2 pages.
- 2) Answer to each new question to be started on a fresh page.
- 3) Figures in brackets on the right hand side indicate full marks.
- 4) Assume Suitable data if necessary

Q-1 Answer Following (Any two):

[14]

1. Given following code explain master theorem used, find its recurrence relation and Complexity:

```
def func(n):
    cnt=0
    if n<=0:
        return
    for i in range(0,n) :
        for j in range(0,n):
            cnt=cnt+1
    func(n-3)
    print(cnt)
```

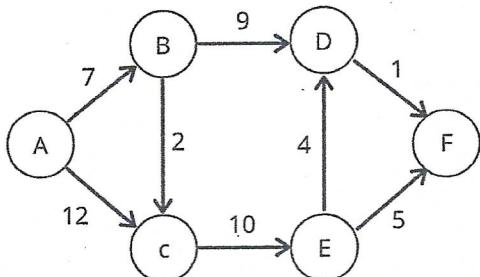
2. Discuss different types of algorithm analysis with its notations. Which is most commonly used analysis? Why?
3. Given following python program, discuss master theorem to find its complexity

```
def func(n):
    if (n<2):
        return
    else:
        cnt=0
    for i in range(0, 16):
        func(n//2)
    for i in range(0, n**4)
        cnt=cnt+1
```

Q-2 Answer Following (Any two):

[14]

- Given following graph:



Find shortest path using dijkstra's algorithm. Consider the source as A.

- Explain AVL tree with example.
- Describe tournament method to find 2<sup>nd</sup> smallest element using following values:  
20, 12, 30, 40, 5, 7, 10, 19, 25, 35, 45

Q-3 Answer Following (Any two):

[14]

- What is greedy algorithm? Explain properties of greedy algorithm. Give two applications of greedy algorithm.
- Find out longest common subsequence of "longest" and "stone".
- Given following characters and frequency, create Huffman code:

Character	Frequency
A	11
B	12
C	13
D	14
E	24
F	26

Q-4 Answer Following: (Any Four)

[08]

- Draw the node structure of threaded binary tree.
- Explain Recursion or Iteration as algorithm classification method.
- Discuss worst case complexity of linear search.
- Discuss in-degree and out-degree with example.
- Given recurrence relation  $T(n)=T(n-3)+n^2$  find its  $\Theta$ .
- Describe properties of dynamic programming.

SY B.Sc Comp Sci

22 JUN 2022

SVKM'S

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Max. Marks: 50

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Q-1 Answer Following (Any two):

[14]

1. Given following code explain master theorem used, find its recurrence relation and Complexity:

```
def func(n):
    cnt=0
    if n<=0:
        return
    for i in range(0,n) :
        cnt=cnt+1
    func(n-3)
    print(cnt)
```

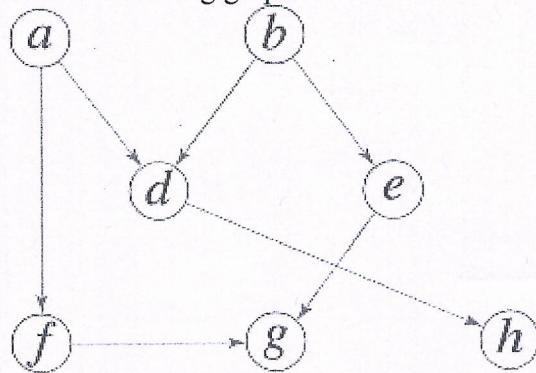
2. Explain different asymptotic notations.
3. Given following python program, discuss master theorem to find its complexity

```
def func(n):
    if (n<2):
        return
    else:
        cnt=0
    for i in range(0, 16):
        func(n//2)
    for i in range(0, n**4)
        cnt=cnt+1
```

[14]

Q-2 Answer Following (Any two):

- Given following graph:



Generate topological sorting.

