

Code No: 113AP

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, April/May - 2018

ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CE, ME, AME, PTM)

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) Discuss about parallel resistive circuit with an example. [3]
 - c) Define Back EMF. [2]
 - d) What is meant by buildup of a generator? [3]
 - e) Define copper loss in a transformer. [2]
 - f) What is the purpose of alternator? [3]
 - g) Draw the structure of a P-N junction diode. [2]
 - h) Define latching and holding currents of a SCR. [3]
 - i) What is meant by electrostatic deflection? [2]
 - j) What is meant by Lissajous pattern? [3]

PART-B

- (50 Marks)
- 2.a) Explain the working of permanent magnet moving coil instrument. [5+5]
 - b) Find the current 'i' in the circuit shown in the figure 1.

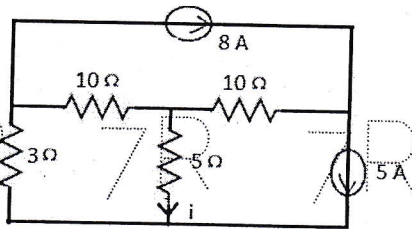


Figure: 1

OR

- 3.a) Explain the working of moving iron instrument.
- b) Find the current 'I' in the circuit shown in the figure-2. [5+5]

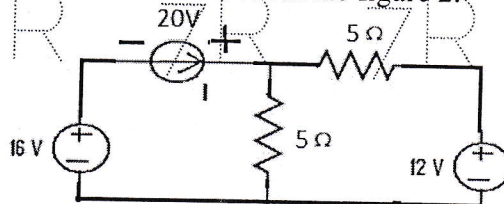


Figure: 2

- 4.a) Explain in detail about various types of compound wound DC generators.
b) Determine developed torque and shaft torque of 220-V, 4-pole series motor with 800 conductors wave connected supplying a load of 8.2 kW by taking 45 A from the mains. The flux per pole is 25 mWb and its armature circuit resistance is 0.6Ω . [5+5]

OR

- 5.a) A long shunt compound generator delivers a load current of 50 A at 500 V and has armature, series field and shunt field resistances of 0.05Ω , 0.03Ω and 250Ω respectively. Calculate the generated voltage and the armature current. Allow 1 V per brush for contact drop.

- b) Write the voltage equation of a DC motor and discuss. [6+4]

- 6.a) Explain in detail about the principle of working of induction motor.

- b) The No load current of a transformer is 5 A and 0.3 power factor when supplied at 230-V, 50-Hz. The number of turns on the primary winding is 200. Calculate (i) the maximum value of flux in the core (ii) the core loss (iii) the magnetizing current. [5+5]

OR

- 7.a) Explain in detail about the voltage regulation by synchronous impedance method.

- b) A single phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60 cm^2 . If the primary winding be connected to a 50-Hz supply at 520 V, calculate the peak value of flux density in the core and the voltage induced in the secondary winding. [5+5]

- 8.a) Explain in detail about the bridge rectifier with neat sketch.

- b) With the help of physical structure, explain the operation of PNP transistor. [5+5]

OR

- 9.a) Discuss in detail about the applications of a diode.

- b) Draw the SCR characteristics and explain in detail. [5+5]

- 10.a) Explain in detail about the structure of CRT.

- b) Explain in detail about magnetic deflection. [5+5]

OR

- 11.a) Derive the expression for vertical deflection in CRO.

- b) Explain in detail about frequency measurement using CRO. [5+5]