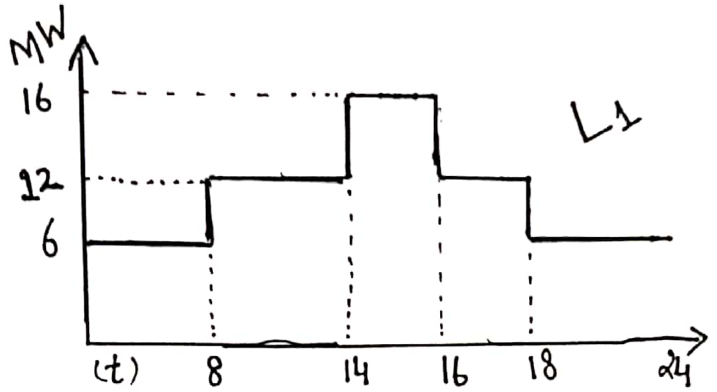
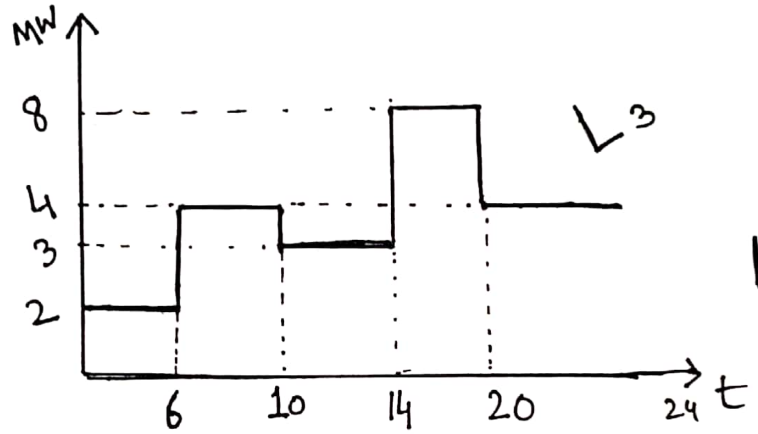
Q=1(A).



