## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
### B.Tech II Year I Semester Examinations, February/March - 2016
### ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE, ME, AME, PTE, CEE, MSNT)

Time: 3 Hours                                                                          Max. Marks: 75

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

## PART- A

[25 Marks]

1.a) Define KCL. [2]
  b) What are the limitations of Kirchoff's laws? [3]
  c) What is the function of Commutator? [2]
  d) What is the construction of DC series motor? [3]
  e) Define voltage regulation in a single phase transformer. [2]
  f) What are the basic parts of an alternator? Explain. [3]
  g) What is forward bias? [2]
  h) Explain the operation of a half wave rectifier. [3]
  i) Define Deflection sensitivity. [2]
  j) Write short notes on electrostatic deflection. [3]

## PART-B

[50 Marks]

2.a) What is the equivalent resistance of parallel connection of resistors? Explain.
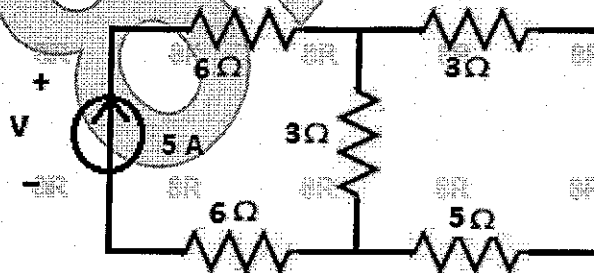  b) In the circuit shown in figure 1, determine 'V'.



**Figure: 1**

  c) What is the basic principle of measuring instruments? Explain. [2+4+4]

**OR**

3.a) What is voltage division rule?
  b) In the circuit shown in figure 2, determine the voltage 'V'



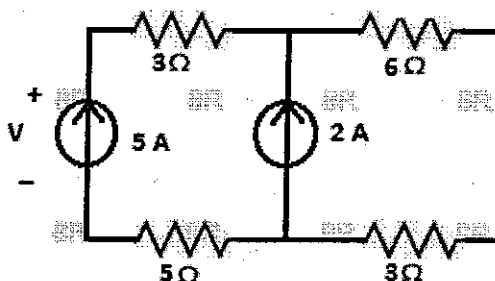**Figure: 2**

  c) Explain the working principle of Permanent magnet moving coil instruments. [2+4+4]

4.a) Explain the Principle of operation of DC generator in detail.
   b) Draw the circuit diagram of a three point starter and explain its operation. [5+5]

**OR**

5.a) Derive the Torque equation of DC series motor.
   b) What are the applications of DC compound motor? Explain. [5+5]

6.a) A 20 KVA, 2000/200V, 50 Hz single phase transformer has HV and LV winding resistances of 5Ω and 0.001Ω respectively. The equivalent leakage reactance as referred to HV side is 30Ω. Calculate the full load and half load percentage voltage regulations of the transformer at 0.8 lagging power factor.
   b) What is synchronous impedance method? Explain. [5+5]

**OR**

7.a) In a 10 KVA, 1000/100 V single phase transformer, the iron and full load copper losses are 150W and 200W respectively. Calculate the efficiency at unity power factor on full load and half the full load.
   b) Explain the principle of operation of induction motor. [5+5]

8.a) Draw the V-I characteristics of a PN junction diode and explain.
   b) Explain the operation of transistor as an amplifier. [5+5]

**OR**

9.a) Derive the expression for the average output voltage of a diode bridge wave rectifier.
   b) Draw the SCR static characteristics and explain. [5+5]

10.a) What are the functions of Electron gun and accelerating anode in the CRT? Explain.
   b) Explain about the frequency measurement using CRO. [5+5]

**OR**

11.a) Discuss the control functions of CRO.
   b) Give the applications of CRO. [7+3]

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