ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

(A Unit of Alva's Education Foundation)
Shobhavana Campus, Mijar, Moodbidri, D.K – 574225
(Accredited by NAAC with A+ Grade)
Affiliated to VTU Belagavi, Approved by AICTE, New Delhi

TIMETABLE

w.e.f: 15/11/2023

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Academic Year	Scheme	Semester	Section	Class Coordinator	Room No
2023-24	2022	III	A	Dr. Pradeep Nazareth	203

TIME / DAY	9.00 To 9.50	9.50 To 10.40	10.40 To 11.00	11.00 To 11.50	11.50 To 12.40	12.40 To 1.40	1.40 To 2.30	2.30 To 3.20	3.30 To 5.00
MON	OS	SCR	TEA BREAK	DDCO	DSA	LUNCH BREAK	MATHS	DAE LAB	
TUE	MATHS	APT		OS	DDCO		Digital Design Lab (B1 Batch) / OS Lab (B2 Batch)		Java
WED	DSA	MATHS		OS	DDCO		Digital Design Lab (B2 Batch) / OS Lab (B1 Batch)		Java
THU	DDCO	MATHS		DSA	OS		Data Structures Lab		Java
FRI	DDCO	APT		MATHS	DSA		Object Oriented Programming with Java		
SAT	OS	DE		SCR	DSA		NSS / PE / Yoga		

Allocation of Courses

Course Code	Course Initial	Course Title	Name of the Faculty	Faculty Initial
MATHS	BCS301	Mathematics for Computer Science	Dr. Prameela Kolake	PRA
DDCO	BCS302	Digital Design & Computer Organization	Dr. Ganesh K	GK
OS	BCS303	Operating Systems	Dr. Pradeep Nazareth	PN
DSA	BCS304	Data Structures and Application	Dr. Ramesh G	RG
DS Lab	BCSL305	Data Structures Lab	Dr. Ramesh G	RG
Java	BCS306A	Object Oriented Programming with Java	Dr. Vishwanath Pai	VP
SCR	BSCK307	Social Connect and Responsibility	Mr. Rohith Kumar	RK
DAE LAB	BCS358A	Data Analytics with Excel	Dr. Ramesh G Dr. Pradeep Nazareth	RG PN
APT		Aptituoe Training	Prof. Harish Kunder	HK
DE		Design Engineering	BACCE Foundation	

BNSK359 - National Service Scheme (NSS) / BPEK359 - Physical Education (PE) (Sports and Athletics) /
BYOK359 - Yoga.....Mr. Dilip Shetty – Physical Education Director / Mr. Suresh P S – Dept. of Mechanical Engg..

Timetable Coordinator

Head of the Department
Dept. of Artificial Intelligence & Machine Learning
Alva's Institute of Engineering and Technology
Shobhavana Campus, Mijar
Moodubidire 574 225, D.K. Karnataka, India

Dean Academics

Principal
PRINCIPAL
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225, D.K.

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Individual Faculty Time Table with effect from 15/09/2023

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Academic Year	2023-24	Faculty Name	Dr. Pradeep Nazareth (PN)
Semester	ODD	Designation	Professor

Time / Day	9.00 To 9.50	9.50 To 10.40	10.40 To 11.00	11.00 To 11.50	11.50 To 12.40	12.40 To 1.40	1.40 To 2.30	2.30 To 3.20	3.30 To 5.00
MON	OS		TEA BREAK	IOT		LUNCH BREAK	DAE Lab		
TUE				OS			OS Lab (B2)		
WED	IOT			OS			OS Lab (B1)		
THU		IOT			OS		Internship Presentation		
FRI				IOT			Data Structures Lab		
SAT	OS								

UNITS:	Theory:18	LAB: 15	Others: 01	TOTAL UNITS:34

Allocation of Courses (Courses with Course Code)	
BAI303	Operating System
18AI731	Internet of Things
BAI358B	Data Analytics with Excel
	Mentoring (2Hrs / Week)

Responsibilities
Workshop / SDP / FDP / Conference
NBA / NAAC
MOU Incharge
Review Paper, SDP, FDP, Conference, IIC, NAIN Coordinator, Research Consultancy

ead of the Department Dean Academics PRINCIPAL

OPERATING SYSTEMS		Semester	3
Course Code	BCS303	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory + 20 hours practicals	Total Marks	100
Credits	04	Exam Hours	3
Examination nature (SEE)	Theory		

Course objectives:

- To Demonstrate the need for OS and different types of OS
- To discuss suitable techniques for management of different resources
- To demonstrate different APIs/Commands related to processor, memory, storage and file system management.

Teaching-Learning Process (General Instructions)
Teachers can use the following strategies to accelerate the attainment of the various course outcomes.