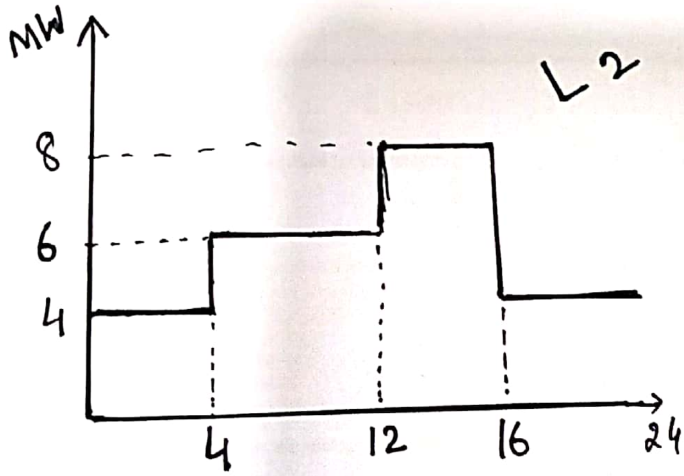
MW
16
12
6
L1
(t)
8
14
16
18
24
t


$L_1$



MW
8
4
3
2
L3
6
10
14
20
24
t

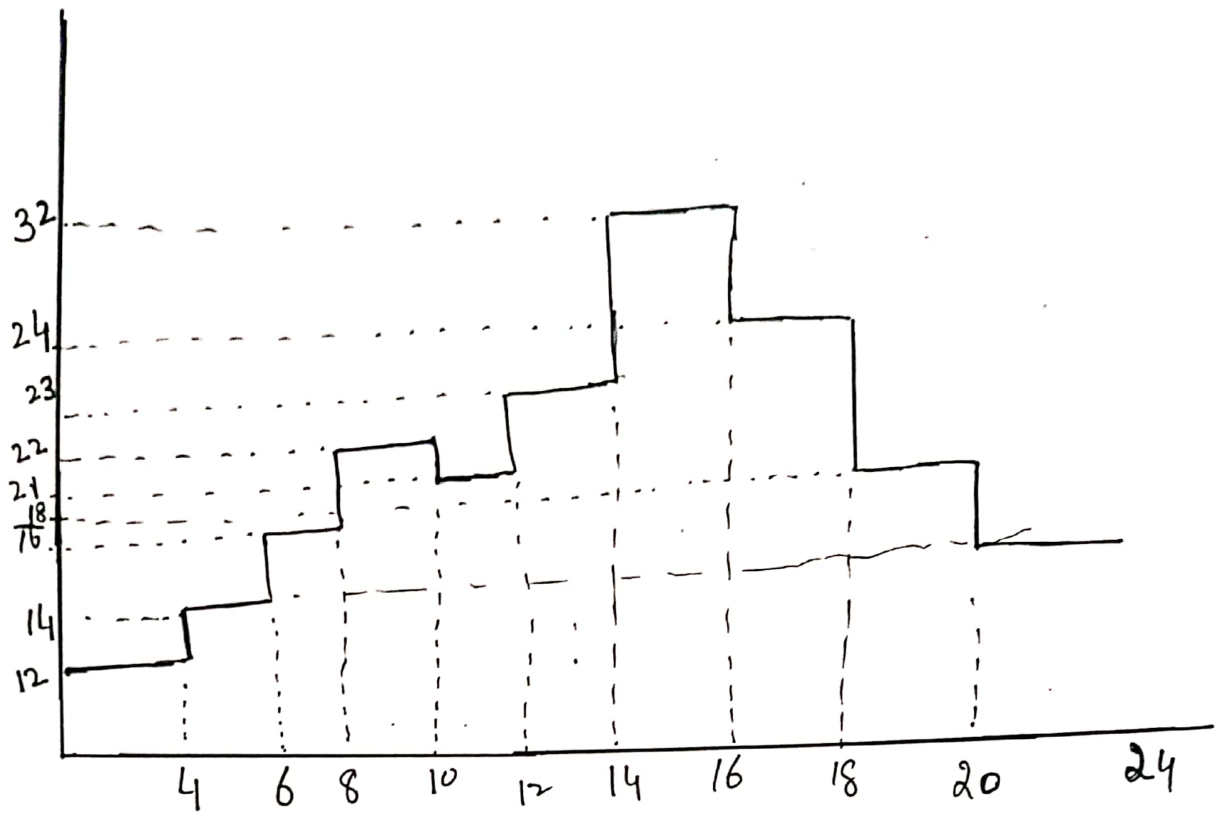

L3



MW
8
6
4
L2
4
12
16
24


$L_2$

$Q=1(A)$




Time duration:

2 | 8 – 12 ⟹ 4 MVA (D.G)
2 | 12 – 14 ⟹ 6 MVA (B.G)
2 | 14 – 16 ⟹ Load Shedding (L1)
2 | 16 – 18 ⟹ 6 MVA (B.G)

Q-1(B)

(i) PV 1

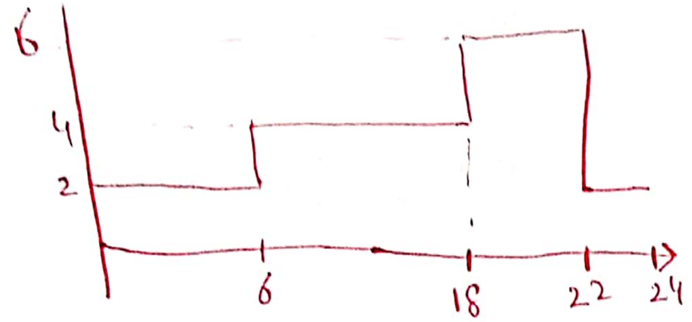
(ii) PQ 1

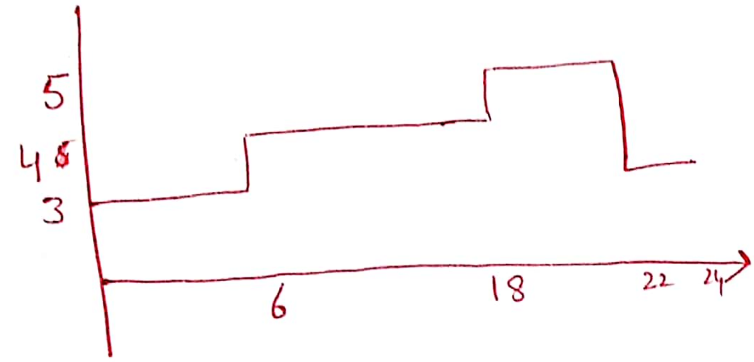
(iii) PV 1

(iv) PQ buses 1

RMU on half of Poles and RTU on half of Poles of distribution System. 2

Q-1(b)