- Explain N-ary tree with suitable example.
- Describe tournament method to find 2<sup>nd</sup> largest element using following values:  
12, 10, 8, 14, 16, 18, 22, 20, 5

Q-3 Answer Following (Any two):

[14]

- What is greedy algorithm? Explain properties of greedy algorithm. Give two applications of greedy algorithm.
- Find out longest common subsequence of "intention" and "execution".
- Given following characters and frequency, create Huffman code:

Character	Frequency
A	4
B	5
C	7
D	8
E	10
F	12
G	20

Q-4 Answer Following: (Any Four)

[08]

- Give properties of AVL tree.
- Explain procedural or declarative as algorithm classification method.
- Discuss best case complexity of linear search.
- Give applications of divide and conquer algorithm.
- For a recurrence relation  $T(n)=2T(n/4)+n^{0.51}$  apply suitable theorem to find it  $\Theta$ .
- Describe tabulation as approach of dynamic programming.

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 Amrutben Jivanlal College of Commerce and Economics (Autonomous)  
 Academic Year (2022-23)  
 Year: 2 / Semester: IV

Program: B.Sc. Computer Science

Max. Marks: 75

Course: Fundamentals of Algorithms

Date:

Duration: 2 ½ hrs.

## REGULAR EXAMINATION

## Instructions:

- 1) This question paper contains 2 pages.
- 2) All questions are compulsory
- 3) Answer to each new question to be started on a fresh page.
- 4) Figures in brackets on the right hand side indicate full marks.
- 5) Assume Suitable data if necessary
- 6) Draw neat and well labelled diagrams wherever necessary.
- 7) Use of scientific calculator is permitted

**Q.1 Attempt any three.**

[21]

A What is Algorithm? Discuss different types of algorithm analysis.

Which is the most commonly used analysis? Why?

B What is the complexity of the following code? Detail each step.

def func1(n):

i=1

while i&lt;=n:

i=i\*2

print(i)

for j in range(0, n):

print(j)

C Given following python code find its complexity.

def func(n):

cnt=0

if n&lt;=0:

return

for i in range(0,n) :

for j in range(0,n):

cnt=cnt+1

func(n-3)

print(cnt)

D Develop recursive python program to find  $x^y$ . Find its complexity.**Q.2 Attempt any three:**

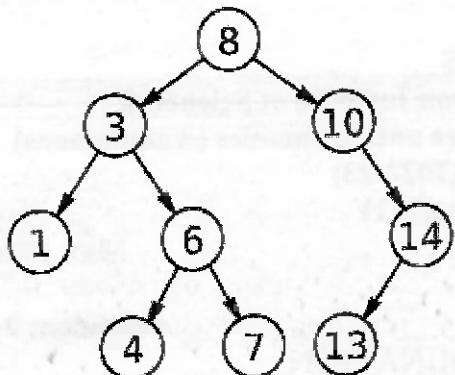
[21]

A What are heaps? Explain heapsort with following example:

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

B What is string matching? Describe naïve approach of the string matching with an example.

C Explain the concept of threaded binary tree with its node structure. Given following binary tree generate threaded binary tree.



- D Discuss median of median algorithm with suitable example.

**Q.3**

**Attempt any three.**

[21]

- A Explain following methods of algorithm classification:

- Linear Programming
- Reduction
- Deterministic or Non-Deterministic
- Exact or Approximate

- B Find out longest common subsequence of "longest" and "stone".

- C Write a program of quick sort as an application of divide and conquer strategy.

- D Given following character frequencies:

Character	a	e	i	o	u	s	t
Frequency	10	15	12	3	4	13	1

Find its Huffman code.

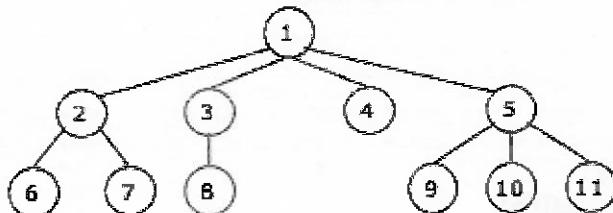
**Q.4**

**Attempt any three:**

[12]

- A Given recurrence relation  $T(n)=16T(n/4)+n$  find its  $\Theta$ .

- B What is Generic tree? Given the following generic tree convert it into the corresponding binary tree.



