Code No: 124AB

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, November/December - 2020
ELECTRICAL MACHINES - II
(Electrical and Electronics Engineering)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. Derive the EMF equation of transformer? Hence derive the voltage ratio. [15]

2.a) Draw the exact equivalent circuit of a transformer and describe briefly the various parameters involved in it?

b) The EMF per turn of a 1-ϕ, 2200/220 V, 50 Hz transformer is approximately 12V. Calculate: i) The number of primary and secondary turns and ii) The net cross-sectional area of core for a maximum flux density of 1.5 T. [8+7]

3. With neat diagram, discuss the various tests to be conducted on transformer to obtain its equivalent circuit. Derive all related equations. [15]

4. A 300 KVA, single-phase transformer is designed to have a resistance of 1.5% and maximum efficiency occurs at a load of 173.2 kVA. Find its efficiency when supplying full-load at 0.8 p.f lagging, normal voltage and frequency? [15]

5. Explain with necessary diagrams how two, 3-phase transformers can be used to convert a 3-phase supply to a 2-phase supply. [15]

6.a) Show that an auto-transformer will result in saving copper in place of two winding transformer.

b) Two transformers are connected in open-delta and supply a balanced 3 phase load of 240 KW at 400V and a p.f of 0.866. Determine: (i) Secondary line current (ii) the kVA load on each transformer. [8+7]

7.a) Why the rotor of a poly phase induction motor can never attain synchronous speed? Discuss.

b) The power input to a 500V, 50Hz, 6-pole, 3-phase induction motor running at 975 rpm is 40 KW. The stator losses are 1KW and the friction and windage losses total to 2KW, Calculate: i) The slip ii) Rotor copper loss iii) Shaft power. [8+7]

8. With neat diagram discuss the various tests to be conducted on 3phase IM to plot the circle diagram. [15]

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