TARE NO. LOR LINE

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

AERONAUTICAL ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	MATHEMATICAL TRANSFORM TECHNIQUES
Course Code	:	AHSB11
Program	:	B.Tech
Semester	:	II
Branch	•	Aeronautical Engineering
Section	:	A & B
Academic Year	• •	2019 - 2020
Course Faculty	:	Dr. S. Jagadha, Associate Professor

OBJECTIVES:

I	Enrich the knowledge solving algebra and transcendental equations and understanding Laplace transforms.
II	Determine the unknown values of a function by interpolation and applying inverse Laplace transforms.
III	Fitting of a curve and determining the Fourier transform of a function.
IV	Solving the ordinary differential equations by numerical techniques.
V	Formulate to solve Partial differential equation

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code				
	MODULE-I									
1	What is the order of convergence in Bisection method?	The order of convergence in Bisection method is one or linear.	Remember	CO 1	CLO 1	AHSB11.01				
2	What is the order of convergence in Newton-Raphson method?	The order of convergence Newton-Raphson method is two.	Remember	CO 1	CLO 1	AHSB11.01				
3	State the other name of Bisection method in determining the real root of algebraic and transcendental equation.	Bisection method is also called as Bolzono method in solving the real root of algebraic and transcendental equation.	Remember	CO 1	CLO 1	AHSB11.01				
4	State the most powerful and elegant method in determining the real root of algebraic and transcendental equation.	Newton-Raphson method is the powerful and elegant method in solving the real root of algebraic and transcendental equation.	Remember	CO 1	CLO 1	AHSB11.01				

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
5	Define the term	If f(t) be a given function which is defined	Remember	CO 1	CLO 2	AHSB11.02
	Laplace transform	for all positive values of t, if				
	_	∞				
		$F(s) = \int e^{-st} f(t) dt$ exists, then $F(s)$ is				
		called Laplace transform of f(t) and is				
		denoted by $L\{f(t)\}$				
6	State linearity	If $L\{f(t)\} = f(s)$ then	Understand	CO 1	CLO 2	AHSB11.02
	property of Laplace	L[a f(t) + b g(t)] = a L[f(t)] + b L[g(t)]	Chacistana		0202	1110211102
	transform					
7	State change of scale	If $L\{f(t)\} = f(s)$ then	Understand	CO 1	CLO 3	AHSB11.03
	property of Laplace	$L[f(at)] = \frac{1}{a}f(\frac{s}{a})$				
	transform					
8	State Laplace	If $L\{f(t)\} = f(s)$ and $f(t)$ is a periodic	Understand	CO 1	CLO 6	AHSB11.06
	transform of periodic	function with period T then				
	functions	$1 \int_{T} \int_$				
		$L[f(t)] = \frac{1}{1 - e^{-sT}} \int_{0}^{T} f(t)e^{-st} dt$				
9	When does a Laplace	Laplace Transform exists the function is	Understand	CO 1	CLO 2	AHSB11.02
	transform exists?	piece-wise continuous and of exponential				
		order				
10	State the Laplace	The Laplace transform of unit impulse	Understand	CO 1	CLO 2	AHSB11.02
	transform of unit	function is e ^{-as}				
	impulse function					
11	Describe the use of	Laplace Transformation is very much	Understand	CO 1	CLO 2	AHSB11.02
	studying the Laplace	useful in obtaining solution of Linear				
	transforms?	D.E's(both Ordinary and Partial),				
		Solution of system of simultaneous D.E's,				
		Solutions of Integral equations, solutions of Linear Difference equations and in the				
		evaluation of definite Integral.				
12	State Laplace	If $f(t)$, $f'(t)$, $f''(t)$,, $f^{(n-1)}(t)$ are	Understand	CO 1	CLO 4	AHSB11.04
1-	transform of	continuous, and $f^{(n)}(t)$ is piecewise	Choorstand		020 .	111221110
	derivatives	continuous, and all of them are				
		exponential order functions, then		1		
		$L[f^{(n)}(t)] = s^n F(s) - \sum_{i=1}^n s^{n-i} f^{(i-1)}(0)$		1		
13	State Laplace	If $L\{f(t)\} = f(s)$ then	Understand	CO 1	CLO 4	AHSB11.04
	transform of integrals	r∞ r∞ r∞ 1		1.4.		
		$\Rightarrow \int_{s}^{\infty} \int_{s}^{\infty} \cdots \int_{s}^{\infty} F(s) ds ds \cdots ds = L \left[\frac{1}{t^{n}} f(t) \right]$	- "			
		l l	- %			
14	Why Laplace	Laplace transforms are so useful for	Understand	CO 1	CLO 2	AHSB11.02
1 +	transforms are so	solving linear differential equations	Gilderstand	201		7113011.02
	useful for solving	because the Laplace transform of the n th				
	linear differential	derivative $f^n(x)$ can be related to the				
	equations?	transform of $f(x)$ in a simple manner.				
15	In H(t-a) at what	At the point $t = a$	Understand	CO 1	CLO 2	AHSB11.02
	point unit step					
	function is defined					
1	XX71	MODULE-II	D1	CO 2	CI O Z	ALICD 11 OZ
1	What is the symbol μ called as?	The symbol μ is called as Average or	Remember	CO 2	CLO 7	AHSB11.07
2	What is the symbol E	Mean operator The symbol E is called as Shift operator	Remember	CO 2	CLO 7	AHSB11.07
	called as?	The symbol E is called as Shift operator	Kemember	CO 2	CLO /	AUSDII.U/
3	Express the relation	The relation between E in terms of Δ	Remember	CO 2	CLO 7	AHSB11.07
4	between E in terms of	is1+Δ				
	Δ.					

