ATKT Exam. Sem-III

SYBSC - Computer Science

March - 2024

SYCS

ATKT Exam

Sem III

March - 2024

SY. CS
2/3/24

D. B. J. College Chiplun

ATKT **Examination** Mar 2024

Class: S. Y. B. Sc. Sem: III **Subject: Computer Science**

Paper No. :I **Paper Name : Operating Systems (USCS301)**

Duration : 2 ½ hrs **Marks: 75**

Notes:

1. Figures to right indicate full marks.
2. All questions are compulsory. Use internal options to the questions.
3. Mixing of sub-questions is not allowed.

Q. 1 **Attempt any four.** **(20M)**

a) State and explain operating systems services.

b) Explain five state process model.

c) Describe various types of system calls in detail.

d) Explain the types of schedulers in detail.

e) Write a note on multithreading models.

f) State and explain operations on process.

Q. 2 **Attempt any four.** **(20M)**

a) Consider a system with three processes p1 through p3 and four resource types A, B, C .Compute the need array and check whether system is under safe state or not. Also find safe sequence.

PID	Allocation			Need		
	A	B	C	A	B	C
P1	0	1	0	7	4	3
P2	3	0	2	0	2	0
P3	3	0	1	6	0	0

Available		
A	B	C
2	3	0

b) Write a note on multilevel feedback queue scheduling.

c) Consider the following table calculate waiting time and turn-around time using SJF and also draw a Gantt chart.

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	3	3
P4	1	4
P5	4	7

d) Explain dinning philosopher problem in detail.

e) Define the following.

1. CPU scheduling
2. Throughput
3. Turnaround time
4. Response time
5. Waiting time

f) Discuss the techniques of recovery from deadlock.

P.T.O.

Q. 3 **Attempt any four.** (20M)

a) What is swapping? Explain in detail.

b) Explain demand paging technique with the help of example.

c) State and explain different attributes of file.

d) Consider the following page references string and find total number of page faults using LRU and FIFO where page frame size is 3.
c d e d e f c e d f

e) Consider a disk queue with requests for I/O to blocks on cylinders
45, 39, 90, 65, 180, 120 Find total head movement of cylinders of head starts at 50 using SSTF scheduling.

f) State and explain file operations.

Q. 4 **Attempt any five** (15M)

a) Explain the concept of deadlock.

b) Define thread and its types.

c) Write a note on critical section problem.

d) Explain shared memory in detail.

e) Write a note on fragmentation.

f) Explain producer consumer problem.

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SYBSC C.S
4/3/24

D. B. J. College Chiplun

ATKT Examination Nov 2024

Class: S. Y. B. Sc. Sem: III **Subject: Computer Science**

Paper No. :II **Paper Name : Linear Algebra (USCS302)**

Duration : 2 ½ hrs **Marks: 75**

1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mixing of sub-questions is not allowed.

Q1 **Attempt the Four** **20**

a Define the terms.
   a) Zero Vector
   b) Unit Vector
   c) Equal Vectors
   d) Like Vectors
   e) Collinear Vectors

b Find modulus principal argument of $1+\sqrt{3}i$

c Solve the following system by backward substitution method
$2x_1 + 3x_2 - 4x_3 = 10$
$x_2 + 2x_3 = 3$
$10x_3 = 40$

d Write a note on matplotlib.

e Check whether the vectors are linearly dependent
{(-1,1,1),(2,1,1),(1,2,2)} of R^3

f Express the vector (2,6) as a linear combination of vectors(1,1)and(2,3).

Q2 **Attempt the Four** **20**

a Find vector matrix multiplication using dot product.

1. V= [1,2,3] $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$

2. V= [7,9] $A = \begin{bmatrix} 9 & 8 \\ 7 & 6 \\ 2 & 1 \end{bmatrix}$

b Let $A = \begin{bmatrix} 2 & 3 \\ 1 & 5 \\ 3 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 6 \\ 1 & 3 \\ 2 & 5 \end{bmatrix}$ $C = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$ $D = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$
Compute the following
   a) A+ B b) 3A c) C+D d)2A+ 3B

c Show that given vectors are linearly dependent.
S= {(4,-1,0),(2,1,3),(0,1,2)} in R^3.

d State and explain Greedy algorithms for finding a set of generators.

e Explain the following methods of numPy package
   1. Scalar Product
   2. Matrix inversion

P.T.O.

f Solve the given system of linear equation using gauss elimination method.
X+5y=7
-2x-7y=-5

20

Q3 **Attempt the Four**

a Find the Eigen values and Eigen Vectors of matrix A where

$$A = \begin{matrix} 2 & 1 \\ 1 & 2 \end{matrix}$$

b Explain page rank in detail.

c Prove that following pair of matrices are orthogonal.