- C Explain the programming terminology by which D & C divides problems in sub-problems. Draw visualization of divide and conquer strategy.
- D Explain properties and approaches of dynamic programming

19 MAR 2022

SVKM'S

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Academic Year (2021-22)  
Class: SYBSc Semester: IV

Program: Bachelor of Science

Subject: Computer Science

Course Name: Linear Algebra with Python

Course Code: USMACS405

Date:

Max. Marks: 50

Time: 7:30 am to 9:15 am

Duration: 1 hr 45 minutes

**REGULAR EXAMINATION**

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**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

- 1) This question paper contains 03 pages.
- 2) All questions are compulsory.
- 3) Answer to each new question to be started on a fresh page.
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- 5) Assume Suitable data if necessary
- 6) Use of only non-scientific calculators is allowed

**Q 1. Attempt any two**

14

- A. Given  $u = (3, -2, -3, 1, -2)$ ,  $v = (2, -1, -2, 2, -1)$ , find 07
- i. distance between the vectors  $u$  and  $v$
  - ii. angle between the vectors  $u$  and  $v$
  - iii. projection between the vectors  $u$  and  $v$
  - iv. norm of the vector  $u$
- B. Given  $z$  and  $w$  are complex numbers where  $z = 2 - i$  and  $w = 3 + 2i$  then find 07
- i.  $z + w$
  - ii.  $zw$
  - iii. conjugate of  $z$
  - iv.  $w / z$
  - v.  $|z|$
- C. i. Solve the following triangular system of linear equations: 07
- $$\begin{aligned} 2p - 4q - 3r - 2s &= -9 \\ q + 4r - s &= 4 \\ 3r + s &= -6 \\ 2s &= -6 \end{aligned}$$

- ii. Determine whether the following homogeneous system of linear equations have non zero solution

$$\begin{aligned}x + y - z &= 0 \\2x + 4y - z &= 0 \\3x + 2y + 2z &= 0\end{aligned}$$

**Q 2.** Attempt any two

14

A. Given that

$$A = \begin{bmatrix} -7 & -12 & 1 \\ -4 & 3 & 4 \\ -2 & 5 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 4 & 1 & -2 \\ 5 & 4 & 2 \\ -2 & -3 & -1 \end{bmatrix}$$

- i. Find the sum of the matrices
- ii. Find the transpose of matrix A
- iii. Find the inverse of matrix B from its adjugate matrix

B. Given that

$$A = \begin{bmatrix} 3 & -4 & 4 \\ 1 & 3 & -2 \\ 1 & 6 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 4 & -1 & 2 \\ 3 & 2 & 2 \\ -1 & -2 & 4 \end{bmatrix}$$

- i. Find the difference  $A - B$
- ii. Find the transpose of matrix A
- iii. Find the product of matrices

C. Find the basis and the rank of following matrix:

07

$$\begin{bmatrix} 1 & 2 & 0 & -1 \\ 2 & 6 & -3 & -3 \\ 3 & 5 & 4 & 0 \\ -2 & 2 & 1 & 2 \end{bmatrix}$$

**Q 3.** Attempt any two

14

A. Reduced the following matrix to it echelon form and then to its row-canonical form

07

$$\begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & -1 \\ 3 & 2 & 4 \end{bmatrix}$$

- B. Solve the following system of linear equations using Gaussian Elimination 07

$$\begin{aligned}3x + 5y + 2z &= -5 \\x + 3y + 2z &= -7 \\3x + y - 2z &= 11\end{aligned}$$

- C. For the following matrix A 07
- Find all eigenvalues and corresponding eigenvectors.
  - Find matrices P and D such that P is nonsingular and  $D = P^{-1}AP$  is diagonal.

$$A = \begin{bmatrix} 4 & 1 \\ 7 & -2 \end{bmatrix}$$

- Q 4. Attempt any four** 08

- A. Explain norm of a vector. 02  
B. Describe linearly dependent vectors. 02  
C. Explain degenerate linear equations and its solutions. 02  
D. What are the elementary row operations allowed on system of linear equations? 02  
E. Explain homogeneous system of linear equations 02  
F. Define eigenvalue and eigenvector. 02

- 2 JUL 2022

SVKM'S

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Class: SYBSc Semester: IV

Program: Bachelor of Science

Max. Marks: 50

Subject: Computer Science

Time:

Course Name: Linear Algebra with Python

Duration: 1 hr 45 minutes

Course Code: USMACS405

Date:

