

Electrical Machines - I

P. Pages : 2

NIR/KW/18/3366/3395

Time : Three Hours



Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) Draw and explain phasor diagram of single phase transformer for Lagging power factor. **6**
- b) A 20-KVA transformer has a maximum efficiency of 98% when delivering $\frac{3}{4}$ full load at **7**
unity power factor. If during the day, the transformer is loaded as follows:
12 hours → No load
6 hours → 12kw, 0.8 p.f
6 hours → 20kw, 1.0 p.f .
Calculate the all day Efficiency of the transformer.

OR

2. a) Explain the following terms along with the phasor diagram and connection diagram **6**
i) Y_{d1} ii) Y_{y0}
- b) Explain how to convert single phase transformer into an auto transformer. State advantages **7**
of autotransformer over two winding transformer.
3. a) Enumerate various conditions for parallel operation of two 3 phase transformer. **3**
- b) Write short note OFAN method of cooling of transformer. **4**
- c) Describe 'Back to Back test for determining the regulation and efficiency of a pair of **7**
transformer giving in circuit diagram.

OR

4. a) Explain (Scott Connection) i.e. 3 phase to 2 phase conversion for 3.ph. Supply what are its **7**
application?
- b) A Scott connected transformer set is rated at 11kv, on 3 phase side and at 80V on two phase **7**
side. When teaser transformer is loaded upto 500kw, unity power factor and the main
transformer, upto 800kw at unity power factor, calculate the line currents on 11 KV side.

