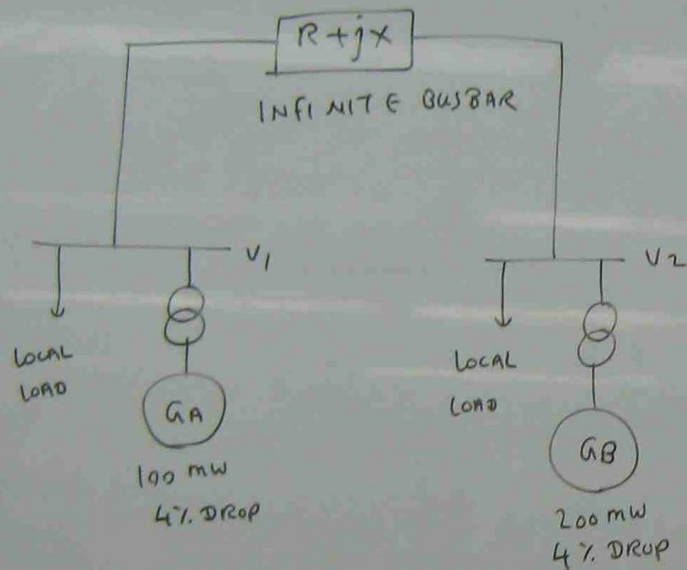
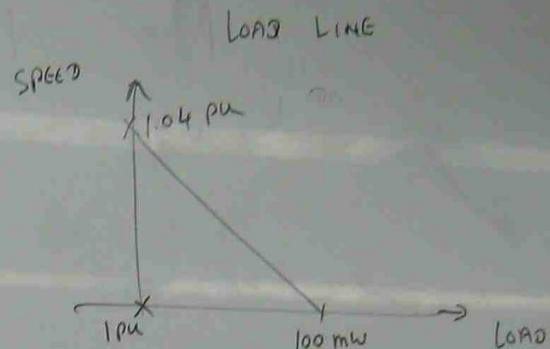


Q



FIND THE LOAD SHARING BETWEEN GENERATOR A & B TO SUPPLY 200 MW LOAD.



(A)

SPEED LOAD CHARACTERISTICS

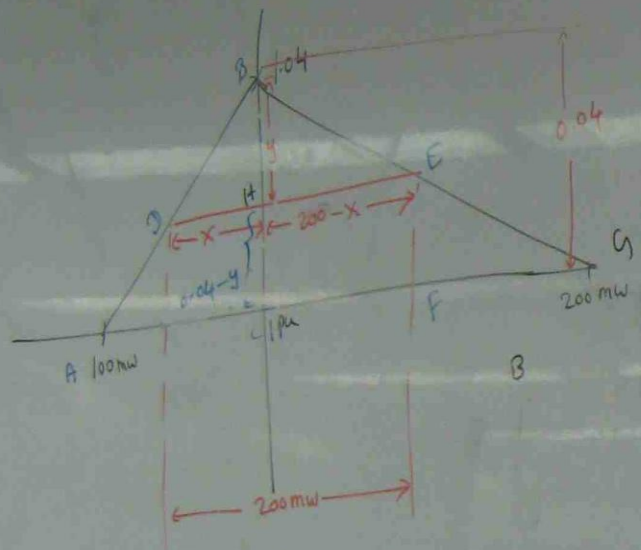
$$1.04 \text{ pu} \rightarrow 1 \text{ pu}$$

$$1700 \text{ rpm} \rightarrow 1 \text{ pu}$$

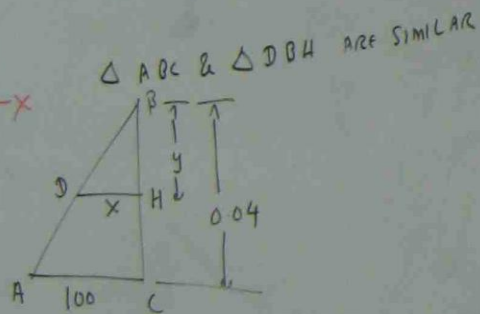
$$3400 \text{ rpm} \rightarrow 2 \text{ pu}$$

