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Note : Remove "Table of Content" before including in CP Book

Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

# 17EC553 : OPERATING SYSTEM

## A. COURSE INFORMATION

#### 1. Course Overview

Degree:	BE	Program:	EC
Year / Semester :	3/5	Academic Year:	2019-20
Course Title:	OPERATING SYSTEM	Course Code:	15EC553
Credit / L-T-P:	40-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	55	SEE Marks:	100 Marks
CIA Marks:	40	Assignment	1 / Module
Course Plan Author:	SHILPA RANI P	Sign	Dt:
Checked By:		Sign	Dt:

### 2. Course Content

Mod	Module Content	Teaching	Module	Blooms
ule		Hours	Concepts	Level
1	OS, Goals of an OS, Operation of OS, Computational	10	Operation of	L2, L2
	structures, Resource allocation techniques, Efficiency,		OS,	
	System Performance and User Convenience, Classes of		Classes of OS	
	Operating System, Batch processing, Multi-programming,			
	Time sharing systems, Real time and distributed Operating			
	System.			
2	OS view of Processes, PCB, Fundamental state transitions,	11	Threads in	L2,L3
	Threads, Kernel and User level Threads, Non-Preemptive		process,	
	scheduling-FCFS and SRN, Preemptive Scheduling-RR and		Process	
	LCN, Long term, medium term and short term scheduling in		scheduling	
	a time sharing system.			
3	Contiguous memory allocation, Non-contiguous memory	11	Memory	L3, L3
	allocation, Paging, Segmentation, Segmentation with		allocation,	
	paging, Virtual Memory Management, Demand paging,		Virtual	

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	Paging hardware, VM handler, FIFO, LRU page replacement policies	memory	
4	File system and IOCS, File Operations, File Organizations, Directory Structures, File Protection, Interface between File system and IOCS, Allocation of disk space, Implementing file access	File system, File access	L2, L3
5	Overview of message passing, Implementing message passing, Mailboxes, Deadlocks, Deadlocks in resource allocation, Resource state modelling, Deadlock detection algorithm, Deadlock prevention	Data sharing, deadlock	L2, L3

#### 3. Course Material

Mod	Details	Available
ule		
1	Text books	
	Operating Systems - A concept based approach by Dhamdare, TMH, 2 <sup>nd</sup>	In Lib
	edition.	In dept
2	Reference books	
	1. Operating systems concepts, Silberschatz and Galvin, John Wiley India pvt. Ltd, 5 <sup>th</sup> edition, 2001	In lib
	2. Operating system - internals and design system, William Stalling, Pearson Education, 4 <sup>th</sup> ed, 2006.	In lib
	3. Design of operating systems, Tannanbhaum, TMH, 2001	In lib
3	Others (Web, Video, Simulation, Notes etc.)	

#### 4. Course Prerequisites

SNo	Course	Course Name	Module / Topic / Description	Sem	Remarks	Blooms
	Code					Level
1						

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

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#### **B. OBE PARAMETERS**

#### 1. Course Outcomes

#	COs	Teach.	Concept	Instr	Assessmen	Blooms'
		Hours		Method	t Method	Level
17EC553.	Understand the goals, structure	4	Operation	Lecture	Slip Test	L2
1	and operation of OS		of OS			Understand
17EC553.	Compare 5 different classes of OS	6	classes of	Lecture	Assignmen	L2
2			OS		t	Understand
17EC553.	Understand the concept of threads	5	Threads in	Lecture	Assignmen	L2
3	to achieve process concurrency		process		t and Slip	Understand
					Test	
17EC553.	Apply scheduling techniques to find	6	Process	Lecture /	Assignmen	L3
4	performance factors		Scheduling	PPT	t	Apply
17EC553.	Apply suitable techniques for	6	Memory	Lecture	Slip test	L3
5	contiguous and non-contiguous		allocation			Apply
	memory allocation					
17EC553.	Illustrate page replacement policies	5	Virtual	Lecture	Assignmen	L3
6	to find the performance		memory	and	t	Apply
				Tutorial		
17EC553.	Explain the operations supported	5	File system	Lecture	Assignmen	L2
7	by the file system and IOCS				t and Slip	Understand
					Test	
17EC553.	Implement file access using	4	File access	Lecture	Slip test	L3
8	directory structure and FCB					Apply
17EC553.	Understand inter-process	4	Data	Lecture	Assignmen	L2
9	communication using message		sharing		t	Understand
	passing					
17EC553.	Solve the problems of deadlock	6	Deadlock	Lecture	Slip test	L3
10	during resource allocation			and		Apply
				Tutorial		
-	Total	51	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

### 2. Course Applications

SNo	Application Area	CO	Level
1	Linux operating system working	CO1	L2
2	Automated transaction processing	CO2	L2
3	Multi-threading by time slicing	CO3	L2
4	Human resource management	CO4	L3
5	Video games	CO5	L3
6	File swapping	CO6	L3

and the state		SKIT	Teaching Process Rev 1	No.: 1.0	
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7	7 Multiple file system within a single system				L2
8	8 Directory structure				
9 Message oriented middleware					L2
10	10 Resource management				

## 3. Articulation Matrix

#### (CO – PO MAPPING)

17EC553.2 C	COs Inderstand the goals tructure and operation of OS Compare 5 different classes of	PO 1 , 3	PO2	PO 3	PO 4		PO6	PO	PO	PO9	PO	PO	PO	Level
s 17EC553.2 C	tructure and operation of OS	· ·		3	4	-								
s 17EC553.2 C	tructure and operation of OS	, 3				5		7	8		10	11	12	
17EC553.2 C														L2
	Compare 5 different classes of													
	DS	3												L2
tł	Inderstand the concept of hreads to achieve process oncurrency													L2
	pply scheduling techniques to ind performance factors	3	2											L3
c	pply suitable techniques for ontiguous and non- ontiguous memory allocation		2											L3
р	lustrate page replacement policies to find the performance		2											L3
s	xplain the operations upported by the file system nd IOCS	3												L2
	nplement file access using lirectory structure and FCB	3												L3
	Inderstand inter-process ommunication using message bassing													L2
0 d	olve the problems of deadlock uring resource allocation i <b>on the mapping strength a</b>		2	1										L3

#### 4. Mapping Justification

Mapping	Justification	Mapping
		Level

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СО	РО	-	-
CO1	PO1	Knowledge of OS is required for understanding software problems.	3
CO2	PO1	Knowledge of classes of OS is required for developing new software.	3
CO3	PO1	Knowledge of threads is required for writing programs	3
CO4	PO1	Knowledge of scheduling techniques is required for real time program development	3
CO4	PO2	Analyzing problem in OS requires knowledge of scheduling techniques	2
CO5	PO1	Knowledge of memory allocation is required for proper utilization of memory	3
CO5	PO2	Analyzing problems in memory utilization requires knowledge of memory allocation	2
CO6	PO1	Knowledge of page replacement policies is required to manage memory related problems	3
CO6	PO2	Analyzing problems in memory management requires knowledge of page replacement policies.	2
C07	PO1	Knowledge of file system and IOCS is required for solving file related problems	3
CO8	PO1	Knowledge of directory structure is required for solving file related problems	3
CO9	PO1	Knowledge of inter-process communication is required for solving communication related problems	3
CO10	PO1	Knowledge of Deadlock is required for solving resource related problems	3
CO10	PO2	Analyzing problems in resource management requires knowledge of deadlocks	2
CO10	PO3	Deadlock prevention is necessary for proper management of resources	1

Note: Write justification for each CO-PO mapping.

