	CATHER MODERNIA	a opiewchibycho	pareintegration	regiserovinteluit	Memoracoperor	endomica serges	Colombia Name	COMPOSIÇÃO	e to the contract of the contr	HISONEN CHICAGO	
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BCS/BAD/BAI/BDS301

Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Mathematics – III for Computer Science Stream

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. VTU Mathematics Hand Book is parmitted.

3. M: Marks , L: Bloom's level , C; Course outcomes.

the history of south a 2014	espery an expression con-	Module - 1	M	L	C							
Q.1	a.	A random variable x has the following prob. density function for various		L2	COI							
~		values of x.	0,									
		processor and the second secon										
		$\begin{array}{ c c c c c c c c c c c c c c c c c c c$										
		Find the value of k and evaluate $P(x < 6)$, $P(3 < x \le 6)$ and $(x \ge 6)$.										
			=		*							
	b.	Derive the mean and variance of Poisson distribution.	06	L2	CO2							
THE LOCAL PROPERTY.	SA A MARKET VIOLENCE											
	c.	In a certain town the duration of a shower is exponentially distributed with	07	L3	CO ₂							
	-	mean 5 minutes. What is the probability that a shower will last for?		1.	7 =							
		(i) less than 10 minutes (ii) more than 10 minutes and (iii) between 10										
CONTRACTOR OF THE PARTY OF THE	non-the control of the control	and 12 minutes.		ergalliskers werden bestellt	н одина чарна основи започения з							
	NO WEST DESCRIPTIONS	OR OR	0.7	Y 3	CO1							
Q.2	a.	The probability density function of	07	L3	COI							
		$f(x) = \begin{cases} Kx^2, & -3 < x < 3 \\ 0, & \text{elsewhere} \end{cases}$										
		0, elsewhere	r									
		Find the value of K and evaluate (i) $P(x \le 2)$, $P(x > 1)$ (ii) $P(1 \le x \le 2)$			=							
	b.	When a coin is tossed 4 times, find the probability of getting (i) exactly	06	L2	CO2							
propriate distribution and distribution of the second	pi e norveteralerile	one head (ii) atleast three heads and (iii) less than two heads.		- Digestrians graph again in the	- ORDS AND CONTROL OF STATE OF							
	c.	The marks of 1000 students in an examination follows a normal distribution	07	L2	CO ₂							
		with mean 0 and S.D 5. Find the number of students whose marks will be										
		(i) less than 65 (ii) more than 75 and (iii) between 65 and 75.										
greet until state of the control of the	SCHOOLS (MINISTER)	Madula 2		Mental and the characters of the	NORMAL TO A MUNICIPAL OF CASES (A SEC.) A SEC.							
	and the second second	Module – 2 Afthe joint probability distribution of x and y is given by	07	T 2	COL							
Q.3	a.	The joint probability distribution of x and y is given by	07	L2	CO2							
		$f(x, y) = \frac{1}{20}(x + y)$ for $x = 0, 1, 2, 3$, $y = 0, 1, 2$	-									
		30 P(5 m)										
		f(x, y) = $\frac{1}{30}$ (x + y), for x = 0, 1, 2, 3 \(y = 0, 1, 2 \) Find (i) P(x \le 2), y = 1) (ii) P(x > y)			\$ \$							
and an animal materials	b.	Find the unique fixed probability vector of	06	L2	CO3							
	В.	Find the unique fixed probability vector of	00	112	COS							
		U I O	= .									
	18	$P = \begin{bmatrix} 1/6 & 1/2 & 1/3 \end{bmatrix}$	1									
		$P = \begin{bmatrix} 0 & 1 & 0 \\ 1/6 & 1/2 & 1/3 \\ 0 & 2/8 & 1/3 \end{bmatrix}$		4								
MARININI TANÀN MANAGATAN	c.	Three boys A, B and C are throwing a ball to each other. A always throw	07	L3	CO3							
		the ball to B. B always throw the ball to A and C is just as likely to throw										
		the ball to A as to B. Find the probability that C has the ball after three	=									
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	throws, jf & starts the game.	approximation and the second	open page and produce the control of	PERMITTER TO PERMITTER THE							



