

## NUMERICAL 10TH

### CHAPTER # 10

$$T = 2s \quad \boxed{10.1}$$

$$g_e = 10m/s$$

$$g_m = g_e/6 = 10/6 = 1.67m/s$$

$$L = ?$$

$$T = 2\pi\sqrt{l/g}$$

$$T^2 = [2\pi\sqrt{l/g}]^2$$

$$T^2 = 4\pi^2 \times L/g$$

$$L = T^2 \times g / 4\pi^2$$

زمین کے لیے لمبائی

$$L = (2)^2 \times 10 / 4 \times (3.14)^2$$

$$= 10 / 9.8596$$

$$= 1.02m$$

چاند کے لیے لمبائی

$$L = (2)^2 \times 1.67 / 4 \times (3.14)^2$$

$$= 1.67 / 9.8596$$

$$= 0.17m$$

$$L = 0.99m \quad \boxed{10.2}$$

$$T = 4.9s$$

$$T = 2\pi\sqrt{l/g}$$

$$T^2 = [2\pi\sqrt{l/g}]^2$$

$$T^2 = 4\pi^2 \times L/g$$

$$g = 4\pi^2 \times L / T^2$$

$$= 4(3.14)^2 \times 0.99 / (4.9)^2$$

$$= 4(9.8596)(0.99) / 24.01$$

$$g = 1.63m/s^2$$

$$L = 1m \quad \boxed{10.3}$$

$$g_e = 10m/s$$

$$g_m = 1.67m/s$$

$$T = 2\pi\sqrt{l/g}$$

زمین کی سطح پر قائم بیریڈ

$$T = 2(3.14)\sqrt{1/10}$$

$$= 6.28\sqrt{0.1} = 2s$$

چاند کی سطح پر قائم بیریڈ

$$T = 2(3.14)\sqrt{1/1.6}$$

$$= 6.28\sqrt{0.598}$$

$$= 4.9s$$

$$T = 2s \quad \boxed{10.4}$$

$$g = 10m/s^2$$

$$L = T^2 \times g / 4\pi^2$$

$$= (2)^2 \times 10 / 4 \times (3.14)^2$$

$$L = 1.02m$$

$$t = 20s \quad \boxed{10.5}$$

$$= n = 100$$

$$\lambda = 6cm = 0.06m$$

$$f = \text{وقت / دیویز کی تعداد} = n/t$$

$$f = 100/20 = 5Hz$$

$$T = 1/f$$

$$= 1/5 = 0.2s$$

$$V = f\lambda$$

$$= 5 \times 0.06 = 0.3m/s$$

$$f = 12Hz \quad \boxed{10.6}$$

$$\lambda = 3cm = 0.03m$$

$$V = f\lambda$$

$$= 12 \times 0.03 = 0.36m/s$$

$$f = 190Hz \quad \boxed{10.7}$$

$$S = 90m$$

$$t = 0.5s$$

$$(a) T = 1/f$$

$$T = 1/190 = 0.005s$$

$$(b) V = S/t$$

$$V = 90/0.5 = 180m/s$$

$$(c) \lambda = V/f$$

$$\lambda = 180/190 = 0.95m$$

$$f = 4.8Hz \quad \boxed{10.8}$$

$$\lambda = 6cm = 0.06m$$

$$(a) V = f\lambda$$

$$V = 4.8 \times 0.06$$

$$= 0.29m/s$$

$$(b) T = 1/f$$

$$T = 1/4.8 = 0.21s$$

$$f = 5Hz \quad \boxed{10.9}$$

$$\lambda = 40mm$$

$$= 40 \times 10^{-3}m$$

$$S = 80cm = 0.8m$$

$$V = f\lambda$$

$$= 5 \times 40 \times 10^{-3}$$

$$= 0.2m/s$$

$$t = S/V \quad (S=Vt)$$

$$= 0.8/0.2 = 4s$$

$$f = 90MHz \quad \boxed{10.10}$$

$$= 90 \times 10^6 Hz$$

$$V = 3 \times 10^8 m/s$$