1. Lecturer methods (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.
5. Role play for process scheduling.
6. Demonstrate the installation of any one Linux OS on VMware/Virtual Box

MODULE-1 **8 Hours**

Introduction to operating systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Process management; Memory management; Storage management; Protection and Security; Distributed system; Special-purpose systems; Computing environments.

Operating System Services: User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure; Virtual machines; Operating System debugging, Operating System generation; System boot.

Textbook 1: Chapter – 1 (1.1-1.12), 2 (2.2-2.11)

MODULE-2 **8 Hours**

Process Management: Process concept; Process scheduling; Operations on processes; Inter process communication

Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues.

Process Scheduling: Basic concepts; Scheduling Criteria; Scheduling Algorithms; Thread scheduling; Multiple-processor scheduling,

Textbook 1: Chapter – 3 (3.1-3.4), 4 (4.1-4.4), 5 (5.1 -5.5)

MODULE-3 **8 Hours**

Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization;

Deadlocks: System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

Textbook 1: Chapter – 6 (6.1-6.6), 7 (7.1 -7.7)

MODULE-4 — 8 Hours

Memory Management: Memory management strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation.

Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

Textbook 1: Chapter -8 (8.1-8.6), 9 (9.1-9.6)

MODULE-5 — 8 Hours

File System, Implementation of File System: File system: File concept; Access methods; Directory and Disk structure; File system mounting; File sharing; **Implementing File system:** File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.

Secondary Storage Structure, Protection: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; **Protection**: Goals of protection, Principles of protection, Domain of protection, Access matrix.

Textbook 1: Chapter – 10 (10.1-10.5) ,11 (11.1-11.5),12 (12.1-12.5), 14 (14.1-14.4)

PRACTICAL COMPONENT OF IPCC*(May cover all / major modules)*

Sl.NO	Experiments
1	Develop a c program to implement the Process system calls (fork (), exec(), wait(), create process, terminate process)
2	Simulate the following CPU scheduling algorithms to find turnaround time and waiting time a) FCFS b) SJF c) Round Robin d) Priority.
3	Develop a C program to simulate producer-consumer problem using semaphores.
4	Develop a C program which demonstrates interprocess communication between a reader process and a writer process. Use mkfifo, open, read, write and close APIs in your program.
5	Develop a C program to simulate Bankers Algorithm for DeadLock Avoidance.
6	Develop a C program to simulate the following contiguous memory allocation Techniques: a) Worst fit b) Best fit c) First fit.
7	Develop a C program to simulate page replacement algorithms: a) FIFO b) LRU
8	Simulate following File Organization Techniques a) Single level directory b) Two level directory
9	Develop a C program to simulate the Linked file allocation strategies.
10	Develop a C program to simulate SCAN disk scheduling algorithm.

Course outcomes (Course Skill Set):

At the end of the course, the student will be able to:

CO 1. Explain the structure and functionality of operating system
CO 2. Apply appropriate CPU scheduling algorithms for the given problem.
CO 3. Analyse the various techniques for process synchronization and deadlock handling.
CO 4. Apply the various techniques for memory management
CO 5. Explain file and secondary storage management strategies.
CO 6. Describe the need for information protection mechanisms

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of the IPCC (maximum marks 50)

- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are **25 marks** and that for the practical component is **25 marks**.
- 25 marks for the theory component are split into **15 marks** for two Internal Assessment Tests (Two Tests, each of 15 Marks with 01-hour duration, are to be conducted) and **10 marks** for other assessment methods

mentioned in 22OB4.2. The first test at the end of 40-50% coverage of the syllabus and the second test after covering 85-90% of the syllabus.

- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for **25 marks**).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

CIE for the practical component of the IPCC

- **15 marks** for the conduction of the experiment and preparation of laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.
- On completion of every experiment/program in the laboratory, the students shall be evaluated including viva-voce and marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments write-ups are added and scaled down to **15 marks**.
- The laboratory test **(duration 02/03 hours)** after completion of all the experiments shall be conducted for 50 marks and scaled down to **10 marks.**
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **25 marks**.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

SEE for IPCC

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.
4. Marks scoredby the student shall be proportionally scaled down to 50 Marks

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have CIE component only. Questions mentioned in the SEE paper may include questions from the practical component.

Suggested Learning Resources:

Textbooks

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 8th edition Wiley-India, 2015

Reference Books

1. Ann McHoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition
2. D.M Dhamdhere, Operating Systems: A Concept Based Approach 3rd Ed, McGraw- Hill, 2013.
3. P.C.P. Bhatt. An Introduction to Operating Systems: Concepts and Practice 4th Edition, PHI(EEE) 2014.
4. William Stallings Operating Systems: Internals and Design Principles, 6th Edition, Pearson.