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

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- 6) Use of only non-scientific calculators is allowed

**Q 1. Attempt any two** 14

- A. Given  $u = (2, -3, 2, 0, -4)$ ,  $v = (-1, -3, -3, -3, 2)$  find 07
- i. distance between the vectors  $u$  and  $v$
  - ii. angle between the vectors  $u$  and  $v$
  - iii. projection between the vectors  $u$  and  $v$
  - iv. norm of the vector  $u$
- B. Given  $z$  and  $w$  are complex numbers where  $z = 2 - 2i$  and  $w = -3 - 4i$  then find 07
- i.  $z + w$
  - ii.  $zw$
  - iii. conjugate of  $z$
  - iv.  $w / z$
  - v.  $|z|$
- C. i. Solve the following triangular system of linear equations: 07
- $$\begin{aligned} 2p - 3q + 5r - 2s &= 9 \\ 5q - r + 3s &= 1 \\ 7r - s &= 3 \\ 2s &= 8 \end{aligned}$$

- ii. Determine whether the following homogeneous system of linear equations have non zero solution

$$3x + 2y - 2z = 0$$

$$x - 2y + 2z = 0$$

$$x - 2y + 3z = 0$$

**Q 2.** Attempt any two

14

A. Given that

$$A = \begin{bmatrix} -2 & -3 & 1 \\ -14 & 2 & 4 \\ -2 & 3 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -1 & -1 & -1 \\ -2 & 1 & -2 \\ 1 & 2 & 4 \end{bmatrix}$$

- i. Find the sum of the matrices
- ii. Find the transpose of matrix A
- iii. Find the inverse of matrix B from its adjugate matrix

B. Given that

07

$$A = \begin{bmatrix} -2 & -3 & 4 \\ 3 & 1 & -2 \\ 0 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 4 & 1 & 1 \\ 2 & -2 & 3 \\ -1 & -3 & 2 \end{bmatrix}$$

- i. Find the difference  $A - B$
- ii. Find the transpose of matrix A
- iii. Find the product of matrices

C. Find the basis and the rank of following matrix:

07

$$\begin{bmatrix} 1 & 1 & 2 & 0 \\ 2 & 4 & 2 & 4 \\ 2 & 1 & 5 & -2 \\ -1 & 2 & 3 & -2 \end{bmatrix}$$

**Q 3.** Attempt any two

14

A. Reduced the following matrix to it echelon form and then to its row-canonical form

07

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & -1 \\ 3 & 2 & 2 \end{bmatrix}$$

- B. Solve the following system of linear equations using Gaussian Elimination 07  
 $x + 2y - 3z = 1$   
 $2x + 5y - 8z = 4$   
 $3x + 8y - 13z = 7$

- C. For the following matrix A 07  
i. Find all eigenvalues and corresponding eigenvectors.  
ii. Find matrices P and D such that P is nonsingular and  $D = P^{-1}AP$  is diagonal.

$$A = \begin{bmatrix} 3 & 2 \\ 3 & -2 \end{bmatrix}$$

- Q 4. Attempt any four 08
- A. Explain linear combination of vectors. 02  
B. Explain spanning set and linear span of a vector space. 02  
C. What is a system of linear equations and its solutions? 02  
D. Describe the steps to convert a matrix into its row canonical form 02  
E. Describe diagonalization 02  
F. Define eigenvalue and eigenvector. 02

21 MAR 2022

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Mithibai College of Arts, Chauhan Institute of Science &  
Amrutben Jivanlal College of Commerce and Economics (Autonomous)  
Academic Year (2021-22)  
Class:S.Y.B.Sc. Semester:IV

Program: Bachelor of Science  
Subject: Computer Science  
Course Code : USMACS406  
Course Name : .NET Technologies  
Date: \_\_\_\_\_

Max. Marks: 50  
Time: 7:30 am to 9:15 am  
Duration: 1 hr 45 minutes

**REGULAR EXAMINATION**

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**Q.1 Attempt any TWO Questions (14)**

- A How does language compilation take place in .NET Framework ? (7)  
Explain it with a diagram
- B Write the list of datetime related functions available in C# along with (7)  
syntax and coding example
- C Discuss different class accessibility options available in C#. Create a (7)  
class and a constructor for the class. Create an object for the class.

