

Code No: RT21011

**R13**
**SET - 1**
**II B. Tech I Semester Supplementary Examinations, May/June - 2017**
**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

(Com. to CE, ME, CHEM, AME, MM, PE, PCE)

Time: 3 hours

Max. Marks: 70

 Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

 2. Answer **ALL** the question in **Part-A**

 3. Answer any **THREE** Questions from **Part-B**
**PART -A**

1. a) What are the limitations of ohm's law? (3M)
- b) Write the necessity of commutator for operation of a D.C machine? (4M)
- c) How does transformer transfer electric energy from one circuit to another? (4M)
- d) A 3-phase, 4-pole, 50 Hz induction motor is running at 1455 rpm. Find the slip speed and slip? (4M)
- e) What is the operation of PN junction diode? (4M)
- f) What is the need of feed back in amplifiers? (3M)

**PART -B**

2. a) Define the following terms with an example: (4M)
  - (i) Unilateral elements
  - (ii) Distributed elements
  - (iii) Linear elements
  - (iv) active elements
- b) In the given circuit shown in figure1, find the value of the resistance R and the current through it, when the branch AD carries no current. (12M)

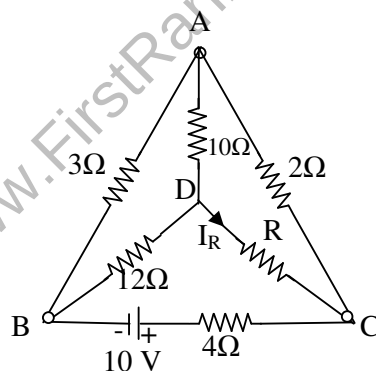


Figure 1

3. a) Classify the dc generators along with voltage and current equations showing diagrammatically (8M)
- b) The output of a shunt generator is 24 kW at a terminal Voltage of 200 V armature resistance =  $0.05 \Omega$  , shunt field resistance =  $40 \Omega$  , If iron and friction losses equal the Copper losses at this load , find (i) Output of the engine driving the generator (ii) efficiency of the generator. (8M)

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4. a) Draw and explain the circuit diagram for short circuit of a single phase transformer. (8M)
- b) The voltage/turn of a single phase transformer is 1.1 V, when the primary winding is connected to a 220 V, 50 Hz, AC supply, the secondary voltage is found to be 660 V. Find (i) primary and secondary turns and (ii) Core area if the maximum flux density is 1.2 T? (8M)
5. a) Derive the expressions for the distribution factor and pitch factor (8M)
- b) A 3-phase, 6-pole induction motor working from a 3-phase 400V, 50 Hz supply is running at 970 r.p.m. What is the synchronous speed, slip speed, and the frequency of rotor currents? (8M)
6. a) Explain the operation of an integrator using OP-AMP. (8M)
- b) Distinguish between positive and negative feedbacks. List out the characteristics of OP-AMP. (8M)
7. a) Give the advantages of negative feedback amplifier. Draw the circuit of a voltage shunt feedback amplifier and explain. (10M)
- b) Justify the answer the transistor acts as an amplifier? (6M)