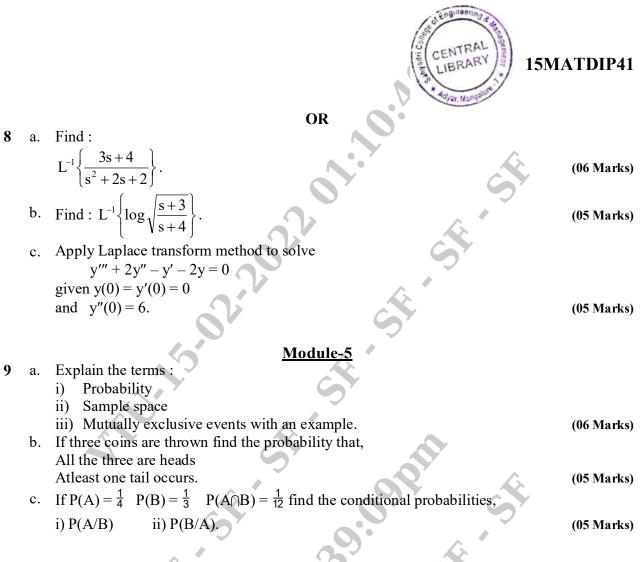




15MATDIP41

OR

4	a.	Solve $\frac{d^2y}{dx^2} - \frac{3dy}{dx} + 2y = e^{4x}$.	(06 Marks)
		Solve $\frac{d^2y}{dx^2} - \frac{4dy}{dx} + 4y = e^{2x} \cos x$	(05 Marks)
	c.	Solve by the method of variation of parameters, $\frac{d^2y}{dx^2} + 4y = tan(2x)$.	(05 Marks)
		Module 3	
5	a.	Find Laplace transform of $f(t) = 6 + \frac{Module-3}{e^{3t} + sin(4t)} + cos(6t) + t^4$.	(06 Marks)
		Find $L\left\{\int_{0}^{t} \sin(4t)dt\right\}$ applying Laplace transforms of integrals rule.	(05 Marks)
	c.	If $f(t) = \begin{cases} t^2 & 0 < t < 2 \\ = t & t > 2 \end{cases}$	
		Express f(t) interms of unit step function and hence find the Laplace transform.	(05 Marks)
6	a.	Find L.T. of:	
	1	i) $\sin(5t) \cos(2t)$ ii) $\cos^2(3t)$.	(06 Marks)
	b.	Apply rule of transforms derivatives to find $L\{f'(t)\}\$ for $f(t) = \cos t$ where $f'(t) = c$	
	c.	f(t). Find the Laplace transform of the periodic function :	(05 Marks)
		$f(t) = E \sin(\omega t) \qquad 0 < t < \frac{\pi}{\omega}$ $= 0 \qquad \frac{\pi}{\omega} < t < \frac{2\pi}{\omega}$	(05 Marks)
-		<u>Module-4</u>	
/	a.	Find inverse Laplace transform : $\frac{1}{s^{3/2}} - \frac{2s}{s^2 + 64} + \frac{10}{s^2 - 100} + \frac{1}{s + 8} + \frac{1}{s}.$ Even	(06 Marks)
	b.	Find :	
		$L^{-1}{\bar{f}(s)}$ if $\bar{f}(s) = \frac{1}{s(s-1)(s-2)}$.	(05 Marks)
	c.	Solve using Laplace transforms :	
		$\frac{dx}{dt} + 5x - 2y = t$ $\frac{dy}{dt} + 2x + y = 0$	
		Given $x = 0$, $y = 0$ at $t = 0$.	(05 Marks)
		2 of 3	



OR

- 10 a. For any, two events A and B state the 'law of addition' of probabilities. Also for two independent events A and B state the 'law of multiplication' of probabilities. (06 Marks)
 - b. If three persons hit a target with probabilities $P(A) = \frac{1}{2} P(B) = \frac{1}{3} P(C) = \frac{1}{4}$. Find the probability that, i) All hit the target ii) Target not hit. (05 Marks)
 - c. In a bolt factory three machines A, B, C produce 20%, 30% and 50% of the total output and of their outputs 5%, 4%, 3% are defective respectively. If a bolt is chosen randomly and found defective, find the probability that bolt was manufactured by machine A. (05 Marks)