Q.4	a.	The joint probability for the full size that find F(x)	0.5	, ,	
۲.9	a.	The joint prob. distribution for the following data, find $E(x)$ and $E(y)$.	07	L	co CO
	a 1,3*				
		X 1 0.1 0.2 0.0 0.3	1		
		0.1 0.2 0.0 0.5		_5	100
		2 0.2 0.1 0.1 0			
	b.	Show that the matrix			
	0.	Show that the matrix	06	L ₂	CO
		$P = \begin{vmatrix} 1/2 & 0 & 1/2 \end{vmatrix}$ is a regular stochastic matrix.			
		$P = \begin{bmatrix} 0 & 0 & 1 \\ 1/2 & 0 & 1/2 \\ 0 & 1 & 0 \end{bmatrix}$ is a regular stochastic matrix.	,		,
s 1	c.				
		A gambler's luck follows pattern. If he wins a game the prob. of winning	07	L3	CO.
		the next game is 0.6. However, if he loses a game, the prob. of losing the			
		next game is 0.7. There is an even chance of the gambler winning the first	= =	14	
		game. What is the prob. of he winning the second game.			
		Module – 3			
Q.5	a.	Define (i) Null hypothesis (ii) A statistic (iii) Standard error (iv) Level	0.5	T 4	00
		of significance (v) Test of significance. (iv) Level	07	L1	CO ₄
	b.	A coin was tossed 400 times and head turned up 216 times. Test the	0.0	1.2	004
		hypothesis that the coin is unbiased at 5% LOS	06	L3	CO4
	c.	In a city A 20% of a random sample of 900 school boys had a certain slight	07	L3	COF
]- :	physical defect. In another city B, 18.5% of a random sample of 1600	07	LS	CO5
		school boys had the same defect. Is the difference between the proportions			
		significant at 5% significance level?	-		
2.0		OR OR	-	1	
Q.6	a.	Explain the following terms:	07	L1	CO4
	11.1	(i) Type-I and Type-II errors			
	7=	(ii) Statistical hypothesis			
		(iii) Critical region	v.		
	1-	(iv) Alternate hypothesis			
	b.	The average marks in Engg. Maths of a sample of 100 students was 51 with	06	L2	CO ₅
		S.D 6 marks. Could this have been a random sample from a population with average marks 50?			
			0-		
				L3	CO ₄
	c.	One type of aircraft is found to develop engine trouble in 5 flights out of a total of 100 and another type in 7 flights out of a total of 200 flights. In	07		
	c.	total of 100 and another type in 7 flights out of a total of 200 flights. Is	07		
	c.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine	07		
	c.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level.	07		
). 7		total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Modulé – 4			<u>CO4</u>
2.7	а.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Module - 4 State central limit theorem. Use the theorem to evaluate P(50 < x < 56)		L2	CO4
2.7		total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Modulé – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an			CO4
2.7	a.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Modulé – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$.	07	L2	
2.7		total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Module – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$. Suppose that 10, 12, 16, 19 is a sample taken from a normal population	07		CO4
). 7	a.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Modulé – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$. Suppose that 10, 12, 16, 19 is a sample taken from a normal population with variance 6.25. Find 95% confidence interval for the population mean.	07	L2	20
2.7	a. b.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Module – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$. Suppose that 10, 12, 16, 19 is a sample taken from a normal population with variance 6.25. Find 95% confidence interval for the population mean. Given that $Z(0.15) \neq 0.0596$.	07	L2	CO5
2.7	a.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Modulé – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$. Suppose that 10, 12, 16, 19 is a sample taken from a normal population with variance 6.25. Find 95% confidence interval for the population mean. Given that $Z(0.15) \neq 0.0596$. Fit a Poisson distribution to the following data and test for goodness of fit	07	L2	
2.7	a. b.	total of 100 and another type in 7 flights out of a total of 200 flights. Is there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level. Module – 4 State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$ where x represents the mean of a random sample of size 100 from an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$. Suppose that 10, 12, 16, 19 is a sample taken from a normal population with variance 6.25. Find 95% confidence interval for the population mean. Given that $Z(0.15) \neq 0.0596$.	07	L2	CO5