## 5. Curricular Gap and Content

SNo	Gap Topic	Actions Planned	Schedule Planned	<b>Resources Person</b>	PO Mapping
1					
2					
3					
4					
5					

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Note: Write Gap topics from A.4 and add others also.

#### 6. Content Beyond Syllabus

SNo	Gap Topic	Actions Planned	Schedule Planned	<b>Resources Person</b>	PO Mapping
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Note: Anything not covered above is included here.

#### C. COURSE ASSESSMENT

#### 1. Course Coverage

Mod	Title	Teaching	No. of question in Exam					CO	Levels	
ule		Hours	CIA-	CIA-	CIA-	Asg	Extra	SEE		
#			1	2	3		Asg			
1	Introduction to operating system	10	2	-	-	1	1	2	CO1,	L2, L2
									CO2	
2	Process management	11	2	-	-	1	1	2	CO3,	L2, L3
									CO4	
3	Memory management	11	-	2	-	1	1	2	CO5,	L3, L3
									CO6	
4	File systems	9	-	2	-	1	1	2	C07,	L2, L3
									C08	
5	Message passing and deadlocks	10	-	-	4	1	1	2	CO9,	L2, L3
									CO10	
-	Total	51	4	4	4	5	5	10	-	-

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

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#### 2. Continuous Internal Assessment (CIA)

Evaluation	Weightage in Marks	СО	Levels
CIA Exam - 1	15	CO1, CO2, CO3, CO4	L2, I2, I2, I3
CIA Exam - 2	15	CO5, CO6, CO7, C08	L3, L3, L2, L3
CIA Exam - 3	15	CO9, CO10	L2, L3
Assignment – 1	03	CO1, CO2, CO3, CO4	L2, I2, I2, I3
Assignment – 2	03	CO5, CO6, CO7, CO8	L3, L3, L2, L3
Assignment – 3	03	CO9, CO10	L2, L3
Seminar – 1	02	CO1, CO2, CO3, CO4	L2, I2, I2, I3
Seminar – 2	02	CO5, CO6,CO7,CO8	L3, L3, L2, L3
Seminar – 3	02	CO9, CO10	L2, L3
Other Activities – define			
- Slip test			
Final CIA Marks	20	-	-

Note : Blooms Level in last column shall match with A.2 above.

### D1. TEACHING PLAN - 1

#### Module – 1

Title:	Introduction to operating system	Appr	16 Hrs
		Time:	
а	Course Outcomes	-	Blooms
-	The student should be able to:	-	Level
1	Understand the goals, structure and operation of OS	CO1	L2
2	Compare 5 different classes of OS	CO2	L2
b	Course Schedule		_
Class No	Module Content Covered	CO	Level
1	Introduction to OS, Goals of an OS, Operation of OS	CO1	L1
2	Computational structures,	C01	L2
3	Resource allocation techniques	C01	L2
4	Efficiency, System Performance and User Convenience	CO1	L2
5	Classes of Operating System	CO2	L1
6	Batch processing	CO2	L2
7	Multi-programming	CO2	L3
8	Time sharing systems	CO2	L2

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9	Real time Operating System	CO2	L2
10	Distributed Operating System	CO2	L2
С	Application Areas	СО	Leve
1	Linux operating system working	CO1	L2
2	Automated transaction processing	CO2	L2
d	Review Questions	_	
1	Discuss the common tasks performed by an operating system.	CO1	L1
2	Explain the resource pre-emption, resource allocation strategies of an OS.	CO1	L2
3	What is a distributed system? Discuss the key concepts, techniques and benefits of distributed OS.	CO2	L2
4	What is O.S? What are the common tasks performed by an O.S and when they are performed?	CO1	L2
5	Explain turn-around time in batch processing system	CO1	L2
6	Explain the goals of an operating system.	CO1	L2
7	Explain the designer's view of operating system.	CO1	L2
8	Explain modes of performing I/O operations.	CO1	L2
9	Explain the benefits/features of distributed operating system.	CO2	L2
10	Define an operating system. What are the facets of user convenience?	CO1	L1
11	Explain partition based and pool based resource allocation strategies.	CO1	L2
12	Explain time sharing operating system with respect to (i) Scheduling and (ii) memory management	CO2	L2
13	Describe the batch processing system and functions of scheduling and memory management for the same.	CO2	L2
14	Why I/O bound programs should be given higher priorities in a multi programming environment? Illustrate with timing diagram.	CO2	L3
15	Explain the features and special techniques of distributed operating system	CO2	L2
16	Explain briefly the key features of different classes of operating system.	CO2	L2
17	Explain the concepts of memory compaction and virtual memory with respect to memory management.	CO1	L2
18	Define operating system. Explain the functions of an operating system.	CO1	L2
19	Differentiate sequential sharing and concurrent sharing devices, with examples.	CO1	L2
20	Briefly explain the different classes of operating systems, specifying the primary concern and key concepts used.	CO1	L2
21	Discuss the spooling technique with a block representation. Also highlight the importance of distributed operating systems.	CO2	L2

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е	Experiences	
1		
2		
3		
4		
5		

### Module - 2

Title:	Divide and Conquer	Appr	10 Hrs
		Time:	
а	Course Outcomes	-	Blooms
_	The student should be able to:	-	Level
1	Understand the concept of threads to achieve process concurrency	CO3	L4
2	Apply scheduling techniques to find performance factors	CO4	L3
b	Course Schedule	_	-
Class No	Module Content Covered	CO	Level
11	OS view of Processes	CO3	L1
12	РСВ	CO3	L2
13	Fundamental state transitions	CO3	L2
14	Threads, Kernel level Threads	CO3	L2
15	User level Threads	CO3	L2
16	Non-Preemptive scheduling-FCFS	CO4	L3
17	Non-Preemptive scheduling-SRN	CO4	L3
18	Preemptive Scheduling-RR	CO4	L3
19	Preemptive Scheduling- LCN	CO4	L3
20	Long term, medium term scheduling in a time sharing system.	CO4	L2
21	short term scheduling in a time sharing system.	CO4	L2
С	Application Areas	СО	Level
1	Multi-threading by time slicing	CO3	L2
2	Human resource management	CO4	L3
d	Review Questions		
22	Discuss the primary concerns/reasons for process termination.	CO3	12
23	List the events occur during the operation of OS. With a diagram	CO3	L2
	discuss the event handling actions of kernel.		
24	With a diagram, explain the relationship between threads and processes. Discuss the advantages of threads.	CO3	L2