$$\lambda = V/f$$

$$= 3 \times 10^8 / 90 \times 10^6$$

$$= 3.33m$$

### CHAPTER # 11

$$I = 3 \times 10^{-6} W/m^2 \quad \boxed{11.1}$$

$$I_0 = 10^{-12} W/m^2$$

$$S.L = 10 \log I / I_0 \text{ (dB)}$$

$$= 10 \log (3 \times 10^{-6} / 10^{-12})$$

$$= 10 \log (3 \times 10^6)$$

$$= 10 [\log 3 + \log 10^6]$$

$$= 10 [\log 3 + 6 \log 10]$$

$$= 10 [0.4771 + 6(1)]$$

$$= 64.771 = 64.8dB$$

$$(b) S.L = 100dB$$

$$S.L = 10 \log I / I_0 \text{ (dB)}$$

$$100 = 10 \log I / 10^{-12}$$

$$10 = \log I / 10^{-12}$$

$$10^{10} = I / 10^{-12}$$

$$10^{10} \times 10^{-12} = I$$

$$10^{-2} = I$$

$$I = 0.01 W/m^2$$

$$S.L = 80dB \quad \boxed{11.2}$$

$$I_0 = 10^{-12} W/m^2$$

$$S.L = 10 \log I / I_0 \text{ (dB)}$$

$$80 = 10 \log I / 10^{-12}$$

$$8 = \log I / 10^{-12}$$

$$10^8 = I / 10^{-12}$$

$$10^8 \times 10^{-12} = I$$

$$I = 10^{-4} W/m^2$$

$$V = 330m/s \quad \boxed{11.3}$$

$$\lambda = 5cm = 0.05m$$

$$V = f\lambda$$

$$330 = f \times 0.05$$

$$f = 330/0.05$$

$$= 6.6 \times 10^3 Hz$$

قابل سماعت ہے

$$n = 72 \quad \boxed{11.4}$$

$$t = 60s$$

$$(a) f = n/t$$

$$= 72/60 = 1.2Hz$$

$$(b) T = 1/f$$

$$= 1/1.2 = 0.83s$$

$$T = 1.5s \quad \boxed{11.5}$$

$$t = 1.5/2 = 0.75s$$

$$V = 1500m/s$$

$$S = Vt$$

$$= 1500 \times 0.75$$

$$= 1125m$$

$$T = 5s \quad \boxed{11.6}$$

$$t = 5/2 = 2.5s$$

$$V = 346m/s$$

$$S = Vt$$

$$= 346 \times 2.5$$

$$= 865m$$

$$T = 3.42s \quad \boxed{11.7}$$

$$t = 3.42/2 = 1.71s$$

$$V = 1531m/s$$

$$S = Vt$$

$$= 1531 \times 1.71$$

$$= 2618m$$

$$V = 343m/s \quad \boxed{11.8}$$

$$f = 20000Hz$$

$$(a) V = f\lambda$$

$$343 = 20000 \times \lambda$$

$$\lambda = 343/20000$$

$$\lambda = 1.7 \times 10^{-2}m$$

$$(b) V = f\lambda$$

$$343 = 20 \times \lambda$$

$$\lambda = 343/20 = 17.2m$$

$$f = 2kHz \quad \boxed{11.9}$$

$$= 2000Hz$$

$$\lambda = 35cm = 0.35m$$

$$S = 1.5km = 1500m$$

$$V = f\lambda$$

$$= 2000 \times 0.35$$

$$= 700m/s$$

$$t = S/V \quad (S=Vt)$$

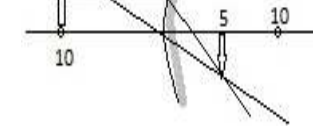
$$= 1500/700 = 2.1s$$

### CHAPTER # 12

$$p = 10cm \quad \boxed{12.1}$$

$$q = -5cm$$

انج مر کے پیچھے



$$1/f = 1/p + 1/q$$