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	г Т	OR III is the first of the second sec			
Q.8	a.	Height of a random sample of 50 college student showed a mean of	07	L2	CO ₄
. 23		174.5 cms and a S.D 6.9 cms. Construct 99% confidence limits for the			
		mean height of all college students.			
	b.	A random sample of 10 boys had the following (1.0:70, 120, 110, 101, 88,	06	L3	COS
		83, 95, 98, 107, 100. DO these data support the assumption of a			
	100	population mean I.Q of 100 (at 5% LOS)?	07	L3	COS
	c.	The theory predicts the propositions of beans in the four groups, G_1 , G_2 ,	07	L3	CO.
		G ₃ , G ₄ should be in the ratio 9:3:3:1. In experiment with 1600 beans			
		the numbers in the groups were 882, 313, 287 and 118. Does the experimental support the theory.			
	11.00 m	Module – 5			
Q.9	a.	4 1.	10	L3	CO
Q.9	a.	following yields in quintals per acre were obtained.			
		A 8 4 6 7			
		B 7 6 5 3		11 E	
		C 2 5 4 4 4			
		Test the significance of difference between the yields of varieties, given		*	
		that 5% tabulated value of $F = 4.26$ with $(2, 9)$ d.f. Set up one-way			
		ANOVA and using direct method.	,	1.	1.1
Mark!	b		10	L3	CO
	2 3	Latin-square design conducted in respect of five fertilizers which were used			ane
		on plots of different fertility.	-		
		A(16) B(10) E(11) D(9) E(9)			
		E(10) C(9) A(14) B(12) D(11) B(15) D(8) E(8) C(10) A(18)			
		B(15) D(8) E(8) C(10) A(18) D(12) E(6) B(13) A(13) C(12)			
		C(13) $A(11)$ $D(10)$ $E(7)$ $B(14)$			
_					
		OR			
Q.1	10 a	. Set up two-way ANOVA table for the data given below, using coding	10	L3	CO
	12	method subtracting 40 from the given numbers.		1	7
		Pieces of land Treatment			
1 4		A B C D		III	2
=		P 45 40 38 37			
	-1,	Q 43 41 45 38			
	, - l	R 39 39 41 41	1 1		
	h	There are three main brands of a certain power. A set of its 120 sales is	10	7.0	-
	"	There are three main brands of a certain power. A set of its 120 sales is examined and found to be allocated among four groups (A, B, C, D) and	10	L3	CO
		brands (I, II, III) as follows:			
		Groupe	-		
		Brands A B D			
		I 0 4 8 15			
		II 5 8 13 6			3 44
		III 18 19 11 13			
		Is there any significant difference in brands preference? Answer at 5%			
		difference in blands preference: Answer at 5%		1	
		level, using one-way ANOVA. Take 10 as the code value to subtract it			a 2 1

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BCS302

Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Digital Design and Computer Organization

Time: 3 hrs.