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	Define a process. List the different fields of a process control block.CO3Explain the four fundamental states of a process with state transitionCO3											L2	
	Explain the four fundamental states of a process with state transiti diagram.											L2	
	What are the advantages of threads over process? Explain kernel level CO: threads.											L2	
28	List the dif	ferent	ypes of	process	inter	action	and e	xplain	them in b	orief.	CO3	L2	
	Explain wi operating :		-	ram, th	e diff	erent	states	ofp	rocess in	UNIX	CO3	L2	
	What is a p			re the c	ompo	nents	of a p	rocess	? Explain.		CO3	L2	
	Explain wit				-		-				CO3	L2	
	Mention t										CO3	 L2	
	process in	thread	s in Sola	ris, alor	ıg witl	n ad	liagrai	n.					
	With a stat of states, s			-				-		iction	CO3	L2	
	Explain th algorithm	ne race	e condit	ion in	airlir	ie res	ervati	on sy	stem wit	h an	CO3	L2	
35	Explain 'Ev	ent Hai	ndling' p	ertainir	ig to a	a proce	ess.				CO3	L2	
36	Explain arr	rangem	ent and	working	of th	reads	in Sol	aris wi	th a neat	block	CO3	L2	
	diagram.												
	Explain synchroniz		ontrol with exa	synchro mples.	onizat	ion	and	the	data a	ccess	CO3	L2	
	<i>,</i> What is a t				ies.						CO3	L2	
	Explain in			-		<i>v</i> of r	oroces	ses. V	/ith intera	ction	CO3	L2	
	between p			-		-							
	With a nea		-	-							CO4	L2	
	Determine	-					-		-	ound	CO4	L3	
	for LCN an							-					
·		Arrival	time	Execut		time		line	time				
	s	(sec)		(sec)			(sec)						
	<b>P</b> <sub>1</sub>	0		03			04						
		2		03			14						
		3		02			06						
		5		05			11						
	-	8		03			12						
42	Discuss the	e two fi	undamer		niaue	es of so		lina.			CO4	L2	
	With diagr							-	and short	term	CO4	L2	
	scheduling	-			-		,,						
	For the fol					edulin	a.				CO4	L3	
		Process	J PT	$P_1$	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	<b>P</b> <sub>5</sub>	]				
			on time	0	2	3	4	8	1				
		Service t		3	3	5	2	3	1				
	ے ۲ Calculate			-	-	-		-	」 urn aroun	d for			

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Copyright ©2017. cAAS. All rights reserved. the (i) FCFS scheduling (ii) Round–Robin scheduling with time slicing (δ)												
	for 1 second.											
45			oun	d tirr	ie an	d m	ean	veiał	nted turn-around	time	CO4	L3
	-	ving set of pro						-		time		20
		5		,	J	-		_	J			
	Γ	Process	$\mathbf{P}_1$	<b>P</b> <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	<b>P</b> <sub>5</sub>					
		Arrival time	0	2	3	5	8					
		Service time	3	3	2	5	3					
46	Explain t	ne process sch	edu	le wi	th a	neat	sche	emati	ic diagram.		CO4	L2
47	Summariz	ze the approad	hes	of re	eal ti	me s	chec	luling	].		CO4	L2
48	Compare	(i) Preemptive	anc	l non	-pre	emp	tive	sche	duling		CO4	L2
		term and short										
49			•						ighest response		CO4	L3
			•						e average turn-ar			
		•		ound	tim	e tor	the	tollo	wing set of proce	esses		
	shown in	the table belo		n	D	D	n					
	-	Process	$P_1$	$P_2$	P <sub>3</sub>	$P_4$	<b>P</b> <sub>5</sub>					
	-	Arrival time Service time	0 3	2	3 5	4	8					
50	What are	the functions	-	<u> </u>	-	-	<b>–</b>	orm	schodulors?		CO4	L2
51									scheduling, assu	mina	C04	L2 L3
		ce of 1 second				-			scheddinig, assu	ining	0.04	LJ
	u time sh			ence			cub.	<b>c</b> .				
	Process	Arrival ti	ne	Exe	cutio	n tin	ne (s	ec)	Dead line time	1		
		(sec)							(sec)			
	<b>P</b> <sub>1</sub>	0		03					04	1		
	P <sub>2</sub>	2		03					14			
	<b>P</b> <sub>3</sub>	3		02					06			
	<b>P</b> <sub>4</sub>	5		05					11			
	<b>P</b> <sub>5</sub>	8		03					12			
52			blo	cks	in a	lor	ng t	erm	scheduling with	JCB	CO4	L2
	structure											
53			agra	m, e	xpla	in a	bout	the	event handling	and	CO4	L2
	schedulin	-		NUN7							<u> </u>	
54		ne scheduling							roomotivo		CO4	L2
55		you mean b Explain i) LCN	-	-		-		ia p	reemptive sched	uiing	CO4	L2
56	-	-						mo	dules of short	term	CO4	L2
	-	cheduler with				-	-		Source of short	cerni	04	LL
57						-			system. Also ex	plain	CO4	L2
	-	tate transition						-		Prant		
58						-			d to scheduling?	With	CO4	L2
	What 15	scheduning: W	nat	are	the	CVEII	13 10	atel	a to scheduling:	VVI LI I	0.04	LL

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	A A C A H		

	block view, explain the event control block and handler		
59	Describe the static, dynamic and priority based scheduling in real time systems. Also explain the modes of process scheduling done in unix	CO4	L2
е	Experiences	_	_
1			
2			
3			
4			
5			

## E1. CIA EXAM - 1

## a. Model Question Paper - 1

Crs		15EC553	Sem:	V	Marks:	30	Time:	75	minut	es			
Cod													
Cou	rse:	Operating	system										
-	-	Note: Ans	swer any 1	question	from each	part.			Mark s	CO	Level		
				P	PART A								
1	a	Define an	operating sys	stem. Wha	at are the fa	cets of	user convenien	ce?	5	CO1	L1		
	b	Explain partition based and pool based resource allocation strategies. 5 CO1 L2											
	с	Explain tin	ne sharing op	perating s	ystem with	respect	to Scheduling		5	CO1	L2		
					OR								
2	a		Briefly explain the different classes of operating systems, specifying 8 CO2 L2 the primary concern and key concepts used.										
	b	Explain th system	e features ar	nd special	l techniques	of dis	tributed operat	ting	7	CO2	L2		
				P	ART-B								
3	a	With a diagram, explain the relationship between threads and								CO3	L2		
		processes.	Discuss the	advantag	es of thread	s.							
	b	Explain the diagram.	e four fundaı	mental sta	ates of a pro	ocess w	ith state transi	tion	8	CO3	L2		
					OR								
4	a		the mean LCN and ST				an weighted t g table:	urn	7	CO4	L3		
		Proces	Arrival time	e Execut	ion time (se	c) Dea	ad line time						
		s	(sec)			(se	c)						
		<b>P</b> <sub>1</sub>	0	03		04							
		P <sub>2</sub>	2	03		14							
		P <sub>3</sub>	3	02		06		1					

ALL STATUTE OF TROUBULE
*BANGALORE*

SKIT	Teaching Process	Rev No.: 1.0
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Title:	Course Plan	Page: 14 / 30

copying	gint ©20	17. CAAS. All HQ	giits reserved.									
		<b>P</b> <sub>4</sub>	5	05			11					
		<b>P</b> <sub>5</sub>	8	03			12	)				
	b	For the f	ollowing given p	rocess f	or sch	edulin	ıg.			8	CO4	L3
			Process	<b>P</b> <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	<b>P</b> <sub>4</sub>	<b>P</b> <sub>5</sub>				
			Admission time	e 0	2	3	4	8				
			Service time	3	3	5	2	3				
		Calculate	e mean turn-aro	und time	e and	mean	weigh	ted tur	n around fo	-		
		the (i) FC	CFS scheduling (	ii) Roun	d-Rob	in sch	edulir	ng with	time slicing			
		(δ) for 1	second.									