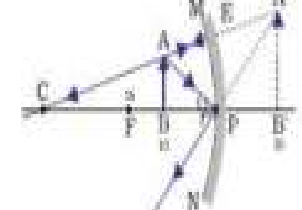
$$= 1/10 + 1/(-5)$$

$$f = -10cm \quad (\text{div-m})$$

$$O = 30cm \quad \boxed{12.2}$$

$$p = 10.5cm$$

$$f = 16cm$$



$$1/f = 1/p + 1/q$$

$$1/16 = 1/10.5 + 1/q$$

$$1/q = 1/16 - 1/10.5$$

$$= (10.5 - 16) / 16 \times 10.5$$

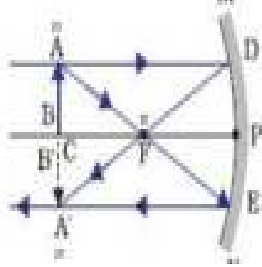
$$1/q = -168/5.5$$

$$q = 30.54cm \quad (\text{con-m})$$

$$I/O = q/p$$

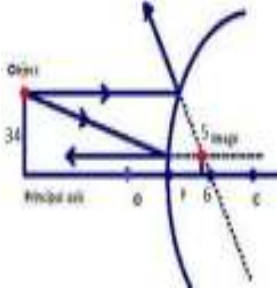
$$I/30 = 30.54/10.5$$

$I = 87.26\text{cm}$   
 $p = 20\text{cm}$  12.3  
 $I/O = q/p$   
 $I/I = q/p$   
 $1 = q/p$   
 $q = p = 20\text{cm}$



$1/f = 1/p + 1/q$   
 $= 1/20 + 1/20$   
 $f = 10\text{cm}$

$p = 34.4\text{cm}$  12.4  
 $q = -5.66\text{cm}$  (div-m)



$1/f = 1/p + 1/q$   
 $= 1/34.4 + 1/(-5.66)$   
 $= (5.66 - 34.4)/34.4 \times 5.66$   
 $f = -194.7/28.74$   
 $= -6.77\text{cm}$  (div-m)

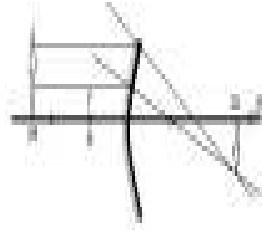
$f = -13.5\text{cm}$  12.5  
 $q = -11.5\text{cm}$



$1/f = 1/p + 1/q$   
 $1/(-13.5) = 1/p + 1/(-11.5)$   
 $1/p = 1/11.5 - 1/13.5$   
 $= (13.5 - 11.5)/11.5 \times 13.5$   
 $p = 155.25/2$   
 $= 77.62\text{cm}$

$f = -8.70\text{cm}$  12.6  
 $O = 13.2\text{cm}$   
 $p = 19.3\text{cm}$   
 $p = 2p = 2(19.3)$

$= 38.4\text{cm}$

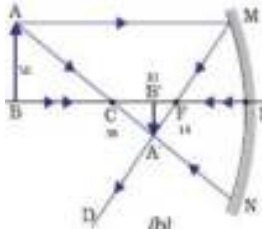


$1/f = 1/p + 1/q$   
 $1/(-8.70) = 1/19.3 + 1/q$   
 $1/q = 1/8.70 + 1/19.3$   
 $= (19.3 - 8.70)/8.70 \times 19.3$   
 $q = 167.91/10.6$   
 $= 15.84$

**(b)**  $I/O = q/p$   
 $I/13.2 = 16.84/19.3$   
 $I = 10.8\text{cm}$

**(c)**  $I/O = q/p$   
 $I/13.2 = 15.84/38.4$   
 $I = 5.42\text{cm}$

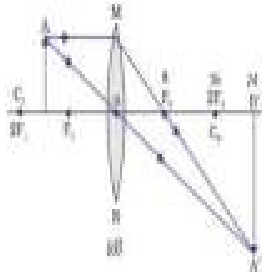
$R = 38\text{cm}$  12.7  
 $f = R/2 = 38/2$   
 $= 19\text{cm}$   
 $p = 50\text{cm}$



$1/f = 1/p + 1/q$   
 $1/19 = 1/50 + 1/q$   
 $1/q = 1/19 - 1/50$   
 $= (50 - 19)/19 \times 50$   
 $q = 950/31$   
 $= 30.64\text{cm}$

انچ سیدھی ہوگی

$O = 4\text{cm}$  12.8  
 $p = 12\text{cm}$   
 $f = 8\text{cm}$

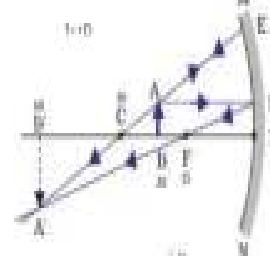


$1/f = 1/p + 1/q$   
 $1/8 = 1/12 + 1/q$

$1/q = (6-4)/48$   
 $q = 24\text{cm}$   
**(b)**  $I/O = q/p$   
 $I/4 = 24/12$   
 $I = 8\text{cm}$

