D.B.J. College, Chiplun
Semester III ATKT Examination March-25
Class:- S.Y.C.S. Subject:- Principles of operating systems
Paper No: 01
Date:- 01/3/2025 Time:- 9.00 to 11.30

Time:(2 ½ Hours) **[Total Marks: 75]**

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

Q1 **Attempt any Four.** **20**

A State and explain any five operating system services.
B Write a note on microkernel approach.
C Explain various categories of system calls.
D With the help of neat diagram explain process state.
E Explain types of schedulers.
F Write a note on multithreading model.

Q2 **Attempt any Four.** **20**

A State and explain necessary conditions to occurring a deadlock.
B Draw Gantt chart of FCFS for the following and find average waiting time.

Process ID	CPU burst time
P1	13
P2	7
P3	8
P4	6
P5	9

C Write a note on Multilevel queue scheduling.
D Consider a system with three processes p1 through p3 and four resource types A, B, C and D. Resources type A has Six, Resources type B has five, Resources type C has Seven, Resources type D has Six instances. Compute the need array and check whether system is under safe state or not. Also find safe sequence.

PID	Allocation				Max			
	A	B	C	D	A	B	C	D
P1	1	2	2	1	3	3	2	2
P2	1	0	3	3	1	2	3	4
P3	1	2	1	0	1	3	5	0

Available			
A	B	C	D
3	1	1	2

E With suitable example explain resource allocation graph.
F Write a note on deadlock prevention.

Q3 **Attempt any Four.** **20**

A Write a note on swapping.
B Explain paging technique with the help of suitable diagram.

[P.T.O]

C 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

D State and explain different attributes of file.

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 Write a note on tree structured directories.

Q4 **Attempt any Five.** **15**

A Explain process control block.

B Write a note on scheduling queue.

C Briefly explain fragmentation technique.

D Discuss the techniques of recovery from deadlock.

E Enlist and explain file operations.

F Define the terms.

1. Starvation
2. Aging
3. CPU utilization

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D. B. J. College, Chiplun
Semester III ATKT Examination March-25
Class:- S.Y. C.S. Subject:- Linear Algebra
Date:- 3/3/2025 Time:- 9.00 to 11.30am

Time:(2 ½ Hours) **[Total Marks: 75]**

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

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

A List and explain methods of sets data types in python.

B Find the modulus and principal argument of the complex number $\frac{(1+i)^2}{(1-i)}$.

C Enlist and explain types of vector.

D Solve the Triangular system.
$2x_1+2x_2-4x_3=10$
$X_2+2x_3=3$
$5x_3=15$

E Write a note on NumPy package in python.

F Find the Square root of 21-20i.

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

A Show that vectors{(2,1,4),(1,-1,2),(3,1,-2)} of R^3 form a basis of R^3

B Find the matrix vector multiplication using dot product.

1. $A=\begin{matrix}1&2\\4&1\\5&6\end{matrix}$ and v=[5,3]

2. $\begin{matrix}7&3&1\\4&6&6\\7&2&9\end{matrix}$ and v=[1,2,5]

C Find the null space of the given system.
$2x_1 + x_2 = 0$
$-4x_1 - 2x_2 = 0$

D Reduce the given matrix A in Echelon form.
$A = \begin{matrix}1&-4&-3\\1&-5&-3\\-1&6&4\end{matrix}$

E Write a note on NumPy.Matlib library in python.

F Find vector matrix multiplication.

1. V= [4,5,6] $A = \begin{matrix}4&9\\6&7\\5&4\end{matrix}$

2. V= [7,9] $A = \begin{matrix}5&4\\6&9\\8&7\end{matrix}$

[P.T.O]

D.B.J. College, Chiplun
Semester-III AT KT Examination March: 2025
Class:- S.Y.B.Sc. Subject:- Calculus-III Paper no. I
Date:- 03-03-2025 Time:- 9.00am to 11.30pm Max. Marks:- 75

Time: 02:30 hours

Total Marks: 75

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Use of calculator is not allowed.

Q.1 A) Attempt any one questions of the following. **(8)**

a) Using sequence of partial sum show that $\sum_{n=1}^{\infty}(\frac{4}{5})^n$ is convergent. Also find its limit.

b) Prove that a positive term series $\sum \frac{1}{n^p}$ is convergent for $p > 1$ and diverges for $p \leq 1$.