| Load (MW) | $I = P/(\sqrt{3} \times 33 \times 10^3)$ | Losses $= I^2R$ (KW) |
|---|---|---|
| 2 | 34.99 | 6.09 |
| 3 | 52.48 | 13.77 |
| 4 | 69.98 | 24.48 |
| 5 | 87.47 | 38.25 |
| 6 | 104.97 | 55.09 |

4

Energy losses without DSI.

$$= 8 \times 6.09 + 12 \times 24.48 + 4 \times 55.09$$

$$= 562.84 \text{ kwh}$$

Energy loss with DSI

$$= 8 \times 13.77 + 12 \times 24.48 + 4 \times 38.25$$

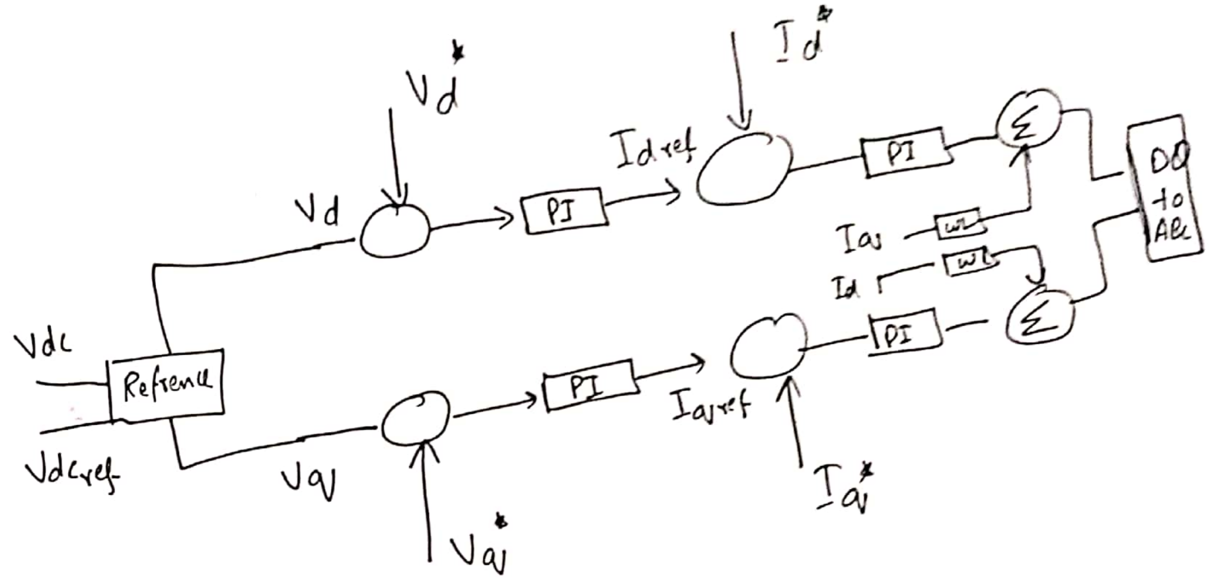
$$= 556.92 \text{ kwh}$$

$$\% \text{ Reduction} = \frac{562 - 556.92}{562.84} \times 100$$

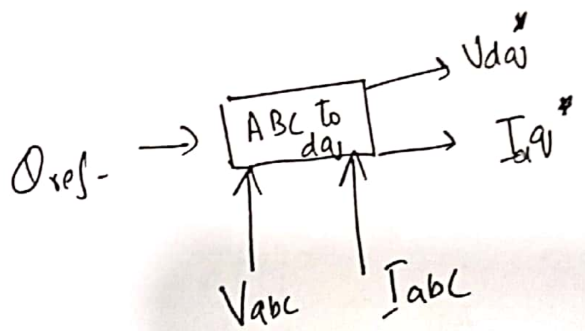
$$= 1.1 \%$$

4

Q=2(A):




3




1

$$V_{dref} = V_d - \omega L I_q + \frac{L\,di_d}{dt}$$

$$V_{qref} = V_q + \omega L I_d + \frac{L\,di_q}{dt}$$

→ All Nanogrids must be on same dc line for power flow between nanogrids in Microgrid.

