

I B. Tech II Semester Supplementary Examinations, July/August - 2021**BASIC ELECTRICAL ENGINEERING**

(Com. to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any five Questions one Question from Each Unit**All Questions Carry Equal Marks**

1. a) Explain the different methods of excitation of DC Generators and give its broad classification (8M)
- b) A six pole lap connected dc generator has a total of 600 conductors. The flux per pole is 0.04 Wb. Calculate the speed at which the armature is to be driven to generate an emf of 220V (7M)

Or

2. a) Explain the function of Commutator in a DC Motor and list the applications of different types of motors. (7M)
- b) A 4-pole generator has a lap-wound armature with 50 slots with 16 conductors per slot. The useful flux per pole is 30 mWb. Determine (a) speed at which the machine must be driven to generate an e.m.f. of 240 V (b) change in the generated voltage when the field current is reduced by 20%, assuming the flux is proportional to the field current. (8M)

Or

3. a) Draw and explain the equivalent circuit of a transformer under no load and lagging load condition. (8M)
- b) The maximum flux density in the core of a 1100/ 220V, 50 Hz, 150 KVA transformer is 3.6 Wb/m^2 . Calculate the area of cross section of the core and the number of turns of the primary and secondary winding if the emf per turn is 1.5 V (7M)
4. a) How can we calculate the efficiency of a transformer by knowing its losses? (8M)
- b) A 100 KVA, 2400/240V, 50 Hz transformer has no – load current of 0.64 A and a core loss of 700 W, when its high voltage side is energized at rated voltage and frequency. Calculate the components of the no load current and no load branch parameters of the equivalent circuit (7M)
5. Explain how the voltage regulation of a Synchronous generator can be calculated by Synchronous impedance method (15M)

Or

6. a) Draw and explain the equivalent circuit of a Synchronous motor (8M)
- b) A three phase, delta connected, 16 – pole, 50 Hz synchronous generator has 144 slots and 10 conductor /slot. Coils are full pitch and the flux/pole is 0.0248 Wb. Determine the value of alternator speed and no load voltage. (7M)
7. a) Explain the concept behind Rotating field in a three phase Induction motor. (8M)

- b) The power supplied to a three-phase induction motor is 32 kW and the stator losses are 1200 W. If the slip is 5%, determine (a) the rotor copper loss, (b) the total mechanical power developed by the rotor, (c) the output power of the motor if friction and windage losses are 750 W, and (d) the efficiency of the motor, neglecting rotor iron loss. (7M)

Or

8. a) Distinguish between Squirrel cage and Wound cage Inductor motors (8M)
- b) A three phase, 5 HP, 415 V, 50 Hz induction motor is working at full load with an efficiency of 78% at a power factor of 0.78 lagging. Calculate i)the input power and ii)the line current. (7M)
9. Explain the working of Split – phase capacitor – start induction motor with a neat diagram and characteristics (15M)

Or

10. Explain the construction and working of a Single phase Induction motor (15M)