B) Attempt any two questions of the following. **(12)**

a) Prove that the series $\sum \frac{3^n+2}{2^n+5}$ is divergent.

b) Discuss the convergence of the series $\frac{\log(2)}{2^2} - \frac{\log(3)}{3^2} + \frac{\log(4)}{4^2} - \frac{\log(5)}{5^2} + \ldots\ldots$

c) Show that the series $\sum \frac{\sin(nx)}{n^2}$ is absolutely convergent.

Q.2 A) Attempt any one questions of the following. **(8)**

a) Prove that every constant function is Riemann integrable.

b) Consider the function $f: [1, 6] \to \mathbb{R}$ be defined by

$$f(x) = \begin{cases} x \text{ if } 1 \leq x < 2 \\ 2x \text{ if } 2 \leq x < 3 \\ 3x \text{ if } 3 \leq x < 5 \\ 4x \text{ if } 5 \leq x \leq 6 \end{cases}$$

And P is the partition on $[1, 6]$. Prove that $L(P, f) \leq U(P, f)$.

B) Attempt any two questions of the following. **(12)**

a) Show that $f(x) = x^3$ for $0 \leq x \leq 1$ is Riemann integrable function on $[0, 1]$ and $\int_0^1 f(x)dx = \frac{1}{4}$.

b) Let $f: [0, 1] \to \mathbb{R}$ defined by $f(x) = 1 - x$. Let $P = \{0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\}$, find $L(P, f), U(P, f)$ and $||P||$.

c) Let $f: [a, b] \to \mathbb{R}$ be a bounded function and P be a partition then prove that $L(P, f) \leq U(P, f)$.

Q.3 A) Attempt any one questions of the following. **(8)**

a) Let the function $f: [a, b] \to \mathbb{R}$ be a bounded function and let P is the partition of $[a, b]$. Prove that $m(b - a) \leq L(P, f) \leq U(P, f) \leq M(b - a)$.

b) Prove that a positive term geometric series $\sum_{n=0}^{\infty} r^n$ converges for $r < 1$ and diverges to infinity for $r \geq 1$.

B) Attempt any two questions of the following. **(12)**

a) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.

b) Prove that $\beta(m, n) = \beta(n, m)$.

c) Prove that $\int_0^{\infty} e^{-x^2} = \frac{1}{2}\sqrt{\pi}$.

Q.4 **Attempt <u>any three</u> questions of the following.** (15)

a) Show that the series 1+2+3+..... is divergent series.

b) Define: i) Upper Riemann sum
ii) Lower Riemann sum
iii) Upper Riemann integral
iv) Lower Riemann integral
v) Riemann integration

c) Test for convergence of the series $\sum \frac{n^{n^2}}{(n+1)^{n^2}}$.

d) Prove that $\Gamma(1) = 1$.

e) Test for convergence of the series $\sum \frac{n^{n^2}}{(n+1)^{n^2}}$.

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D.B.J. College, Chiplun
Semester - III AIKT Examination March, - 2025
Class:- S.Y.B.Sc. Subject:- Linear Algebra I Paper no: II
Date:- 04-03-2025 Time:- 9.00 am to 11.30 am Max. Marks:- 75

Time: 02.30 hours

Total Marks: 75

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Use of calculator is not allowed.

Q.1 A) Attempt any one questions of the following. **(8)**

a) Define elementary matrix. Express the following matrix and their inverse as a product of elementary matrices: $\begin{bmatrix} 1 & 6 \\ 2 & 3 \end{bmatrix}$

b) Define row echelon form of a matrix and convert the following matrix into row echelon form: $\begin{bmatrix} -3 & 1 & 1 \\ 2 & 1 & 1 \\ 1 & 4 & 0 \\ -1 & 2 & 2 \end{bmatrix}$

B) Attempt any two questions of the following. **(12)**

a) Solve the following system by Gauss elimination method.
$x + 2y + z = 8$, $2x + 3y - z = 11$, $3x - y - 2z = 5$

b) Define Skew-symmetric matrix, scalar matrix, orthogonal matrix & nilpotent matrix with one example each.

c) The sum of three numbers is six. Thries the third number when added to the first number gives 7. On adding, three times the first number to the sum of second and third number, we get 12. Find the three numbers.

Q.2 A) Attempt any one questions of the following. **(8)**

a) Prove that intersection of two subspace is a subspace. What can you say about union of two subspaces?

b) Prove that every subset of linearly independent set is linearly independent and every superset of linearly dependent set is linearly dependent.

