Subject		
	Section . A.	
vlo2 .	$(p^2+g)y = \cos 3x$	
	we will find of (complementary function)	
Aux	$\frac{11084 \cdot eq^2}{m^2 - eq} = \frac{m^2 + q}{q} = 0$	
	m ² = -9	
	. M = ± 31	
δος	s of egg cua imaginary & distinct.	
	C.F = CON (C; COS 3N + C, Sin 3x)	
	O8:	
	[C.E = (C,(0)3x + C, sin 3x)]	
NOW,	we will find P.I (particular integral)	
	Y = (0) 3x	
	02+9-10-07 CA 151	
	$\delta eplacing D^2 \rightarrow -9^2$	
	$\frac{y = \cos 3x}{-a^2 + g}$	
	Y = cos 3x Not defined	
	-9+9	
	$y = x \cos 3x = x \cos 3x (-20) = 0$	d
	F'(0) -402	1x
	$y = 2x \cdot 3\sin 2x - x\sin 3x$	
	-4 (-9)	
	6.F = y = c] + PI => y = C, cos Jx + C2sin 3x + x	xsin3x
		6
2. Solv	(p2-4)y=e2x	
5070	$(0^2-4)y = e^{3x}$	
1,10	and cf	
· We	Auxillary eqn $m^2 - 4 = 0$	
	$m^2 = 4 \Rightarrow m = \pm 2$	
Value	A CONTRACTOR OF THE PROPERTY O	
80018	of eqn are real 2 district [cf = (,e2n + Ge-2n]	
	Cr - Cc - 70 J	

	Now we find PE u = e2x
	Now we find PI y=e2x
	sellacing D -> a
	$\frac{y = e^{1x}}{4 - 4} = \frac{xe^{2x}}{2D} = \frac{xe^{2x}}{4}$
	General egn = y = cf + PI
-	y = C102M + C20-2M + NOZM
3	Solve $(D^2 + D - 2)y = x$ $(D^2 + D - 2)y = x$
Ŧ	$(D^2 + D - 2)y = x$
	C.F. will be
	$A \cdot E \Rightarrow m^2 + m - 2 = 0$
	$m^2 + 2m - m - 2 = 0$
	$[c \cdot f = (e^{x} + (2e^{-2n})]$
	ax God PI
	$\frac{y = x}{D^2 + D - 2}$
	$\frac{J : X}{-2\left[1 \cdot \frac{D^2}{D} - \frac{D}{2}\right]} = \frac{-1}{2}\left[1 - \frac{D^2 + D}{2}\right] \times \frac{1}{2}$
+	
+	
+	
	$\frac{y^2-1}{2}\begin{bmatrix}1+D^2+D\\2\end{bmatrix}$
-	
_	24 261 4.1
_	$y = \frac{1}{2} \left[1 + 0 + \frac{1}{2} \right] x \Rightarrow \left[y = \frac{1}{2} x - \frac{1}{4} \right]$
	2 7 2 4
	G.E > y = CF + PI
	1 -2M
	y = ciex + cze-2x - 1 x - 1

4.	
	solve $(D^3 + 1)y = (e^n + 1)^2$
	$= (p^3 + 1)y = (e^n + 1)^2$
	we find cf
	A.E = m3+1=0 => M=-1
	M > -1
	$m+1$) m_0+1 (m_2-m+1
	$-\frac{m}{3} \pm m^2$
	$\frac{1}{2}$ $\frac{1}$
	Manuface mt) slavent vara al mater
	0
	$M^2 - M + 1 \ge 0$
	$\frac{-b + \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{1 + \sqrt{1 - 4}}{2} = \frac{1 + \sqrt{3}i}{2}$
	<u> </u>
	[CF = Cre-x + ex/2 (C2 cos \(\sigma x \) \]
	[fair magan de muantan]
	Now we find P.I
	$E(D)A = G_{5N} + 1 + 5 G_{5N} = G_{5N} = G_{5N}$
	$f_{08} e^{2N} \Rightarrow y = e^{2N} = e^{2N} = e^{2N}$
	[- 37 - 1 7
	$\int_{00}^{\infty} 1 \Rightarrow y = \frac{1}{0^{3}+1} = \left[1 + D^{3}\right]^{-1}$
	$[1-p^{5}+p^{0}] \cdot 1 = [1]$
	$600 2e^{x} \Rightarrow y = 2e^{x} = 2e^{x} = [e^{x}]$
	$\frac{608 2e^{x} \Rightarrow y = \frac{2e^{x}}{D^{3} + 1} = \frac{2e^{x}}{2} = \frac{e^{x}}{2}$
	G.F & Y = C.F +PI
	$\frac{(s \cdot f \Rightarrow y = c \cdot f + p)}{y = c \cdot e^{x} + e^{x/2} \left[c_2 \cos \sqrt{3} x + G \sin \sqrt{3} x \right] + e^{2x} + 1 + e^{x}}{g}$
	2 1 9