Max. Marks: 100

Module 1 Determine the complement of the following function: (i) F = xy'+ x'y (ii) F = x'yz' + x'y'z Describe map method for three variables.	M 06	L L3	C CO1
$\begin{array}{ll} \text{(i) } F = xy' + x'y \\ \text{(ii) } F = x'yz' + x'y'z \\ \text{Describe map method for three variables} \end{array}$		L3	
$\begin{array}{ll} \text{(i) } F = xy' + x'y & \text{(ii) } F = x'yz' + x'y'z \\ \text{Describe map method for three variables} \end{array}$			
Describe map method for three variables.			
Annala, IZ	04	L2	CO
Apply K map technique to simplify the following function:	10	L3	CO
(1) $\Gamma(x, y, z) = \Sigma(0, 2, 4, 5, 6)$			
(ii) $F(x, y, z) = x'y + yz' + y'z'$	- ,		
OR		l	
. Apply K map technique to simplify the function.	06	1.3	CO
$F(w, x, y, z) = \Sigma(1, 3, 7, 11, 15)$ and $f(w, x, y, z) = \Sigma(0, 2, 5)$	00	LJ	
Determine an the prime implicants for the Boolean function E and also	10	1.3	CO
determine which are essential $F(w, x, \hat{x}, z) = \Sigma(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$	10	13	CO
Develop a verilog gate-level description of the circuit shown in Fig O2(c)	04	I 2	CO
15	04	LS	CO
0 'W' ~			
60			14
B			
'VIL E.			. A
C TO TO THE TOTAL PROPERTY OF THE PARTY OF T			
1 G3			
	7.		
Module – 2			
Explain the combinational circuit design procedure with code conversion	10	L2	CO
		=	100
Design a full adder circuit, Also develop data flow verilog model for full	10	L3	CO2
			. !
Describe 4 × 1 MOX with block diagram and truth table. Also develop a	10	L2	CO2
behavioral model verilog code for 4 x l'MUX.			
what are storage elements? Explain the working of SR and D latch along	10	L2	CO2
	,		
Module – 3	1 1 1		
Explain the basic operational concepts between the processor and memory.	10	L2	CO ₃
	10	L2	CO ₃
	-		
(ii) Clock rate		1	
	10	L2	CO ₃
			, ;
	Apply K map technique to simplify the function: F(w, x, y, z) = \(\Sigma(1, 3, 7, 11, 15) \) and d(w, x, y, z) = \(\Sigma(0, 2, 5) \) Determine all the prime implicants for the Boolean function F and also determine which are essential F(w, x, \(\sigma, z \)) = \(\Sigma(0, 2, 4, 5, 6, 7, 8, 10, 13, 15) \) Develop a verilog gate-level description of the circuit shown in Fig.Q2(c). Fig.Q2(c) Module - 2 Explainable combinational circuit design procedure with code conversion example. Design a full adder circuit Also develop data flow verilog model for full adder. OR Describe 4 × 1 MUX with block diagram and truth table. Also develop a behavioral model verilog code for 4x PMUX. What are storage elements? Explain the working of SR and D latch along with logic diagram and function table. Module - 3 Explain the basic operational concepts between the processor and memory. Describe the following: (i) Processor clock (ii) Basic performance equation (iii) Clock rate (iv) SPEC rating	Apply K map technique to simplify the function; F(w, x, y, z) = \(\frac{2}{3}, \frac{3}{3}, \frac{11}{15} \) and \(\frac{4}{3}, \frac{1}{3}, \frac{15}{3}, \frac{15}{3} \) Determine all tipe prime implicants for the Boolean function F and also determine which are essential \(F(w, x, \hat{\hat}, z) = \frac{1}{2}(0, 2, 4, 5, 6, 7, 8, 10, 13, 15) \) Develop a verilog gate-level description of the circuit shown in Fig.Q2(c). Fig.Q2(c) Wodule - 2 1. Explain the combinational circuit design procedure with code conversion example. Design a full adder circuit Also develop data flow verilog model for full adder. OR Describe 4 × 1 MU with block diagram and truth table. Also develop a behavioral model verilog code for \(\frac{1}{4} \) PMUX. What are storage elements? Explain the working of SR and D latch along with logic diagram and function table. \(\frac{10}{4} \) Module - 3 Explain the basic operational concepts between the processor and memory. Describe the following: (i) Processor clock (ii) Basic performance equation (iii) Clock rate (iv) SPEC rating OR Define addressing mode. Explain any four types of addressing mode with log example.	Apply K map technique to simplify the function; F(w, x, y, z) = \(\(\frac{1}{2} \) (1, 3, 7, 11, 15 \) and \(\frac{1}{2} \) (w, x, y, z) = \(\frac{1}{2} \) (0, 2, 5 \) Determine all the prime implicants for the Boolean function F and also determine which are essential \(F(w, x, \hat{y}, z) = \(\frac{1}{2} \) (0, 2, 4, 5, 6, 7, 8, 10, 13, 15 \) Develop a verilog gate-level description of the circuit shown in Fig.Q2(c). A