## b. Assignment -1

Note: A distinct assignment to be assigned to each student.

				Model	Assignme	nt Questior	าร				
Crs Co	ode:	15EC55	3 Sem:	5	Marks:	5 / 10	Time:	90	- 120	minut	es
Cours	e:	Operatin	g system								
Note:	Each	student	to answer 2	-3 assignr	ments. Eac	h assignme	ent carries equ	ial m	nark.		
SNo	ι	JSN		Assi	gnment D	escriptior	ı		Mark	CO	Leve
1			Discuss the system.	common	tasks pe	rformed	by an opera	iting	<b>s</b> 5	CO1	L1
2			Explain the strategies of		e pre-em	ption, res	source alloca	tion	7	CO1	L2
3			What is a o techniques a		-		he key conce	epts,	8	CO2	L2
4			What is O.S O.S and whe				performed by	y an	7	CO1	L2
5			Explain turn	-around ti	ime in bato	h processi	ng system		6	CO1	L2
6			Explain the g	goals of ar	n operating	system.			6	CO1	L2
7			Explain the o	designer's	view of op	erating sys	stem.		4	CO1	L2
8			Explain mod	es of perf	orming I/C	operation	s.		5	CO1	L2
9			Explain the system.	e benefits	s/features	of distri	ibuted opera	iting	5	CO2	L2
10			Define an c convenience	_	system. W	/hat are th	ne facets of	user	6	CO1	L1
11			Explain part strategies.	ition base	ed and poo	ol based re	esource alloca	ition	6	CO1	L2
12			Explain time (i) Schedulin	-		ystem with v managem	•		8	CO2	L2
13			Describe th scheduling a			•	and functions	s of	8	CO2	L2
14		,	Why I/O bou	nd progra	ms should	be given h	nigher prioritie	es in	8	CO2	L3

Doc Code:SkIT.PhSb1.F02Date:16-08-2019Title:Course PlanPage:15Control Coll. 2005.a multiprogramming environment?Illustrate with timing diagram.Illustrate with timing diagram.Illustrate with timing diagram.16Explain the features and special techniques of distributed8CO2L2operating system10CO2L2operating system.10CO2L2in the concepts of memory compaction and virtual operating system.5CO1L218Define operating system.5CO1L219Differentiate sequential sharing and concurrent sharing specifying the primary concern and key concepts used.9CO1L220Briefly explain the different classes of operating system.10CO2L221Discuss the spooling technique with a block representation. Also highlight the importance of distributed operating systems.9CO1L222Discuss the primary concerns/reasons for process and processes. Discuss the advantages of threads.7CO3L223List the events occur during the operation of S. With a and processes. Discuss the advantages of threads.7CO3L224With a diagram.Subscuss the advantages of threads.7CO3L225Define a process. List the different fields of a process? Explain the min brief.8CO3L228List the different types of proces interaction and explain the min brief.8 <t< th=""><th colspan="2" rowspan="3">Doc C</th><th>SKIT</th><th>Г</th><th>Teaching Process</th><th>Rev</th><th>No.:</th><th>1.0</th><th></th></t<>	Doc C		SKIT	Г	Teaching Process	Rev	No.:	1.0	
Copyright 2007, CASE All rights received.       a multi programming environment? Illustrate with timing diagram.       15     Explain the features and special techniques of distributed operating system.     8     CO2     L2       16     Explain briefly the key features of different classes of loo coperating system.     10     CO2     L2       17     Explain the concepts of memory compaction and virtual memory with respect to memory management.     5     CO1     L2       18     Define operating system.     Explain the functions of an features.     6     CO1     L2       19     Differentiate sequential sharing and concurrent sharing devices, with examples.     9     CO1     L2       20     Briefly explain the different classes of operating systems.     9     CO1     L2       21     Discuss the spooling technique with a block representation.     10     CO2     L2       22     Discuss the primary concerns/reasons for process 5     CO3     L2       23     List the events occur during the operation of OS. With a 8     CO3     L2       24     With a diagram, explain the relationship between threads.     7     CO3     L2       25 <td< td=""><td>Doc Co</td><td>de:</td><td>SKIT.Ph5b1.F02</td><td colspan="4">Date: 16-08-2</td></td<>			Doc Co	de:	SKIT.Ph5b1.F02	Date: 16-08-2			
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32Mention the three kinds of entities used for concurrency within a process in threads in Solaris, along with diagram.4CO3L233With a state transition diagram and PCB structure, explain8CO3L2	31			-	-	evel	8	CO3	L2
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33With a state transition diagram and PCB structure, explain8CO3L2			V	withi	n a process in threads in Solaris, along with	a			
			C	diagr	am.				
the function of states, state transitions and the functions of	33		١	With	a state transition diagram and PCB structure, exp	lain	8	CO3	L2
			t	the fu	unction of states, state transitions and the function	s of			

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	a schedule.			
34	Explain the race condition in airline reservation system wi	th 8	CO3	L2
	an algorithm .			
35	Explain 'Event Handling' pertaining to a process.	10	CO3	L2
36	Explain arrangement and working of threads in Solaris with	a 10	CO3	L2
	neat block diagram.			
37	Explain the control synchronization and the data acce	ss 8	CO3	L2
	synchronization, with examples.			
38	What is a thread? List its advantages.	4	CO3	L2
39	Explain in detail the programmer view of processes. Wi	th 10	CO3	L2
	interaction between processes, highlight the remarks for	its		
	interaction.			
40	With a neat diagram, explain the event handling a	nd 8	CO4	L2
	scheduling.			
41	Determine the mean turn-around time and mean weight	ed 8	CO4	L3
	turn around for LCN and STG scheduling for the followi	ng		
	table:			
	Proces Arrival Execution time Dead line			
	s time (sec) (sec) time (sec)			
	P <sub>1</sub> 0 03 04			
	P <sub>2</sub> 2 03 14			
	P <sub>3</sub> 3 02 06			
	P <sub>4</sub> 5 05 11			
	P <sub>5</sub> 8 03 12			
42	Discuss the two fundamental techniques of scheduling.	4	CO4	L2
43	With diagram explain the working of a long, medium a	nd 10	CO4	L2
	short term scheduling in a time sharing system.			
44	For the following given process for scheduling.	10	CO4	L3
	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			
	Admission time     0     2     3     4     8			
	Service time     3     3     5     2     3			
	Calculate mean turn-around time and mean weighted tu	rn		
	around for the (i) FCFS scheduling (ii) Round-Rob			
	scheduling with time slicing ( $\delta$ ) for 1 second.			
45	Compute mean turn-around time and mean weighted tur	n- 10	CO4	L3
	around time for following set of processes, using FCFS a			
	SRN scheduling.			
	Process $P_1$ $P_2$ $P_3$ $P_4$ $P_5$			
	Arrival time     0     2     3     5     8			
	Service time 3 3 2 5 3			
46	Explain the process schedule with a neat schematic diagram	n. 5	CO4	L2
47	Summarize the approaches of real time scheduling.	5	CO4	L2

