

Code No: R21013

R10**SET - 1**

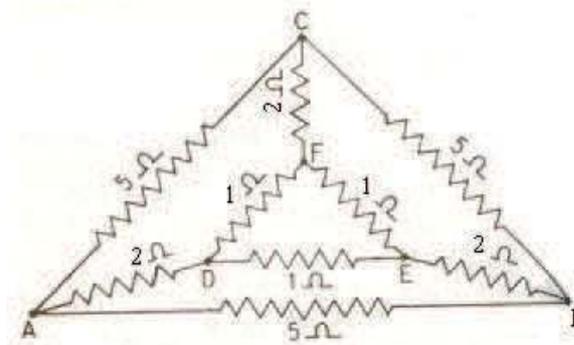
II B. Tech I Semester, Supplementary Examinations, May – 2013
ELECTRICAL AND ELECTRONICS ENGINEERING
 (Com. to CE, ME, CHEM, PE, AME, MM)

Time: 3 hours

Max. Marks: 75

All Questions carry **Equal Marks****Note: Answer any FIVE Questions, not exceeding Three Questions from any one part****PART-A**

1. a) State and explain Kirchoff's laws.
 b) For the given circuit shown in Figure1. Find the resistance between 'A' and 'B' terminals. (7M+8M)

**Figure 1**

2. a) Derive the torque equation of DC motor.
 b) Explain the applications of DC generators and the types of DC generators (7M+8M)
3. a) Derive the e.m.f equation of single phase transformers.
 b) A single phase transformer working at unity power factor has an efficiency of 95 percent at both one half load and at full load of 1500W. Determine the efficiency at 60 percent of full load. (7M+8M)
4. Explain the procedure to find out regulation by synchronous impedance method with neat circuit diagram. (15M)

PART-B

5. a) Explain the behavior of a PN junction for both forward and reverse biased conditions.
 b) Discuss in detail various applications of PN junction diode. (8M+7M)
6. a) Explain the working of both PNP and NPN transistors.
 b) Discuss how the transistor acts as an amplifier. (7M+8M)
7. a) Explain the principle of induction heating and also discuss various industrial applications of induction heating.
 b) Discuss the generation of ultrasonics and their applications. (8M+7M)
8. a) Explain how voltage, frequency and current can be measured by using CRO.
 b) Explain the basic principle of operation of CRO. (10M+5M)

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1. a) State and explain ohm's law.
 b) Calculate the value of resistance 'r' when the total current taken by the network is 1.5 A. (7M+8M)

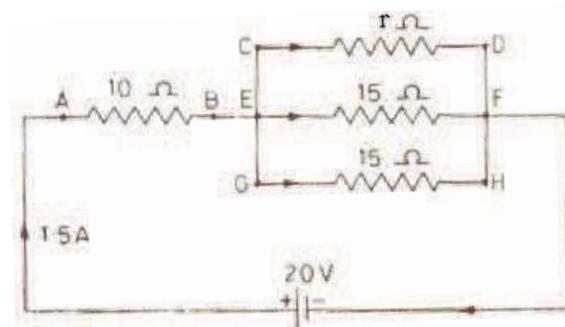


Figure 1

2. a) A short shunt compound generator supplies 250A at 220V. The armature resistance, series field and shunt field are 0.05Ω , 0.04Ω and 75Ω respectively. Find the emf generated.
 b) Derive the e.m.f equation of DC generator. (8M+7M)
3. a) Explain the principle of operation of single phase transformers.
 b) Define and derive expression for efficiency of single phase transformers. (7M+8M)
4. a) Explain the slip-torque characteristics of induction motors.
 b) Explain the principle of operation of alternators. (8M+7M)