**Q.2 Attempt any TWO Questions (14)**

- A Write a note on the following properties with possible values of Web (7)  
Controls.  
a. EnableViewState b. Page c. TabIndex d. AccessKey  
e. Parent f. BorderStyle (with possible values)
- B Write a note on the role of Cross-Page posting and Query String in (7)  
state management with appropriate coding examples

- C Create a Textbox which accepts an input from the user. Discuss all the possible validators that can be used with that textbox for various data types. Mention the properties of validation controls that should be changed for each validation. (7)

**Q.3 Attempt any TWO Questions (14)**

- A Write code snippets to create Connection object, DataReader object and insert a new record in a sample table. Assume the table details (7)

- B Write c# functions to create and retrieve an XML file given below using ASP.NET (7)

```
<clients>
<client location='CA'>
<supervisor> chromatic</supervisor>
<staffcount> 1 </staffcount>
</client>
</clients>
```

- C What is Simple Data Binding ? Write a code snippet to populate a CheckBoxList using class objects and array\_list (7)

**Q.4 Attempt any FOUR Questions (08)**

- A Write the syntax and example C# statements to declare 1D and 2D arrays (2) (Numeric and Strings)

- B What is Client-Side Validation and Server-Side Validation ? Give a (2) Scenario to explain these two concepts.

- C Give at least 4 rich data controls. (2)

- D Write about at least 4 wild card characters that can be used in validator (2) controls for regular expression

- E List the Properties of Connection String. (2)

- F Write a C# code for creating a base class and a derived class in C# (2)

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30 JUN 2022

**SVKM'S**

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Academic Year (2021-22)

Class:S.Y.B.Sc. Semester:IV

**Program: Bachelor of Science**

**Max. Marks: 50**

**Subject: Computer Science**

**Time:**

**Course Code : USMACS406**

**Course Name : .NET Technologies**

**Date: \_\_\_\_\_**

**Duration: 1 hr 45 minutes**

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- 4) Figures in brackets on the right hand side indicate full marks.

**Q.1 Attempt any TWO Questions (14)**

- A What are the implications of Common Language Runtime in .NET Framework ?
- B Write the list of array related methods available in C# along with syntax and coding example (7)
- C Discuss different class accessibility options available in C#. Create a class and a constructor for the class. Create an object for the class. (7)

**Q.2 Attempt any TWO Questions (14)**

- A Draw the diagram to depict when a page is requested and rendered and explain the steps. Also write about Page directive code. (7)
- B Give at least 4 types of errors made by the user during data entry. Suggest ways to avoid them. (7)
- C What is AdRotator Control ? Write the XML file which is created for the AdRotator Control. (7)

**Q.3 Attempt any TWO Questions (14)**

- A Draw the ADO.NET architecture diagram and explain about the two ways of accessing the data from back end. (7)
- B Write functions to insert a record and retrieve the contents of a SQL table using disconnected architecture (7)
- C What is data binding and what are its types ? How do you populate a list box with SQL table contents using data binding ? (7)

**Q.4 Attempt any FOUR Questions (08)**

- A What are static members ? How is it different from other members ? (2)  
Give example
- B Write the properties that should be changed while adding (2) RangeValidator ?
- C What are cookies ? How do you create them in ASP.NET (2)
- D Write at least 4 generic properties of a web control (2)
- E Write a C# code for creating a base class and a derived class in C# (2)
- F List the Properties of Connection String. (2)

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15 MAR 2023

SVKM'S

Mithibai College of Arts, Chauhan Institute of Science &  
Amrutben Jivanlal College of Commerce and Economics (Autonomous)

Academic Year (2022-23)

Class:S.Y.B.Sc. Semester: IV

Program: B.Sc. Computer Science

Max. Marks: 75

Course Name: .NET Technologies

Time:

Course Code: USMACS406

Duration: 2 hrs 30 minutes

Date:

### REGULAR EXAMINATION

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- 1) This question paper contains 2 pages.
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- 3) Answer to each new question to be started on a fresh page.
- 4) Figures in brackets on the right hand side indicate full marks.
- 5) Assume Suitable data if necessary

**Q-1 Attempt any THREE Questions :** (21)

- a) How does Common Language Runtime impact .NET Framework ? (7)
- b) Draw the diagram to depict when a page is requested and rendered and explain the steps. (7)  
Also write about Page directive code.
- c) Discuss different class accessibility options available in C#. Create a class and a constructor (7) for the class. Create an object for the class.
- d) Explain passing parameter by value and by reference in functions with the help of a coding (7) example in C#.