5 Stabilish the relation between E and D is $E = e^{AD}$ Remember CO 2 CLO 7 AHSB11.07 6 Express Py ₃ in terms of y ₄ , y ₄ , y ₄ and y ₄ ? 7 Define the term Interpolation The range of pin Gauss-Forward interpolation formulae The range of pin Gauss-Forward The range of pin	S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
6 Express Vy, in terms of y, y, y, and y, y = y, y, and y ≤ y = y, y = y, y = y, y = y, y = y = y =	5		The relation between E and D is $E = e^{hD}$	Remember	CO 2	CLO 7	AHSB11.07
The range of p in Gauss-Forward interpolation formulae is used for unequal interval of x values to obtain the desired value of y. The name of formulae is used for unequal interval of x values to obtain the desired value of y. The heart of x values to obtain the desired value of y. State Newton's formulae is used for unequal length of intervals. State Newton's formulae for equal length of intervals.		between E and D.					
Pefine the term Interpolation Interpolation is an estimation of a value within two known values in a sequence of values.	6		$\nabla y_5 = y_5 - 3y_4 - 3y_3 - y_2$	Understand	CO 2	CLO 8	AHSB11.08
Interpolation. within two known values in a sequence of values. September of pin Gauss-Forward interpolation formulae. The range of p in Gauss-Forward interpolation formulae is used for unequal interval of x values to obtain the desired value of y. The name of formulae is used for unequal interval of x values to obtain the desired value of y is 1 agrange's interpolation formulae The name of formulae is used for unequal interval of x values to obtain the desired value of y is 1 agrange's interpolation formulae The name of formulae The name	7		Interpolation is an assimation of a value	Domombor	CO 2	CLO 7	AUSD11.07
8 Represent the range of p in Gauss-Forward interpolation formulae. 9 Represent the range of p in Gauss-Forward interpolation formulae is $0 < P < 1$ 10 Remember of p in Gauss-Backward interpolation formulae is $-1 < P < 0$ 11 Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State State State State State of the equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree. 18 Define the term Inverse Laplace transform inverse Laplace transform inverse Laplace transform in $(n+1)^{1/6}$ order $(n+$,		within two known values in a sequence of	Kememoer	CO 2	CLO /	Alisbii.07
of p in Gauss-Forward interpolation formulae. 9 Represent the range of p in Gauss-Backward interpolation formulae is used for unequal interval of x values to obtain the desired value of y. 10 Mention the name of formulae is used for unequal interval of x values to obtain the desired value of y. 11 Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae is $y = y_0 + p \Delta y_0 + \frac{p(p-1)}{2!} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-1)}{2!} \Delta^2 y_0 + \cdots + p(p-1)$	8	Represent the range		Remember	CO 2	CLO 8	AHSB11.08
Formulae			interpolation formulae is $0 < P < 1$				
9 Represent the range of p in Gauss-Backward interpolation formulae is $-1 and interpolation formulae. 10 Mention the name of formulae is used for unequal interval of x values to obtain the desired value of y: value of y is Lagrange's interpolation formulae interval of x values to obtain the desired value of y: Lagrange's interpolation formulae for equal length of intervals. 11 Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Causs's forward interpolation formulae for equal length of intervals. 16 State Causs's forward interpolation formulae for equal length of intervals. 17 Express the value of y = y_0 + p \Delta y_0 + \frac{p(p-1)}{2!} \Delta^2 y_1 + \cdots + \frac{p(p+1)(p+2) - (p+(n-1))}{2!} \nabla^2 y_n + \cdots + \frac{p(p+1)(p+2) - (p+(n-1))}{2!} \Delta^2 y_2 + \cdots + p(p+1)(p+2) - (p$			_				
interpolation formulae is $-1 < P < 0$ Backward interpolation formulae. The name of formulae is used for unequal interval of x values to obtain the desired value of y, values to obtain the desired value of y is Lagrange's interpolation formulae formulae for equal length of intervals. State Newton's backward interpolation formulae for equal length of intervals. State State State Newton's formulae for equal length of intervals. State State Newton's formulae for equal length of intervals. State State Newton's backward interpolation formulae for equal length of intervals. State Causs's forward interpolation formulae for equal length of intervals. State Causs's forward interpolation formulae for equal length of intervals. State Causs's forward interpolation formulae for equal length of intervals. State Causs's forward interpolation formulae for equal length of intervals. State Sta							