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

d Write a note on Internet Worm.

e Check that the set {(1, 2, 2),(2,1,-2),(2,-2,1)} is orthogonal or not.

f Reduce the given matrix A in echelon form.

$$A=\begin{pmatrix} 1 & 1 & 2 \\ 2 & 2 & 2 \\ 0 & 3 & 2 \end{pmatrix}$$

15

Q4 **Attempt the Five**

a Find the Multiplication of matrix A and matrix B

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

b Find the Null Space of the given system $A=\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

c Express [(3 + 2i)/(2 + i)(1 – 3i)] in the form x + iy

d Write the GCD function recursively using Euclid's algorithm.

e Find the factors of a number 84.

f Solve the following using GF2.

1. 1.1+0.1+0.0+1.1
2. 0+1.1+0.1+0.0

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SYBSC C.S
5/4/24.

D.B.S. College, Chiplun
ATKT Exam Mar. 2024
Sem III
SyBSc. (Comp. Sci.)
Sub: Data structures

[2 ½ hours] [Marks: 75]

N.B. **1) All questions are compulsory.**
2) Figures to the right indicate full marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q1 **Attempt any four** **(20)**

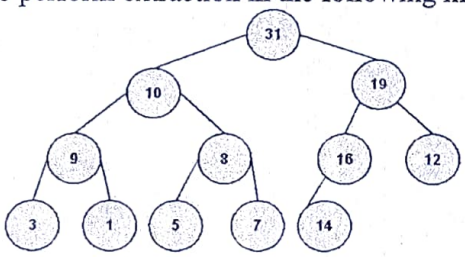
a) Write a short note on queue ADT.
b) Illustrate with the help of an example how to delete an element in a singly linked list.
c) Convert the following infix expression into posfix expression using stack: (A+B*C-D)/(E*F)
d) Elaborate on the working of circular array with the help of an example.
e) Evaluate the following postfix string using stack: 3 5 * 2 – 7 * 4 2 / +
f) What is deque? Explain how it is different from a regular queue.

Q2 **Attempt any four** **(20)**

a) With the help of an example explain how insertion operation is performed in a doubly linked list.
b) Define binary tree. State and explain the types of binary tree.
c) Write a short note on priority queue.
d) Find the Huffman code for the following data items:

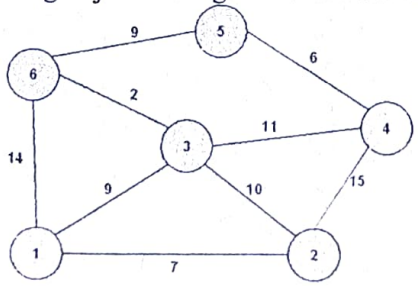
Data items	A	B	C	D	E	F	G
Probability	10	30	5	15	20	15	5

e) Construct an AVL tree for the following sequence of nodes:
35,50,40,25,30,60,78,20,28
f) Demonstrate how to perform extraction in the following max heap:



Q3 **Attempt any four** **(20)**

a) With the help of suitable example compare adjacency matrix & adjacency list.
b) Explain the implementation of DFS with an example.
c) Find the shortest path using Dijkstra's algorithm for the following graph:



[P.T.O]

d) What is collision? Explain the techniques for collision resolution.

e) Insert the following sequence of keys in the hash table using linear probing technique for collision resolution.
Keys:50,700,76,85,92,73,101
Hash function: k mod 7

f) Define hashing. State and explain the operations performed in hashing.

Q4 Attempt any five (15)

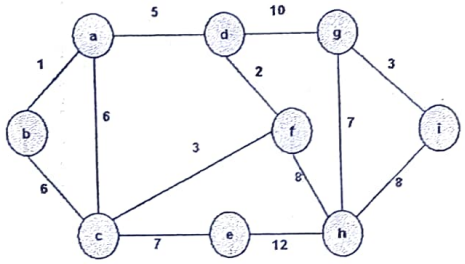
a) Write a short note on abstract data type.

b) State and explain the operations of stack.