**Q-2 Attempt any THREE Questions :** (21)

- a) How is information passed through query strings ? Explain with the help of a coding (7) example. Also write about URL encoding.
- b) Give at least 7 types of errors made by the user during data entry. Suggest ways to avoid (7) them.
- c) What is AdRotator Control ? Write the XML file which is created for the AdRotator (7) Control.
- d) List at least 7 web control classes with their equivalent HTML elements. Also write the (7) functionality of every control.

**Q-3 Attempt any THREE Questions :** (21)

- a) Draw the ADO.NET architecture diagram and explain about the two ways of accessing the data from back end. (7)
- b) Write functions to insert a record and retrieve the contents of a SQL table using disconnected architecture (7)
- c) What is Single-value Data binding ? Incorporate Single-value data binding and display different types of information on the web page. Also write the problems in single-value data binding (7)
- d) Assume an XML file which stores information about students. Create that file using XMLTextWriter and related classes. (XML Tree should have a depth of at least 4). (7)

**Q-4 Attempt any THREE Questions :** (12)

- a) Write a note on .NET languages and Intermediate Language (4)
- b) List any 4 derived classes of HtmlInputControl class. (4)
- c) Write down the steps to query information from a table with simple data access. (4)
- d) Write at least 4 generic properties of a web control (4)

- 5 JUL 2022

**SVKM'S**  
**Mithibai College of Arts, Chauhan Institute of Science &**  
**Amrutben Jivanlal College of Commerce and Economics (Autonomous)**  
**Academic Year (2021-22)**  
**Class: S. Y. B. Sc. Semester: IV**

**Program: Bachelor of Science** **Max. Marks: 50**  
**Subject: Computer Science**  
**Course Code / Name : USMACS407 Software Engineering** **Time:**  
**Date: \_\_\_\_\_** **Duration: 1 hr 45 minutes**

---

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

- 1) This question paper contains 2 pages.
- 2) All Questions are Compulsory
- 3) Answer to each new question to be started on a fresh page.
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**Q1. Answer the following (Any 2 out of 3)** 14

1. Explain Waterfall Model and CBSE.
2. Explain Extreme Programming and XP Process.
3. What is Feasibility Study and explain any 3 Feasibilities.

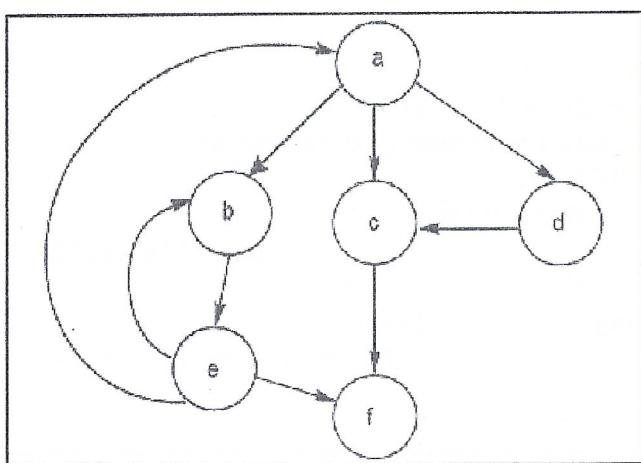
**Q2. Answer the following (Any 2 out of 3)** 14

1. Write a note on Functional and Non-functional requirements for a system.
2. Write a note on Design Specifications and attributes from IEEE Standard 1016.
3. Explain Activity Diagram. Draw an activity diagram for Online Shopping System for a Web Customer.

