

**I B.TECH II SEMESTER REGULAR EXAMINATIONS, SEPTEMBER - 2021**  
**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**  
**(COMMON TO CIV AND MEC BRANCHES)**

Time : 3 Hours

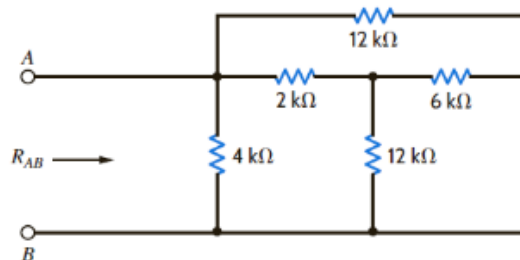
Max. Marks : 70

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

~~~~~

**UNIT-I**

1. a) Define the following: [7M]
- (i) Potential Difference
  - (ii) Resistance
  - (iii) Inductance
  - (iv) Capacitance
  - (v) Work
  - (vi) Power and
  - (vii) Energy
- b) Find  $R_{AB}$  in the following circuit using star-delta transformation. [7M]



(OR)

2. a) Determine the form factor and peak factor of a sinusoidal waveform. [7M]
- b) Explain (i) Real power (ii) Reactive power (iii) Apparent power and (iv) Power factor. [7M]

**UNIT-II**

3. a) Explain the brake test on DC shunt motor. [7M]
- b) A four pole, 500V, wave wound DC shunt motor has 900 conductors on its armature. Calculate the speed of the motor if its armature current is 70A, the flux per pole is 21mWb and armature resistance is 0.2Ω. [7M]

(OR)

4. a) Explain the principles of operation of DC generator. [7M]
- b) An 8-pole, DC generator has a lap wound armature, when driven at a constant speed of 420RPM .If it generates 220V with 50 slots in armature. The flux per pole is 12mWb. Find the number of conductors per slot. [7M]

## UNIT-III

5. a) Explain the various losses in a transformer. Describe how each loss varies with the load current, supply voltage and frequency. [7M]  
b) Derive EMF equation of a single phase transformer. [7M]

(OR)

6. a) Describe briefly torque-slip characteristics of induction motor. Based on these characteristics what are its applications? [7M]  
b) Differentiate Squirrel cage and slip ring type induction motors. [7M]

## UNIT-IV

7. a) Describe the operation of PN junction diode by including majority and minority carriers in your discussion. [7M]  
b) Explain zener diode and how zener acts as a regulator. [7M]

(OR)

8. a) Explain the working and analysis of a half wave rectifier with a neat diagram and corresponding wave forms. [7M]  
b) Describe the operation of full wave bridge rectifier. What is its output current when rms input voltage is 120V AC and  $R_L = 150\Omega$ ? [7M]

## UNIT-V

9. a) With a neat circuit, draw the input – output characteristics of a NPN transistor in Common Base configuration. [7M]  
b) Discuss the role of emitter, base and collector regions in the operation of BJT. [7M]

(OR)

10. a) Explain in detail about the frequency response of Common Emitter amplifier. [7M]  
b) Explain the Op-Amp with neat block diagram. [7M]

\* \* \* \* \*