B) Attempt any two questions of the following. **(12)**

a) Check whether the $(5, 25, -15)$ as a linear combination of $(4, 6, 2)$ and $(1, -1, 3)$

b) State & prove subspace criteria.

c) Show that $\mathbb{R}^2$ is a vector space.

Q.3 A) Attempt any one questions of the following. **(8)**

a) State & prove Cramer's rule.

b) Prove that, for each n, if there exists an $n \times n$ determinant function then it is unique.

B) **Attempt <u>any two</u> questions of the following.** (12)

a) Prove that Determinant of an upper or lower triangular matrix is the product of diagonal entries.

b) Solve the following system by using Cramer's rule.

$$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=-2, \quad \frac{1}{x}-\frac{2}{y}+\frac{1}{z}=3, \quad \frac{2}{x}-\frac{1}{y}+\frac{3}{z}=-1$$

c) Find the inverse of the matrix $\begin{bmatrix}1 & 2 & 3\\0 & 2 & 4\\0 & 0 & 5\end{bmatrix}$ by using adjoint method.

Q.4 **Attempt <u>any three</u> questions of the following.** (15)

a) Find the rank of matrix : $\begin{bmatrix}1 & 1 & 1\\3 & 1 & -2\\2 & 4 & 7\end{bmatrix}$

b) If area of Δ LMN is 33/2 square unit and vertices are L (3, −5), M (−2, k), N (1,4) then find k.

c) Check that given vectors are linearly dependent or linearly independent.{(4, -1, 3), (0, -4, 1), (-2, -5, 2)}

d) Find $|A|$ by using Laplace expansion by 2nd row & 1st column.

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

e) Solve the system of linear equation by using Elimination method.

$$x+2y-z=2, \quad 2x-3y+z=-1, \quad 5x-y-2z=-3$$

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D.B.J. College Chiplun
S-I m - III ATKT March 2025 (CBCS)
Sub. paper → Advance database concept -
Date - 4/03/25
Time - 9.30am to 11.30am

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) Differentiate between if ... else condition and case structure by using PL/SQL block.

b) Write a PL/SQL code block that will accept an account_number from the user. Check if the user balance is less than the minimum balance only then deduct RS.100 from the balance.

c) What is a sequence in SQL, and how is it used to generate unique values in a database? Provide an example of creating and using a sequence in a SQL query.

d) Write a PL/SQL block to calculate the area of a circle for radius values from 1 to 5. Store the radius and corresponding area into a table named circle_area. Ensure the table contains two columns: radius (for the radius values) and area (for the calculated areas).

e) Describe the architecture of PL/SQL.

f) Write a short note on creation, alteration and dropping a sequence.

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

a) What is a cursor in PL/SQL? Explain its types.

b) 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.

c) List some pre-defined oracle exceptions? Explain any four.

d) Define following terms with example :
(i) declaring. (ii) opening. (iii) closing a cursor.

e) What is user-defined exception? Explain.

f) What is basic syntax of oracle exception handling block? Explain

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

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) Explain two phase commit protocol.

c) Explain the three main phases of the ARIES recovery algorithm.

d) What is ACID? What does each property say with respect to the execution of transaction?

e) What is deadlock? How to handled deadlock occurred in transaction?

f) Define log. What are the contents of log record?

P.T.O

15

Q4 Attempt any five of the following.

a) Write advantages of PL/SQL.

b) What is lock? Explain it along with its types.

c) What are the disadvantages of SQL?

d) Write a note on lock conversion.

e) What is lock management in database systems? Explain

f) Discuss the role of exit when statement in loop... end loop with an example.

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D. B. J. College, Chiplun
Semester-III ATKT Examination March-25
Class:- S.Y.C.S. Subject:- Java based Application Development

Time: 2 ½ Hrs. Total Marks:75

Date:- 5/3/2025 Time:- 9.00 to 11.30 am

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 Enlist and describe Java Features.
- B Compare method overloading and over-riding.
- C What is String in Java? Explain methods with syntax.
- D Explain role of final keyword in programming.
- E Write a Java program that displays given array numbers in both directions.
- F Write a java program that calculates square and cube values of a given number. Accept number from command line.