انچ، ریل، الٹی، بڑی

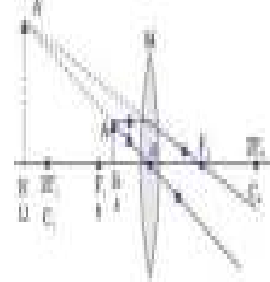
$O = 10\text{cm}$  12.9  
 $p = 20\text{cm}$   
 $f = -15\text{cm}$



$1/f = 1/p + 1/q$   
 $1/(-15) = 1/20 + 1/q$   
 $1/q = (-4-3)/60$   
 $q = -8.75\text{cm}$   
 $I/O = q/p$   
 $I/10 = 8.75/20$   
 $I = 4.28\text{cm}$

انچ، درچوئک، سیدھی، بڑی

$f = 6\text{cm}$  12.10  
 $q/p = 3/1$   
 $q = 3p = -3p$



$1/f = 1/p + 1/q$   
 $1/6 = 1/p + 1/(-3p)$   
 $p = 4\text{cm}$

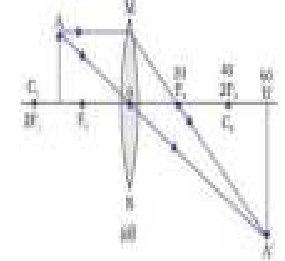
$\theta = 35^\circ$  12.11  
 $n = 1.25$

**(a)**  $n = \text{Sin}i/\text{Sin}r$   
 $1.25 = \text{Sin}35^\circ/\text{Sin}r$   
 $\text{Sin}r = 0.57/1.25$   
 $\text{Sin}r = 0.45$   
 $r = \text{Sin}^{-1}(0.45)$   
 $r = 27.32^\circ$

**(b)**  $n = \text{Sin}i/\text{Sin}r$   
 $1.25 = \text{Sin}e/\text{Sin}90^\circ$

$\text{Sin}e = \text{Sin}90^\circ/1.25$   
 $\text{Sin}e = 0.80$   
 $e = \text{Sin}^{-1}(0.80)$   
 $= 53.13^\circ$

$P = 5D$  12.12  
 $f = 1/P$   
 $= 1/5 = 0.2\text{m}$   
 $f = 20\text{cm}$   
 $q/p = 2/1$   
 $q = 2p$



$1/f = 1/p + 1/q$   
 $1/20 = 1/p + 1/2p$   
 $p = 30\text{cm}$

### CHAPTER # 13

$Q = 100\mu\text{C}$  13.1  
 $= 100 \times 10^{-6}\text{C} = 10^{-4}\text{C}$   
 $e^- = 1.6 \times 10^{-19}\text{C}$   
 $n = Q/e$  ( $Q = ne$ )  
 $= 10^{-4}/1.6 \times 10^{-19}$   
 $= 0.625 \times 10^{-4+19}$   
 $n = 6.25 \times 10^{14}$

$q_1 = 10\mu\text{C}$  13.2  
 $= 10 \times 10^{-6}\text{C} = 10^{-5}\text{C}$   
 $q_2 = 5\mu\text{C} = 5 \times 10^{-6}\text{C}$   
 $r = 150\text{cm} = 1.5\text{m}$   
 $k = 9 \times 10^9 \text{Nm}^2/\text{C}^2$   
 $F = kq_1q_2/r^2$   
 $= 9 \times 10^9 \times 10^{-5} \times 5 \times 10^{-6}$   
 $= (1.5)^2$

$= 45 \times 10^{9-5-6}/2.25$   
 $F = 20 \times 10^{-2} = 0.2\text{N}$

دفع کی فورس، مثبت چارجز

$F = 0.8\text{N}$  13.3

$r = 0.1\text{m}$   
 $k = 9 \times 10^9 \text{Nm}^2/\text{C}^2$   
 $F = kq_1q_2/r^2$   
 $0.8 = 9 \times 10^9 \times q^2/(0.1)^2$   
 $q^2 = 0.8 \times 0.01/9 \times 10^9$   
 $= 8 \times 10^{-3}/9 \times 10^9$   
 $= 0.888 \times 10^{-12}$