Web links and Video Lectures (e-Resources):

1. https://youtu.be/mXw9ruZaxzQ

2. https://youtu.be/vBURTt97EkA
3. https://www.youtube.com/watch?v=783KAB-tuE4&list=PLIemF3uozcAKTgsCIj82voMK3TMR0YE_f
4. https://www.youtube.com/watch?v=3-ITLMMeeXY&list=PL3pGy4HtqwD0n7bQfHjPnsWzkeRn6mkO

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Assessment Methods
  - Case Study on Unix Based Systems (10 Marks)
  - Lab Assessment (25 Marks)

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Semester III

Course Code: **BCS303**	Course name: **Operating Systems**

Course Teacher: **Dr. Pradeep Nazareth**

Course Outcomes: After studying this course, student will be able to:

CO Numbers	Course Outcome	Blooms Level	Target Level
BCS303.1	**Explain** the structure and functionality of operating system	Understand (L2)	2
BCS303.2	**Apply** appropriate CPU scheduling algorithms for the given problem.	Apply (L3)	2
BCS303.3	**Analyse** the various techniques for process synchronization and deadlock handling.	Analyze (L4)	2
BCS303.4	**Apply** the various techniques for memory management.	Apply (L3)	2
BCS303.5	**Explain** file and secondary storage management strategies..	Understand (L2)	2
BCS303.6	**Describe** the need for information protection mechanisms	Understand (L2)	2

CO-PO/CO-PSO Mapping Matrix:

Co Numbers	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
BCS303.1	3	3										3					3
BCS303.2	3	3										3					3
BCS303.3	3	3										3					3
BCS303.4	3	3										3					3
BCS303.5	3	3										3					3
BCS303.6	3	3										3					3
Avg	3	3										3					3

CO-PO/CO-PSO Mapping Matrix justification: Student should have

CO Numbers	POs	Level	Justification
BCS303.1	PO1	3	Substantially mapped as students are able to apply enginee understand thestructure of operating system.
	PO2	3	Substantially mapped as studentss are able to analyze con structure of OS.
	PO12	3	Substantially mapped as new OS technologies results in life-l
	PSO5	3	Substantially mapped as students are able work in multidiscip
BCS303.2	PO1	3	Substantially mapped, as students are able apply str knowledge to understand need for CPU scheduling.
	PO2	3	Substantially mapped as students are able to conduct re literature in understanding various issues associated with CPU
	PO12	3	Substantially mapped as there is a scope for life-long learn appropriate CPU scheduling algorithm to applications.
	PSO5	3	Substantially mapped as students are able work in multidiscipli
BCS303.3	PO1	3	Substantially mapped as students are able to apply engineerir understand synchrinization and deadlock problems.
	PO2	3	Substantially mapped as students are able to analyze the is deadlock.
	PO12	3	Substantially mapped as there is a opportunity for life-long learn
	PSO5	3	Substantially mapped as students are able work in multidisciplin
BCS303.4	PO1	3	Substantially mapped as students are able to apply engineering analyze the various issues related with memory management.
	PO2	3	Substantially mapped as students are able to analyze complex to memory management leading to solutions.
	PO12	3	Substantially mapped as students will engage in independent learning.

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

	PSO5	3	
BCS303.5	PO1	3	Substantially mapped as students are able to apply engineering knowledge solve issues of secondary memory management.
	PO2	3	Substantially mapped as students are able to analyze /review the issues secondary memory management.
	PO12	3	Substantially mapped as students are able engage in life-long learning enhance solutions to issues of secondary emory.
	PSO5	3	Substantially mapped as students are able work in multidisciplinary projects.
BCS303.6	PO1	3	Substantially mapped as students are able to apply engineering knowledge solve complex problems in information protection.
	PO2	3	Substantially mapped as students are able to analyze/review the issues information protection.
	PO12	3	Substantially mapped as students are able to engage in life-long learning enhance solutions for information protection.
	PSO5	3	Substantially mapped as students are able work in multidisciplinary projects.

10/11/2023
Course Teacher
Signature with date

10/11/23
IQAC Member
Signature with date

IQAC Chairman
Signature with date

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Operating Systems
Semester – III
AY 2023-24 Odd

Course Code: BCS303

Faculty Name : Dr. Pradeep Nazareth

Content beyond the syllabus

- Multiprocessor Operating Systems
- Distributed Operating Systems

(Dr. Pradeep Nazareth)
Course Coordinator

10/11/23
Signature of IQAC Member (Module)

Signature of IQAC Chairman (HOD)