Backward interpolation formulae: 10 Mention the name of formulae is used for unequal interval of x values to obtain the desired value of y is Lagrange's interpolation formulae for equal length of intervals. 11 Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 State Gauss's forward interpolation formulae for equal length of intervals. 18 State Lagrange interpolation formulae for equal length of intervals. 19 State Lagrange interpolation formulae for equal length of intervals. 10 State Lagrange interpolation formulae for equal length of intervals. 11 Express the value of $(n + 1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree. 12 State Gause's forward interpolation formulae for equal length of intervals. 13 State State Gause's forward interpolation formulae for equal length of intervals. 14 State Gause's forward interpolation formulae for equal length of intervals. 15 State Gause's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 Express the value of $(n + 1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree. 18 Define the term Inverse Laplace $(n + 1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree is always zero $(n + 1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree is real or complex. 19 State linearity properly of Inverses $(n + 1)^{1/6}$ order difference of a polynomial of $(n + 1)^{1/6}$ order difference of a polynomial of $(n + 1)^{1/6}$ order difference of a polynomial of $(n + 1)^{1/6}$ order difference of a polynomial of $(n + 1)^{1/6}$ order difference of a polynomial of $(n + $	9			Remember	CO 2	CLO 8	AHSB11.08
interpolation formulae. 10 Mention the name of formulae is used for unequal interval of x values to obtain the desired value of y, a stagrange's interpolation formulae interval of x values to obtain the desired value of y, a stagrange's interpolation formulae for equal length of intervals. 11 State Newton's backward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 Express the value of $(n + 1)^{16}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term Inverse Laplace transform of State Laplace transform is real or complex. 19 State Inverse for scale properly of Inverse Laplace transform 19 State Inverse Laplace transform 20 State change of scale properly of Inverse Laplace transform 21 State Newton's backward interpolation formulae for equal length of intervals. 22 State change of scale properly of Inverse Laplace transform 19 State Inverse Laplace properly of Inverse Laplace transform 19 State Inverse Laplace properly of Inverse Laplace transform 19 State Lagrange properly of Inverse Laplace properly of Inverse Lapla			interpolation formulae is $-1 < P < 0$				
formulae forward interpolation formulae for equal length of intervals. 13 State Newton's forward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange formulae					7		
Montion the name of formulae is used for unequal interval of x values to obtain the desired value of y is Lagrange's interpolation formulae for equal length of intervals. State Newton's forward interpolation formulae for equal length of intervals. Y = y_0 + p $\Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) \cdot (p-(n-1))}{n!} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0 + \frac{p(p-1)}{21} \Delta^n y_0 Y = y_0 + p \Delta y_0$					J.		
formulae is used for unequal interval of x values to obtain the desired value of y . It is Lagrange's interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Gauss's forward interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{1/6}$ order difference of a polynomial of $n^{1/6}$ degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 21 Lift ((s)) = h Li (g) then 22 State change of scale property of Inverse Laplace transform of the degree is property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace property of	10		The game of famous last and famous and	Damanhan	CO 2	CLOS	ALICD 11 00
unequal interval of x values to obtain the desired value of y. State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Gauss's forward interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 10 Express the value of $(n+1)^{th}$ order the state of the st	10			Remember	CO 2	CLO 8	AHSB11.08
values to obtain the desired value of y. 11 Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Gauss's forward interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 10 State charge of scale property of Inverse Laplace transform 11 L'[f(s)] = f(t) then 12 L'[f(s)] = f(t) then 13 L'[f(s)] = f(t) then 14 L'[f(s)] = f(t) then 15 L'[f(s)] = f(t) then 16 L'[f(s)] = f(t) then 17 L'[f(s)] = f(t) then 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 19 State linearity and the degree is always zero 19 State change of scale property of Inverse Laplace transform 19 State change of scale property of Inverse Laplace transform 10 L'[f(s)] = f(t) then 11 L'[f(s)] = f(t) then 12 L'[f(s)] = f(t) then 13 L'[f(s)] = f(t) then 14 State Gauss's forward interpolation 15 State Gauss's forward interpolation 16 State Lagrange interpolation 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term 19 State linearity property of Inverse Laplace transform = n^{th} (n^{th}) or n^{th}) or n^{th} (n^{th}) or							
desired value of y. Define Average or Mean operator. 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Gauss's forward interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 10 State change of scale property of Inverse Laplace transform 11 Express the value of $(n+1)^{th}$ order $(n+$							
11 Define Average or Mean operator. $\mu y_r = \frac{1}{2} \left[y_{r+1/2} + y_{r-1/2} \right] \qquad \text{Remember} \qquad \text{CO 2} \qquad \text{CLO 7} \qquad \text{AHSB11.07}$ 12 State Newton's forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale			Tormulae				