				ВС	S302
	b.	Mention four types of operations to be performed by instructions in a computer. Explain the basic types of instruction formats to carry out. $C \leftarrow [A] + [B]$	10	L2	CO3
Q.7	a.	With a past diagram symbols the second of th	10		
Q./	b.	With a neat diagram, explain the concept of accessing I/O devices.	10	L2	CO4
	D.	What is bus arbitration? Explain centralized and distributed arbitration method with a neat diagram.	10	L2	CO4
		OR OR			
Q.8	a.	With neat sketches, explain various methods for handling multiple interrupts requests raised by multiple devices.	10	L2	CO4
4 - 4	b.	What is cache memory? Explain any two mapping function of cache	10	L2	CO ₄
, - t <u>- t</u>		memory.	10		
7 8 1		Module – 5		8.	
Q.9	a.	Draw the single bus architecture and write the control sequence for execution of instruction ADD (R ₃), R ₁ .	10	L3	COS
	b.	With suitable diagram, explain the concept of register transfer and fetching	10	L2	CO
		of word from memory			
	1	OR			
Q.10	a.	With a neat diagram, explain the flow of 4-stage pipeline operation.	10	L2	CO
	b.	Explain the role of cache memory and pipeline performance.	10	L2	CO
			4 - 4		170
		2 of 2			

BCS303

Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Operating Systems

Time: 3 hrs.

Max. Marks: 100

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		Module 1	M	L	C
Q.1	a.	Define Operating System. Explain dual mode of operating systems with a	06	L1	COI
		neat diagram.		L2	
	b.	Distinguish between the following terms:	06	L2	CO
		i) Multiprogramming and Multitasking			
		ii) Multiprocessor and Clustered system			
	c.	Explain with a neat diagram VM-WARE Architecture.	08	L1	CO
			٨	L2	
		OR OR	0.5		
Q.2	a.	List and explain the services provided by OS for the user and efficient	06	L2	CO
		operation of system.			=
	b.	Explain the different computing equipments.	06	L2	CO
5 11					
	c.	What are systems calls? List and explain the different types of systems	08	L1	CO
		calls.		L2	
	- 27	Module – 2			
Q.3	a.	What is process? Explain process state diagram and process control block	10	L1	CO
		with a neat diagram.		L2	1
	 	What is interprocess communication? Explain direct and indirect	10	L1	CO
	b.	communication with respect to message passing system.	10	L1	CO
		Communication with respect to message passing system.			
		OR			
Q.4	a.	List and explain the different types of multithreading models.	06	L1	CO2
				L2	
	b.	Calculate the average waiting time and average turnaround time by	14	L3	CO
		drawing the Gantt-chart using FCFS, SJF, RR (Q = 4ms) and priority			
		scheduling (Higher Number is having highest priority).			
		Process B.T. (ms) Priority			- 130 a
		$\frac{P_1}{P_1} = \frac{24}{03} = \frac{1}{2}$			
		$P_2 \nearrow 03$			
		P ₃ 03 3	- 1	2	
		Module – 3			- V
0.5	T _	What is critical section? Give the Peterson's solution to 2 processes critical	05	L1	CO3
Q.5	a.	section problem.	5 57A-4	L2	
	la la	Explain Reader's and Writer's problem in detail.	07	L2	CO3
	b.				000
	+-	What is semaphore? Discuss the solution to the classical dinning	08	L1	CO
	c.	philosopher problem.		L2	