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNI

Operating Systems
Semester – III
AY 2023-24 Odd

Course Code: BCS303

Faculty Name : Dr. Pradeep Nazareth

Modes of content delivery

Module No.	Modes of content delivery
I	• Lecture through black board • Lecture through slide presentation
II	• Lecture through black board • Lecture through slide presentation
III	• Lecture through black board • Lecture through slide presentation • Animation
IV	• Lecture through black board • Lecture through slide presentation
V	• Lecture through black board • Lecture through slide presentation • Demonstration classes

(Dr. PRADEEP NAZARETH)
Course Coordinator

10/11/23
Signature of IQAC Member (Module)

Signature of IQAC Chairman (HOD)

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Operating Systems
Semester – III
AY 2023-24 Odd

Course Code: BCS303

Faculty Name : Dr. Pradeep Nazareth

Modes of delivery for contents beyond the syllabus

Topic or module name	Modes of content delivery
Multiprocessor Operating Systems	• Lecture through black board • Lecture through slide presentation
Distributed Operating Systems	• Lecture through black board • Lecture through slide presentation

(Dr. PRADEEP NAZARETH)
Course Coordinator

10/11/23
Signature of IQAC Member (Module)

Signature of IQAC Chairman (HOD)

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

I-INTERNAL

Semester: III
Subject: Operating Systems (BCS303)
Max Marks: 30
Faculty: Dr. Pradeep Nazareth

Date: 02.01.2024
Time: 9:30 AM - 11:00 AM

Answer any 2 full questions, by selecting one full question from each Part

Q#		Question	Marks	CO	BT/ CL
		PART-A			
1	a.	What is Operating Systems? Explain multiprogramming and multitasking systems.	8	CO1	L2
	b.	List and explain different types of memories	7	CO1	L2
		OR			
2	a.	Explain dual-mode operation of operating Systems.	8	CO1	L2
	b.	What are the responsibilities of operating systems in process management.	7	CO1	L2
		PART-B			
3	a.	What is system call? How operating system handles them. Write the different types of system calls.	7	CO1	L2
	b.	What is a process. Explain different process states with a transition diagram.	8	CO2	L4
		OR			
4	a.	With neat diagram explain virtual machine with advantages and disadvantages.	7	CO1	L2
	b.	Explain interprocess communication using i) Message passing and ii) Shared memory with neat diagram.	8	CO2	L4

CO1: Explain the structure and functionality of operating system.
CO2: Apply appropriate CPU scheduling algorithms for the given problem.

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QUESTION PAPER REVIEW REPORT

Continuous Internal Evaluation (CIE) Test: I ODD AY 2023-24

Department: Artificial Intelligence and Machine Learning Semester/Section: III Max Marks: 30

Course Title: Operating Systems Course Code: BCS303 Date: 02/01/2024

Faculty: Dr. Pradeep Nazareth

Qn. No.	Course Outcome (CO)	Bloom's Taxonomy Level	Marks
1a	CO1	L2	8
1b	CO1	L2	7
2a	CO1	L2	8
2b	CO1	L2	7
3a	CO1	L2	7
3b	CO2	L4	8
4a	CO1	L2	7
4b	CO2	L4	8
Total Marks			60

BT Level: L1-Remember, L2-Understand, L3 -Apply, L4 -Analyze, L5- Evaluate, L6- Create

Consolidated Marks for Different BT Levels:

BT Level	Marks for Each Level	% of Marks	Remarks
L2	44	73.33%	
L3	16	26.66%	

Scrutinizer/Reviewer Remark:

Approved	✓	Approved with Correction		Rejected	
Reason for Rejection					

Dr. Pradeep Nazareth

Name & Signature of the Scrutinizer

Date: 28/12/2023

SHRIKANTH N.G.