$\sqrt{q^2} = \sqrt{0.888 \times (10^{-6})^2}$   
 $q = 0.942 \times 10^{-6}$   
 $= 9.42 \times 10^{-7}\text{C}$

$$F = 0.1N \quad \boxed{13.4}$$

$$r = 5cm = 0.05m$$

$$k = 9 \times 10^9 Nm^2/C^2$$

$$F = kq_1q_2/r^2$$

$$q^2 = Fr^2/k$$

$$= 0.1 \times (0.05)^2 / 9 \times 10^9$$

$$= 0.1 \times 0.0025 \times 10^{-9} / 9$$

$$q^2 = 2.8 \times 10^{-5} \times 10^{-9}$$

$$= 2.8 \times 10^{-14} C$$

Now if

$$r = 2cm = 0.02m$$

$$q^2 = 2.8 \times 10^{-14} C$$

$$F = kq_1q_2/r^2$$

$$= \frac{9 \times 10^9 \times 2.8 \times 10^{-14}}{(0.02)^2}$$

$$= (25.2/0.0004) \times 10^{9-14}$$

$$= 63000 \times 10^{-5}$$

$$F = 0.63N$$

$$V = 10^4 V \quad \boxed{13.5}$$

$$q = 100 \mu C$$

$$= 100 \times 10^{-6} = 10^{-4} C$$

$$V = W/q$$

$$10^4 = W/10^{-4}$$

$$W = 10^4 \times 10^{-4} = 10^0$$

$$W = 1J$$

$$q = +2C \quad \boxed{13.6}$$

$$V_a = 100V$$

$$V_b = 50V$$

$$W = q(V_a - V_b)$$

$$= 2(100 - 50) = 100J$$

$$V_b = 9V \quad \boxed{13.7}$$

$$Q = 0.06C$$

$$Q = CV$$

$$0.06 = 9 \times C$$

$$C = 0.06/9$$

$$= 6.67 \times 10^{-3} F$$

$$Q_1 = 0.03C \quad \boxed{13.8}$$

$$V_1 = 6V$$

$$Q_2 = 2C$$

$$C = C$$

$$Q_1/V_1 = Q_2/V_2$$

$$V_2 = Q_2 \times V_1 / Q_1$$

$$= 2 \times 6 / 0.03 = 400V$$

$$C_1 = 6 \mu C \quad \boxed{13.9}$$

$$C_2 = 12 \mu C$$

$$V = 12V$$

$$1/C_{eq} = 1/C_1 + 1/C_2$$

$$= 1/6 + 1/12 = 4 \mu C$$

سیریز میں تمام کپیسٹرز پر چارج ایک جیسا ہوگا

$$Q = C_{eq} V$$

$$= 4 \times 10^{-6} \times 12$$

$$= 48 \times 10^{-6} = 48 \mu C$$

$$V_1 = Q/C_1$$

$$= 48 \times 10^{-6} / 6 \times 10^{-6}$$

$$= 8V$$

$$V_2 = Q/C_2$$

$$= 48 \times 10^{-6} / 12 \times 10^{-6}$$

$$= 4V$$

$$C_1 = 6 \mu C \quad \boxed{13.10}$$

$$C_2 = 12 \mu C$$

$$V = 12V$$

$$C_{eq} = C_1 + C_2$$

$$= 6 + 12 = 18 \mu F$$

پیرالل میں ہر کپیسٹرز پر پوٹینشل ایک جیسا ہوگا

$$p.d = 12V$$

$$Q_1 = C_1 V$$

$$= 6 \mu \times 12 = 72 \mu C$$

$$Q_2 = C_2 V$$

$$= 12 \mu \times 12 = 144 \mu C$$

### CHAPTER # 14

$$I = 3mA \quad \boxed{14.1}$$

$$= 3 \times 10^{-3} A$$

$$t = 1 \text{ mint} = 60s$$

$$I = Q/t$$

$$3 \times 10^{-3} = Q/60$$

$$Q = 60 \times 3 \times 10^{-3}$$

$$= 180 \times 10^{-3} C$$

خٹک جلد سے کرنٹ

$$R = 100000 \Omega$$

$$V = 12V$$

$$V = IR$$

$$12 = I \times 10^5$$

$$I = 12/10^5$$

$$= 1.2 \times 10^{-4} A$$

گیلی جلد سے کرنٹ

$$R = 1000 \Omega$$

