(परीक्षार्थी द्वारा भरा जाए)

(To be filled by the Candidate)

Second Periodical Test, January-April/May, 2021

परीक्षा का नाम (Name of Examina	tion).	2nd	perio	dical	6th se	em
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प्रश्न पत्र कोड सहित (Paper withCo		Numerio	cal Met	hods MA	ATH311	
परीक्षा दिवस और दिनांक (Day and Date		and the second of the second	27 on)	7.03.21	and Sa	aturday
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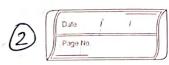
	Tyanni () Date 1 Page No.
	Numerical Methods
	MATH-311.
	Les II a musical les II
1 (1	$LHS = \Lambda^2 y_8$
	= Vy8 - Vy7
	· = (48-47) - (47-40)
TT I	= y8-247+461=1RHS
200	The second secon
	6° \\ \D^2 y_8 = y_8 - 2y_7 + y_6
	Hence Proved.
	5= 11+2×311 5= 2 = 1 + 1 + 1
(ü)	Given, Zin J
	1et A = 4 3
	we know that in Doplittle's Method
22 FF	Me WOOD END A = LU O
	white,
	L = [1 0] and U = [U11 U12]

 $L = \begin{bmatrix} 1 & 0 \end{bmatrix} \quad \text{and} \quad U = \begin{bmatrix} U_{11} & U_{12} \\ 0 = U_{22} \end{bmatrix}$ $\begin{bmatrix} U_{21} & 1 \end{bmatrix} = \begin{bmatrix} U_{11} & U_{12} \\ 0 = U_{22} \end{bmatrix}$

· From eq. n (1)

	4	3	E		D	Un	Ye
	6	3	4	L21	[]	0	U22
- 1							E

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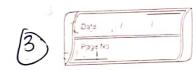
7	The state of the s
	=> [4 3] = [1 UIT TAM U12
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
	on comparing both sides, we get.
	U11 = 4
	U12 = 13.
	1 V1 = 6 => 121 X4 = 6
	$l_{21} V_{11} = 6 \implies l_{21} \times 4 = 6$ $= P l_{21} = \frac{6}{4}$
	121 = 1.5
	121=1.5
	الودووز الجهاري المستمري
	$J_{21}V_{12} + V_{21} = 3 \Rightarrow 1.5 \times 3 + V_{22} = 3$
	$=P$ $V_{22} = 3 - 4.5$
	V ₂₂ = 1.5
	D ₂₂ = 105
	perilished of with properties and the second of the
	:. L = [1 0] = [1 0] and
	[12] 1] [1.5]
	The last to the terms of the last the terms of the last t
OFF F	V= V11 V12 = 4 3 1
	[0 V22] [0 -1.3]
	in a survival in the survival
1	Land Varie matriex.
	1 1 1 1 1 2 1 1 2 1 1 3
e ^{rro}	6.920 6.32 6.33 6.

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 $\frac{\left(\Delta - \nabla \right) y}{\nabla - \Delta} = \frac{\left(E - 1 - \frac{1 - E^{-1}}{1 - E^{-1}} \right) y}{\left(1 - E^{-1} - E^{-1} \right)}$

 $= \left(\begin{array}{c} E - I \\ \hline E - I \\ \hline \end{array}\right) \left(\begin{array}{c} E - I \\ \hline$

= (E-1)-41 F) 0x

= (E- E-1) y

= {(1+1) - (1-V)314x

= (SXX) (0+ V) yx

Huncig $\frac{\Delta}{\nabla} = \Delta + \nabla$

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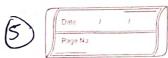
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(iii)	Given,	1000 1000 1000 1000 1000 1000 1000 100	6.11
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	y: 0 0.223144 0.405465	6.559619	0.693147
-	\		.1
-	$\frac{2}{2}$ $\frac{1}{2}$ $\frac{7^2y}{y}$	V3y	D4y
		7	-
per en e		<u> </u>	
**	1.25 6.223144 -0.040	022	
	0.182321	0.01265	·
220	1.5 0.405465 -0.02		-0.005115
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- 16-	0.133528	, F. 1 198 -	
	2.0 D.693147		1
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	ut, x=1:9/-1-/		
2 13	$\alpha_{\eta} = 2 \cdot D$	h	The state of the s
	yn = 0.693147	= 1.9-2	
	$h = \alpha_1 - \lambda_0$	D.25	
100	· = 1.25-1 V + A V	P=-D.4	
4	h= 0.25	*	
		A MARIA	
	Tyn = D. 133 528		
	$\nabla^2 y_m = -0.020626$		
	$\nabla^3 y_n = 0.007541$	and the second second	-
	$\nabla^{4}y_{n} = -0.005115$	(भ)	
1 3 8		The state of the s	

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: Pm(x) = ym + PTym + [P(P+1)/21] V2yn + [P(P+1) (P+2) | 31,] r3yn + [P(P+1)(P+2)(P+3) | 41] = 0.693147 + (-0.4) x b.133528 + [(-b.4) (-D.4+1) | 21] x (-0.020626) + [(-0.4) (-0.4+1)(-0.4+2) / 31] x (0.007541) + [(-0.4)(-0.4+1)(-0.4+2)(-0.4+3)/41] X (-0.005115) = b.6933147-b.0534112 + b.00247512 -D. D D D 48 2 6 2 4 + D. D D D 2 12 7 8 4 = f(109) = Pn(n) = 0.64194108 f(1.9) = 0.64194108 Giren, 3 202 - 4 - 22 = 172x - 3y + 2bz = 25From the eq. ns, we can see that

