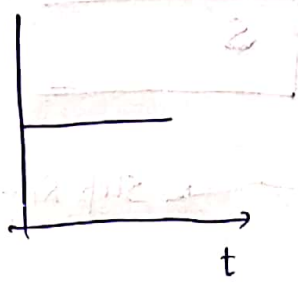
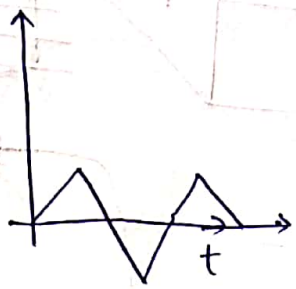
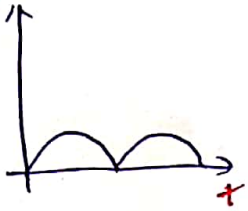
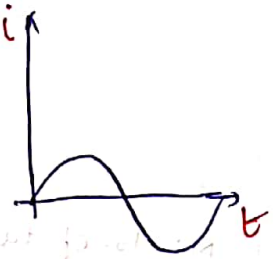
:- Alternating current :- (A.C.)

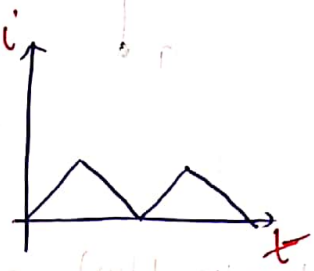
Identify whether A.C. or D.C.

(a) 

(b) 

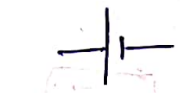
(c) 

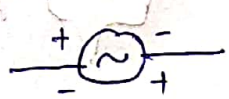
(d) 

(e) 

Alternating current / voltage ⇒ Current changes direction after a fixed time interval
or voltage changes its polarity after a fixed time interval.

D.C. (Direct Current / voltage) :⇒ Current flows in one direction
Voltages have fixed polarity