$$1000 \text{ kVA} = 1 \text{ pu}$$

$$2000 \text{ kVA} = 2 \text{ pu}$$



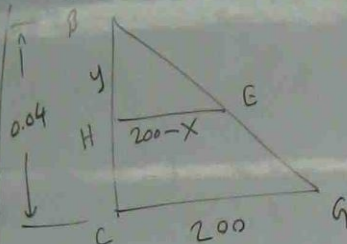
$AD = X$   
 $BD = 200 - X$



$$\frac{AC}{DH} = \frac{BC}{BH}$$

$$\frac{100}{X} = \frac{0.04}{y} \quad \text{--- (1)}$$

$\Delta BGC$  &  $\Delta BHE$  ARE SIMILAR



$$\frac{CG}{HE} = \frac{BC}{BH}$$

$$\frac{200}{200-X} = \frac{0.04}{y} \quad \text{--- (2)}$$

① & ② SAME RHS, EQUATE LHS

$$\frac{100}{X} = \frac{200}{200-X}$$

$$\frac{1}{X} = \frac{2}{200-X}$$

$$200 - X = 2X$$

$$3X = 200$$

$$X = 66.66 \text{ MW}$$

GEN (A) LOAD SHARE

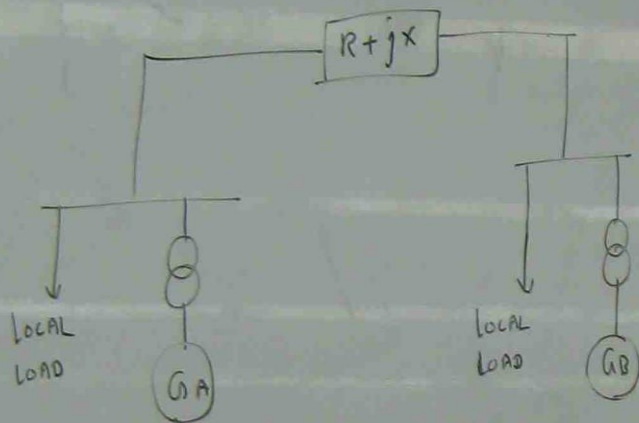
$$\text{GEN (B) LOAD} = 200 - X$$

$$= 200 - 66.66$$

$$= 133.34 \text{ MW}$$

# EXERCISE ④

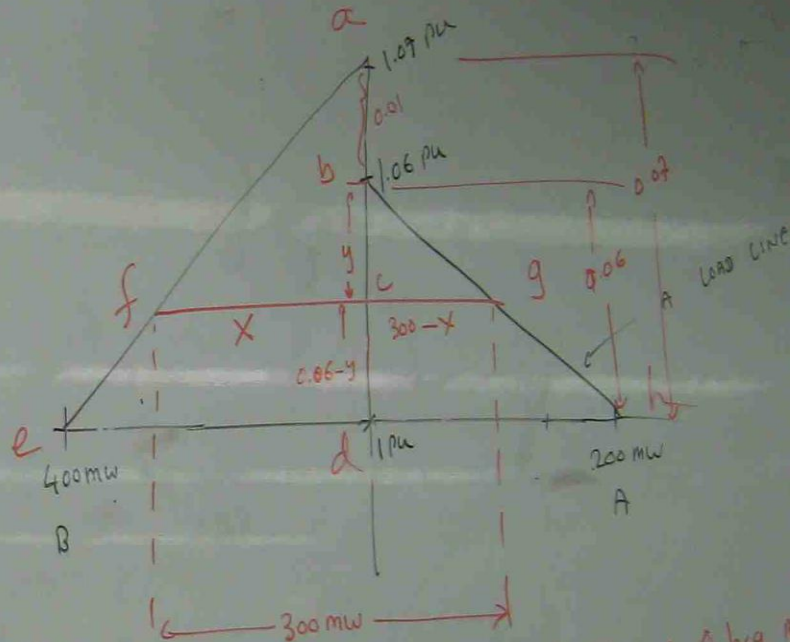
Q5



GENERATOR (A) 200 MW 6% DROP

GENERATOR (B) 400 MW 7% DROP

IF BOTH MACHINES ARE SUPPLYING 300 MW LOAD  
CALCULATE LOAD SHARE OF EACH MACHINE.



B LOAD SHARE = X

A LOAD SHARE = 300 - X

$\Delta aed$  &  $\Delta afc$  ARE SIMILAR

$$\frac{ad}{ac} = \frac{ed}{fc} \rightarrow \frac{0.07}{0.01+y} = \frac{400}{X} \quad \text{--- ①}$$

$\Delta bdh$  &  $\Delta bfg$  ARE SIMILAR

$$\frac{bd}{bc} = \frac{dh}{cy}$$

$$\frac{0.06}{y} = \frac{200}{300-X} \quad \text{--- ②}$$

~~$$\frac{0.07 \times 400}{0.01 + y}$$~~

$$0.07x = 400(0.01 + y)$$

$$0.07x = 400 \times 0.01 + 400y$$

$$0.07x = 4 + 400y$$

$$0.07x - 4 = 400y$$

$$\text{Thus } y = \frac{0.07x - 4}{400} \quad \text{--- (3)}$$

$$\text{(2) } \frac{0.06}{y} = \frac{200}{300 - x}$$

$$\frac{y}{0.06} = \frac{300 - x}{200}$$

$$y = \frac{0.06(300 - x)}{200}$$

$$y = \frac{0.06 \times 300 - 0.06x}{200}$$

$$y = \frac{18 - 0.06x}{200} \quad \text{--- (4)}$$

(3) & (4) LHS IS THE SAME, EQUATE RHS

$$\frac{0.07x - 4}{400} = \frac{18 - 0.06x}{200}$$

$$\frac{0.07x - 4}{2} = 18 - 0.06x$$

$$0.07x - 4 = 36 - 0.12x$$

$$0.07x + 0.12x = 36 + 4$$

$$0.19x = 40$$

$$x = \frac{40}{0.19} = 210 \text{ MW}$$

(R LOAD SHARE)

$$A \text{ LOAD SHARE} = 300 - x$$

$$= 300 - 210$$

$$= 90 \text{ MW}$$