$$V = 12V$$

$$V = IR$$

$$12 = I \times 1000$$

$$I = 12/1000$$

$$= 1.2 \times 10^{-2} A$$

$$R = 10M \Omega \quad \boxed{14.2}$$

$$= 10 \times 10^6 \Omega$$

$$V = 100V$$

$$V = IR$$

$$100 = I \times 10^7$$

$$I = 100/10^7 = 1/10^5$$

$$= 1/10^2 \times 10^3$$

$$= (1/100) \times 10^{-3}$$

$$= 0.01mA$$

$$V = 10V \quad \boxed{14.3}$$

$$I = 1.5A$$

$$t = 2 \text{ mint} = 120s$$

$$R = V/I = 10/1.5$$

$$= 6.667 \Omega$$

$$W = I^2 R t$$

$$= (1.5)^2 \times 6.667 \times 120$$

$$W = 1800J$$

$$R_1 = 2k \Omega \quad \boxed{14.4}$$

$$R_2 = 8k \Omega$$

$$V = 10V$$

(a)  $R_e = R_1 + R_2$

$$= 2 + 8 = 10k \Omega$$

(b) سیریز میں ہر رزسٹنس پر کرنٹ ایک جیسا ہوگا

$$V = IR_e$$

$$10 = I \times 10 \times 10^3$$

$$I = 1 \times 10^{-3} = 1mA$$

(c)  $V_1 = IR_1$

$$= 1 \times 10^{-3} \times 2 \times 10^3$$

$$= 2V$$

$$V_2 = IR_2$$

$$= 1 \times 10^{-3} \times 8 \times 10^3$$

$$= 8V$$

$$R_1 = 6k \Omega \quad \boxed{14.5}$$

$$R_2 = 12k \Omega$$

$$V = 6V$$

(a)  $1/R_e = 1/R_1 + 1/R_2$

$$= 1/6 + 1/12 = 4k \Omega$$

(b) پیرالل میں ہر رزسٹنس کے گرد پوٹینشل ایک جیسا ہوگا

$$V = 6V$$

(c)  $V = I_1 R_1$

$$6 = I_1 \times 6 \times 10^3$$

$$I_1 = 6/6 \times 10^3 = 1mA$$

$$V = I_2 R_2$$

$$6 = I_2 \times 12 \times 10^3$$

$$I_2 = 6/12 \times 10^3 = 0.5mA$$

$$V = 220V \quad \boxed{14.6}$$

$$P = 100W$$

$$\text{Hours} = 5$$

$$\text{Days} = 30$$

$$t = 5 \times 30 = 150h$$

$$P = VI = V(V/R)$$

$$P = V^2/R$$

$$100 = (220)^2/R$$

$$R = 48400/100$$

$$= 484 \Omega$$

$$E = P \times \text{Hours} / 1000$$

$$= 100 \times 150 / 1000$$

$$= 15kWh$$

$$P = 150W \quad \boxed{14.7}$$

$$R = 95 \Omega$$

$$P = VI = V(V/R)$$

$$P = V^2/R$$

$$150 = V^2/95$$

$$V^2 = 150 \times 95$$

$$V^2 = 14250$$

$$\sqrt{V^2} = \sqrt{14250}$$

$$V = 120V$$

بلبوں کے صرف شدہ پوٹنٹس

$$P = 10 \times 60 = 600W$$

$$t = 5 \times 30 = 150h$$

$$E_b = P \times h / 1000$$

$$= 600 \times 150 / 1000$$

$$= 90kWh \quad \boxed{14.8}$$

پتکھوں کے صرف شدہ پوٹنٹس

$$P = 4 \times 75 = 300W$$

$$t = 10 \times 30 = 300h$$

$$E_p = P \times h / 1000$$

$$= 300 \times 300 / 1000$$

$$= 90kWh$$

ٹی وی کے صرف شدہ پوٹنٹس

$$P = 1 \times 250 = 250W$$

$$t = 2 \times 30 = 60h$$

$$E_t = P \times h / 1000$$

$$= 250 \times 60 / 1000$$

$$= 15kWh$$

اسٹری کے صرف شدہ پوٹنٹس

$$P = 1 \times 1000 = 1000W$$