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48		Compare (i) Preemptive and non-preemptive scheduling					8	CO4	L2
		<ul><li>(ii) Long term and short term schedulers.</li><li>Describe the shortest request next (SRN) and highest</li></ul>							
49						_		CO4	L3
			ratio next (HRN						
		-	ge turn-aroun		•				
	time belo		he following s	et of processe	es snown in t	ne table			
50	What	t are	the function	ns of mediu	im and sho	rt term	4	CO4	L2
	sche	dulers	?						
51	Dete	rmine	mean turn	-around time	e for SJN	and RR	8	CO4	L3
	sche	duling	g, assuming a	time slice	of 1 second	for the			
	follo	wing t	able:						
	Pro	cess	Arrival time	Execution	Dead line				
			(sec)	time (sec)	time (sec)				
	$\mathbf{P}_1$		0	03	04				
	P <sub>2</sub>		2	03	14				
	<b>P</b> <sub>3</sub>		3	02	06				
	$\mathbf{P}_4$		5	05	11				
	<b>P</b> <sub>5</sub>		8	03	12				
52	Desc	ribe t	he various blo	cks in a long	term schedul	ing with	8	CO4	L2
	JCB s	structu	ure.						
53	With	a nea	t block diagra	m, explain abo	out the event	handling	8	CO4	L2
		sched	-						
54	· ·		e scheduling in				8	CO4	L2
55			you mean by				8	CO4	L2
		-	g policies? Expl						
56			iefly the mech	-	-	of short	10	CO4	L2
		-	ess scheduler w						
57			plain the featu		•		10	CO4	L2
			ocess state trai						
58			scheduling? \				_	CO4	L2
		-	g? With block v	iew, explain tl	he event conti	ol block			
		handle					1.0		
59			he static, dynai	-	-	-		CO4	L2
			systems. Als	o explain th	e modes of	process			
	sche	auling	g done in unix						

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# D2. TEACHING PLAN – 2

## Module – 3

Title:	Divide and Conquer	Appr	16 Hrs
а	Course Outcomes	Time:	Blooms
-	The student should be able to:	_	Level
1	Apply suitable techniques for contiguous and non-contiguous	CO5	L3
-	memory allocation		
2	Illustrate page replacement policies to find the performance	CO6	L3
b	Course Schedule		
Class	Module Content Covered	СО	Level
No			
22	Contiguous memory allocation	CO5	L3
23	Non-contiguous memory allocation	CO5	L3
24	Non-contiguous memory allocation	CO5	L3
25	Paging	CO5	L2
26	Segmentation	CO5	L2
27	Segmentation with paging	CO5	L2
28	Virtual Memory Management	CO6	L2
29	Demand paging	CO6	L2
30	Paging hardware	CO6	L2
31	VM handler, FIFO	CO6	L3
32	LRU page replacement policies	CO6	L3
С	Application Areas	СО	Level
1	Video games	CO5	L3
2	File swapping	CO6	L3
d	Review Questions	_	
60	Explain the lazy buddy allocator and slab allocator.	CO5	L2
61	With a diagram, explain the merging of free memory areas using boundary tag.	CO5	L2
62	Compare between contiguous and non-contiguous memory allocation.	CO5	L2
63	Explain the working of a buddy system allocator.	C05	L2
64	Explain first fit and best fit technique used to perform a fresh allocation from a free list.	CO5	L2
65	Describe static and dynamic memory allocation.	C05	L2
66	Explain the techniques used to perform memory allocation by using a free list.	CO5	L2

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67	-	al and external fragmentation with examples.		CO5	L2
68	-	ic and dynamic memory allocation. What are the	four	CO5	L2
		ponents for which the memory is to be allocated?			
69		Best fit technique for free space allocation and	(ii)	CO5	L2
		ioned allocation with their merits and demerits.	<u> </u>	605	
70		dy system allocator for program controlled data. I	Nor	CO5	L2
		rom process-of-two allocator?		605	
71		eatures of static and dynamic memory allocation.		C05	L2
72		o contiguous memory allocation.		C05	L2
73	-	slab allocator of solaris 2.4 system.		CO5	L2
74		nory fragmentation? Discuss the method of men	-	CO5	L3
	-	nd reuse of memory concepts to overcome the prob	Iem		
75	-	gmentations, give examples.		COL	12
75		diagram, mention the components of a men	-	CO5	L2
		a program during its execution. Also describe ation preliminaries.	the		
76	-	e practical issues in contiguous and non-contigu		C05	L3
70	memory alloca		ous	205	LJ
77	-	n explain the following:		CO6	L3
//	(i)	Practical page replacement policy.		000	LJ
	(i) (ii)	Page replacement policy using clock algorithms.			
78	( )	iagram, the copy_on_write for shared pages.		CO6	L2
79		explain virtual memory manager's action in dem	and	CO6	L2
	loading of a pa		and		
80		are the functions performed by paging hardware.		CO6	L2
81	-	functions of VM handler? Give the data structures of	VM	CO6	 L1
01	handler.		••••		
82		page reference string 5,4,3,2,1,4,3,5,4,3,2,1,5. I	How	CO6	L3
	many page fa				
		ning 3 frames? (i)FIFO (ii) LRU			
83	Explain the im	portant concepts in the operation of demand paging	J.	CO6	L2
84	What are the	functions performed by the virtual memory management	ger?	CO6	L2
	Explain.		_		
85	For the follow	ing page reference string, calculate the number of p	age	CO6	L3
	faults with FIF	O and LRU page replacement policies when i) Num	ıber		
	of page frame	s are three ii) Number of page frames are four.			
	Page reference	e string : 5 4 3 2 1 4 3 5 4 3 2 1 5			
		e string : $t_1, t_2, t_3, \ldots, t_{13}$			
86		ddress translation using ATU and TLB in demand pa	ged	CO6	L2
		n a block diagram.			
87		n page replacement policies.		CO6	L2
88	With a neat dia	agram, explain the concept of demand paging.		CO6	L2

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89	How virtual memory can be implemented?	CO6	L2
90	Describe demand paging, page replacement policy and page sharing	CO6	L2
	in detail.		
е	Experiences	_	_
1			
2			
3			
4			
5			

#### Module - 4

Title:	Divide and Conquer	Appr	16 Hrs
		Time:	
а	Course Outcomes	-	Blooms
_	The student should be able to:	-	Level
1	Explain the operations supported by the file system and IOCS	C07	L2
2	Implement file access using directory structure and FCB	CO8	L3
b	Course Schedule		
Class No	Module Content Covered	CO	Level
33	File system and IOCS,	C07	L2
34	File Operations,	C07	L2
35	File Organizations,	C07	L3
36	Directory Structures,	C07	L2
37	File Protection,	C07	L2
38	Interface between File system and IOCS,	CO8	L2
39	Allocation of disk space,	CO8	L3
40	Allocation of disk space,	CO8	L3
41	Implementing file access	CO8	L3
С	Application Areas	СО	Level
1	Multiple file system within a single system	CO8	L3
2	Directory structure	C07	L3
d	Review Questions	-	-
91	Explain the following with a diagram:	CO8	L3
	(i) Linked allocation.		
	(ii) File allocation table.		
	(iii) Indexed allocation.		