Que 2 Solve any four of the following. 20
- A What is Collection Framework? Explain with suitable examples.
- B Write a note on Text entry components of Swing.
- C Write a JDBC Java program that display records of table.
- D Explain steps for JDBC program.
- E Describe different methods of ResultSet object.
- F Write a Swing Java program on JTree.

Que 3 Solve any four of the following. 20
- A Explain the life cycle of Servlet.
- B Describe advantages of JSP.
- C Explain Implicit objects defined by JSP.
- D Write note on JSON.
- E Write a program in JSP that takes the number from Html page and displays it's factorial value.
- F Write a program in Servlet that takes the value of Name and id from Html page and displays the same.

Que 4 Solve any five of the following. 15
- A Describe keywords: extends, implements, abstract.
- B What is Servlet? Give its types.
- C What is Event? Give examples of events.
- D State methods of Statement interface.
- E Define terms: JDK, JVM,JRE
- F What is Cookie? Give its methods.

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D.B.J. College, Chiplun
Semester-III ATKT Examination March-2025
Class:- S.Y.C.S Subject:- Web Technologies
Paper No:- 6
Date:- 06/03/2025 Time:- 9.00 to 11.30 am

Time: $2^{1/2}$ Hours Total 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) Write a HTML program to generate a form accept the name(textbox), contact number (textbox), gender (radio button),hobbies(checkbox), country(dropdown) and button for resetting and submitting the form.

b) Explain following text formatted tags in HTML5.
   i) sup ii) sub iii)b iv)i v) u

c) What is the table tag and its attributes explain with one suitable example.

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

e) Write a html program for following output:
   I. Mobile Operating System
      - Android
      - Blackberry
   II. Mobile Manufactures
      - Samsung
      - Micromax

f) What is the use of the following CSS selectors? Explain with example:
   a) .class b) #id

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

a) With the help of diagram explain Document Object Model.

b) Difference between XML and HTML.

c) Explain following terms with example:
   i) clearTimeout() ii)setTimeout

d) Write a note on function in JavaScript.

e) Explain three different types for creating objects in JavaScript.

f) What is validation? Write a program to validate username and password.

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

a) What is use of AJAX? With the help of diagram explain working of Ajax.

b) Write a note on operators in PHP.

c) Define JQuery. Explain features of JQuery.

d) Write a program in PHP and HTML to check the entered username and password is valid or invalid.

P.T.O.

e) Explain different types of Arrays available in PHP.

f) Write a PHP program to create an array of five student names and display its using foreach loop.

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

a) Explain with an example properties used to set the font style of the text in HTML5.

b) Explain Advantages of Ajax.

c) Write a JavaScript program to enter number from user, check and display message "The number is even number or odd number".

d) With the help of example explain 'if structure' in PHP.

e) Explain img tag and its attributes in HTML5

f) Write a JavaScript program to find the sum of 1 to 10 numbers.

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Semester III MIT Examination March 25

Class:- S.Y.C.S. Subject: Creative Content writing

Paper No: 7

Date:- 7/3/2025

Time: 2½ hrs Time:- 9.00 to 11.30 am Full marks: 75

N.B:

1. Figures to right indicate full marks.
2. All questions are compulsory.

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

a) Define tone. State and explain any four types of tones.

b) Write a short note on content referencing.

c) What the common grammatical errors in writing? Explain with suitable examples.

d) Write in brief the ideal length for the following content:

i) Blog post ii) Email subject line iii) Line of text

iv) Paragraph v) YouTube video

e) Explain the techniques to make your story elegant and professional.

f) Write a short note on writing style.

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

a) Write a short note on the science of visualization.

b) Explain any five key strategies for writing effective tweets.

c) Describe the various types of audiences.

d) Write in brief the few tactical suggestions for writing a better blog post.

e) State and explain the guidelines for writing with hashtags.

f) Explain the most effective ways to differentiate your profile from others on LinkedIn.

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

a) State and explain any five research and knowledge management tools.

b) Write a note on Google authorship.

c) Describe any five non-text writing tools.

d) What is legal writing? Explain the features of legal writing.

e) Define Intellectual property. State and explain the types of intellectual properties

f) Write a short note on plagiarism.

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

a) Explain how to use lists in content writing.

b) Write in brief any three tips to consider while writing headlines.

c) Describe how to write annual reports.

d) Write a short note on chunking information.

e) State and explain any three editing tools.

f) Write a short note on copyright infringement.

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