Name & Signature of the IQAC Coordinator

Date: 28/12/23

28/12/2023

Signature of Head of the Department

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY, MOODBIDRI

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

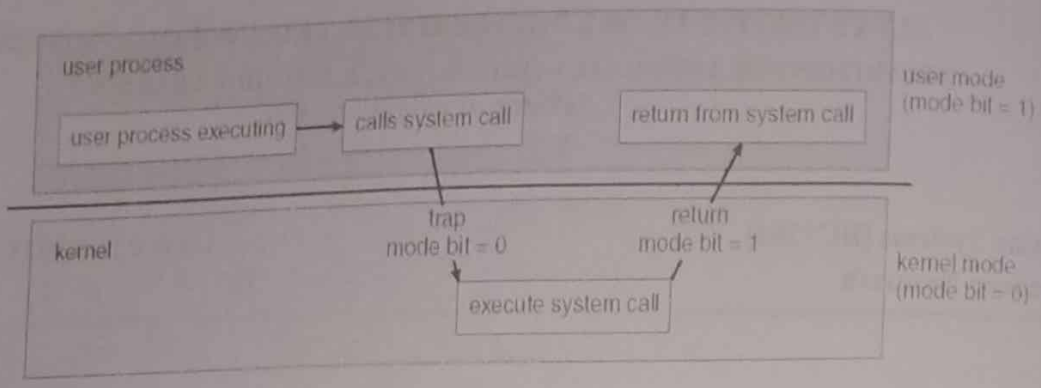
Scheme of valuation , CIE

-I

Semester: III
Subject: Operating Systems (BCS303)
Faculty: Dr. Pradeep Nazareth

Date: 02.01.2024

Questions		Details	Marks
	a	An operating system is intermediatery between user of computer and computer hardware. + brief introduction of OS	2 Marks
		Multi programming:- Multi-programming increases CPU utilisation by organising jobs (code and data) so that the CPU always has one to execute. The idea is to keep multiple jobs in main memory. If one job gets occupied with IO, CPU can be assigned to other job.	3 Marks
		Multi-tasking:- Multi-tasking is a logical extension of multiprogramming. Multitasking is the ability of an OS to execute more than one **task** simultaneously on *a CPU machine*. These multiple tasks share common resources (like CPU and memory). In multi-tasking systems, the CPU executes multiple jobs by switching among them typically using a small time quantum, and the switches occur so quickly that the users feel like interact with each executing task at the same time.	3 Marks
	b	Register, Cache memory, Main memory, Secondary, and tertiry memory with brief information like uses, speed and cost.	1.75 x 4 = 7 Marks
		OR	
2	a	Two modes of OS: 1. User Mode 2. Kernel or supervisory mode	2 marks
		Diagram showing switching between user and kernel mode:	4 Marks



Brief information about switching between user and kernel mode

2 Ma

b

Operating System is responsible for following tasks w.r.t. process management (with brief explanation, any 5):

1. Creating and deleting both user and system processes
2. Suspending and resuming processes
3. Providing mechanisms for process synchronization
4. Providing mechanisms for process communication
5. Providing mechanisms for deadlock handling

7 Ma

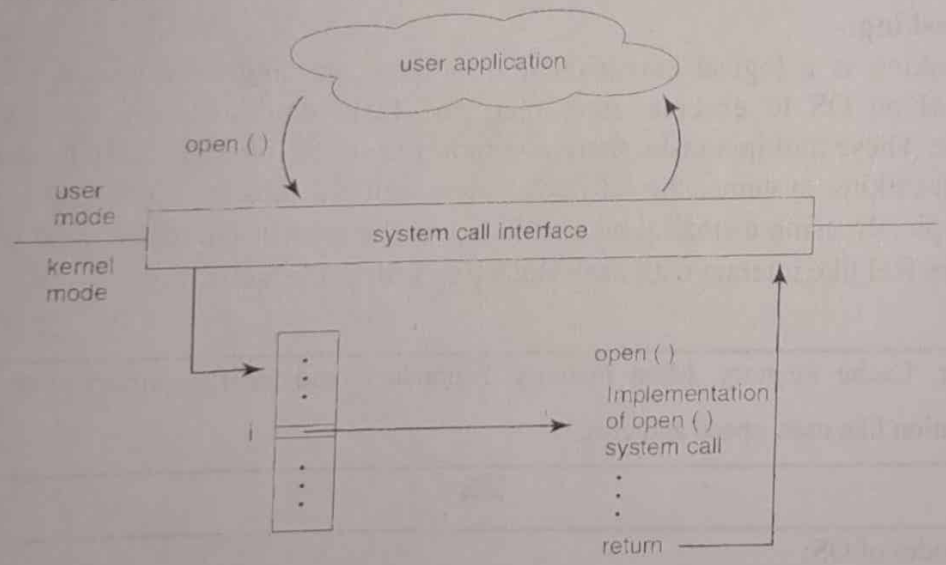
3 a

System calls provide interface to the services provided by the operating systems.

1 Mar

OS handling system call example:

2 Mar



1x 4 = 4
Marks

Types of system calls:

Process control
- end, abort
- load, execute
- create process, terminate process
- get process attributes, set process attributes
- wait for time

wait event, signal event
allocate and free memory

File management
create file, delete file
open, close file
read, write, reposition
get and set file attributes

Device management
request device, release device
read, write, reposition
get device attributes, set device attributes
logically attach or detach devices

Information maintenance
get time or date, set time or date
get system data, set system data
get and set process, file, or device attributes

Communications
create, delete communication connection
send, receive messages
transfer status information
attach and detach remote devices

