

NAME: OMOYIBO EMEUEJEVOKE PRECIOUS

DEPARTMENT: ELECTRICAL ELECTRONICS

MATRIC NO:15/ENG04/045

SUBJECT: ENG381

OMOTIBO EMUEJIOKE PREVIOUS.

15/ENR04/045

ELECT/ELECT ENA.

ASSIGNMENT.

$$a) \frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 5y = 6\sin\theta.$$

$$\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 5y = 0$$

$$m^2 + 4m + 5 = 0$$

$$-b \pm \sqrt{b^2 - 4ac}$$

2a

$$-4 \pm \sqrt{4^2 - 4(1)(5)}$$

2(1)

$$-4 \pm \sqrt{-4}$$

2

$$-4 \pm j2$$

2

$$m = -2 \pm j$$

$$C.F. y = e^{-2\theta} (A \cos\theta + B \sin\theta)$$

$$P.I. = y = C \cos\theta + D \sin\theta.$$

$$\frac{dy}{d\theta} = -C \sin\theta + D \cos\theta$$

$$\frac{d^2y}{dx^2} = -C \cos\theta - D \sin\theta$$

$$-C \cos \theta - D \sin \theta + 4(-C \sin \theta + D \cos \theta) + 5(C \cos \theta + D \sin \theta) = 6 \sin \theta$$

$$-C \cos \theta - D \sin \theta - 4C \sin \theta + 4D \cos \theta + 5C \cos \theta + 5D \sin \theta = 6 \sin \theta$$

$$-C \cos \theta + 4D \cos \theta + 5C \cos \theta - D \sin \theta - 4C \sin \theta + 5D \sin \theta = 6 \sin \theta$$

$$C \cos \theta (-C + 4D + 5C) + \sin \theta (-D - 4C + 5D) = 6 \sin \theta$$

∴ Comparing Coefficients

$$-C + 4D + 5C = 0$$

$$-D - 4C + 5D = 6$$

$$\therefore -4D + 4C = 0 \quad \text{--- (i)}$$

$$-4C + 4D = 6 \quad \text{--- (ii)}$$

$$4D + 4C = 0$$

$$\underline{4D - 4C = 6}$$

$$0 \quad 8C = \frac{-6}{8}$$

$$C = -\frac{3}{4}$$

$$4D + 4\left(-\frac{3}{4}\right) = 0$$

$$4D + (-3) = 0$$

$$4D = 3$$

$$D = \frac{3}{4}$$

$$P.I. \quad y = -\frac{3}{4} \cos \theta + \frac{3}{4} \sin \theta$$

$$y = \frac{3}{4} (-\cos \theta + \sin \theta)$$

$$G.S = C.F + P.I$$

$$y = e^{-2t} (A \cos t + B \sin t) + \frac{1}{4} (-\cos t + \sin t)$$

$$y = e^{-2t} (A \cos t + B \sin t) + 0.75 (-\cos t + \sin t)$$

(c) Neglecting the C.F

where the model:

$$y = 0.75 (-\cos t + \sin t) = -0.75 (\cos t - \sin t)$$

from 0° to 270°

(c) Steady state value.

(2)

$$El \frac{d^4 y}{dx^4} = w (l-x)^2 \dots (1)$$

$$f.l.m^2 = 0$$

$$m^2 = 0$$

$m = 0$ twice.

$$y = e^{0x} (A + Bx)$$

$$P.f = y = Cx^2 + Dx^3 + Ex^4$$

$$\frac{dy}{dx} = 2Cx + 3Dx^2 + 4Ex^3$$

$$\frac{d^2 y}{dx^2} = 2C + 6Dx + 12Ex^2$$

Substituting into eqn (1)

$$El (2C + 6Dx + 12Ex^2) = w/2 (l-x)^2$$

$$El (2C + 6Dx + 12Ex^2) = w/2 (l^2 - 2lx + x^2)$$

Equating both sides:

$$El2C = wL^2/2$$

$$C = \frac{wL^2}{2} \neq \frac{wL^2}{4}$$

$$C = \frac{wL^2}{4}$$

$$EI \delta d = -2Lw/2$$

$$d = -2Lw/2EI \cdot 6 = -wL/6EI$$

$$EI \delta z = w/2$$

$$e = w/24EI$$

$$P.f = y = \left[\frac{wL^2}{4EI} \right] x^2 + \left[\frac{-wL}{6EI} \right] x^3 + \left[\frac{w}{24EI} \right] x^4$$