Mean operator. $\mu y_r = \frac{1}{2} \left[y_{r+1/2} + y_{r-1/2} \right]$ State Newton's forward interpolation formulae for equal length of intervals. $y = y_0 + p \Delta y_0 + \frac{p(p-1)}{2!} \Delta^2 y_0 + \cdots + \frac{p(p-1)(p-2) - (p-(n-1))}{n!} \Delta^n y_0$ Remember CO 2 CLO 8 AHSB11.08 State Newton's backward interpolation formulae for equal length of intervals. $y = y_0 + p \nabla y_n + \frac{p(p+1)}{2!} \nabla^2 y_n + \cdots + \frac{p(p+1)(p+2) - (p+(n-1))}{n!} \nabla^n y_n$ Remember CO 2 CLO 8 AHSB11.08 CO 2 CLO 8 AHSB11.09 CO 2 CLO 8 AHSB11.09 CO 2 CLO 9	11		1.	Remember	CO 2	CLO 7	AHSB11.07
State Newton's forward interpolation formulae for equal length of intervals. State State Newton's backward interpolation formulae for equal length of intervals. $y = y_0 + p \ Dy_n + \frac{p(p-1)}{2!} \ D^2y_n + \cdots + \frac{p(p+1)(p-2)(p-(n-1))}{n!} \ D^3y_n D^3y$			$\mu y_r = \frac{1}{2} \left[y_{r+1/2} + y_{r-1/2} \right]$				
forward interpolation formulae for equal length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 State Gauss's forward interpolation formulae for equal length of intervals. 18 State Lagrange interpolation formulae for equal length of intervals. 19 State Lagrange interpolation formulae for equal length of intervals. 10 State Lagrange interpolation formulae for equal length of intervals. 11 State Lagrange interpolation formulae for equal length of intervals. 12 State Lagrange interpolation formulae for unequal length of intervals. 13 State Causs's forward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for unequal length of intervals. 15 State Lagrange interpolation formulae for unequal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform inverse of Leff(t) or $F(s)$, is $f(t) = L^{-1}\{F(s)\}$ where s is real or complex. 19 State linearity property of Inverse Laplace transform in the state of Lagrange interpolation interpolation interpolation for $L^{-1}\{f(s)\} = f(t)$ then property of Inverse Laplace transform in the state of $L^{-1}\{f(s)\} = f(t)$ then property of Inverse cannot cannot be a Laplace transform in the state of $L^{-1}\{f(s)\} = f(t)$ then property of Inverse cannot cannot be a Laplace transform in the state of $L^{-1}\{f(s)\} = f(t)$ then property of Inverse cannot cannot be a Laplace transform in the state of $L^{-1}\{f(s)\} = f(t)$ then $L^{-1}\{f(s)\} =$	10	Ct-t-Nt2-		D1	00.2	CI O 0	AUCD11 00
formulae for equal length of intervals. 13 State Gauss's forward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for equal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform is real or complex. 19 State linearity property of Inverse Laplace transform is real or complex. 19 State linearity property of Inverse Laplace transform a size real real real real real real real rea	12			Remember	CO 2	CLO 8	AHSB11.08
length of intervals. 13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 19 State inverse Laplace transform 20 State change of scale property of Inverse Laplace transform to the state of the s			$\frac{p(p-1)(p-2)(p-(n-1))}{\Delta^n v_0}$				
13 State Newton's backward interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State cannow interpolation for file degree interpolation formulae for unequal length of intervals. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 21 State change of scale property of Inverse Laplace transform 22 State change of scale property of Inverse Laplace transform 23 State (16)			n!				
14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform If $L^{-1}[f(s)] = f(t)$ then $L^{-1}[f(s)] = a L^{-1}[f(s)] = a L^{-1}[f(s)] = a L^{-1}[f(s)] = a^{th} \int_{t}^{(p+1)(p+2)(p+h)(p-1)} \nabla^n y_n \rangle$ Remember CO 2 CLO 8 AHSB11.08 AHSB11.08 CO 2 CLO 8 AHSB11.09 CO 2 CLO 8 AHSB11.09 CO 2 CLO 9 AHSB11.09	13		$p(p+1)$ ∇^2	Remember	CO 2	CLO 8	AHSB11 08
interpolation formulae for equal length of intervals. 14 State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform interpolation a property of Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 10 State change of scale property of Inverse Laplace transform 11 Express the value of $(n+1)^{th}$ or $(n+1)^{th$	13		$y = y_0 + p v y_n + \frac{1}{2!} v^2 y_n + \dots + $	Remember	CO 2	CLO	71115111.00
formulae for equal length of intervals.			$\frac{p(p+1)(p+2)(p+(n-1))}{n!} \nabla^n y_n$				
State Gauss's forward interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform is real or complex. 19 State linearity property of Inverse Laplace transform 10 State Lagrange of State change of scale property of Inverse Laplace transform 11 Express the value of $(n+1)^{th}$ order difference of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero of $(n+1)^{th}$ order difference of a polynomial of $(n+1)^{th}$ degree is always zero of a polynomial of $(n+1)^{th}$ order difference of a polynomial of $($			<i>i</i>				
interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform is real or complex. 18 State linearity $f(t) = f(t) =$							
Interpolation formulae for equal length of intervals. 15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform is real or complex. 18 State linearity property of Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 10 State Cagnange interpolation $(n+1)^{th}$ order $(n+1)^{th}$ order $(n+1)^{th}$ order $(n+1)^{th}$ order $(n+1)^{th}$ order $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero $(n+1)^{th}$ order $(n+1)^{th}$ order $(n+1)^{th}$ order difference of a polynomial of $(n+1)^{th}$ order differenc	14		$y = y_0 + p \Delta y_0 + \frac{p(p-1)}{2} \Delta^2 y_{-1} +$	Remember	CO 2	CLO 8	AHSB11.08