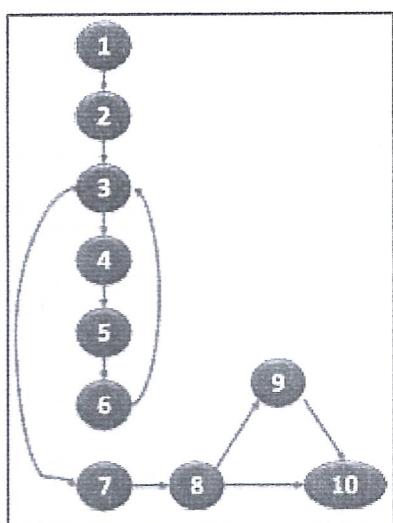
**Q3. Answer the following (Any 2 out of 3)** 14

1. Write a short note on Effort Distribution and Timeline charts.
2. Explain Function Based Metric and Object Oriented Design in details.
3. Explain: Cyclomatic complexity. Find the Cyclomatic Complexity of the following figures using atleast 2 ways.

a)



b)



Q4. Answer the following in two or few lines (Any 4 out of 6) 08

1. List broad categories of software application domain.
2. List the General principles of Software Engineering.
3. Who are the users of the SRS document?
4. Draw a Statechart Diagram for Traffic Signal.
5. What are the two fundamental testing activities?
6. List Project Scheduling Basic Principles.

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Amrutben Jivanlal College of Commerce and Economics (Autonomous)  
Academic Year (2022-23)

Class: SYBSC Semester: IV

Program: B.Sc Computer Science

Max. Marks: 75

Course Name: Software Engineering

Time:

Course Code: USMACS407

Duration: 2 hrs 30 minutes

Date:

**REGULAR EXAMINATION**

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**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

- 1) This question paper contains 2 pages.
- 2) Answer to each new question to be started on a fresh page.
- 3) Figures in brackets on the right-hand side indicate full marks.
- 4) Assume Suitable data if necessary.

**Q1 ATTEMPT ANY 3 FROM THE FOLLOWING: [21]**

- |   |   |
|---|---|
| A Define Software process. Explain software process framework with the help of a diagram. | 7 |
| B Explain Cultural, Economic and Organizational Feasibility in detail.                    | 7 |
| C What are the problems with waterfall model? Describe the concurrent model in detail.    | 7 |
| D What is Spiral model? How does the Spiral Model handle the need for risk management?    | 7 |

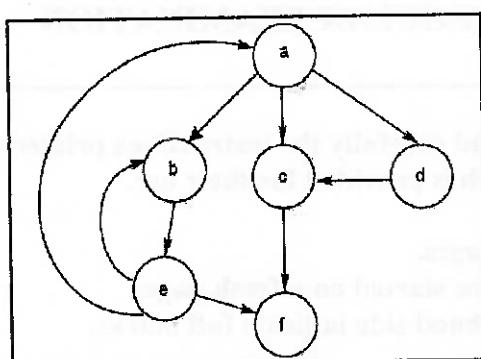
**Q2 ATTEMPT ANY 3 FROM THE FOLLOWING: [21]**

- |   |   |
|---|---|
| A What is Software Requirement Specification? State and explain the characteristics of SRS. | 7 |
| B Draw a State diagram for depicting a telephone call.                                      | 7 |
| C Explain usecase diagram with its components.  | 7 |
| D What is Cohesion? Explain any 3 types of cohesion.  | 7 |

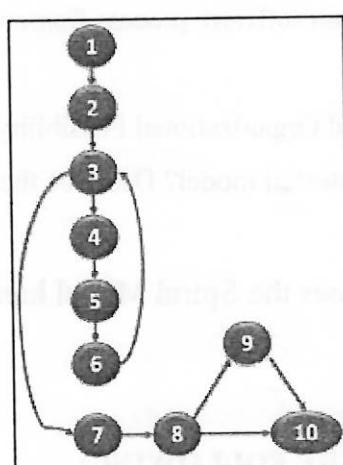
**Q3 ATTEMPT ANY 3 FROM THE FOLLOWING:** [21]

- A Write a short note on Effort Distribution and Timeline charts. 7
- B Explain Function point analysis in detail with an example. 7
- C What is testing? Discuss any 3 types of testing in detail. 7
- D Explain: Cyclomatic complexity. Find the Cyclomatic Complexity of the following figures using at least 2 ways. 7

a)



b)