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92	Explain the operations performed on files.	C07	L3
93	Discuss with a diagram the directory trees of a file system.	C07	L2
94	With a neat diagram, explain the facilities provided by the file system	C07	L2
	and input-output control system?		
95	With a figure explain the working of a linked allocation of disk space.	CO8	L3
96	Explain the interface between file system and IOCS.	C07	L2
97	Explain the organization of sequential access and direct access files.	C07	L2
98	Describe file system actions during a file operation.	C07	L2
99	Explain the index sequential file organization with an example.	CO8	L3
100	What is a link? With an example, illustrate the use of a link in an	CO8	L3
	acyclic graph structure directory.		
101	Compare sequential and direct file organization.	C07	L3
102	Explain the file system actions when a file is opened and when a file	C07	L2
	is closed.		
103	Explain UNIX file system.	C07	L2
104	Discuss methods of allocation of disk space with block	CO8	L3
	representation.		
105	Explain briefly linked allocation of disk space with a neat sketch.	CO8	L2
106	Briefly explain File Control Block (FCB).	CO8	L2
е	Experiences	-	-
1			
2			
3			
4			
5			

## E2. CIA EXAM - 2

# a. Model Question Paper - 2

Crs		15EC553 Sem: 5 Marks: 20 Time: 75 minutes									
Code	e:										
Cou	rse:										
-	-	Note: Ans	wer any	1 questio	on from eac	ch part.			Mark	СО	Level
									S		
					Part A						
1	a		With a diagram, explain the merging of free memory areas using boundary tag.						8	CO5	L2
		Compare allocation.	between	contiguo	ous and	non-con	tiguous n	nemory	7	CO5	L2
		OR									
2	a	With a diag	th a diagram explain the following:								L3

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		(iii) Practical page replacement policy.			
		(iv) Page replacement policy using clock algorithms.			
	b	What are the functions of VM handler? Give the data structures of VM handler.	7	CO6	L1
		Part B			
3	a	Explain the operations performed on files.	8	C07	L3
	b	Explain the organization of sequential access and direct access files.	7	C07	L2
4	a	Discuss methods of allocation of disk space with block representation.	8	CO8	L3
	b	Briefly explain File Control Block (FCB).	7	CO8	L2

## b. Assignment - 2

Note: A distinct assignment to be assigned to each student.

			Mode	el Assignme	nt Question	S			
Crs Code	: 15EC5	15EC553 Sem: 5 Marks: 5 / 10 Time: 90					90 - 120	) minu	tes
Course:	Opera	ting System	5	·					
Note: Ead	h stude	nt to answer	2–3 assigr	nments. Eac	h assignme	nt carries equ	al mark.		
SNo	USN		Assi	gnment De	escription		Mark s	СО	Level
60		Explain the lazy buddy allocator and slab allocator.					8	CO5	L2
61		With a dia using bou		ain the mer	ging of free	memory area	as 8	CO5	L2
62		Compare memory a	between llocation.	contiguou	s and n	ion-contiguoi	us 6	CO5	L2
63		Explain th	e working o	of a buddy s	ystem alloc	ator.	10	CO5	L2
64			Explain first fit and best fit technique used to perform a fresh allocation from a free list.				a 8	CO5	L2
65		Describe s	tatic and d	ynamic mer	nory allocat	ion.	4	CO5	L2
66			Explain the techniques used to perform memory allocation by using a free list.				on 10	CO5	L2
67		Explain examples.		and exteri	nal fragm	entation wi	th 6	CO5	L2
68			rogram coi	•	•	ation. What a e memory is		CO5	L2
69	69			•	•	e allocation ar eir merits ar		CO5	L2
70						ram controlle o allocator?	ed 8	CO5	L2

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71		ribe the features of static and dynamic memo ation.	ry 5	CO5	L2		
72	Write	a note no contiguous memory allocation.	7	CO5	L2		
73	Expla	ain about slab allocator of solaris 2.4 system.	8	CO5	L2		
74	mem overo	is memory fragmentation? Discuss the method ory compaction and reuse of memory concepts come the problem of memory fragmentations, given pples.	to	CO5	L3		
75	mem	a neat diagram, mention the components of ory allocation to a program during its execution. Als ribe the memory allocation preliminaries.		CO5	L2		
76		nerate the practical issues in contiguous and nor guous memory allocation.	10	CO5	L3		
77	With	a diagram explain the following: (v) Practical page replacement policy. (vi) Page replacement policy using cloo algorithms.	9 :k	CO6	L3		
78	Expla	ain with diagram, the copy_on_write for shared pages	5. 4	CO6	L2		
79		diagram, explain virtual memory manager's action and loading of a page.	in 7	CO6	L2		
80	-	ain what are the functions performed by pagir ware.	ng 6	CO6	L2		
81		are the functions of VM handler? Give the dattures of VM handler.	ta 6	CO6	L1		
82	Cons 5,4,3 occu	ider the page reference strir 9,2,1,4,3,5,4,3,2,1,5. How many page faults wou r for the following page replacement policie ming 3 frames? (i)FIFO (ii) LRU	ld	CO6	L3		
83	Expla pagir	ain the important concepts in the operation of demarng.	nd 12	CO6	L2		
84		are the functions performed by the virtual memo ager? Explain.	ry 8	CO6	L2		
85	numl repla three Page	the following page reference string, calculate the ber of page faults with FIFO and LRU page cement policies when i) Number of page frames and the ii) Number of page frames are four. reference string : 5 4 3 2 1 4 3 5 4 3 2 1 5 rence time string : $t_1$ , $t_2$ , $t_3$ ,, $t_{13}$	je	CO6	L3		
86	Desc	ribe the address translation using ATU and TLB and paged allocation with a block diagram.	in 8	CO6	L2		
87	Write	a note on page replacement policies.	8	CO6	L2		
88	With	a neat diagram, explain the concept of demar	nd 10	CO6	L2		