Symball :-  dc

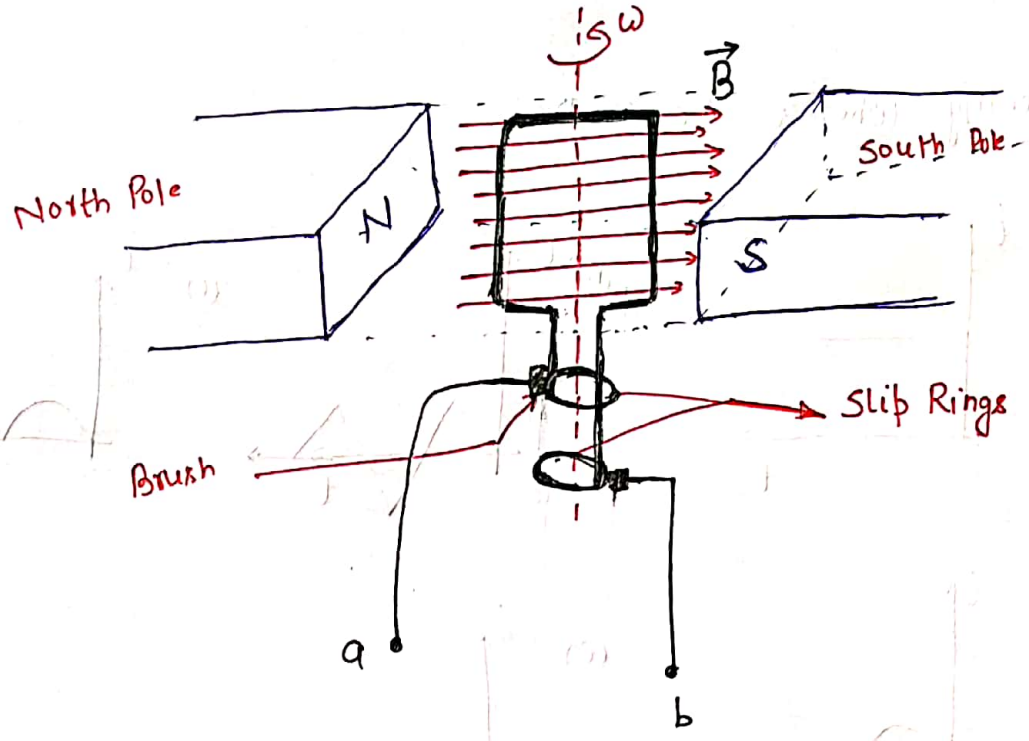
 ac

Indian System :- V_0 = Maximum Voltage = Voltage Amplitude = 230 V

$f = 50\,Hz$

US system : $V_0 = 100\,V$, $f = 60\,Hz$

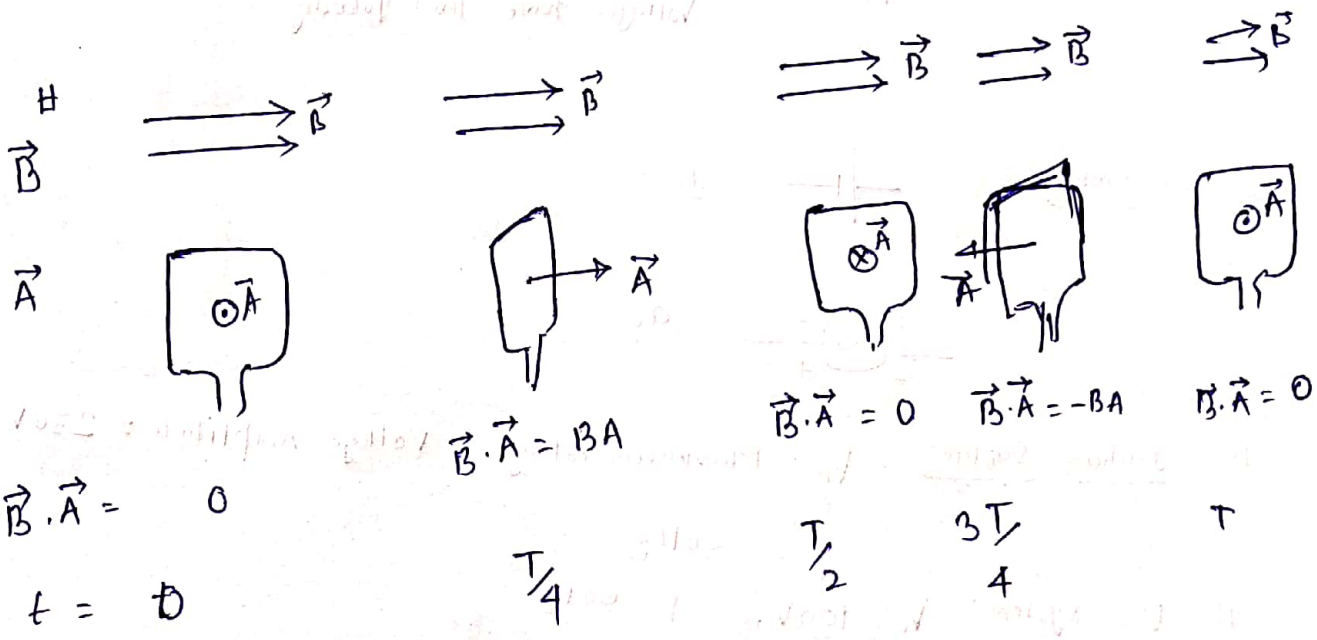
Principle of Generation of A.C.



- Φ_B (Magnetic Flux) $= N\vec{B}\cdot\vec{A}$

[N: No. of turns
$\vec{B}$: Magnetic field vector
$\vec{A}$: Area Vector]

Area Vector ($\vec{A}$) ⇒ Area is a vector quantity whose magnitude is the area of the coil while direction is perpendicular to the plane of coil (2D).



H It can be concluded ϕ_B is changing with time.

$$\phi_B = f(t)$$

H According to Principle of Electromagnetic Induction:-

$$\mathcal{E} = -N\frac{d\phi_B}{dt}$$

H $\phi_B = B A \cos\theta$

$\theta = \omega t$

$\therefore \phi_B = BA \cos(\omega t + \pi/2)$

$$\mathcal{E} = -N\frac{d\phi_B}{dt} = NBA\omega \sin(\omega t + \pi/2)$$

W $\boxed{\mathcal{E} = \mathcal{E}_0 \sin(\omega t + \pi/2)}$

ϕ | $\mathcal{E}$