Service America	tarantes (established	OR	neverines transference	STATE PARTY	
Q.6	a.	What is a Deadlock? What are the necessary conditions for the deadlock to occur?	06	l.1 l.2	CO3
III. Menneda en did April Grande	b.	Consider the following snap shot of the system.	14	1.3	CO2
		Process Allocation Max Available			
		ABC ABC ABC			-
		P ₀ 0 1 0 7 5 3 3 3 2		9	
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(4)		
		$P_2 = \begin{bmatrix} 3 & 0 & 2 & 9 & 0 & 2 & 2 \end{bmatrix}$			
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
		P ₄ 0 0 2 4 3 3			
		Answer the following questions:			
		i) What is the content of the matrix need?			
mi.		ii) Is the system on a safe state? If so, find safe sequence.			
ž.		iii) If P ₁ requirements for (1, 0, 2) additional resources can P ₁ be granted.			e
2					
		Module – 4	C Bridge and Colorests		
Q.7	a.	What is paging? Explain with a neat diagram paging hardware with TLB.	10	L1	CO4
				L2	-
	b.	Explain the different strategies used to select a free hole from available	05	L1	CO4
		holes.		1	
	c.	What is Fragmentation? List and explain its types.	05	L2	CO4
		ÖR O	•	PROGRAMMATICATE DE CONTRACTOR	V-100-00-00-00-00-00-00-00-00-00-00-00-00
Q.8	a.	What is page fault? With a neaf diagram explain steps in handling page	08	L2	CO4
	Tea .	fault.			
	b.	Consider the page reference string for a memory with 3 frames determine	12	L3	CO4
		the number of page faults using FIFO, optimal and LRU replacement	, ,		3
		algorithms. Which algorithms is more efficient?	11		
		7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1			
Name of the state of	1 .	Modifie -5			
Q.9	a.	Define File. List and explain different file operations and file attributes.	10	L1	CO5
	b.	Explain the different file allocation methods.	10	L2	CO5
	1	OR		raconstruit/processissississississis	
Q.10	a.	What is Access Matrix? Explain the implementation of Access Matrix.	10	L2	CO5
	b.	A drive has 5000 cylinders numbered 0 to 4999. The drive is currently	10	L3	CO5
	υ.	servicing at a request 143 and previously served a request at 125. The			
		queue of pending request in FIFO order.			
		86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130	:		
		starting from current head position. What is the total distance travelled			
		(in cylinders) by a disk arm to satisfy the request using			
		FCFS, SSTF, SCAN, LOOK and C-Look algorithm	7.	N	
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Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Data Structures and Applications

Time: 3 hrs.

Max. Marks: 100

		Module -1	M	L	C
Q.1	a.	Define Data Structures. Explain the classification of data structures with a neat diagram.	8	L2	CO1
2	b.	Write a C Functions to implement pop, push and display operations for stacks using assays.	7	L2	CO2
	c.	Differentiate structures and unions.	5	L2	CO1
	r	OR			
Q.2	a.	Write an algorithm to evaluate a postfix expression and apply the same for the given postfix expression. 6 2 / 3 - 4 2 * +.	7	L3	CO2
1 *	b.	Explain the dynamic memory allocation function in detail.	8	L2	CO1
	c.	What is Sparse matrix? Give the triplet form of a given matrix and find its transpose $A = \begin{bmatrix} 0 & 0 & 3 & 0 & 4 \\ 0 & 0 & 5 & 7 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 6 & 0 & 0 \end{bmatrix}$	5	L3	CO1
Q.3		Module 2			
Q.S	а. b.	Define Queue. Discuss how to represent a queue using dynamic assays.	8	L2	CO2
*		Write a C Function to implement insertion (), deletion () and display () operations on circular queue.	6	L3	CO2
- L	c.	Write a note on Multiple stacks and queues with suitable diagram.	6	L2	CO2
-	See The see	OR A			
Q.4	a.	What is a linked list? Explain the different types of linked list with neat diagram.	6	L2	CO3
		Write a C function for the following on singly linked list with example: i) Insert a node of the beginning ii) Delete a node at the front iii) Display.	8	L3	CO3
; -1, -1	c.	Write the C function to add two polynomials.	6	L2	CO3

