



Studybeesofficial

Where Minds Pollinate

Class 12
Physics

Chapter 20

Exercise Solution

Follow Our Socials



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- motor over loading I (very large) ϵ ^{Induced emf} $\rightarrow$ very small

Numericals Ch#20

(1)

Data: $V_{rms} = ?$

$$V_0 = 300V$$

Solution $V_{rms} = \frac{V_0}{\sqrt{2}} = \frac{300}{\sqrt{2}} = \boxed{212V}$

(2)

Data: $L = 100 \times 10^{-6} H$

$$L = 10^{-4} H$$

$$I = 10 \times 10^{-3} A \Rightarrow \boxed{I = 10^{-2} A}$$

$f = ?$

ohm law:-

$$V = I (X_L) \quad \text{or } \omega L$$

$$V = I(2\pi fL)$$

$$f = \frac{V}{2\pi LI}$$

$$f = \frac{6.3}{2\pi(10^{-4})(10^{-2})}$$

$$\boxed{f = 10^6 Hz}$$

③

Data: $L = 318 \times 10^{-3} \text{ H}$

$$R = 75 \Omega$$

$$V = 150 \text{ V}$$

$$f = 50 \text{ Hz}$$

$$Z = ?$$

Sol: For RL-series circuit

$$Z = \sqrt{R^2 + X_L^2}$$

$$Z = \sqrt{R^2 + (2\pi fL)^2}$$

$$Z = 125 \Omega$$

④

Data: $R = 30 \Omega$

$$C = 79.5 \times 10^{-6} \text{ F}$$

$$f = 50 \text{ Hz}$$

$$V = 100 \text{ V}$$

$$Z = ?$$

for RC series circuit:-

$$Z = \sqrt{R^2 + X_C^2}$$

$$Z = \sqrt{R^2 + \left(\frac{1}{2\pi fC}\right)^2}$$

$$Z = \sqrt{30^2 + \frac{1}{(2 \times 3.14 \times 50 \times 79.5 \times 10^{-6})^2}}$$

$$Z = 50 \Omega$$

Short Qs.

(2)

Ques ① $\mathcal{E} = L \frac{\Delta I}{\Delta t}$

$$L = \frac{\mathcal{E}}{\frac{\Delta I}{\Delta t}} = \frac{V}{AS^{-1}} = VSA^{-1} = H$$

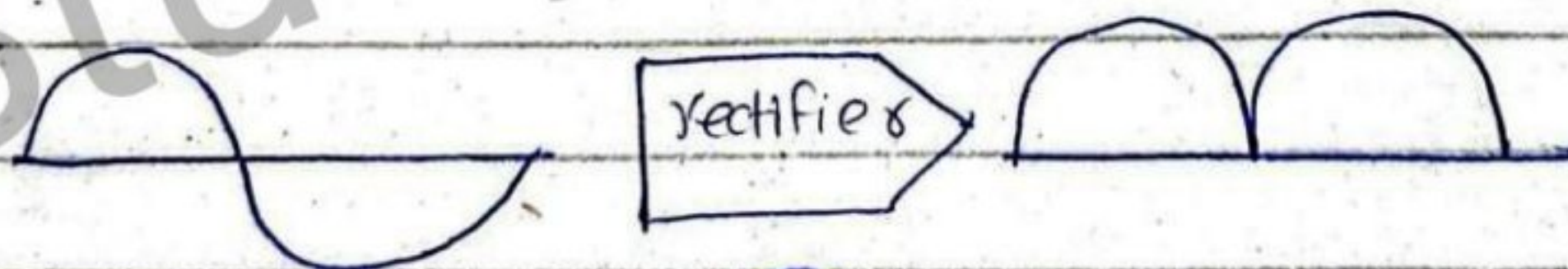
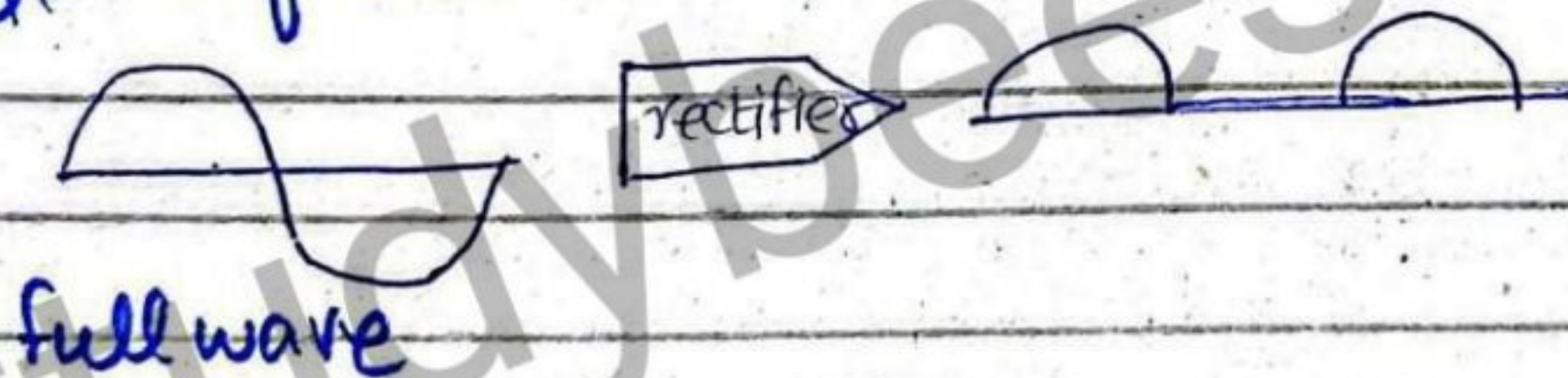
② $\mathcal{E} = M \frac{\Delta I_p}{\Delta t}$