2

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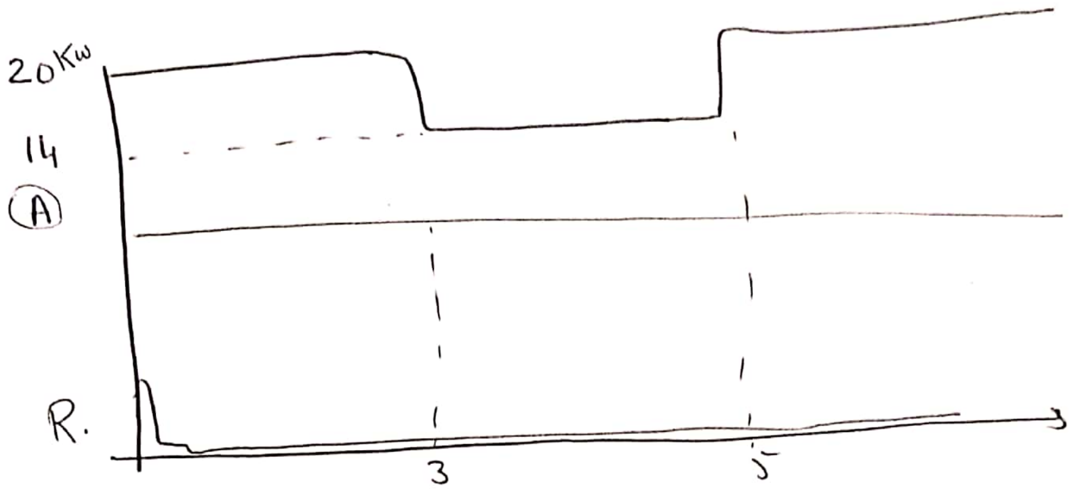
Q=2(B).

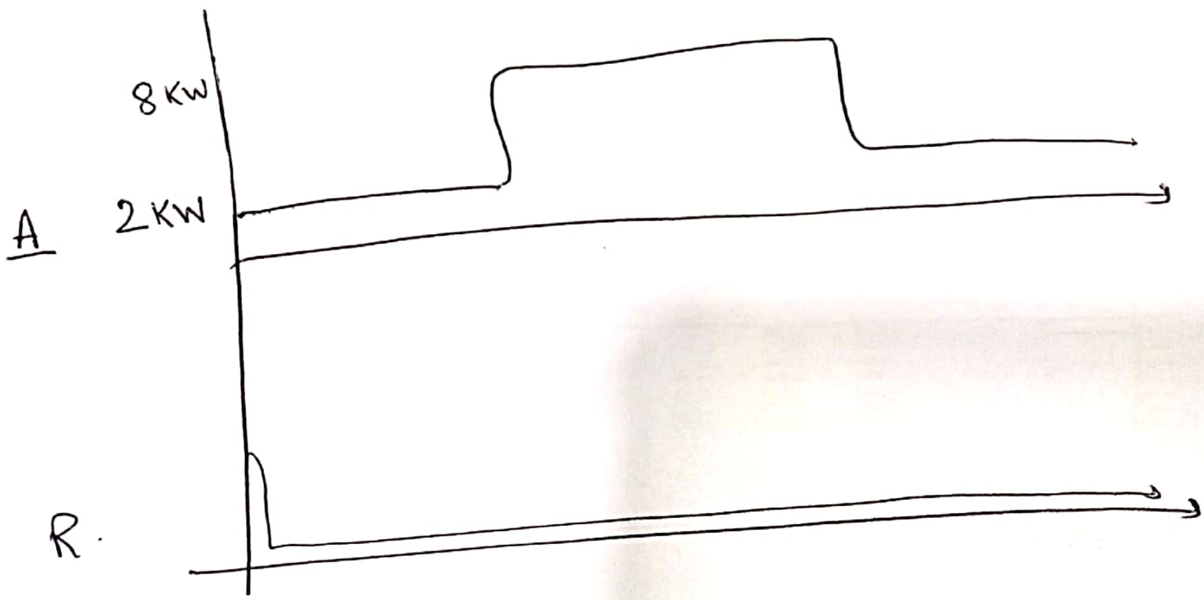
As wind type 4 is fully Power electronics Converter type, So it reduced the pressure on gear box. The gear box may be reduced because with fully PE converter generation Can be done at lower speed as compare with grid frequency. 3