**Q4 ATTEMPT ANY 3 FROM THE FOLLOWING:** [12]

- A State the reasons for failure of a software. 4
- B Who are the users of the SRS document? 4
- C Write a note on stakeholders in Software engineering. 4
- D What are the two fundamental testing activities? 4

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## SVKM'S

Mithibai College of Arts, Chauhan Institute of Science &  
 Amrutben Jivanlal College of Commerce and Economics (Autonomous)  
 Academic Year (2021-22)  
 Class: S. Y. B. Sc. Semester: IV

**Program: Bachelor of Science** **Max. Marks: 50**

**Subject: Computer Science**

**Course Code / Name : USMACS407 Software Engineering**

**Time: 7:30 am to 9:15 am**

**Date:** \_\_\_\_\_

**Duration: 1 hr 45 minutes**

**REGULAR EXAMINATION**

**Instructions:** Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

- 1) This question paper contains 2 pages.
- 2) All Questions are Compulsory
- 3) Answer to each new question to be started on a fresh page.
- 4) Figures in brackets on the right hand side indicate full marks.
- 5) Assume Suitable data if necessary

**Q1. Answer the following (Any 2 out of 3)**

**14**

1. Explain Incremental Delivery and Spiral Development.
2. Explain: Software, Software Application Domains, Software Engineering
3. Explain Cultural, Economic and Organizational Feasibility in detail.

**Q2. Answer the following (Any 2 out of 3)**

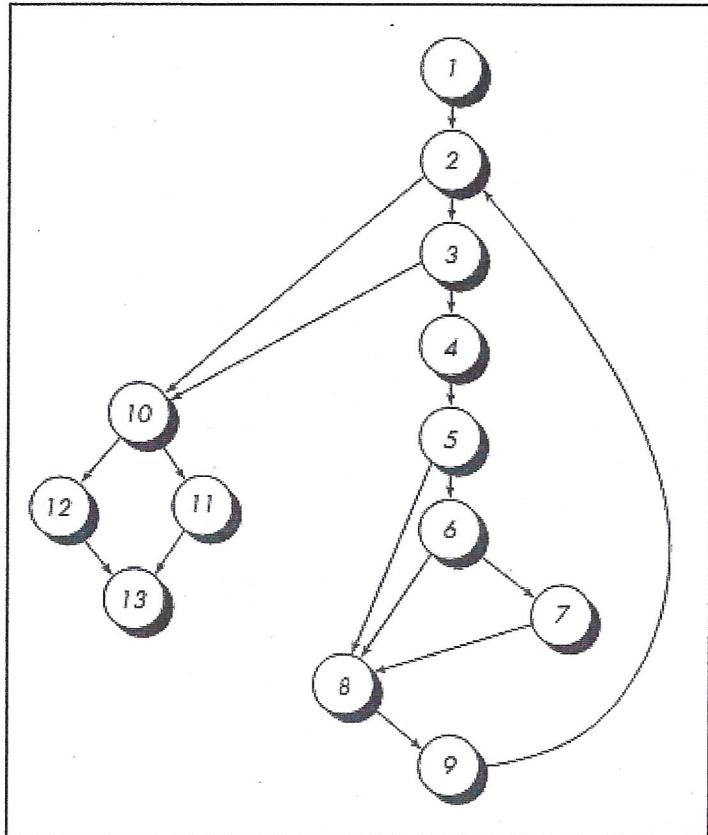
**14**

1. Explain SRS, its need and structure of SRS document.
2. Write a short note on Interaction Diagrams- Sequence and Collaboration with examples (diagrams).
3. Explain Use Case Diagram. Draw a Use Case Diagram for Student Management System.

**Q3. Answer the following (Any 2 out of 3)**

**14**

1. Describe COCOMO-II in brief.
2. Explain in short: Testing Principles, Levels of Testing, Test plan and Test oracles.
3. Explain: Cyclomatic complexity. Find the Cyclomatic Complexity of the following figure using all 3 ways.



Q4. Answer the following in two or few lines (Any 4 out of 6)

08

1. What are the attributes of Good Software?
2. Give the full form of: a) CBSE  
b) COTS  
c) CASE  
d) RUP
3. Define Coupling and Cohesion.
4. Draw the diagram of RE Process.
5. Which are the 3 major categories of Software Engineering Resources?
6. Define terms measurement, metrics, indicator.