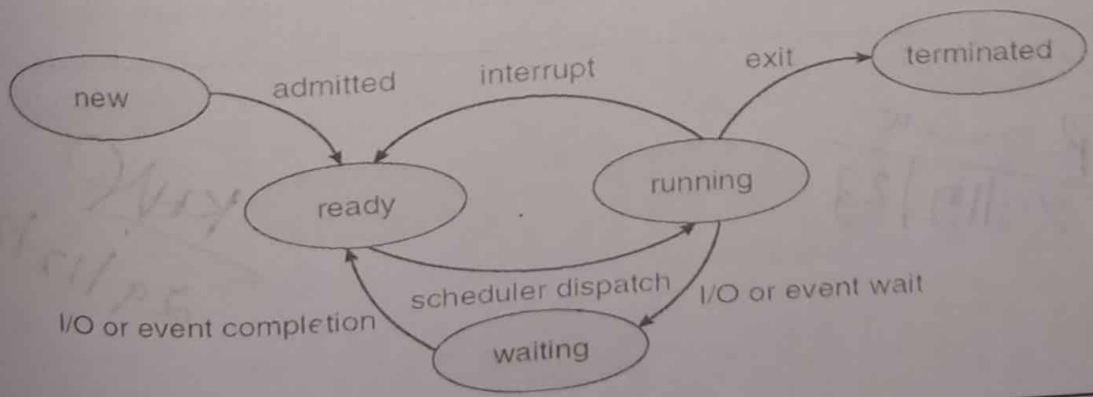
b

Process is a program in its execution. A process contains program (text section), program couter, and contents of processor's register. **2 Marks**

As a process executes, it changes state **3 Marks**

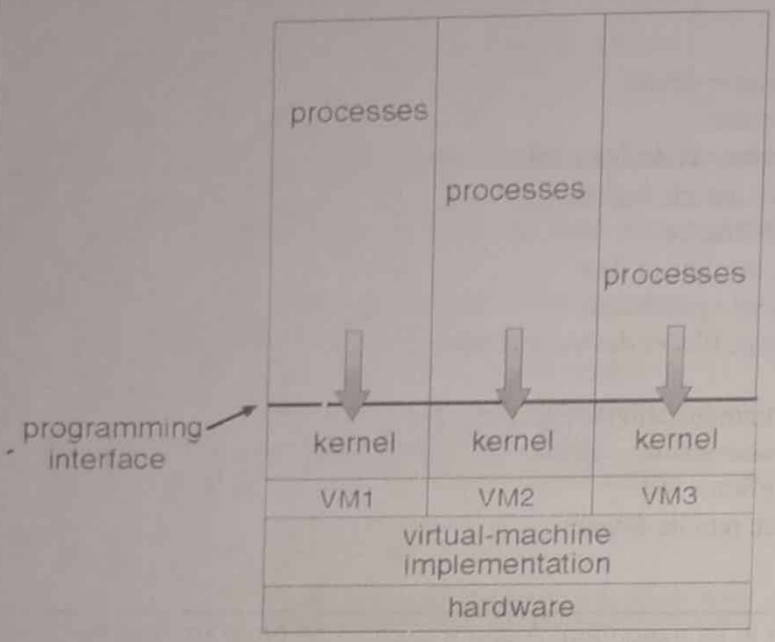
1. new: The process is being created
2. running: Instructions are being executed
3. waiting: The process is waiting for some event to occur
4. ready: The process is waiting to be assigned to a processor
5. terminated: The process has finished execution

State transition diagram of process: **3 Marks**



OR

4	a	A virtual machine takes the layered approach to its logical conclusion. It treats hardware and the operating system kernel as though they were all hardware. The operating system host creates the illusion that a process has its own processor and (virtual memory).	



Advantages:

1. Most of them are fundarnentally related to being able to share the same hardware yet run several different execution environments (that is, different operating systems) concurrently.
2. System is protected from the virtual machines, just as the virtual machines are protected from each other.
3. Multiple operating systems can be running on the developer's workstation concurrently.

Disadvantages:

As simultaneously system is used by multiple users speed of system will reduce.

29/12/23

29/12/2023

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
Shobhavana Campus, Mijar, Moodbidri, D.K – 574225
Phone: 08258-262724, Fax:08258-262726