length of intervals. State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 20 State change of scale property of Inverse Laplace transform 21 State change of scale property of Inverse Laplace transform 22 CLO 8 AHSB11.08 AHSB11.08 Remember CO 2 CLO 8 AHSB11.08 CO 2 CLO 8 AHSB11.08 CO 2 CLO 8 AHSB11.08 CO 2 CLO 9 AHSB11.09							
15 State Gauss's forward interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse 10 State Lagrange interpolation formulae for unequal length of intervals. 11 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 12 State linearity property of Inverse 13 State change of scale property of Inverse 14 Lagrange interpolation $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 15 Lagrange interpolation $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 16 State Gauss's forward $(n+1)^{th} = (n+1)^{th} =$			${3!}$ $\Delta^{*}y_{-1} + \cdots$				
Interpolation formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term Inverse Laplace transform is real or complex. 19 State linearity property of Inverse Laplace transform $[L^{-1}] [a \ f(s)] = b \ L^{-1} [f(s)] = f(t) then L^{-1} [f(s)] = f(t) t$	1.5		(n+1)n	Damamhan	CO2	CLOS	ALICD 11 00
formulae for equal length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 19 State change of scale property of Inverse 19 State change of scale property of Inverse 10 State change of scale property of Inverse 11 Laplace transform 12 State change of scale property of Inverse 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 State Lagrange intervals. 17 State Lagrange $(x-x_1)(x-x_2)(x-x_n)$ y_0++ 18 Laplace transform 19 State change of scale property of Inverse 19 State change of scale property of Inverse 10 State change of scale property of Inverse 11 Laplace transform 12 State change of scale property of Inverse 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 Laplace transform 17 Laplace transform 18 Laplace transform 19 State change of scale property of Inverse 19 Laplace transform 10 Laplace transform 11 Laplace transform 12 Laplace transform 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 Laplace transform 17 Laplace transform 18 Laplace transform 19 Laplace transform 19 Laplace transform 10 Laplace transform 10 Laplace transform 11 Laplace transform 12 Laplace transform 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 Laplace transform 17 Laplace transform 18 Laplace transform 19 Laplace transform 19 Laplace transform 19 Laplace transform 10 Laplace transform 10 Laplace transform 11 Laplace transform 12 Laplace transform 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 Laplace transform 17 Laplace transform 18 Laplace transform 19 Laplace transform 19 Laplace transform 19 Laplace transform 19 Laplace transform 10 Laplace transform 11 Lapl	15		$y = y_0 + p \Delta y_{-1} + \frac{(p+1)p}{2!} \Delta^2 y_{-1} +$	Remember	CO 2	CLO 8	AHSB11.08
length of intervals. 16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree. 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace Laplace transform 19 State change of scale property of Inverse Laplace transform 20 State change of Scale property of Inverse Laplace transform 10 State Lagrange interpolation $(x-x_1)(x-x_2)(x_0-x_n)$ $y_0++(x_0-x_1)(x_0-x_2)(x_0-x_n)$ $y_0++(x_0-x_1)(x_0-x_2)(x_0-x_n)$ $y_0++(x_0-x_1)(x_0-x_2)(x_0-x_n)$ y_0 The value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero The value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero The inverse transform, or inverse of Lef(t)} or F(s), is $f(t) = L^{-1}{F(s)}$ where s is real or complex. 19 State linearity property of Inverse Laplace transform Lapla			$\frac{(p+1)p(p-1)}{\Delta^3 v_{-1} + \cdots}$		100		
16 State Lagrange interpolation formulae for unequal length of intervals. 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term Inverse Laplace transform 19 State linearity property of Inverse Laplace transform 20 State change of scale property of Inverse 10 State Lagrange interpolation $y = f(x) = \frac{(x-x_1)(x-x_2)(x-x_n)}{(x_0-x_1)(x_0-x_2)(x_0-x_n)} \cdot y_0 + + \frac{(x-x_1)(x-x_2)(x-x_n)}{(x_0-x_1)(x_0-x_2)(x_0-x_n)} \cdot y_0 + + \frac{(x-x_1)(x-x_2)(x-x_n)}{(x_0-x_1)(x_0-x_2)(x_0-x_n)} \cdot y_n$ 17 Express the value of $(n+1)^{th}$ order difference of a polynomial of n^{th} degree is always zero 18 Define the term Inverse transform, or inverse of transform 19 State linearity property of Inverse Laplace transform 19 State change of scale property of Inverse 19 Laplace transform 20 State change of scale property of Inverse 10 Laplace transform 11 Laplace transform 12 Laplace transform 13 Laplace transform 14 Laplace transform 15 Laplace transform 16 Laplace transform 17 Laplace transform 18 Define the term Inverse transform, or inverse of transform 19 State linearity property of Inverse transform, or inverse of transform to the transform transform to the transform transform to the transform t			3!	- 1	7.		
interpolation formulae for unequal length of intervals.	16		y = f(x) =	Remember	CO 2	CLO 8	AHSB11.08
			$(x-x_1)(x-x_2)(x-x_n)$ $y_0 + +$	~~~			
		formulae for unequal	$(x_0-x_1)(x_0-x_2)(x_0-x_n) \cdot y_0 \cdot$	100			
		length of intervals.	$\frac{(x-x_1)(x-x_2)(x-x_n)}{(x_0-x_1)(x_0-x_2)(x_0-x_n)} \cdot y_n$				
