

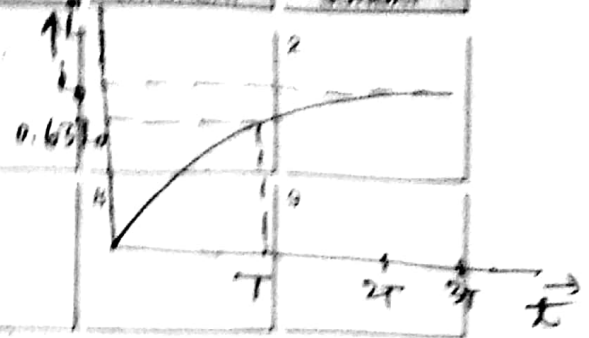
GROWTH & DECAY OF CURRENTS

IN L-R CIRCUITS

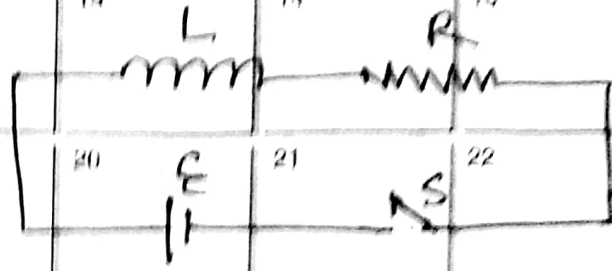
W. 11. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.

TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY

$L =$ Inductance
 $R =$ Resistance



GROWTH OF CURRENT



$L =$ Inductance
 $R =$ Resistance
 $E =$ e.m.f.
 $S =$ Switch

The current at any instant is given by

$$I = I_0 \left(1 - e^{-\frac{R}{L}t} \right)$$

May
 Saturday
 122-244

01
 WEEK 13

Where,

$I =$ instantaneous current,

$I_0 =$ maximum current $\left(\frac{E}{R} \right)$ or steady current.

$R =$ Resistance, L inductance as $\frac{L}{R} =$ time constant

If $t = \frac{L}{R}$, then $\frac{R}{L} = \frac{1}{t}$

$$I = I_0 (1 - e^{-1}) = I_0 \left(1 - \frac{1}{2.718} \right)$$

$$= 0.632 I_0$$

Therefore, time constant $\left(\frac{L}{R} \right)$ of a circuit may be defined as the time taken by the current to grow from zero to 0.632 times the maximum value of the final steady value.

M	T	W	T	F	S	S	M	T	W	T	F	S	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31											