$$y = \frac{wL^2 x^2 \cdot 6 - 4wLx^3 + wx^4}{24EI}$$

When $y=0$ $x=0$

$$0 = A + B(0) + w/24EI(0)$$

$$A = 0$$

$$\frac{dy}{dx} = B + \frac{w}{24EI} (12L^2x - 12Lx^2 + 4x^3)$$

When $\frac{dy}{dx} = 0$ $x=0$

$$0 = B + w(0)$$

$$24EI$$

$$B = 0$$

$$C.S = y = 0 + 0 + \frac{w}{24EI} (6L^2x^2 - 4Lx^3 + x^4)$$

$$y = \frac{w}{24EI} (6L^2x^2 - 4Lx^3 + x^4)$$

When $x = L$

$$y = \frac{w}{24EI} (6L^2(L)^2 - 4L(L)^3 + (L)^4)$$

$$y = \frac{w}{24EI} (6L^4 - 4L^4 + L^4)$$

$$y = \frac{w}{24EI} 3L^4$$

$$y = \frac{3wL^4}{24EI}$$

$$y = \frac{wL^4}{8EI} .$$



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Close

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	y	e															
2		0	-0.75														
3		1	0.225877														
4		2	0.994083														
5		3	0.848334														
6		4	-0.07737														
7		5	-0.93194														
8		6	-0.92969														
9		7	-0.07269														
10		8	0.851144														
11		9	0.992437														
12		10	0.221288														
13		11	-0.75331														
14		12	-1.03532														
15		13	-0.36546														
16		14	0.640403														
17		15	1.057482														
18		16	0.502317														
19		17	-0.51468														
20		18	-1.05848														
21		19	-0.62912														
22		20	0.378647														
23		21	1.038289														
24		22	0.743332														
25		23	-0.23504														
26		24	-0.99732														

Chart1 Sheet1

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
25		23	-0.23504														
26		24	-0.99732														
27		25	-0.84267														
28		26	0.086729														
29		27	0.936386														
30		28	0.925134														
31		29	0.063318														
32		30	-0.85671														
33		31	-0.98909														
34		32	-0.2121														
35		33	0.759891														
36		34	1.03324														
37		35	0.356632														
38		36	-0.64786														
39		37	-1.05671														
40		38	-0.49403														
41		39	0.522864														
42		40	1.059038														
43		41	0.621537														
44		42	-0.3874														
45		43	-1.04017														
46		44	-0.73661														
47		45	0.244186														
48		46	1.000475														
49		47	0.836931														
50		48	-0.09608														

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
50	48	-0.09608															
51	49	-0.94076															
52	50	-0.92051															
53	51	-0.05394															
54	52	0.862214															
55	53	0.985656															
56	54	0.202891															
57	55	-0.76641															
58	56	-1.03108															
59	57	-0.34778															
60	58	0.655269															
61	59	1.055864															
62	60	0.485702															
63	61	-0.53101															
64	62	-1.05952															
65	63	-0.61391															
66	64	0.396127															
67	65	1.041962															
68	66	0.729822															
69	67	-0.25331															
70	68	-1.00355															
71	69	-0.83113															
72	70	0.105429															
73	71	0.945058															
74	72	0.915805															
75	73	0.044566															

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Which file do I want to save? Close

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
76	74	-0.86765															
77	75	-0.98215															
78	76	-0.19367															
79	77	0.772871															
80	78	1.028836															
81	79	0.338894															
82	80	-0.66263															
83	81	-1.05493															
84	82	-0.47734															
85	83	0.539118															
86	84	1.05991															
87	85	0.606226															
88	86	-0.40482															
89	87	-1.04368															
90	88	-0.72298															
91	89	0.262419															
92	90	1.006553															
93	91	0.825266															
94	92	-0.11477															
95	93	-0.94928															
96	94	-0.91103															
97	95	-0.03518															
98	96	0.873014															
99	97	0.978566															
100	98	0.18443															
101	99	-0.77927															

Chart1 Sheet1

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