

I B.TECH II SEMESTER REGULAR EXAMINATIONS, SEPTEMBER - 2021
BASIC ELECTRICAL ENGINEERING
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time : 3 Hours

Max. Marks : 70

Note : Answer ONE question from each unit (5 ×14 = 70 Marks)

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UNIT-I

1. a) Derive the EMF equation of a DC generator. [7M]
- b) Explain the procedure of conducting brake-test on DC machine with a neat circuit diagram. [7M]

(OR)

2. a) Explain in detail about various Types of D.C. Generators. [7M]
- b) Discuss in detail about speed control methods of (i) Flux control (ii) armature control. [7M]

UNIT-II

3. a) Explain in detail about core type and shell type transformer. [7M]
- b) Derive the expression for voltage induced in secondary winding of a transformer. [7M]

(OR)

4. a) A 10KVA ,500/250V single phase transformer has a net area of cross section  $90\text{cm}^2$  and maximum flux density is 1.2T. Calculate the number of turns on both primary and secondary. [7M]
- b) Briefly discuss about single phase transformer by OC test and SC test. [7M]

UNIT-III

5. a) Explain the construction details of alternator. [7M]
- b) Explain regulation of alternator by EMF method. [7M]

(OR)

6. a) Derive the expression for voltage induced in an alternator. [7M]
- b) Explain the principle operation of synchronous motor. [7M]

UNIT-IV

7. a) In a 6-pole 3-phase, 50Hz motor with star connected rotor resistance per phase is  $0.3\Omega$ , the reactance at stand still is  $1.5\Omega$  /phase , and an EMF between the slip rings on open circuit is 175V. Calculate slip at speed of 950 RPM (ii) Rotor EMF/ phase. [7M]
- b) Explain the procedure of brake test on 3 phase induction motor. [7M]

(OR)

8. a) Explain the principle of operation of three phase induction motor. [7M]  
b) Explain the auto transformer starting method of induction motor? Explain in detail. [7M]

UNIT-V

9. a) Explain the principle operation of single-phase induction motor. [7M]  
b) Explain the constructional features and working principle of shaded pole induction motor? [7M]

(OR)

10. a) Explain the construction details of single phase induction motor. [7M]  
b) Explain the principle operation of capacitor start, capacitor run induction motor. [7M]

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