ELECTRICAL II 2025

MARKING SCHEME

1. D, A, C, B, C, A, B, A, B, C

2. E, B, C, A, G.

3. i) The positive plate is dark brown in colour.
   ii) The negative plate is dry in colour.
   iii) electrostatic
   iv) cathode
   v) anode

4. (a) $V = 5200mV = \frac{5200}{1000} = 5.2V$
   $I = 1.2kA = 1.2 \times 1000 = 1200A.$

   (i) Power consumed $= VI = 5.2 \times 1200 = 62,400W$
   $= 62.4kW.$

   (ii) Resistance of the resistor $R = \frac{V}{I} = \frac{5.2}{1200} = 0.0043\Omega.$

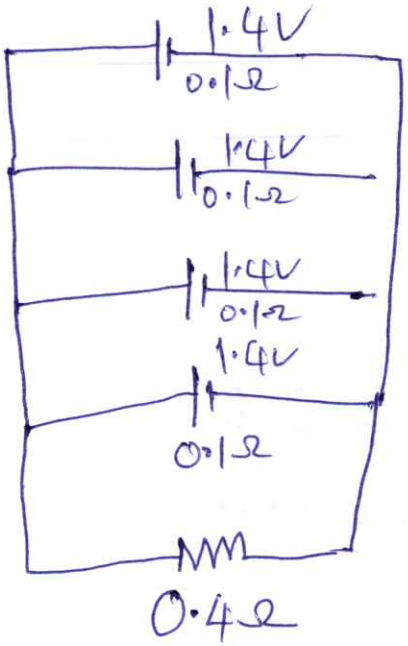
6. $R = 25\Omega$, $I = 15A$, $t = 5hrs = 5 \times 60 \times 60 = 18,000$ seconds.

   (a) Energy = Power x time
   $= VIt \quad (V = IR).$
   $= InIt$
   $= I^2Rt = (15)^2 \times 25 \times 18,000 = 101,250,000J$

   (b) Cost $= \frac{101,250,000}{3,600,000} kwh \times 30/= = Sh$
   8437.50

7 (a)

(i)



(ii) $\frac{1}{R_T} = \frac{1}{0.1} + \frac{1}{0.1} + \frac{1}{0.1} + \frac{1}{0.1}$

$\frac{1}{r_T} = \frac{1+1+1+1}{0.1}$

$\frac{1}{r_T} = \frac{4}{0.1}$

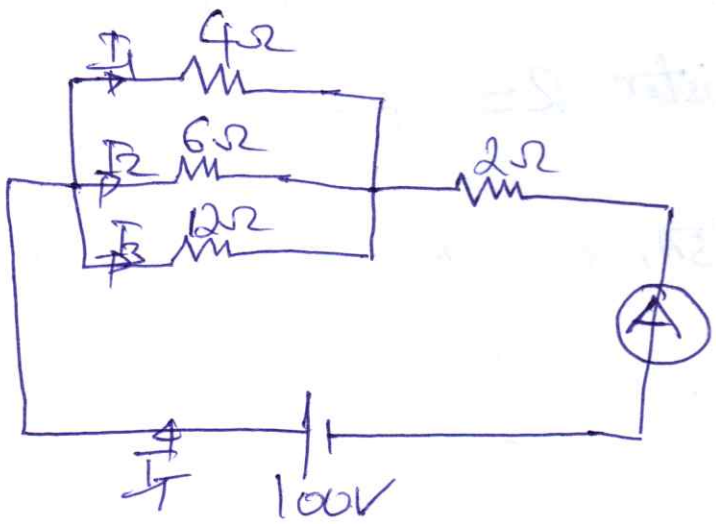
$r_T = \frac{0.1}{4} = 0.025\Omega.$

$I = \frac{Emf}{R + r_T} = \frac{1.4}{0.4 + 0.025}$

$= \frac{1.4}{0.425} = 3.29A.$

(b) $R_1 = 4\Omega, R_2 = 6\Omega, R_3 = 12\Omega, V = 100V, R_4 = 2\Omega.$

(i)



(ii) $\frac{1}{R_a} = \frac{1}{4} + \frac{1}{6} + \frac{1}{12}$

$\frac{1}{R_a} = \frac{3+2+1}{12}$

$$\frac{1}{R_a} = \frac{6}{12}$$

$$R_a = \frac{R}{6} = 2\Omega.$$

$$R_T = R_a + R_4 = 2\Omega + 2\Omega = 4\Omega.$$

$$I = \frac{V}{R_T} = \frac{100}{4} = 25A.$$

The ammeter reading will be 25A.

8. a) Battery should only charged in open ventilated areas.

b) Turn the battery charger to the off position before the charger comes in contact with the battery.

c) Connect the appropriate cable colors to the appropriate terminals.

d)

9 a) Moving coil instrument work on the Principle that a current-carrying coil experience torque when placed in a magnetic field.

As the electric current is passed through the coil, a torque acts on it, which deflects the coil.

9(b) i) Deflecting torque:

The torque needed to move the Pointer over a callibrated scale it can overcome the inertia of the moving system. ~~Controlling torque and damping torque.~~

ii) Controlling torque:

Is the torque which limits the movement of pointer and ensures that the magnitude of deflection is unique and is always same for the given value of electrical quantity to be measured.

iii) damping torque.

Is the physical process of controlling the movement of a system by providing the motion such that it oppose the natural oscillation of the system.