	17	Express the value of	The value of $(n+1)^{th}$ order difference of	Understand	CO 2	CLO 8	AHSB11.08
difference of a polynomial of n^{th} degree. The inverse transform, or inverse of Inverse Laplace transform Inverse Laplace transform If $L^{-1}\{f(s)\} = f(t)$ then the term is real or complex. The inverse transform, or inverse of Laplace transform Inverse Laplace transform If $L^{-1}\{f(s)\} = f(t)$ then the Laplace transform $L^{-1}[a f(s)] + b L^{-1}[g(s)]$ The inverse transform, or inverse of Laplace transform If $L^{-1}\{f(s)\} = f(t)$ then the Laplace transform the inverse below the complex of laplace transform the complex of laplace transfor			a polynomial of n^{th} degree is always zero				
degree. 18 Define the term Inverse Laplace I		difference of a					
Define the term The inverse transform, or inverse of Remember CO 2 CLO 9 AHSB11.09							
Inverse Laplace transform $L\{f(t)\}$ or $F(s)$, is $f(t) = L^{-1}\{F(s)\}$ where s is real or complex. 19 State linearity property of Inverse Laplace transform $L^{-1}\{f(s)\} = f(t)$ then $L^{-1}\{f(s)\} = f(t)$							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	18			Remember	CO 2	CLO 9	AHSB11.09
19 State linearity property of Inverse Laplace transform $L^{-1}[a f(s)] = f(t)$ then $L^{-1}[a f(s)] + b L^{-1}[g(s)]$ Understand $L^{-1}[a f(s)] + b L^{-1}[g(s)]$ 20 State change of scale property of Inverse $L^{-1}[F(s-a)] = e^{at} f(t) = e^{at} L^{-1}[F(s)]$ Understand $L^{-1}[F(s)] = f(t)$ then $L^{-1}[F(s-a)] = e^{at} f(t) = e^{at} L^{-1}[F(s)]$ Understand $L^{-1}[F(s)] = f(t)$ Understand $L^{-1}[F(s)] = f(t)$ Then							
property of Inverse Laplace transform	10			TT. 1 / 1	00.2	OT C C	ALICDIA
Laplace transform $= a L^{-1} [f(s)] + b L^{-1} [g(s)]$ 20 State change of scale property of Inverse $L^{-1} \{ F(s-a) \} = e^{at} f(t) = e^{at} L^{-1} \{ F(s) \}$ Understand CO 2 CLO 9 AHSB11.09	19			Understand	CO 2	CLO 9	AHSB11.09
State change of scale property of Inverse $L^{-1}\{f(s)\}=f(t)$ then $L^{-1}\{F(s-a)\}=e^{at}$ $L^{-1}\{F(s)\}$ Understand $L^{-1}\{F(s)\}$ CLO 9 AHSB11.09							
property of Inverse $L^{-1}{F(s-a)} = e^{at} f(t) = e^{at} L^{-1}{F(s)}$	20			Understand	CO 2	CLOO	AHSR11 00
	20		$L^{-1}{F(s-a)} = e^{at} f(t) = e^{at} L^{-1}{F(s)}$	Chacistana			7110011.07

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
21	State convolution	If $L\{f(t)\} = f(s)$ then	Understand	CO 2	CLO 10	AHSB11.10
	theorem of Laplace transform	$L\left[\int_{0}^{t} f(\tau)g(t-\tau)d\tau\right] = F(s).G(s)$				
	transform					
22	C(-1-1-11-1-0	TCT ((1) C(1) -85 T (C(1))	TT. 1	GO 2	CLOO	AUGD11.00
22	State Inverse shifting property of Inverse	If $L\{ua(t) f(t-a)\}=e^{-as} L\{f(t)\}=$ $e^{-as} F(s), then L^{-1} \{e^{-as} F(s)\}=ua(t) f(t-a)$	Understand	CO 2	CLO 9	AHSB11.09
	Laplace transform					
23	State convolution	If $L\{f *g\} = L\{f(t)\}.L\{g(t)\} = F(s).G(s)$	Understand	CO 2	CLO 10	AHSB11.10
	theorem of Inverse	then $L^{-1} \{F(s).G(s)\} = f(t) * g(t)$				
	Laplace transform					
1	D. C. at the same	MODULE-III	D1	CO 2	CI O 12	ALICD11 12
1	Define the term curve fitting.	It is the process of finding the best fit curve for the set of given data values	Remember	CO 3	CLO 13	AHSB11.13
2	State through how	Through the three paired data points the	Understand	CO 3	CLO 13	AHSB11.13
	many paired data	fitting of the best straight line is obtained.				
	points does fitting of					
	the best straight line					
3	must pass through? Mention the principle	The principle involved in determining the	Remember	CO 3	CLO 13	AHSB11.13
	involved in	best fit curve for the set of given data	Remember	203	CLO 13	A113D11.13
	determining the best	values is the Method of least squares				
	fit curve for the set of	-				
	given data values.					
4	Describe the term	The principle of least squares is described	Remember	CO 3	CLO 13	AHSB11.13
	principle of least squares in obtaining	as "Sum of the squares of the errors or residuals is minimum"				
	the best fit of the	Testadas is illililida				
	curve.					
5	State through how	Through the two paired data points the	Understand	CO 3	CLO 13	AHSB11.13
	many paired data	fitting of the best straight line is obtained.				
	points does fitting of the best straight line				-	
	must pass through?					
6	State the Normal	The normal equations of the straight line	Remember	CO 3	CLO 13	AHSB11.13
	equations of the	y = a + bx are		7	-	
	straight line	$\sum y = na + b \sum x$				
	y = a + bx			500		
		$\sum xy = a\sum x + b\sum x^2$				
7	State the Normal	The normal equations of the second degree	Remember	CO 3	CLO 13	AHSB11.13
	equations of the second degree	parabola $y = a + bx + cx^2$ are	~~			
	parabola	$\varepsilon y = na + b\varepsilon x + c\varepsilon x^2$	10			
	$y = a + bx + cx^2$	$\varepsilon xy = a\varepsilon x + b\varepsilon x^2 + c\varepsilon x^3$	1			
		/- L/ //				
		$\varepsilon x^2 y = a\varepsilon x^2 + b\varepsilon x^3 + c\varepsilon x^4$				
8	Define Fourier	Fourier integral is a pair of integralsa	Remember	CO 3	CLO 14	AHSB11.14
	integral transforms	"lower Fourier integral" and an "upper Fourier integral"which allow				
		certain complex-valued functions f to				
		be decomposed as the sum of integral-				
		defined functions, each of which				
		resembles the usual Fourier				
		integral associated to f .				