(3)

20 7 [-1] + 1-2 120 7 13 + 1-11 110-1-120 |20-17-1-121 +1-3 | 1-2 + 1-3 | 1-2 + 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 |

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ie, the given eq. " rou in covert pleder

$$y = \int_{20}^{20} [-18 - 3x + 7]$$

Let the initial approximations are
$$2^{(0)} = y^{(0)} = y^{(0)} = (z)^{(0)} = 0$$

$$2^{(1)} = 1 \left[17 + y^{(0)} + 2z^{(0)} \right] = 17 = 0.85$$

$$y(1) = \frac{1}{20} \left[\frac{1}{20} \left[\frac{1}{20} \right] + \frac{1}{20} \left[\frac{1}{20} \right] = \frac{1}{20} \left[\frac{1}{20} - \frac{1}{20} - \frac{3}{20} \times \frac{5}{20} + \frac{5}{20} \right]$$

$$\frac{Z(1)}{20} = \frac{1}{25} \left[\frac{25 - 2x^{(1)} + 3y^{(1)}}{20} \right] = \frac{1}{20} \left[\frac{25 + 2x \cdot 85 + 3(-1.0275)}{20} \right]$$

2 nd Approx.

$$\chi^{(2)} = \int [17 + y' + 27'] = \int [17 - 1.0275 + 2 \times 1.0109]$$

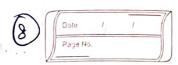
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x = 0.9020 y = -0.9847 z = 1.0122

Solu of the given eq. 4s.

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(3)	Given
	1

$$4x + 2y + 67 = 16$$

 $2x + 82y + 397 = 206$
 $6x + 39y + 267 = 1.13$

The given cystem of linear eq. " can be written

$$A = \begin{bmatrix} 4 & 2 & 6 \\ 2 & 82 & 39 \end{bmatrix}$$
, $X = \begin{bmatrix} x \\ y \end{bmatrix}$, $B = \begin{bmatrix} 16 \\ 206 \\ 5 \end{bmatrix}$

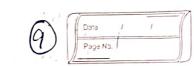
Now

$$A^{\dagger} = \begin{bmatrix} 4 & 2 & 6 \\ 2 & 82 & 39 \end{bmatrix} = A.$$

can appey Choleskey's Method.

Where,

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from eq. " (2)

Let
$$L^T x = V - G$$
 where $V = \begin{bmatrix} V_1 \\ V_2 \\ V_3 \end{bmatrix}$

from eq. " (3)

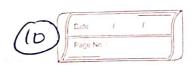
$$\begin{bmatrix} 4 & 2 & 6 \\ 2 & 82 & 34 \end{bmatrix} = \begin{bmatrix} 1_{11} & 0 & 0 \\ 1_{21} & 1_{22} & 0 \end{bmatrix} \begin{bmatrix} 1_{11} & 1_{21} & 1_{31} \\ 0 & 1_{22} & 1_{22} & 0 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 34 & 26 \end{bmatrix} = \begin{bmatrix} 1_{21} & 1_{22} & 0 \\ 1_{31} & 1_{32} & 1_{33} \end{bmatrix} \begin{bmatrix} 0 & 0 & 1_{33} \end{bmatrix}$$

$$\begin{bmatrix} 4 & 2 & 6 \\ 2 & 82 & 39 \end{bmatrix} = \begin{bmatrix} l_{11} & l_{11} l_{21} & l_{11} l_{31} \\ l_{11} l_{21} & l_{21}^{2} + l_{22}^{2} & l_{21} l_{31} + l_{22} l_{32} \\ l_{11} l_{31} & l_{21} l_{31} + l_{22} l_{32} & l_{31}^{2} + l_{32}^{2} + l_{33}^{2} \end{bmatrix}$$

on comparing beth sides,

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 $J_{31}^{2} + J_{33}^{2} + J_{33}^{2} = 26 = 7(3)^{2} + 4^{2} + J_{33}^{2} = 26$

$$l = \begin{bmatrix} 2 & 0 & 0 \\ 1 & 9 & 0 \\ 2 & 4 & 1 \end{bmatrix}$$

from eq. n 3

$$\begin{bmatrix}
2 & 0 & 3 & | V_1 & | 16 \\
1 & 9 & 4 & | V_2 & | = 206 \\
3 & 4 & | V_3 & | & | & | & |
\end{bmatrix}$$

=> V2 = 22 1= 1 = 1

$$3V_1 + 4V_2 + V_3 = 113 \Rightarrow 3 \times 8 + 4 \times 22 + V_3 = 113$$

V3=1

1 - 15 h SI= S = 15h 11h

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From	eg.n	(4)
		$\overline{}$

	2	1	3	[2]		8	1
7	D	9	4	y	2	22	
	D	0	1.	3			J

Hences

x = 1.5 y = 2 3 = 1 $spl.^{n}$ of the given system