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	paging.			
89	How virtual memory can be implemented?	10	CO6	L2
90	Describe demand paging, page replacement policy and page sharing in detail.	10	CO6	L2 L2
91	Explain the following with a diagram: (iv) Linked allocation. (v) File allocation table. (vi) Indexed allocation.	10	CO8	L3
92	Explain the operations performed on files.	8	C07	L3
93	Discuss with a diagram the directory trees of a file system.	5	C07	L2
94	With a neat diagram, explain the facilities provided by the file system and input-output control system?	8	C07	L2
95	With a figure explain the working of a linked allocation of disk space.	7	CO8	L3
96	Explain the interface between file system and IOCS.	8	C07	L2
97	Explain the organization of sequential access and direct access files.	8	C07	L2
98	Describe file system actions during a file operation.	4	C07	L2
99	Explain the index sequential file organization with an example.	8	CO8	L3
100	What is a link? With an example, illustrate the use of a link in an acyclic graph structure directory.	4	CO8	L3
101	Compare sequential and direct file organization.	4	C07	L3
102	Explain the file system actions when a file is opened and when a file is closed.	8	C07	L2
103	Explain UNIX file system.	10	C07	L2
104	Discuss methods of allocation of disk space with block representation.	8	CO8	L3
105	Explain briefly linked allocation of disk space with a neat sketch.	10	CO8	L2
106	Briefly explain File Control Block (FCB).	10	CO8	L2

# D3. TEACHING PLAN - 3

### Module - 5

Title:	Divide and Conquer	Appr	16 Hrs
		Time:	
а	Course Outcomes	-	Blooms
-	The student should be able to:	-	Level
1	Understand inter-process communication using message passing	CO9	L2
2	Solve the problems of deadlock during resource allocation	CO10	L3

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sun realized and the second se	Doc Code:	SKIT.Ph5b1.F02	Date: 16–08	-2019
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	7. cAAS. All rights reser Course Schedule			
~				
Class No	Module Conte	СО	Leve	
42	Overview of m	essage passing	CO9	L2
43	Implementing	message passing	CO9	L2
44	Implementing	message passing	CO9	L2
45	Mailboxes		CO9	L2
46	Deadlocks		CO10	L2
47	Deadlocks in r	esource allocation	CO10	L2
48	Resource state	modelling	CO10	L2
49	Deadlock dete	ction algorithm	CO10	L3
50	Deadlock dete	ction algorithm	CO10	L3
51	Deadlock prev	CO10	L2	
	Application A		CO	Leve
1	Message orien	ted middleware	CO9	L2
2	Resource mana	agement	CO10	L3
d	Review Ques	tions		_
107	Explain the fol	CO9	L2	
	i) Inter process			
	ii)Exceptional d			
108	Explain the	ess CO9	L2	
	communicatio			
109	Explain a mail	box with its features and advantages.	CO9	L2
110	Explain the pri	mary issues in implementing message passing	CO9	L2
	Explain the v protocols.	working of a blocking and non-blocking delive	ery CO9	L2
112	Explain Bufferi	ng of inter-process messages.	CO9	L2
113	Describe the d	elivery of inter-process messages.	CO9	L2
114	-	ct and In-direct naming. king and non blocking sends	CO9	L2
115		and message queues in UNIX.	CO9	L2
		rimitives used for the transmission and reception		L2
	messages in a	· · · · · · · · · · · · · · · · · · ·		
	-	age delivery protocols and the exceptional condition	ns CO9	L2
		e delivery with an example.		
	Explain the int	CO9	L2	
	Write short not		CO9	L2
		inter-process messages.		
	2. Mail boxes.	-		
	3. Inter-proces	ss communication in UNIX.		

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	17. cAAS. All rights reserve							
120		netric and asymmetric naming ii)Blocking and nc	on- CO9	L2				
	blocking proto	cols						
121	Write short not	CO9	L2					
	i) Process and t	threads						
	ii) Process Control Block							
122	Prove that who	of CO10	L3					
	processes, each with a finite execution time, an unsafe request wil							
	become safe in finite time.							
123	Explain deadlo	cks in resource allocation.	CO10	L2				
124	Write a note or	handling deadlocks.	CO10	L2				
125	Write a note or	deadlock prevention.	CO10	L2				
126	Compare SISR a	and MISR systems	CO10	L2				
е	Experiences		-	_				
1								
2								
3								
4								
5								

## E3. CIA EXAM - 3

### a. Model Question Paper - 3

Crs		15EC553	Sem:	5	Marks:	30	Time:	75 minut		
Code:										
Cou	rse:	Design an	d Analysis	of Algorit	hms	I	L			
-	-	Note: Ans	swer any	2 questio	ons, each c	arry equ	al marks.	Mark s	co	Level
1	a	Explain t communic		-	ies and so	ockets fo	or inter proce		CO9	L2
	b	Explain a mail box with its features and advantages.						7	CO9	L2
	or									
2	a	Describe r	ns 8	CO9	L2					
		during me								
	b	Explain the	e inter-pr	ocess com	munication I	nechanis	ms in UNIX OS.	7	CO9	L2
3	a	Define dea	adlock. Ex	plain the d	eadlock han	dling app	proaches.	8	CO10	L2
	b	With nece	ssary ske	tches, exp	lain the dif	erent de	adlock preventi	on 7	CO10	L2
		approache	s.							
					or					
4	a	Prove that	of 8	CO10	L3					
		processes,	, each wit	h a finite	execution ti	me, an u	insafe request v	vill		

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	become safe ir	n finite time.					

	become safe in finite time.			
b	Compare SISR and MISR systems	7	CO10	L2

## b. Assignment - 3

Note: A distinct assignment to be assigned to each student.

				N	Aodel Assignmen	nt Question	IS			
Crs C	ode:	15EC5	53 Sem:	5	Marks:	5 / 10	Time:	90 - 120	) minu	tes
Cours	se:	Operat	ing System							
Note:	Each	n studen	t to answer 2	2-3 as	ssignments. Eacl	n assignme	nt carries equ	al mark.		
SNo	l	USN	Assignmen	t Desc	ription			Mark s	СО	Leve
107		Explain the following: i) Inter process message control block. ii)Exceptional conditions on message passing.						CO9	L2	
108			Explain the message queues and sockets for inter process communication in unix.					s 8	CO9	L2
109			Explain a m	nail bo	ox with its featur	es and adv	antages.	7	CO9	L2
110			Explain th passing	e pri	mary issues in	impleme	nting messag	e 6	CO9	L2
111			Explain th delivery pro		rking of a blo s.	cking and	non-blockin	g 7	CO9	L2
112			Explain Buf	fering	of inter-proces	s messages	5.	6	CO9	L2
113			Describe th	e deli	very of inter-pro	cess mess	ages.	6	CO9	L2
114			Explain i) Direct and In-direct naming. ii)Blocking and non blocking sends			6	CO9	L2		
115			Explain pip	es and	d message queu	es in UNIX.		6	CO9	L2
116			Explain the primitives used for the transmission and reception of messages in an OS				d 4	CO9	L2	
117				-	je delivery proto g message delive		•	al 8	CO9	L2
118			Explain the UNIX OS.	e intei	r-process comm	unication	mechanisms i	n 8	CO9	L2
119			2. Mail box	g of in es.	on: ter-process mes communication	-		8	CO9	L2
120			Explain i)Symmetric and asymmetric naming ii)Blocking and non-blocking protocols		g 6	CO9	L2			
121			Write short i) Process a ii) Process (	nd th	reads			10	CO9	L2