$$t = 2 \times 30 = 60s$$

$$E_i = P \times h / 1000$$

$$= 1000 \times 60 / 1000$$

$$= 60kWh$$

$$U_T = E_b + E_p + E_t + E_i$$

$$= 90 + 90 + 15 + 60$$

$$= 225kWh$$

نی پوٹنٹس قیمت =  $R_s = 4$

$$\text{بل} = 4 \times 225 = 1020/-$$

بلب کے کرنٹ، رزسٹنس

$$P = 100W \quad \boxed{14.9}$$

$$V = 250V$$

(a)  $P = VI$

$$100 = 250 \times I$$

$$I = 100/250 = 0.4A$$

(b)  $V = IR$

$$250 = 0.4 \times R$$

$$R = 250/0.4 = 625\Omega$$

ہیئر کے کرنٹ، رزسٹنس

$$P = 4kW = 4000W$$

$$V = 250V$$

$$(a) P = VI$$

$$4000 = 250 \times I$$

$$I = 4000/250 = 16A$$

$$(b) V = IR$$

$$250 = 16 \times R$$

$$R = 250/16 = 15.6\Omega$$

$$R = 5.6\Omega \quad [14.10]$$

$$V = 3V$$

$$I = 0.5A$$

$$(a) P_r = I^2 R$$

$$= (0.5)^2 \times 5.6$$

$$= 1.4W$$

$$(b) P_b = VI$$

$$= 3 \times 0.5$$

$$= 1.5W$$

کچھ پاور بیٹری کے اندرونی

رزسٹنس کی وجہ سے ضائع ہو جاتی

←

## CHAPTER # 15

$$V_p = 240V \quad [15.1]$$

$$V_s = 12V$$

$$N_p = 2000$$

$$N_s/N_p = V_s/V_p$$

$$N_s/2000 = 12/240$$

$$N_s = 12 \times 2000/240$$

$$= 100$$

$$N_p = 1 \quad [15.2]$$

$$N_s = 100 \quad (\text{step-up})$$

$$V_p = 20V$$

$$N_s/N_p = V_s/V_p$$

$$100/1 = V_s/20$$

$$V_s = 100 \times 20/1$$

$$= 2000V$$

$$N_p = 100 \quad [15.3]$$

$$N_s = 1 \quad (\text{step-down})$$

$$V_p = 170V$$

$$I_p = 1mA = 1 \times 10^{-3}A$$

$$N_s/N_p = V_s/V_p$$

$$1/100 = V_s/170$$

$$V_s = 1 \times 170/100$$

$$= 1.7V$$

ان پٹ پاور = آؤٹ پٹ پاور

$$V_s I_s = V_p I_p$$

$$1.7 \times I_s = 170 \times 1 \times 10^{-3}$$

$$I_s = 170 \times 10^{-3}/1.7$$

$$= 0.1A$$

$$V_p = 240V \quad [15.4]$$

$$V_s = 12V$$

$$N_p = 4000$$

$$I_s = 0.4A$$

$$N_s/N_p = V_s/V_p$$

$$N_s/4000 = 12/240$$

$$N_s = 12 \times 4000/240$$

$$= 200$$

ان پٹ پاور = آؤٹ پٹ پاور

$$V_s I_s = V_p I_p$$

$$12 \times 0.4 = 240 \times I_p$$

$$I_p = 12 \times 0.4/240$$

$$= 0.02A$$

$$P = 500MW \quad [15.5]$$

$$= 500 \times 10^6 W$$

$$V = 250kV$$

$$= 250 \times 10^3 V$$

$$P = VI$$

$$500 \times 10^6 = 250 \times 10^3 I$$

$$I = 500 \times 10^6 / 250 \times 10^3$$

$$= 2 \times 10^3 A$$

$$P_{gen} = 150kW \quad [15.6]$$

$$= 150 \times 10^3 W$$

$$V_{wire} = 10000V$$

$$R = 2\Omega$$

$$S = 5km = 5000m$$

تار میں پاور جزیئر کی وجہ سے

$$P_{gen} = P_{wire}$$

$$150 \times 10^3 = V_w I_w$$

$$150 \times 10^3 = 10000 \times I_w$$