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
9	State Fourier integral theorem.	If $f(x)$ is a given function defined in $(-l,l)$ and satisfies the Dirichlet conditions then $f(x) = \frac{1}{\pi} \int_{0}^{\infty} \int_{-\infty}^{\infty} f(t) \cos \lambda (t-x) dt d\lambda$	Understand	CO 3	CLO 14	AHSB11.14
10	State Fourier Sine integral formulae.	$f(x) = \frac{2}{\pi} \int_{0}^{\infty} \sin \lambda x \int_{0}^{\infty} f(t) \sin \lambda t dt d\lambda$	Remember	CO 3	CLO 14	AHSB11.14
11	State Fourier Cosine integral formulae.	$f(x) = \frac{2}{\pi} \int_{0}^{\infty} \cos \lambda x \int_{0}^{\infty} f(t) \cos \lambda t dt d\lambda$	Remember	CO 3	CLO 14	AHSB11.14
12	Define the term Integral transform	The integral transform of a function $f(x)$ is given by $I[f(x)]$ or $F(s)$ $= \int_{a}^{b} f(x)k(s,x)dx$ Where $k(s,x)$ is a known function called kernel of the transform, s is called the parameter of the transform of $F(s)$	Remember	CO 3	CLO 15	AHSB11.15
13	Define Fourier transforms	The Fourier transform (FT) decomposes a function of time (a signal) into the frequencies that make it up, in a way similar to how a musical chord can be expressed as the frequencies (or pitches) of its constituent notes.	Remember	CO 3	CLO 15	AHSB11.15
14	Why to we need Fourier transforms	A complicated signal can be broken down into simple waves. This break down, and how much of each wave is needed, is the Fourier Transform. Fourier transforms (FT) take a signal and express it in terms of the frequencies of the waves that make up that signal.	Understand	CO 3	CLO 19	AHSB11.19
15	What is difference between Fourier series and Fourier transform?	The Fourier series is used to represent a periodic function by a discrete sum of complex exponentials, while the Fourier transform is then used to represent a general, non periodic function by a continuous superposition or integral of complex exponentials.	Understand	CO 3	CLO 19	AHSB11.19
16	How to represent Fourier transforms of function F(s)	Fourier transforms of function F(s) is defined by $F(s) \equiv \int_{-\infty}^{\infty} f(x) e^{-2\pi i s x} dx$	Understand	CO 3	CLO 15	AHSB11.15
17	How to represent Inverse Fourier transforms of function f(x)	Inverse Fourier transforms of function f(x) is defined by $f(x) \equiv \int_{-\infty}^{\infty} F(s) e^{2\pi i s x} ds$ $F[af_1(x) + bf_2(x)] = aF_1(s) + bF_2(s)$	Understand	CO 3	CLO 15	AHSB11.15
18	State linearity property of Fourier transforms	$F[af_1(x) + bf_2(x)] = aF_1(s) + bF_2(s)$	Understand	CO 3	CLO 15	AHSB11.15

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
19	State change of scale property of Fourier transforms	$F[f(ax)] = \frac{1}{a}F(\frac{s}{a})(a > 0)$	Understand	CO 3	CLO 15	AHSB11.15
20	State Modulation property of Fourier transforms	$F[f(x)\cos ax] = \frac{1}{2}[F(s+a) + F(s-a)], F[s] = F[f(x)]$	Understand	CO 3	CLO 15	AHSB11.15
21	Define Fourier sine transforms	The Fourier sine transform is he imaginary part of the full complex Fourier transform	Remember	CO 3	CLO 16	AHSB11.16
22	Define Fourier cosine transforms	The Fourier cosine transform is the a real part of the full complex Fourier transform.	Remember	CO 3	CLO 16	AHSB11.16
23	Define inverse Fourier transforms	A mathematical operation that transforms a function for a discrete or continuous spectrum into a function for the amplitude with the given spectrum; an inverse transform of the Fourier transform	Remember	CO 3	CLO 17	AHSB11.17
		MODULE-IV				
1	What is single step method in determining the numerical solution to ordinary differential equation?	Taylor's series method is single step method in determining the numerical solution to ordinary differential equation	Remember	CO 4	CLO 20	AHSB11.20
2	What are multi step methods in determining the numerical solution to ordinary differential equation?	Euler's method, Modified Euler's method and Runge-Kutta method are multi step method in determining the numerical solution to ordinary differential equation	Remember	CO 4	CLO 20	AHSB11.20
3	Define Taylor's series formulae.	$y(x) = y(0) + x \cdot y'(0) + \frac{x^2}{2!} y''(0) + \dots + \frac{x^n}{n!} y^n(0) + \dots$	Remember	CO 4	CLO 20	AHSB11.20
4	State the Euler formula to determine the numerical solution of ordinary differential equation.	$y_{n+1} = y_n + hf(x_n, y_n)$	Understand	CO 4	CLO 20	AHSB11.20
5	State the second order Runge- Kutta method to determine the numerical solution of ordinary differential equation.	Second order R-K Formula $y_{i+1} = y_i + 1/2$ ($K_1 + K_2$), Where $K_1 = h$ (x_i , y_i) $K_2 = h$ ($x_i + h$, $y_i + k_1$) For $i = 0, 1, 2$	Understand	CO 4	CLO 21	AHSB11.21
6	State the third order Runge- Kutta method to determine the numerical solution of ordinary differential equation.	Third order R-K Formula $y_{i+1} = y_i + 1/6 (K_1 + 4K_2 + K_3),$ Where $K_1 = h (x_i, y_i)$ $K_2 = h (x_i + h/2, y_0 + k_1/2)$ $K_3 = h (x_i + h, y_i + 2k_2 - k_1)$ For $i = 0, 1, 2$	Understand	CO 4	CLO 21	AHSB11.21