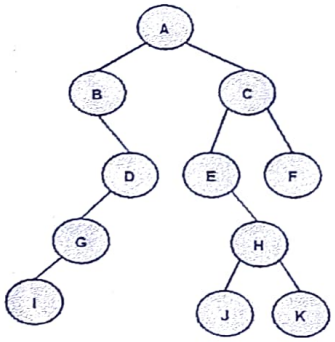
c) Explain the working of threaded binary tree.

d) Define: i) Bipartite graph ii) Directed cyclic graph iii) spanning tree

e) Find the minimum spanning tree and minimum spanning cost using Prim's algorithm for the following graph:



f) Find the preorder, inorder and postorder traversal for the following binary tree:



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S YBSC CS
6/3/24

D. B. J. College Chiplun
CBCS Examination Oct 2023 ATKT Exam Mar. 2024

Class: S. Y. B. Sc. Sem: III
Paper No.: IV

Subject: Computer Science
Paper Name: Advanced Database Concepts
USCS304

Duration: 2 ½ hrs

Marks: 75

Notes:

1. Figures to right indicate full marks.
2. All questions are compulsory. Use internal options to the questions.
3. Illustrations, in-depth answers and diagrams will be appreciated.
4. Mixing of sub-questions is not allowed.

Q. 1 **Attempt any four of the following.** **(20M)**

a) What is PL/SQL? Explain advantages of PL/SQL.
b) Explain control statement in PL/SQL with example.
c) Write a short note on creation, alteration and dropping a sequence.
d) What is stored procedure? Explain its attributes with example.
e) Describe the architecture of PL/SQL.
f) Explain arithmetic and logical operators in PL/SQL.

Q. 2 **Attempt any four of the following.** **(20M)**

a) Write a PL/SQL block for VARRAY for employee name and salary and count total number of employee present in the array, display all the employee names with salary.
b) List some pre-defined oracle exceptions? Explain any four.
c) Explain cursor in PL/SQL with an example.
d) What is basic syntax of oracle exception handling block? Explain
e) Explain explicit cursor with example.
f) What is PL/SQL exception handling and why it is needed?

Q. 3 **Attempt any four of the following.** **(20M)**

a) Draw a precedence graph for following transaction.

T1	T2
R(X)	
X=X-N	
	R(X)
	X=X+M
W(X)	
R(Y)	
	W(X)
Y=Y+N	
W(Y)	

b) What is ACID? What does each property say with respect to the execution of transaction?
c) What is serializability? Write a note on view serializability?
d) What is deadlock? How to handled deadlock occurred in transaction?
e) Write a note on two phase locking protocol.
d) Define log. What are the contents of log record?

P.T.O.

Q. 4 **Attempt any five of the following.** (15M)

a) Discuss the role of 'exit when' statement in loop... end loop with an example.
b) With a suitable example explain function in PL/SQL.
c) Explain redo phase in ARIES.
d) What is user-defined exception? Explain.
e) Explain two phase commit protocol (2PL).
f) How do two transactions conflict? Explain.
g) Explain cursor in for loop.

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S Y C S
7/3/24

D. B. J. College Chiplun
CBGS Examination [illegible] 2023 ATKT Exam Mar 2024

Class: S. Y. B. Sc. Sem: III
Subject: Computer Science
Paper No.: V
Paper Name: Java based Application Development
USCS305

Notes:
1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume necessary data as required.

Que 1 Solve any four of the following. 20
- A Difference between C++ and Java.
- B Enlist life cycle methods of Thread.
- C Explain Java Access specifiers.
- D Write a note on Interface.
- E Write a Java program on Constructor.
- F Write a java program that calculates sum of digits a given number. Accept number from command line.

Que 2 Solve any four of the following. 20
- A Explain JFC features.
- B Write a note on Text entry components of Swing.
- C Explain followings:
  1) JLabel 2)JButton
- D Explain JDBC driver types.
- E Write a Swing Java program on JTable.
- F Write a JDBC Java program on create student table in Database.

Que 3 Solve any four of the following. 20
- A How Servlet help in Session management? Explain.
- B Explain JSP directives.
- C What is a Servlet? Give it's types.
- D Explain JSON Data Types.
- E Write a Servlet program that display date and time.
- F Write a program in JSP that takes number from Html page and JSP code displays square and cube values.

