

December
TUESDAY

PH3105
PS-2

26

360.005 • WK 52

2017

AMIT PRATAR
18MS175

FEB 2017		
	13	27
	14	28
1	15	29
2	16	30
3	17	
4	18	
5	19	
M	6	20
T	7	21
W	8	22
T	9	23
F	10	24
S	11	25
S	12	26

$$1) (a) \frac{dy}{dt} = -1000y + 3000 - 2000e^{-t}$$

$$\Rightarrow \frac{dy}{dt} + 1000y = 3000 - 2000e^{-t}$$

$$\text{I.F.} = e^{\int 1000 dt} = e^{1000t}$$

$$y e^{1000t} = \int (3000 - 2000e^{-t}) e^{1000t} dt$$

$$\Rightarrow y e^{1000t} = \int (3000 e^{1000t} - 2000 e^{999t}) dt$$

$$\Rightarrow y e^{1000t} = \frac{3000}{1000} e^{1000t} - \frac{2000}{999} e^{999t} + C$$

$$\Rightarrow 0 = 3 - \frac{2000}{999} + C$$

$$\Rightarrow C = \frac{2000}{999} - 3$$

$$\Rightarrow C = -0.99799$$

$$y(x) = -0.99799 e^{-1000t} - 2002 e^{-t} + 3$$