in wind type 3 turbine the Stator Side Converter maintain voltage level as integrated with grid side. It also control the Power flow from wind turbine to utility grid, moreover some portion of generation into feedback. 3

Q=2(c).

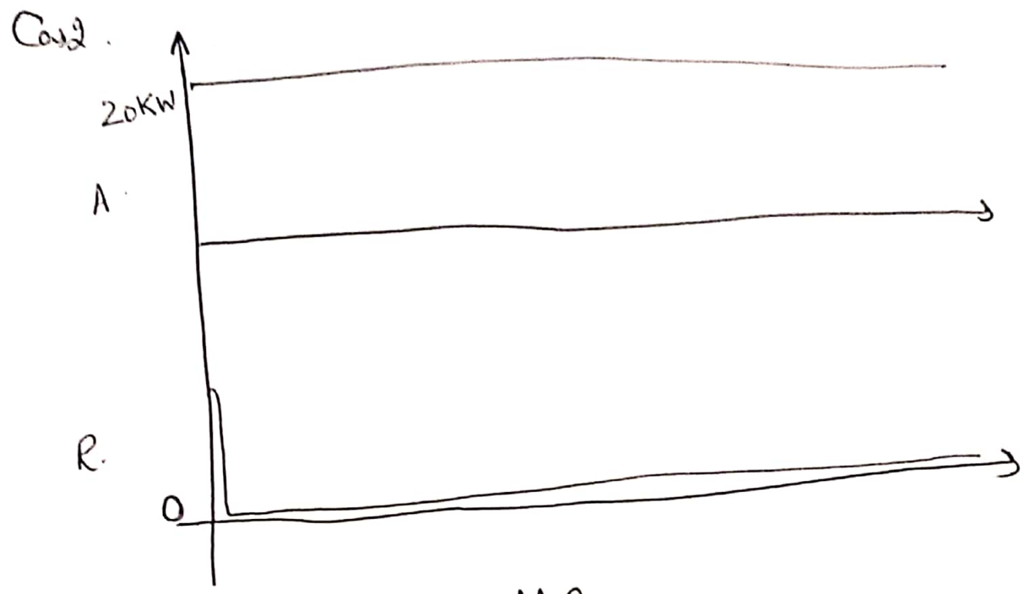



MG.

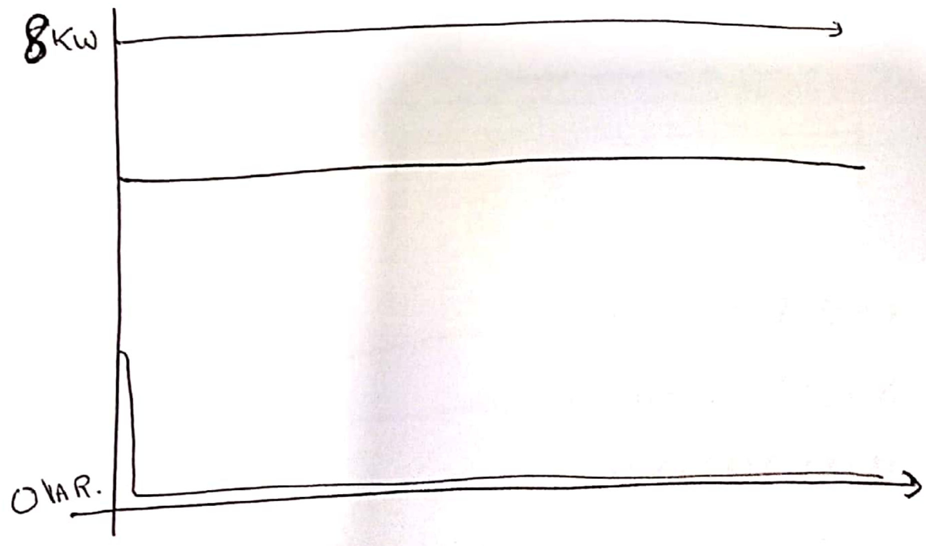



UG.