7	State the fourth order Runge- Kutta method to determine the numerical solution of ordinary differential equation	Fourth order R-K Formula $y_{i+1} = y_i + 1/6 (K_1 + 2K_2 + 2K_3 + K_4),$ Where $K_1 = h (x_i, y_i)$ $K_2 = h (x_i + h/2, y_i + k_1/2)$ $K_3 = h (x_i + h/2, y_i + k_2/2)$ $K_4 = h (x_i + h, y_i + k_3)$ For $i = 0, 1, 2$	Understand	CO 4	CLO 21	AHSB11.21
8	State the modified Euler formula to	$y^{(i)}_{k+1} = y_k + h/2f \left[(x_k, y_k) + f(x_{k+1}, 1)_{k+1}^{(i-1)} \right]$	i Understand	CO 4	CLO 20	AHSB11.20

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
	determine the numerical solution of ordinary differential equation.	For i=0,1,2,3				
9	List numerical method of single- step	Taylor's method is a single-step method	Remember	CO 4	CLO 20	AHSB11.20
10	List numerical method of step by step	Euler and Runge-Kutta methods are step by step methods	Remember	CO 4	CLO 21	AHSB11.21
11	Define boundary- value problem	If the conditions on y are prescribed at n distinct points, then the problems are called boundary-value problems	Remember	CO 4	CLO 20	AHSB11.20
12	Drawback of Taylor method	To evaluate higher order derivatives is difficult	Remember	CO 4	CLO 20	AHSB11.20
13	Which method is unsuitable if f(x,y) is given in tabular form	Taylor's form is unsuitable for tabular form of datas	Remember	CO 4	CLO 20	AHSB11.20
14	Which numerical method is powerful	Runge-Kutta method is very powerful	Understand	CO 4	CLO 21	AHSB11.21
15	Define initial value problems	The values of y are specified at the same value of x is called initial value problem.	Understand	CO 4	CLO 20	AHSB11.20
	procrems	MODULE-V				
1	Define the term partial differential equation	An equation involving partial derivatives of one dependent variable with respective more than one independent variables.	Remember	CO 5	CLO 22	AHSB11.22
2	Describe the formation of partial differential equation	A partial differential equation of given curve can be formed in two ways 1. By eliminating arbitrary constants 2. By eliminating arbitrary functions	Understand	CO 5	CLO 23	AHSB11.23
3	Write Lagrange's linear equation of a non linear partial differential equation	An equation of the form Pp + Qq = R is called Lagrange's linear equation.	Remember	CO 5	CLO 24	AHSB11.24
4	Write auxillary equation of Lagrange's linear partial differential equation	Lagrange's linear equation consider auxiliary equation is given by $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Remember	CO 5	CLO 24	AHSB11.24
5	Define first order equation	A differential equation involving partial derivatives p and q only and no higher order derivatives is called a first order equation.	Understand	CO 5	CLO 23	AHSB11.23
6	Write one example of linear p.d.e	The example of linear p.d.e is $px + qy^2 = z$	Understand	CO 5	CLO 23	AHSB11.23
7	Write general solution of $P_p + Q_q = R$	$\phi(u,v)=0$	Understand	CO 5	CLO 24	AHSB11.24
8	Define order of p.d.e	Highest partial derivative appearing in the equation	Understand	CO 5	CLO 23	AHSB11.23
9	Describe one dimensional wave equation of partial differential equation	The equation which governs the motion of the vibrating string over time, is called the one-dimensional wave equation. It is a second order PDE, and it's linear and homogeneous.	Understand	CO 5	CLO 26	AHSB11.26

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
10	Describe one	The equation which governs the	Understand	CO 5	CLO 27	AHSB11.27
	dimensional heat	mathematical model of how heat spreads				
	equation of partial	or diffuses through an object such as a				
	differential equation	metal rod or a body of water.				
11	Express one	$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$	Understand	CO 5	CLO 26	AHSB11.26
	dimensional wave	$\frac{1}{24^2} = c^2 \frac{1}{2x^2}$				
	equation of partial	$CI \qquad CX$				
10	differential equation	_	XX 1 . 1	00.5	CT 0.26	A 110D 11 26
12	Express one	$\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$	Understand	CO 5	CLO 26	AHSB11.26
	dimensional heat	$\frac{1}{\partial t} = c \frac{1}{\partial x^2}$				
	equation of partial differential equation					
13	•	2 2	Understand	CO 5	CLO 26	AHSB11.26
13	Express two dimensional laplace	$\int \partial^2 u \int \partial^2 u = 0$	Understand	CO 3	CLO 20	AHSB11.20
	equation of partial	$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$	-			
	differential equation	e cy		3		
14	Define the boundary	y(0,t) = 0 for all t and $y(1,t) = 0$ for all t	Remember	CO 5	CLO 26	AHSB11.26
1.	conditions of one	y(o,t) o for all t alla y(i,t) o for all t	remember		CEO 20	1115511.20
	dimensional wave					
	equation					
15	Define the boundary	u(0,t) = 0 for all values of t and	Remember	CO 5	CLO 26	AHSB11.26
	conditions of one	$u(l,t) = f(x) \text{ for } 0 \le x \le l$				
	dimensional heat	$u(t,t) = f(x) \text{ for } 0 \le x \le t$				
	equation					

Signature of the faculty

HOD, AE