

Code No: R21013

R10

SET - 1

II B. Tech I Semester Supplementary Examinations, June - 2015
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 Six resistors are connected as shown in figure 1?. If a battery having an emf of 30V and an internal resistance of 2 is connected to terminals A and B. Find
- Current supplied from battery
  - Potential difference across 8 ohms resistance.

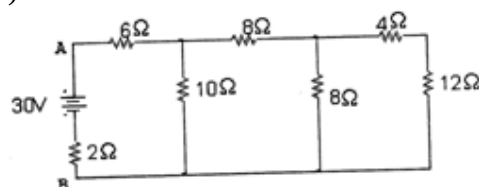


Figure 1

- Explain the basic Principle of DC generator
  - A 6 pole wave wound dc generator is having 50 slots with 25 conductors per slot and rotating at 1500 rpm. The flux per pole is 0.015 wb, calculate the emf generated?
- Explain the procedure for performing the open circuit test on a single phase transformer? What is the information obtained from this test?
  - A 230/400 V single phase transformer has 800 turns on primary. The maximum flux density in the core is 1.5 Wb/m<sup>2</sup>. Calculate the number of turns on secondary, area of cross section and maximum flux in the core.
- What are the merits and demerits of induction motor
  - A 4pole, 3-phase, 50Hz star connected alternator has a single layer winding in 36 slots with 30 conductors per slot. The flux per pole is 0.05wb and winding is full pitched. Find the synchronous speed and the emf induced on no-load?
- Explain the working of P-N junction diode.
  - Describe the full wave rectifier with neat diagrams?
- Compare the input and output characteristics of BJT in the three configuration?
  - Explain the V-I characteristics of SCR?
- Describe the induction heating with diagram
  - Explain various types induction heating and their applications
- Describe the principle of piezo- electric transducer
  - Discuss how to measure the voltage , current and frequency with CRO

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**R10****SET - 2**

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- 1 a) Explain the star to delta transformation with a simple example
b) Explain the concept of series and parallel circuits
- 2 a) Explain the purpose of
(i) Pole shoe, (ii) Carbon brushes and (iii) Slotted armature in a DC machine.
b) A dc generator develop an emf of 220V at 1200 rpm with a flux per pole is 0.01 wb.
What will be the flux value to induce the 240 volts at 1400 rpm?
- 3 a) Explain briefly the operation of a transformer and sketch phasor diagram on no-load
b) The Short-circuit test is conducted on a 5KVA, 400V/100 V single phase transformer with 100 V winding shorted. The input voltage at full load current is 40 V. The wattmeter, on the input reads 250 W. Find the power factor for which regulation at full load is zero.
- 4 a) Discuss the principle of operation of 3-Phase induction Motor
b) A 4-pole alternator is run at a speed of 1500rpm. What is the frequency of the armature emf? If the number of poles is 2 at what speed should it be run so that the armature emf has the same frequency?
- 5 Explain the forward and reverse biasing of the P-N junction diode.
- 6 a) Compare CE, CC and CB amplifier in terms of voltage and current gains and input and output impedances.
b) How a transistor acts as an amplifier? Explain?
- 7 Describe the dielectric heating with diagrams? List out its merits and demerits
- 8 a) Describe the principle of Thermocouple
b) Explain the applications of CRO

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R10**SET - 3**

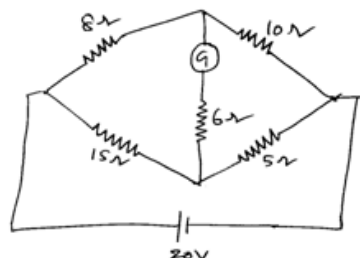
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- 1 Determine the currents in all the bridge arms of the circuit as shown in figure below. Find the value of the current through the galvanometer, and its direction (G is galvanometer, and all resistance are in ohms).



- 2 a) Discuss the Significance of back EMF  
b) A 230V motor has an armature circuit resistance of  $0.8\Omega$ . If the full load armature current is 25A and the no load armature current is 6A. Find the change in back e.m.f from no-load to full-load.
- 3 a) Explain the procedure for performing the short circuit test on a single phase transformer? What is the information obtained from this test?  
b) A 220/440 V single phase transformer has 1000 turns on primary. The maximum flux density in the core is  $1.2 \text{ Wb/m}^2$ . Calculate the number of turns on secondary, area of cross section and maximum flux in the core.
- 4 a) Describe predetermination of regulation of an alternator from the O.C and S.C tests?  
b) If the current in the stator of an 4-pole, 3-phase induction motor has a frequency of 50Hz and that in the rotor is 2 Hz. Determine the slip and speed of the motor?
- 5 Explain the operation of a centre tap full wave rectifier. Show its input and output waveforms. Also list its disadvantages.
- 6 a) Draw the V-I characteristics of an SCR and explain?  
b) Explain the necessity conditions for oscillators
- 7 a) What are the advantages and disadvantages of induction heating  
b) Explain the generation of Ultrasonic's? Give its applications
- 8 a) Describe the principle of LVDT.  
b) Explain the operating principle of digital multimeter with neat diagram

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**R10****SET - 4****II B. Tech I Semester Supplementary Examinations, June - 2015****ELECTRICAL AND ELECTRONICS ENGINEERING**

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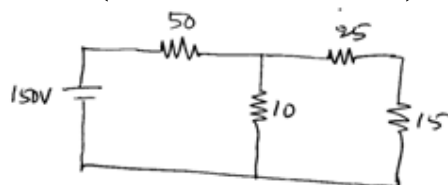
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- 1 a) State and explain Ohm's Law. What is the limitation of Ohm's Law?
- b) Calculate the magnitude and direction of current in the 10 ohms resistor. As shown in following figure that the power delivered by source is equal to power dissipated in the resistors. (All resistance is in ohms).



- 2 a) What are the various types of DC Motors and explain Shunt Wound Motor
- b) A 220V motor has an armature circuit resistance of 0.6Ω . If the full load armature current is 20A and the no load armature current is 5A. Find the change in back e.m.f from no-load to full-load.
- 3 a) State and prove the condition for maximum efficiency of a transformer?
- b) A 230/115 V single phase transformer takes a no load current of 2A at a power factor of 0.2 lagging with low voltage winding kept open. If the low voltage winding is now loaded to take a current of 10A at 0.8 pf lagging find the current taken by high voltage winding.
- 4 a) Define i) Pitch factor ii) Distribution factor
- b) A 6-pole, 100 HP, 3-phase, 440-V, 50Hz induction motor has a slip of 5% on full load. Calculate the speed of the motor?
- 5 Explain the operation of a full wave bridge rectifier. Show its input and output waveforms. Also mention its advantages and disadvantages.
- 6 a) How to get saturation and cutoff regions in a transistor operation
- b) Explain the SCR Characteristics and its applications.
- 7 a) What are the advantages and disadvantages of dielectric heating
- b) Explain the flow detection in ultrasonic with necessary diagram
- 8 a) Describe the principle of strain gauge.
- b) Explain the frequency measurement with CRO