2




MG

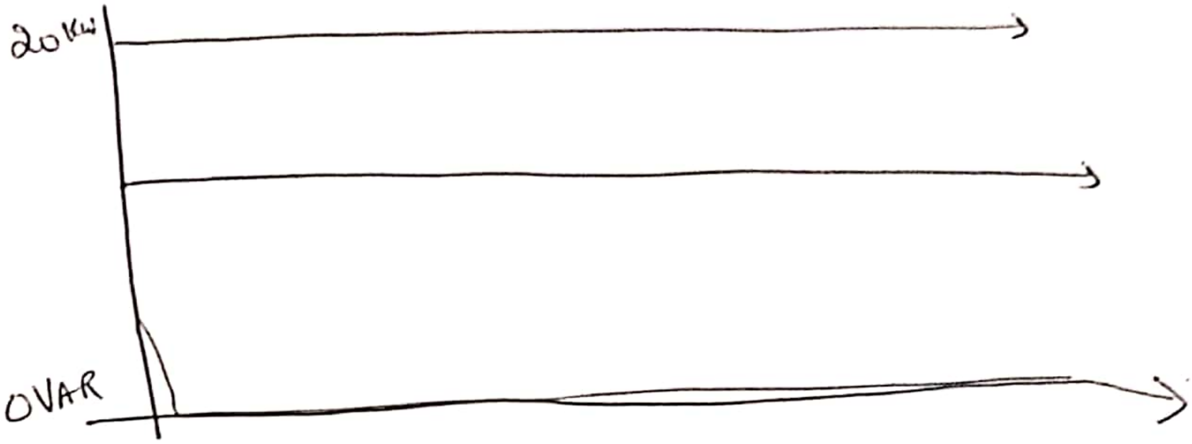



UG

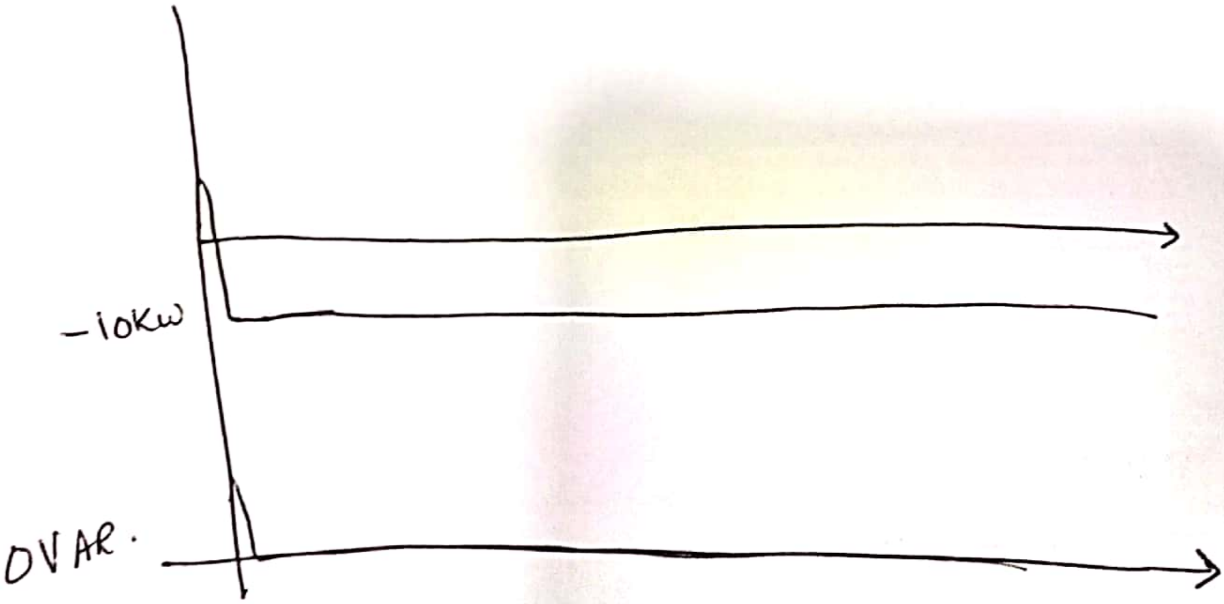
2

Scanned with CamScanner

Case 3:



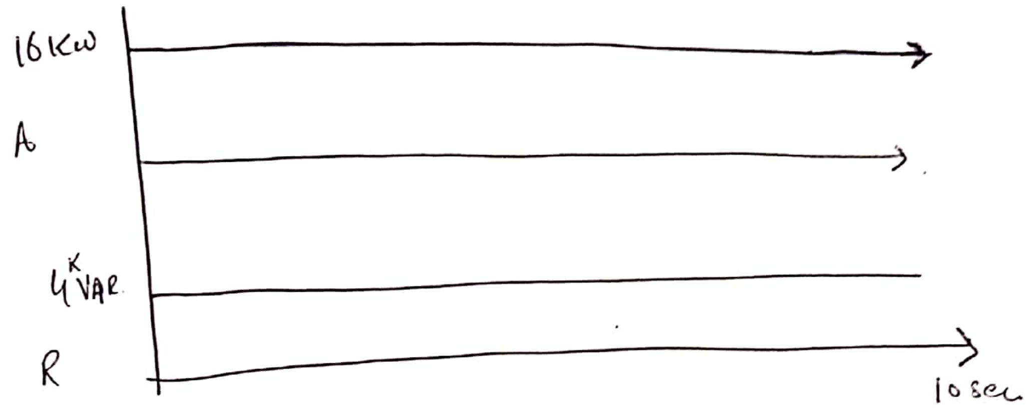

MG.



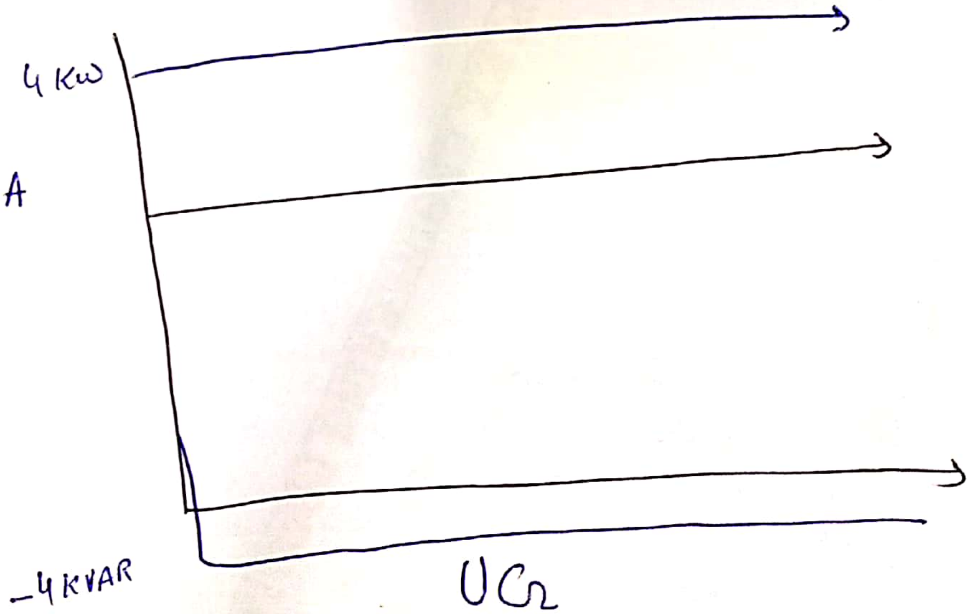

UG.

2

Case 4:        Load is 20 KW:




MCr




UCr

2    9