② $\mathcal{E}_s = M \frac{\Delta I_p}{\Delta t}$

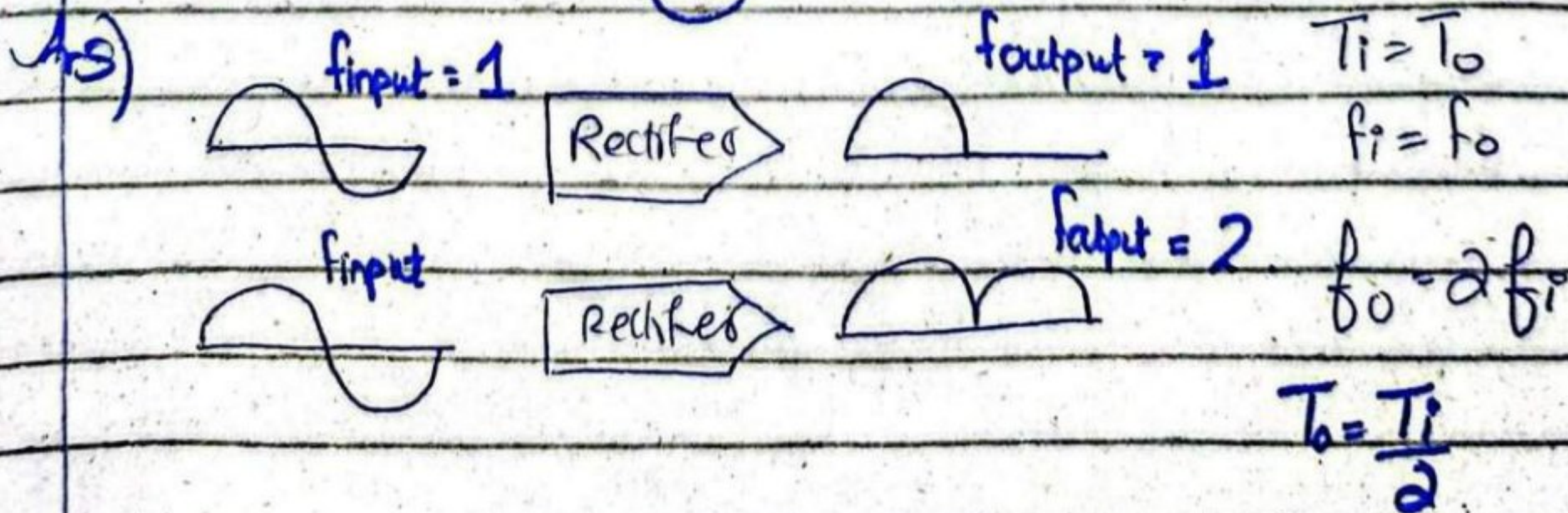
$$M = \frac{\mathcal{E}_s}{\frac{\Delta I_p}{\Delta t}} = \frac{V}{AS^{-1}} = VSA^{-1} = H$$

(5)

Ques Half wave



(6)



$$\therefore f \propto \frac{1}{T}$$