$$I_w = 150 \times 10^3 / 10000$$

$$= 15A$$

تار میں ضائع ہونے والا ووٹیج یا

ووٹیج ڈراپ

$$V_d = I_w R$$

$$= 15 \times 2 = 30V$$

تار میں ضائع ہونے والی پاور

$$P_{loss} = V_d I_w$$

$$= 30 \times 15 = 450W$$

شہر کے ٹرانسمار کو تار سے جو

ووٹیج ملا

$$V_T = V_{in} - V_d$$

$$= 10000 - 30$$

$$= 9970V$$

## CHAPTER # 18

$$T_{1/2} = 7.3s \quad [18.1]$$

$$T_p = 29.2s$$

$$T_p = nT_{1/2}$$

$$29.2 = n \times 7.3$$

$$n = 29.2/7.3 = 4$$

$$N = N_0/2^n$$

$$= N_0/2^4 = N_0/16$$

سولہ واں حصہ باقی رہ جائے گا

$$T_{1/2} = 5.25Y \quad [18.2]$$

$$T_p = 26Y$$

$$T_p = nT_{1/2}$$

$$26 = n \times 5.25$$

$$n = 26/5.25 = 5$$

$$N = N_0/2^n$$

$$= N_0/2^5 = N_0/32$$

بیس واں حصہ باقی رہ جائے گا

$$T_{1/2} = 5730Y \quad [18.3]$$

$$\text{اصل مقدار} = N_0$$

$$\text{باقی مقدار} = N = N_0/8$$

$$N = N_0/2^n$$

$$N_0/8 = N_0/2^n$$

$$1/2^3 = 1/2^n$$

$$2^3 = 2^n$$

$$n = 3$$

$$T_p = nT_{1/2}$$

$$= 3 \times 5730$$

$$= 17190$$

$$= 1.7 \times 10^4 Y$$

$$T_{1/2} = 6h \quad [18.4]$$

$$T_p = 36h$$

$$T_p = nT_{1/2}$$

$$36 = n \times 6$$

$$n = 36/6 = 6$$

$$\text{اصل مقدار} = N_0$$

$$\text{باقی مقدار} = N$$

$$N = N_0/2^n$$

$$= 200/2^6$$

$$= 200/64$$

$$= 3.12mg$$

$$T_{1/2} = 10mint \quad [18.5]$$

$$\text{اصل مقدار} = N_0$$

$$= 368c/m$$

$$\text{باقی مقدار} = N = 23c/m$$

$$N = N_0/2^n$$

$$23 = 368/2^n$$

$$2^n = 368/23$$

$$2^n = 16$$

$$2^n = 2^4$$

$$n = 4$$

$$T_p = nT_{1/2}$$

$$= 4 \times 10$$

$$= 40mint$$

دو ہاف لائف کے بعد

$$T_p = 4mint \quad [18.6]$$

$$T_p = nT_{1/2}$$

$$4 = 2 \times T_{1/2}$$

$$T_{1/2} = 4/2 = 2mint$$

$$T_{1/2} = 1500Y \quad [18.7]$$

$$\text{اصل مقدار} = N_0$$

$$= 32000c/m$$

$$\text{باقی مقدار} = N = N_0/16$$

$$N = N_0/2^n$$

$$N_0/16 = N_0/2^n$$

$$16 = 2^n$$

$$2^4 = 2^n$$

$$n = 4$$

$$T_p = nT_{1/2}$$

$$= 4 \times 1500$$

$$= 6000Y$$

$$T_{1/2} = 4000Y \quad [18.8]$$

$$t = 8h$$

$$C.R = 310, 300, 280,$$

$$270, 312, 305, 290$$

کانڈریٹ میں بے ترتیبی ظاہر کرتی

ہے کہ اس کی ہاف لائف چار ہزار

بہت زیادہ ہے اور مشاہدہ کا ٹائم آٹھ

گھنٹے بہت کم ہے

$$\text{اصل مقدار} = N_0 \quad [18.9]$$

$$\text{باقی مقدار} = N = N_0/8$$

$$T_{1/2} = 5730Y$$

$$N = N_0/2^n$$

$$N_0/8 = N_0/2^n$$

$$1/8 = 1/2^n$$

$$8 = 2^n$$

$$n = 3$$

$$T_p = nT_{1/2}$$

$$= 3 \times 5730$$

$$= 17190Y$$

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