Que 4 Solve any five of the following. 15
- A Explain following keywords:
  1) try 2) catch 3) finally
- B Explain role of 'final' keyword in Java programming.
- C What is Event Adapter? Give examples.
- D State methods of Prepared Statement interface.
- E Explain Graphics class with its methods
- F Explain any 3 JSP tags.

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D.B.J. College Chiplun
ATKT Exam Mar. 2024

SY CS

Sub: Web Technologies

SYBSc-CS
9/3/24

Time: - 2 hr. 30 min. **Marks: -75**

N.B. **1) All questions shall be compulsory with internal choice within the questions.**
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q1 **Attempt any four.** **20**

a) Write a HTML code for following output:

	Class		Total
	FY	SY	
Male	30	25	55
Female	31	25	56
Total	61	50	111

b) Explain following text formatted tags in HTML5.
a) sup b) sub c) b d) i e) u

c) What is Stylesheet? Explain any one type with an example.

d) How to create hyperlink in HTML5? Explain its tag and attributes with an example.

e) How to display multimedia (Audio and Video) file on web page in HTML5? Explain.

f) Write a html code for following output:

I. Mobile Operating System
- Android
- Blackberry

II. Mobile Manufactures
- Samsung
- Micromax

Q2 **Attempt any four.** **20**

a) Write a JavaScriptcode to read a number from text field and displaythe number is prime or not.

b) Describe Document Object Model with a neat diagram.

c) Which are three types of popup boxes in JavaScript? Explain its syntax and example.

d) Write a JavaScript Code to enter any three-digit number from user, display message "The number is Armstrongor not".

e) What is use of Date object in JavaScript? Explain its four methods with example.

f) What is the difference between XML and HTML? Explain.

P.T.O.

Q3 **Attempt any four.** 20

a) What is AJAX? Explain XMLHttpRequest Object with its properties.
b) Explain different JQuery selectors with example.
c) Explain different types of Arrays available in PHP.
d) Write a PHP code to check given number is positive or negative. The number is to be accepted from HTML form.
e) What is PHP? What are the advantages of PHP?
f) Explain different JQuerymethods of traversing with example.

Q4 Attempt any five. 15

a) Explain img tag and its attributes in HTML5.
b) Explain with an example property used to set background of a webpage in HTML using css.
c) What is the structure of XML document? Explain.
d) What is Cookie? How to create cookie?
e) Explain the variable and Operatorswith respect to PHP.
f) What is JQuery? Why JQuery required?

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SYBSC CS
11/3/24

D.B.J. College, Chiplun
ATKT Exam March 2024 Sem III
SY B.Sc. (Comp. Sci.)
Sub: Creative content writing

Time:2½ hrs **Full marks: 75**

Notes:

1. Figures to right indicate full marks.
2. All questions are compulsory. Use internal options to the questions.
3. Illustrations, in-depth answers and diagrams will be appreciated.
4. Mixing of sub-questions is not allowed.

Q1 Attempt any four of the following. **20**

a) State and explain different types of sentences.
b) Explain in brief the following terms:
i) Using Title and Subtitle ii) Organizing for your audience.
c) What are the common grammatical errors in writing? Explain with suitable examples.
d) Elaborate on different writing styles and its types.
e) What is a tone? Explain any four types of tones.
f) Write in brief the ideal length for the following contents:
i) Paragraph ii) Meta Description iii) Tweets
iv) Domain name v) YouTube video

Q2 Attempt any four of the following. **20**

a) How to write annual reports? Explain.
b) What are the different kinds of Audiences? Explain with examples.
c) Explain any five tactical suggestions for writing a better blog post.
d) What are the tips for content marketing on Facebook? Explain.
e) How to differentiate your profile from others on LinkedIn? Explain.
f) Write a note on the art of observation.

Q3 Attempt any four of the following. **20**

a) State and explain the various writing editing tools.
b) Explain any five non-text writing tools.
c) Define style guides. Elaborate on the various useful style guides.
d) What is legal writing? State and explain the categories of legal english.
e) Write a note on google authorship.
f) Explain any five Research and Knowledge Management Tools.

Q4 Attempt any five of the following. **15**

a) Write a short note on Plagiarism.
b) Define the following terms:
i)Copyright ii)Patent iii)Trademark
c) Explain any three tips to follow while writing for Twitter.
d) How to write on social media with humour. Explain.
e) With an example explain "Using Title and Subtitle".
f) Write a short note on the DIY infographic formula.

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