

Code No: 155BB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2021

ELECTRICAL MACHINE DESIGN

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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1. Explain in detail about the major considerations to evolve a good design of Electrical Machines. [15]
2. Explain the design of a three phase transformers with respect to main dimensions. [15]
3. Discuss in detail about different methods of cooling of transformers and explain the design of a cooling tank. [15]
4. A 90 kW, 500 V, 50 Hz, 3 phase, 8 pole induction motor has a star connected stator winding accommodated in 63 slots with 6 conductors per slot. The slip ring voltage on open circuit is to be about 410V. Find number of slots, number of conductors per slot, coil span and slip ring voltage on open circuit. Assume efficiency = 0.85, power factor = 0.9. [15]
5. What are the main dimensions of the induction motor? What are the desired values of  $L/\tau$ , peripheral speed and width of ventilation ducts? [15]
6. Write short notes on the following:  
a) Short circuit ratio  
b) Damper windings design in synchronous machine. [6+9]
7. With the help of the equation, explain the design of rotor of Synchronous Machines in detail. [15]
8. Discuss the finite element method based machine design. [15]

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