PART-B

5. a) Discuss in detail the V-I characteristics of PN junction diode.
 b) What is meant by a rectifier circuit and what are the different types of rectifier circuits? Explain. (8M+7M)
6. With neat circuit explain the Common Emitter configuration of an amplifier circuit and also discuss about its input and output characteristics. (15M)
7. a) Explain the principle of dielectric heating and also discuss various industrial applications of dielectric heating.
 b) Explain the method of induction heating. (8M+7M)
8. a) With neat circuit explain the principle of operation of LVDT.
 b) Write short notes on Digital multi meters. (8M+7M)

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R10**SET - 3**

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1. a) Write equations for star-delta transformations
- b) For the given circuit calculate the value of current in each branch and the value of unknown resistance 'r' when the total current taken by the circuit is 2.25A. (7M+8M)

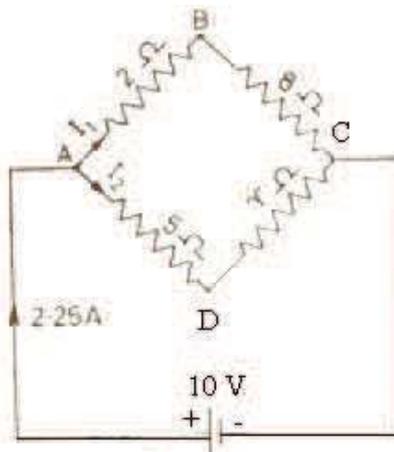


Figure 1

2. a) Explain the principle of operation of DC generator.
- b) A 200 V DC shunt motor takes a total current of 100A and runs at 750 rpm. The resistance of the armature winding and of shunt field winding is 0.1Ω and 40Ω respectively. Find the torque developed by armature. (7M+8M)
3. a) Define regulation and efficiency of transformer and explain their role in selection of transformer.
- b) The required no-load voltage ratio in a single phase, 50 Hz transformer is 5000V/500V. Find the number of turns in each winding if the flux is to be 0.05 Wb. (7M+8M)
4. Explain how the rotating magnetic field is produced in 3-phase induction motors? From that explain the principle of operation of 3-phase induction motors. (15M)

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PART-B

5. a) Explain the operation of half-wave rectifier circuit with neat circuit diagram.
b) A half-wave rectifier is used to supply 12 V dc to a resistive load of 500 ohm. If the crystal diode has a forward resistance of 25 ohm, determine the value of ac voltage supplied to the circuit. (8M+7M)
6. a) Explain the principle of negative feed back in amplifier circuits.
b) What are the differences between PNP and NPN transistors. (7M+8M)
7. a) Give the basic setup and explain the principle of induction heating.
b) Discuss the various industrial applications of dielectric heating and its working principle. (8M+7M)
8. a) Explain in detail the basic principle of operation of strain gauge.
b) How voltage and current are measured with CRO. (7M+8M)

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PART-A

1. a) Briefly explain the types of elements in electrical circuits
b) Three resistances of 5Ω , 10Ω and 15Ω are joined in parallel. If the current in 10Ω resistor is 3A, What is the current in other resistors and total current? (7M+8M)
2. a) Explain the significance and operation of 3-point starters used in DC motors.
b) Explain the types of DC generators in detail. (7M+8M)
3. a) Explain the losses that occur in transformers.
b) A single phase transformer has 500 primary, 1500 secondary turns. The net cross sectional area of the core is 100 cm^2 . If the primary winding be connected to 220V and 50 Hz supply. Calculate the secondary induced voltage. (7M+8M)
4. a) Explain the principle of operation of alternators in detail.
b) What is slip and what is its value at standstill condition and running at synchronous speed. (8M+7M)

PART-B

5. a) With neat circuit explain the operation of full-wave bridge rectifier and draw the relevant waveforms.
b) Discuss diode applications. (7M+8M)
6. a) Discuss the working of single stage CE amplifier.
b) Discuss in detail the SCR characteristics. (8M+7M)
7. a) Give the basic setup and explain the principle of dielectric heating.
b) Discuss various industrial applications of induction heating and its principle of working. (8M+7M)
8. a) What is the basic principle of operation of thermocouples? Explain.
b) Discuss in detail about piezo-electric property. (8M+7M)