

Code No: R21013

R10

SET - 1

II B. Tech I Semester Supplementary Examinations, May/June - 2017
ELECTRICAL AND ELECTRONICS ENGINEERING
(Com. to CE, ME, CHEM, PE, AME, MM)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Derive the relationship between line voltage and phase voltage in star connected system. (8M)
- b) Find current through  $4\Omega$  resistance of the network shown in Figure 1. (7M)

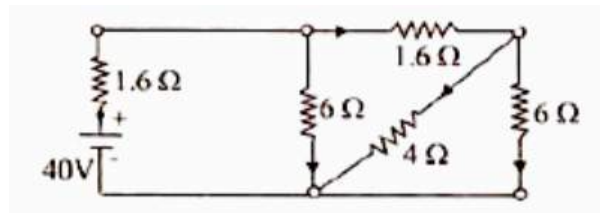


Figure 1

2. a) Derive the EMF equation of DC generator. (8M)
- b) A 220V, 4-pole, wave connected dc series motor has armature and field resistances of  $0.15\Omega$  and  $0.85\Omega$  respectively. The armature of motor has 60 conductors per pole. The flux developed in the air gap is  $20\text{mWb}$ . Find the speed of the motor. (7M)
3. a) Why the transformer rating is expressed in kVA? Give the expression for load kVA at which maximum efficiency occurs. (7M)
- b) A single phase 50 Hz transformer has 100 turns on the primary and 400 turns on the secondary winding. The net cross-sectional area of core is  $250\text{ cm}^2$ . If the primary winding is connected to a 230 V, 50 Hz supply, determine (8M)
  - i) The EMF induced in the secondary winding
  - ii) The maximum value of flux density in the core.
4. a) Explain the principle of operation of 3-phase induction motor with neat sketch (8M)
- b) Explain the regulation of alternator by synchronous impedance method. (7M)



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5. a) Explain the action of a full wave rectifier and sketch the wave forms of input and output voltages. (8M)
- b) Explain the various breakdown mechanisms present in a p-n junction (7M)
6. a) Explain the operation of transistor as an amplifier. (8M)
- b) For a p-n-p transistor in CE mode,  $\beta = 100$ . What is the value of  $\alpha$ ? If  $I_{co} = 12\mu A$ , what is the collector current for an emitter current of 2 mA? (7M)
7. a) Explain the theory of dielectric heating and its applications in industries. (8M)
- b) Discuss the application of ultrasonics for flow detection and also state its other applications. (7M)
8. Write a short note on the following (15M)
- a) Strain gauge
  - b) Piezo-electric transducer
  - c) Digital multi-meter