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

III SEMESTER AIML IA - I MARKS

III Semester, I Test CONSOLIDATED REPORT

Sl. No.	USN	Name	BCS301		BCS302		BCS303		BCS304		BCS306A	
			Marks (25)	Att %	Marks (30)	Att %	Marks (30)	Att %	Marks (25)	Att %		
1	4AL22AI001	AASHISH C A	19	100%	22	94	30	95	24	96		
2	4AL22AI002	Abhay	25	100%	29	94	21	100	25	88		
3	4AL22AI003	ABHISHEK S	7	100%	24	94	19	90	21	86		
4	4AL22AI004	ADITHYA	20	95%	18	82	25	100	25	95		
5	4AL22AI005	AISHWARYA R SHINGADI	19	82%	19	75	25	81	18	81		
6	4AL22AI006	Akash Nayak	19	100%	26	100	24	90	20	88		
7	4AL22AI007	ANANYA S	18	95%	29	100	22	95	21	92		
8	4AL22AI008	ANUSHA IRAPPA MULIMANI	5	100%	21	94	23	100	16	92		
9	4AL22AI009	BHANDARY PRANITH LAXMAN	12	100%	23	82	22	81	14	86		
10	4AL22AI010	BUSIREDDY YASWANTH	16	100%	17	100	17	95	19	92		
11	4AL22AI011	CHARANDEEP B.S	7	95%	14	100	11	95	25	94		
12	4AL22AI012	DANESH M KOLAVI	15	100%	23	94	14	90	9	94		
13	4AL22AI013	DARSHAN C M	21	86%	28	88	25	90	22	88		
14	4AL22AI014	DHANUSH	18	95%	29	88	26	100	25	85		
15	4AL22AI015	FAWAZ SHAIKH	21	95%	29	94	23	95	25	86		
16	4AL22AI016	GANESH A P	22	82%	17	82	17	71	5	62		
17	4AL22AI017	GURUSIDDA	11	100%	23	82	17	95	23	81		
18	4AL22AI018	HARSHINI	21	100%	25	100	28	90	24	92		
19	4AL22AI019	HEMANTH KUMAR S	22	95%	25	94	26	86	21	92		
20	4AL22AI020	JHANAVI.M.P	9	100%	25	94	19	100	25	86		
21	4AL22AI021	KAILAS NAD P	21	100%	26	82	25	90	24	92		
22	4AL22AI022	KARTHIK	7	95%	19	88	23	86	25	94		
23	4AL22AI023	Kavana Y S	11	68%	16	50	23	67	18	94		
24	4AL22AI024	KUTAKOLE GAURI MAHADEV	22	91%	30	100	14	81	25	88		
25	4AL22AI025	LINIYA CRISHEL SALDANHA	12	100%	18	100	11	100	21	95		

26	4AL22AI026	MADHUSUDHAN G	23	100%	20	100	25	95	25	88		
27	4AL22AI027	MANVITH	18	91%	28	69	23	86	17	81		
28	4AL22AI028	MANVITH SUVARNA	20	100%	29	94	27	90	20	86		
29	4AL22AI029	MEERA JAGADEESH H	23	95%	28	88	27	95	25	84		
30	4AL22AI030	MEGHANA.D.G	17	73%	30	82	26	86	25	81		
31	4AL22AI031	MITHUN GOWDA SR	8	64%	28	75	8	52	10	50		
32	4AL22AI032	MOHAMMED FAISAL	10	91%	12	82	AB	71	AB	94		
33	4AL22AI033	NAVYASHREE M	13	86%	16	100	AB	100	AB	96		
34	4AL22AI034	NIKHIL G DEVADIGA	15	86%	25	82	20	86	25	92		
35	4AL22AI035	PADMA POOJA SHETTY	18	95%	24	94	29	95	25	84		
36	4AL22AI036	PAVAN KUMAR A	18	100%	25	100	24	95	23	84		
37	4AL22AI037	PRAMOD UPPOOR	21	86%	29	88	22	95	9	92		
38	4AL22AI038	RAKESH G	20	100%	29	88	26	90	19	86		
39	4AL22AI039	RAKSHA D.R	23	100%	30	100	27	100	24	88		
40	4AL22AI040	RASHAAD N MOHAMMED	AB	95%	AB	88	19	95	18	94		
41	4AL22AI041	SAAKSHI S MOOLYA	20	95%	27	94	28	95	21	92		
42	4AL22AI042	SANJEEV REDDY	14	100%	19	63	25	81	16	85		
43	4AL22AI043	SANKET PATIL	16	86%	25	88	21	100	15	94		
44	4AL22AI044	SATHYAPRAKASH T	21	86%	25	88	24	90	19	96		
45	4AL22AI045	SHANTVEER PAVAN KESTI	25	100%	30	94	25	95	22	92		
46	4AL22AI046	SHARAN S SHETTY	20	95%	24	94	20	95	21	84		
47	4AL22AI047	SHARVARI R K	7	100%	9	88	19	90	16	84		
48	4AL22AI048	SHASHANK HN	15	91%	21	75	19	71	18	68		
49	4AL22AI049	SHEIKH MOHAMMED REHAN	19	91%	26	94	23	86	22	90		
50	4AL22AI050	SHETTY GAURAV JAGADEESHA	22	100%	25	94	22	95	22	92		
51	4AL22AI051	SHIVAMANI M NAYAK	7	95%	13	88	6	86	12	84		
52	4AL22AI052	SHRIHITH S POOJARY	19	95%	17	94	26	90	23	84		
53	4AL22AI053	SMRITI S NAYAK	16	100%	24	82	22	90	21	92		
54	4AL22AI054	SONALI	21	95%	29	88	23	90	20	86		
55	4AL22AI055	SRUSHTI SURESH YADAHALLI	19	100%	23	88	14	95	18	88		
56	4AL22AI056	SRUSHTI UMARANI	16	100%	16	88	24	90	21	94		
57	4AL22AI057	SUJAY S PATTAR	7	100%	12	82	16	86	4	84		
58	4AL22AI058	SUSHMA UMESH MANAPPANAVAR	20	95%	21	94	26	95	25	94		

