

R16

Code No: 133AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, September/October - 2023

ELECTRICAL TECHNOLOGY
(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) What are various losses in a DC machine? [2]
- b) Why is a starter necessary for D.C motor? [3]
- c) State the function of a transformer. [2]
- d) Define regulation and efficiency of a transformer. [3]
- e) Draw the torque slip characteristics of three phase induction motor. [2]
- f) Write the difference between slip ring and squirrel case induction motors. [3]
- g) Define voltage regulation of an alternator. [2]
- h) What are the types of alternators? [3]
- i) What is AC servomotor? [2]
- j) Write the principle of shaded pole motor. [3]

PART – B

(50 Marks)

- 2.a) Explain with neat sketches, how D.C. Generators are classified?
- b) A 250 volts dc shunt motor takes 80 A at full load. Resistances of armature and field windings are 0.1 ohm and 125 ohms respectively.
Determine
 - i) Armature current
 - ii) Field current
 - iii) Back emf developed at full load. [5+5]

OR

- 3.a) Explain any one of the speed control techniques of D.C shunt motor.
- b) A 6-pole lap wound DC generator has 600 conductors on its armature. Flux per pole is 0.02 Wb, speed is 1500rpm. Calculate EMF generated. Also calculate EMF generated if the generator is wave wounded. [5+5]

- 4.a) What are various losses in a single phase transformer? Explain each one in detail.
- b) The primary and secondary windings of a 500 kVA, 11kV/400V transformer have resistances of 0.42Ω and 0.0019Ω respectively. The core loss is 2.9 kW, assuming the power factor of the load to be 0.8. Calculate the efficiency on full load. [5+5]

OR

5. Explain, how OC and SC tests are conducted on a single phase transformers. [10]

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6. Explain the constructional details of the three phase induction motor. [10]

OR

7.a) Explain how a rotating magnetic field is produced in a three phase induction motor.

b) A 12 pole, 3-phase alternator is coupled to an engine running at 500 rpm. It supplies an induction motor which has a full load speed of 1 440 rpm. Find the percentage slip and the no. of poles of the motor. [5+5]

8.a) Derive EMF Equation of alternator.

b) A 50Hz alternator has a flux of 0.1 Wb/pole, sinusoidally distributed. Calculate the rms value of the emf generated in one turn of the winding, which spans 3/4 of a pole pitch. [5+5]

OR

9. Explain synchronous impedance method of determining regulation of an alternator. [10]

10. Explain with a neat diagram the working of Split phase capacitor – start induction motor. [10]

OR

11. Explain in detail the construction and basic principle operation of Permanent Magnet Moving Coil Instruments. Also mention its applications. [10]

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