S	pubject: Date:
_5	find the CF of (p2+1)24 = 24 cosx
	$(D^2 + 1)^2 y = 24 \cos x$
	of will be
	$N \cdot E = (m^2 + 1)^2 = 0 \Rightarrow m^2 + 1 = 0 \Rightarrow m^2$
	=> m ²
	Soots of the equation will become twice
	m = +i, $+i$, $-i$, $-i$
	C.F = e on [(c,+ (2 H). (0) N + (c3 + (4 N lsin N]
	-10^{-10}
	C.F = ((+(2x)(0)x + ((3+(4x))sin x)]
	Section B.
1.	Solve $(D^2+9)y=\sin^2x$
	$(0^2+9)y = \sin^2 x$
	$A \cdot E \rightarrow m^2 + 9 = 0 \Rightarrow m = +3i$
	[cf = e o M (c,(0)3x + C, sin 3x)]
	Now we find PI
	$y = Q(x)$ $y = sin^2 x$
	t(v) 05+3
	W. K.T gin2x = 1-0012x
	2
	$y = \frac{1}{p^2 + 9} \left[\frac{1}{2} - \frac{\cos 2n}{2} \right]$
	D2+9 2 2 14-60
	In a substant
	$y = \frac{1}{2} \left[\frac{1}{D^2 + g} - \frac{(OJ 2N)}{D^2 + g} \right]$ {: $1 = e^{ON}$ }
	$\frac{y}{2} = \frac{1}{2} \left[\frac{e^{0x}}{8^2 + 9} - \frac{\cos 2x}{0^2 + 9} \right] = \frac{1}{2} \left[\frac{e^{0x}}{9} - \frac{\cos 2x}{4 + 5} \right]$
1	02+9 02+9 - 2 5 -4+5
	$y = \frac{1}{2} \left[\frac{1}{9} - \frac{\cos 2x}{3} \right] = \left[\frac{1}{3} - \frac{\cos 2x}{3} \right]$
	$\frac{1}{2} \left[\frac{1}{9} - \frac{10124}{5} \right] = \frac{1}{18} - \frac{10124}{10}$

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	3	ubject:	Date:/	_
		GF +> y = c F + PI	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	_
		y = eon ((1:(0)3x + (25in3x) + 1	COSZM	_
			10	
12 = -1				
==1	2	solve (02-a2) y = cosh (an)	- Au	_
		$(D^2-a^2)y = \cosh(gx)$	3 3 3 5 5 5 T	
		$A \cdot E \rightarrow m^2 - q^2 = 0$ = $M = \pm q$		_
		C.F. = [C1eax + C2e-ax]		_
		Now, we find PI		-
(F)		$\rho \cdot I = \cosh(\alpha x) - \cosh(\alpha x)$ Not de		_
		02-02 02-02	WT - T II	_
		$= \frac{\text{M cosh (an)}}{2D} \times \frac{-2D}{-2D} \Rightarrow$	nx -20 (cosh (anl)	_
		20 L20 L20 -20	- 402	_
		Leading the comment of the comment o		- Park
		$= \frac{2 \times \cdot \sinh(dx) \cdot a}{4a^{2}} \cdot \frac{y}{2a}$	sinh (an)	
		402	15 3 31 2 3 3 3 4	_
			Art Same of	_
		G.E = y = C.F+PI	E 1 4 10 X 15 "	
		y = Ciean + Cze-an + 1	sinh (an)	
		30	Tals.	_
	3.	Solve $(0^3 - 30^2 + 20)y = 12(x^2 - 2n + 4)$	and w	
		$(0^3-30^2+20)y = 12(x^2-2n+4)$		
		$A = m^3 - 3m^2 + 2m = 0$	1 5 N S	
		$m(m^2-3m+2)=0$		
		$m(m^2-2m-m+2) = 0$	al al	-
		m(m-2)(m-1)=0 -> $m=$	0,1,2	
и		[.F = Cieox + czoe + (3e2x]		
5]		Now, we find particular integral by	partial	
		P.I = y = An3 + Bn2 + Cn + E		
	<u></u>	Dy = 3Ax2 + 2Bx + C		
		D2y = 6AN + 2B	1 2 3	_
		B D34 = 6A		