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nindrijosadsjótni Gatiska	ezinesionen	Module – 3	en e		A distribution of the Asset of
Q.5	n.	Discuss how binary trees are represented using: i) Assay (f) Linked list.	6	1,2	CO4
	b.	Define Threaded binary tree. Discuss In – threaded binary tree.	6	1.,2	CO4
COL-FUCION BLACK PARKETS	c.	Write the C function for the following additional list operation: i) Inverting Singly linked list ii) Concatenating Singly linked list.	8	1.3	CO3
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Q.6	a.	Discuss Inorder, Preorder, Postorder and Level order traversal with suitable function for each.	8	1.3	CO4
November Street	b.	Define the threaded binary tree, Construct threaded binary tree for the following element: A, B, C, D, E, F, G, II, I.	6	1.2	CO4
	c.	Write a C function for the following: i) Insert a node at the beginning of doubly linked list. ii) Deleting a node at the end of the doubly linked list.	6	L.3	CO3
	· ·	Module – 4	· · · · · · · · · · · · · · · · · · ·	o y ne interventi studn	· construction of the construction
Q.7	a.	Define Forest, Pransform the forest into a binary tree and traverse using inorder, preorder and postorder traversal with an example.	8	Lı	COS
designation and an extension and	b.	Define Binary search tree. Construct a binary search tree for the following elements: 100, 85, 45, 55, 120, 20, 70, 90, 115, 65, 130, 145.	6	1.2	COS
MOMBA A BATTO SHATAN PERSONAL PROPERTY PERSONAL	c.	Discuss Selection tree with an example.	6	1,2	COS
order indistrinents autoparticiper sicce er	n. Laurence Square	OR	- Indiana		* elements entre
Q.8	a.	Define Graph. Explain adjacency matrix and adjacency list representation with an example.	8	1.2	COS
interes de America de Présidente nomentario que de America de Amer	b.	Define the following terminology with example: i) Digraph ii) Weighted graph iii) Self loop iv) Connected graph.	6	1.2	CO5
	c.	Briefly explain about Elementary graph operations.	6	L3	CO5
AMELYCLUP ON REGULER STORM		Module – 5		A BANK TO STANKING TO	AND THE PROPERTY OF THE PARTY O
Q.9	a.	Explain in detail about Static and Dynamic Hashing.	6	L2	CO5
II ye	b.	What is Collision? What are the methods to resolve collision?	7	L2	CO5
	c.	Explain Priority queue with the help of an examples.	7	L2	CO5
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Q.10	a.	Define Hashing. Explain different hashing functions with suitable examples.	12	L2	CO5
	b.	Write short note on: i) Leftist trees ii) Optimal binary search tree.	8	L3	CO5
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Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Object Oriented Programming with JAVA

Time: 3 hrs.