59	4AL22AI059	SUVEER SR	20	77%	30	69	24	76	16	81			
60	4AL22AI060	TEJASHWINI SHAILENDRA MURDESHWAR	AB	77%	AB	57	23	71	16	75			
61	4AL22AI061	VAISHNAVI S KEDHLAYA	17	100%	28	94	24	100	21	85			
62	4AL22AI062	VIJAYASHRI JM	25	100%	27	94	25	100	21	88			
63	4AL22AI063	YAJNESH POOJARY	25	95%	30	94	29	95	24	95			
64		VINAYAK M NAGANUR	5	100%	17	75	25	95	21	88			
65		LATHESH KUMAR S R	5	86%	10	88	25	100	7	86			
66		SEHRISH ZOHRA R NAVALGUND	8	78%	19	63	27	79	19	62			
# of Students Absent			2		2		2		2				
# of Students Scored Less than or equal to 11			15		2		4		6				
# of Students Scored between 12to 20			31		18		14		21				
# of Students Scored above 20			18		44		46		37				
Pass percentage (>14)			81.25		96.875		93.75		92.1875				
Staff incharge			Dr. Prameela Kolake		Dr. Ganesh K		Dr. Pradeep Nazareth		Dr. Ramesh G				

30/01/2024

Class Coordinator

30/1/2024

HoD

Head of the Department
Dept. of Artificial Intelligence & Machine Learning
Alva's Institute of Engineering and Technology
Shobhavana Campus, Mijar
Moodubidire 574 225, D.K. Karnataka, India

Principal

PRINCIPAL
Alva's Institute of Engg. & Technology,
Mijar. MOODBIDRI - 574 225, D.K

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY, MOODBIDRI

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Assignment- I

emester: **III**
bject: **Operating Systems (BCS303)**
ax Marks: **05**
culty: **Dr. Pradeep Nazareth**

Date: **22.01.2024**
Last date to submit: **03.02.2024**

swer all following questions

1. With neat digram explain virtual machine with its advantages and disadvantages?
2. Explain different computing environments.
3. Consider the following data and calculate average waiting time and turn-around time using FCFS, SJF, SRTF, and RR scheduling with time quantum of 2.

Process	Arrival Time	Burst Time
P_1	0	8
P_2	1	5
P_3	4	1
P_4	5	3

4. Consider the following data and calculate average waiting time and turn-around time using FCFS, SJF, SRTF, and RR scheduling with time quantum of 2, priority scheduling with preemption, priority scheduling with no preemption.

Process	Arrival Time	Burst Time	Priority
P_1	6	4	3
P_2	4	2	2
P_3	5	9	1
P_4	7	3	4

END

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY, MOODBIDRI

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Rubrics for evaluation of Assignment- I

r: III

Operating Systems (BCS303)

Faculty: Dr. Pradeep Nazareth

Criteria	Excellent (5)	Very Good (4)	Good (3)	Needs Work (2)	Poor (1)
owledge of bject matter	Shows proficient understanding of subject matter	Shows adequate understanding of subject matter	Shows basic understanding of subject matter	Don't shows adequate understanding of subject matter	Failed to shows understanding of subject matter
Timelineness	Submitted in time	Submitted with 1 day delay	Submitted with 2 days of delay	Submitted with 3 days of delay	Submitted with more than 4 days of delay or not submitted

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY, MOODBIDRI

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Operating Systems - BCS303

List of slow learners

S. No.	USN	Name
1	4AL22AI011	CHARANDEEP B.S
2	4AL22AI012	DANESH M KOLAVI
3	4AL22AI024	KUTAKOLE GAURI MAHADEV
4	4AL22AI025	LINIYA CRISHEL SALDANHA
5	4AL22AI031	MITHUN GOWDA SR
6	4AL22AI032	MOHAMMED FAISAL
7	4AL22AI033	NAVYASHREE M
8	4AL22AI051	SHIVAMANI M NAYAK
9	4AL22AI055	SRUSHTI SURESH YADAHALLI