	Subject: Date:
	Substituting these values in colginal eqn. $6A - 3(6An + 20) + 2(3An^2 + 2Bn + 6) = 12(42)$
	$6A - 18An - 6B + 6An^{2} + 4Bn + 2C = 12n^{2} - 24n + 48$ $6A = 12 \Rightarrow A = 2$
	-13A + 4B = -24
	$-36+48=-24 \Rightarrow 48=12 \Rightarrow \boxed{8=3}$
100	6A - 6B + 2C = 48
	12-18+2c=48 => 2c=54 => c=27
	$P.I = 2x^2 + 3x^2 + 27x^2$
	G.E > y = C.F + PI
	y = c1+ (2e2x + (3e1x + 2x3 + 3x2 + 27x
V.	Salva (-3
	Solve $(D^3 + 2D^2 + D)y = e^{-x} + \cos x + x^2$ $(D^3 + 2D^2 + D)y = e^{-x} + \cos x + x^2$
*	$A: E \Rightarrow m^3 + 2m^2 + m = 0$
	$m(m^2 + 2m + 1) = 0$
	$m(m^2+m+m+1)=0$
	$m \left[(m+1) (m+1) \right] = 0 \le 1 = u(q \le -3q = -8q)$
	m=0,-1,-1,-1,00-20,101 - slave 100-11
	$[c.f. = (c. + c.x)e^{-x} + c.]$
	NOW, We find solutions too p.I
	$y = e^{-x}$ $p^{2} + 2p^{2} + p$
	e-x Mot deboted
	$y = \frac{e^{-x}}{(-1)^3 + 2(-1)^2 + (-1)} = \frac{e^{-x}}{0}$ Not defined
	~X
	$y = xe^{-x} = xe^{-x}$ $3 D^2 + 4D + 1$ D Not defined
	30 + 10+1

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14	Subject: Data:
	6877
liil	y - Cos x - Cos x
	$\frac{y - \frac{\cos x}{D^2 + 2D^2 + D} - \frac{\cos x}{D \cdot D^2 + 2D^2 + D}}{D \cdot D^2 + 2D^2 + D} = \frac{D^2 - \alpha^2}{D^2 - \alpha^2} = -1$
	4 (05.7)
	$\frac{y = \cos x}{-D - 2 + D} \Rightarrow \frac{y = \cos x}{-2}$
	# 1 to 1 32 to 1
in).	$y = \frac{x^2}{D^3 + 2D^2 + D}$
	$y = \frac{\pi^2}{D(D^2 + 2D + 1)}$
_	$y = \frac{1}{D} \left[D^2 + 2D + i \right]^{\frac{1}{2}} \pi^2$
	$D^2x^2=2$ $\int D=d$ dx
*	$Dx^2 = 2N$
	03x2 > D
	y = 1 [1- (02+20) + 40)]x2
	(y y) 48 mm - 2 /
	y - 1 [x2-2-4x +8]
	y = 1 [x2 - 4x + 6]
	y = S (x2-4x+6) dn
	$\left[\frac{y=x^3-2x^2+6x}{3}\right]$
	6.f = y = c.f + P.I
	$y = (c_1 + (2x)e^{-x} + (3 - x^2e^{-x} - co_1x + x^3 - 2x^2 + 6x)$