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122		Prov	a 8	CO10	L3						
		finite	e set of processes, each with a finite execution time	2,							
		an u	nsafe request will become safe in finite time.								
123		Expla	ain deadlocks in resource allocation.	8	CO10	L2					
124		Write	e a note on handling deadlocks.	6	CO10	L2					
125		Write	6	CO10	L2						
126		6	CO10	L2							

## F. EXAM PREPARATION

### 1. University Model Question Paper

Cou	rse:	Operating	System						Mon	th / Yea	r Jan /2	2018
Crs	Code:	15ec553	Sem:	5		Marks	:	80	Time	2:	180	
										minut	es	
-	Note		iy FIVE full quest	ions, c	hoosi	ng ONE	Efull	questio	n from ea	ach <b>Mar</b>	k CO	Leve
		module								S		
1	a	-	erating system.	What a	re the	goals	of an	operat	ting syste	m? 8	C01	L2
		Explain.										
	b	List and e	explain the diffe	rent co	mput	ational	stru	ctures of	of operati	ing 8	C01	L2
	system.											
or												
2	a	What are the different classes of operating system? Explain them with								ith 10	CO2	L2
		their primary concern. Explain the terms: i) Efficiency ii) system performance iii) Use										
	b		ne terms: i) Eff	iciency	ii)	systen	n per	forman	ce iii) U	ser 6	CO2	L2
		service										
3	a	With the help of neat sketch, explain the view of processor.										L2
	b	Define process state. Write a neat sketch, explain the fundamenta									CO3	L2
		state transitions of processes.										
					or							
4	a	For the g	given set proces	sses, p	perfor	m FCF	S and	d SRN	scheduli	ng. 10	CO4	L3
		Compare	their performan	ce in te	erms	of mea	n tur	n arou	nd time a	ınd		
		mean weig	ghted turn aroun	d time.	•							
				1	1	1	1					
			Process	<b>P</b> <sub>1</sub>	P <sub>2</sub>	<b>P</b> <sub>3</sub>	P <sub>4</sub>	<b>P</b> <sub>5</sub>				
			Admission time	0	2	3	5	9				
			Service time	3	3	2	5	3				
	b	Write a ne	at sketch, explai	n long-	-medi	ium an	d sho	rt term	schedule	rs. 6	CO4	L2
												<u> </u>
5	a	Compare	5	nd no	on-co	ntiguo	us n	nemory	allocat	ion 8	C05	L2
		technique	s.									

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		Define:		8	C05	L1
			external fragmentation			
			segmentation			
		-	dress and physical address			
		iv) Page and p				
_			Or			
6			sketch, explain the concepts involved in demand load	ng 8	CO6	L2
		of a page.				
	b	-	and LRU page replacement policies. Show the operation		CO6	L3
			RU policies for the page reference string: 0, 1, 0, 2, 0,			
			eference string: $t_1$ , $t_2$ , $t_3$ , $t_4$ , $t_5$ , $t_6$ , $t_7$ and find out number	ber		
		of page faults	Given number of page frames = 2.			
7	a	Explain the fi	8	C07	L2	
	b	Explain the fu	Indamental file organizations.	8	C07	L2
			or			
8	а		ectory? Explain directory fields and its operation with	na 8	CO8	L2
	b	-	ory structure. le system actions when a file is opened.	8	C08	L2
	0		e system actions when a me is opened.		000	
9	a	Define messa	age passing. Illustrate the implementation of messa	ige 8	CO9	L2
		passing.				
	b	Define mailb	ox. Explain message passing using a mailbox w	ith 8	CO9	L2
		necessary sk boxes.	etches. Also mention the advantages of using m	nail		
			or			
10	а	Define deadlo	ock. Explain the deadlock handling approaches.	8	CO10	L2
		With necessa approaches.	ry sketches, explain the different deadlock prevent	on 8	CO10	L2

## 2. SEE Important Questions

Course:		Operating System					Month / Year		May /	2018	
Crs	Code:	15EC553	Sem:	5	Marks:	80	Time:		180		
										minutes	
	Note	ote Answer all FIVE full questions. All questions carry equal marks.					-	-			
Мо	Qno.	Important Que	estion					Marks	CO	Year	
dul											
e											
1	1	Discuss the common tasks performed by an operating system (OS).			(OS).	5	CO1	2015			
	2	Explain turn-around time in batch processing system				5	CO2	2015			
	3	Explain the be	enefits/featu	res of distrib	uted operati	ing system.		5	CO2	2014	

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SRI KRISHIA	ANGALORE A	SKIT	Teaching Process R	Rev No.: 1.0				
		Doc Code:	SKIT.Ph5b1.F02 E	Date: 16-08-2019				
BAN		Title:	Course Plan P	Page: 30 / 30				
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	4	Explain partit	ion based and pool based resource allocation strategie	es. 6	CO1	2014		
	5	Why I/O bour	nd programs should be given higher priorities in a mu	ılti 8	C02	2013		

	5	Why I/O bound programs should be given higher priorities in a multi programming environment? Illustrate with timing diagram.	8	C02	2013
2	1	With a diagram, explain the relationship between threads and processes. Discuss the advantages of threads.	7	CO3	2015
	2	Explain the four fundamental states of a process with state transition diagram.	7	CO3	2015
	3	Explain the race condition in airline reservation system with an algorithm	8	CO3	2013
	4	With a neat diagram, explain the event handling and scheduling.	8	C04	2015
	5	With diagram explain the working of a long, medium and short term scheduling in a time sharing system.	10	CO4	2015
3	1	Compare between contiguous and non-contiguous memory allocation.	6	CO5	2015
	2	Explain first fit and best fit technique used to perform a fresh allocation from a free list.	8	CO5	2015
	3	Describe static and dynamic memory allocation.	4	C05	2014
	4	What are the functions of VM handler? Give the data structures of VM handler.	6	CO6	2015
	5	Consider the page reference string 5,4,3,2,1,4,3,5,4,3,2,1,5. How many page faults would occur for the following page replacement policies assuming 3 frames? (i)FIFO (ii) LRU		CO6	2014
4	1	Explain the operations performed on files.	5	C07	2015
	2	Explain the interface between file system and IOCS	5	C07	2015
	3	Explain the index sequential file organization with an example.	8	C07	2014
	4	Explain the file system actions when a file is opened and when a file is closed.	8	C08	2015
	5	Briefly explain File Control Block (FCB).	10	C08	2014
5	1	Explain the message queues and sockets for inter process communication in unix.	8	CO9	2015
	2	Explain a mail box with its features and advantages.	7	C09	2015
	3	Explain the working of a blocking and non-blocking delivery protocols	7	CO9	2015
	4	Define deadlock. Explain the deadlock handling approaches.	8	C010	2018
	5	With necessary sketches, explain the different deadlock prevention approaches.	8	CO10	2018