Max. Marks: 100

Develop a Java program to demonstrate the working of for each version of for doop. Initialize the 2D array with values and print themusing for each. Develop a Java program in Java to implement a stack of integers. Develop a program in Java to implement a stack of integers. Develop a program in Java to implement a stack of integers. Develop a But are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. Develop a But are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. Develop a But are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. Develop a But are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. Develop a But are constructors? But a type and explain the properties of constructors. Support with appropriate examples. Develop a Develop a program in Java with example program. Develop a program to demonstrate the working of for each version of for doop. Initialize the 2D array with values and print themusing for each. Note the working of for each examples. Develop a program in Java to implement a stack of integers. 12 L3 CCC Develop a program in Java to implement a stack of integers. 12 L3 CCC Develop a program in Java to implement a stack of integers. 13 L2 CCC Develop a program in Java to implement a stack of integers. 14 L2 CCC Develop a program in Java to implement a stack of integers. 15 L2 CCC Develop a program in Java with example program. 16 L2 CCC Develop a program in Java with example program. Develop a program in Java with example program in Java with example pr	***************************************					
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C. How to declare and initialize 1=D and 2-D arrays in Jaya. Give examples. OR Q.2 a. List the short circuit operators and show the concept using few examples. b. With a java program, illustrate the use of ternary operator to find the greatest of three numbers. c. Develop a Java program to demonstrate the working of for each version of for doop. Initialize the 2D array with values and print them using for each. Module -2 Q.3 a. Develop a program in Jaya to implement a stack of integers. b. What are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. OR Q.4 a. Illustrate with an example program to pass objects as arguments. Define inheritance. List and explain different types of inheritance in Java with example program for each. Module -3 Q.5 a. Define inheritance. List and explain different types of inheritance in Java with example program for each. OR Q.6 a. Analyze an interface in Java and list out the speed of an interface. Illustrate with the help of a program the importance of an interface. b. List the different uses of final and demonstrate each with the of code snippets.	Q.1	a.	List and explain any three features of object oriented programming.		L1	COI
OR Q.2 a. List the short circuit operators and show the concept using few examples. 4 L.2 CG b. With a java program, illustrate the use of ternary operator to find the greatest of three numbers. c. Developa Java program to demonstrate the working of for each version of for Joop. Initialize the 2D array with values and print them using for each. Module - 2 Q.3 a. Develop a program in Java to implement a stack of integers. b. What are constructors? Give the types and explain the properties of constructors. Support with appropriate examples. OR Q.4 a. Illustrate with an example program to pass objects as arguments. 10 L.2 CG b. Explain different access specifies in Java with example program. 10 L.2 CG Module - 3 Q.5 a. Define inheritance. List and explain different types of inheritance in Java with code snippets. D. Compare and contrast between overloading and overriding in Java with 10 L.2 CG with code snippets. OR Q.6 a. Analyze an interface in Java and list out the speed of an interface. Illustrate with the help of a program the importance of an interface. List the different uses of final and demonstrate each with the of code snippets.		b.	What do you mean by type conversion and type casting? Give examples.	8	L2	CO1
Develop a Java program to demonstrate the working of for each version of fordoop. Initialize the 2D array with values and print them using for each. Develop a Java program to demonstrate the working of for each version of fordoop. Initialize the 2D array with values and print them using for each. Module - 2		c.	How to declare and initialize 1-D and 2-D arrays in Java. Give examples.	6	L2	COI
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Q.7	a.	Define a package. Explain how to create user defined package with example.	7	L2	C
population must be an impressibility of the	b.	Discuss about exception handling in Java. Give the framework of the exception handling block. List the types of exception.	8	L2	C
	c.	Develop a Java program to raise a custom exception for division by zero using try, catch, throw and finally.	5	L3	C
		OR			
Q.8	a.	Compare throw and throws keyword by providing suitable example program.	10	L2	C
edura hazoldur enrumasekostisro-	b.	Explain about the need for finally block.	5	L2	C
auto naritir il chiari quanto fen il mega-	c.	Discuss about chained exceptions.	5	L2	C
	The second secon	Module – 5			
Q.9	a.	Define thread Demonstrate creation of multiple threads with a program.	10	L2	C
	b.	Explain the two ways in which Java threads can be instantiated. Support your explanation with a sample program.	10	L2	C
-		OR			1
Q.10	a.	What is enumeration? Explain the methods values() and valueof().	10	L2	C
	b.	Explain about type wrappers and auto boxing.	10	L2	C
		Explain about type wrappers and auto boxing.			