	2980110389 Date:
	Subject:
2	solve. (p2-50+6) y = sin 3x
	$(p^2 - sp + 6)y - sin 3x$
	$n \in \rightarrow m^2 - Sm + b = 0$
	$m^2 - 3m - 2m + 6 = 0$
	m(m-3)-2(m-3)=0
	(m-3) $(m-2)=0$
	m = 3 2
	$\left[c\cdot F = c_1e^{2x} + c_2e^{3x}\right]$
	NOW, We find P.I
	$y = \frac{\sin 3n}{0^2 - 50 + 6}$
	$\stackrel{2}{0} \rightarrow -\alpha^2 = -9$
	y = Sin 3x
	-9-50+6
	y = Sin 3x
	O -50-3
	y = -sin 3x x sp - 3
	50+3 50-3
	AL Stylesister
	$y = -\sin 3x \ (5D-3)$
	2502-9
	$y = - \left[5 D \left(\sin 3 n \right) - 3 \sin 3 x \right] = -15 \cos 3 n - 3 \sin 3 x$
	25(-9)-9 - 234
	which age was
	5 = 15 cos 3x - 3 sin 3x
	234 234
	$\frac{y}{78} = \frac{5\cos 3x}{78} - \frac{\sin 3x}{78}$
	78 78
4 6	and the same of th

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	Subject: Date:
	(n.E => y = cf + P =
	$\frac{y = c_1 e^{2x} + c_2 e^{3x} + 5 \cos 2x - \sin 3x}{18}$
7	solve (D3-D2-6D)y-(1+x2)
<u>-</u> -	$D^3 - D^2 - 6D y = 1 + x^2$
	$A \cdot E \rightarrow m^3 - m^2 - 6m = 0$
	$m(m^2-m-6)=0$
	$m(m^2-3m+2m-6)=0$
	m(m(m-3)+2(m-3)=0
	m(m+2) (m-3) = 0
	m = 0, 3, -2
	$C \cdot F = C_1 e^{0x} + C_2 e^{2x} + C_3 e^{-2x}$
	Now, we find P.I
i	4 = 1
	$\frac{y}{D^3 - D^2 - 6D}$
	9, = 1 22 2
	$-6D\left[1+\frac{D}{b}-\frac{D^2}{6}\right]$
	Alai xatil to al
	$y_{1} = \frac{1}{1 + \left[\frac{D^{2}}{6} + \frac{D}{6} \right]^{-1}}$
	60
	$y_1 = -\frac{1}{\sqrt{D}} \left[1 - \frac{D}{4} + \frac{D^2}{4} \right]$
	60 6 3
	$y_1 = -1 \left[1 + 0 + 0 \right]$
	60
	$y_1 = -\frac{1}{2} \int dx$
•	6
	$\left(\mathbf{q}_{1}=\frac{-\mathbf{n}}{2}\right) $
	6]

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Subject:

tii	42 =	×2
		D3 - D2 - 60

$$\frac{y_2}{-60\left[1-\frac{D^2}{6}+\frac{D}{6}\right]}$$

$$\frac{y_2}{-60} = \frac{x^2}{6} \left[\begin{array}{c} -1 + \left[\begin{array}{cc} 0 & 0^2 \end{array} \right] \right]^{-1}$$

$$\frac{y_2 = -1 \left[1 - D + D^2 + D^2 \right] x^2}{6D}$$

$$\frac{y_2}{6D} = \frac{-1}{6D} \left[\frac{\pi^2 - 2\pi}{6} + \frac{2}{6} + \frac{2}{36} \right]$$

$$\frac{y_2 - 1}{60} \left[\frac{x^2 - x}{3} + \frac{14}{36} \right]$$

$$\frac{y_2}{6} = -1 \left(\frac{x^2 - x}{3} + \frac{14}{36} \right) dx$$

$$\frac{y_2 = -1}{6} \left[\frac{x^3}{3} \frac{x^2}{6} + \frac{14x}{36} \right]$$

$$\frac{y_2 = -n^2 + x^2}{18 + 36} = \frac{14n}{216}$$

$$P \cdot T = y = y + y_2$$
 $P \cdot L = y = -x - x_3$

Sub	bject:	Date:
	P.I = 4 = - x3 . x2	_ 50 M
	$\frac{P \cdot J}{18} = \frac{y}{36} + \frac{x^2}{36}$	216
	*	h
_	[0.F	- 7
_	$P \cdot I = y = \frac{-x^2}{18} + \frac{x^2}{36}$	101
+		
_		
	6.E => C.F + P.I	April Lucyt
	y = (,e0x + C.e3x + C26	$\frac{1}{2x} - \frac{x^2}{x^2} - \frac{25x}{x^2}$
	100-150 %	18 30 108
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