

B.TECH. SEM -II ELECTRICAL 2014 COURSE (CBCS) :
WINTER - 2017
SUBJECT : ELECTRICAL & ELECTRONICS DEVICES

Day : **Friday**
Date : **24/11/2017**

Time **10.00 AM TO 02.00 PM**
Max. Marks : 60

W-2017-2012

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

Q.1 a) A 1000 watt geyser, 40 watts tubelight and 300 watts fan are connected across 230V single phase ac supply. Determine resistance and current drawn by each device. Draw diagram of variable resistance as potential divider and variable resistance as current regulator. **[06]**

b) What are the different types of inductors? State specifications and applications of it. **[04]**

OR

a) A 1000 microfarad capacitor is connected in series with 10kΩ resistor. They are connected to 10V dc supply. What is the time required for the capacitor to charge to full voltage? Draw charging curve. What is the energy stored in capacitor? **[06]**

b) What are the different types of capacitors? State specifications and applications. **[04]**

Q.2 a) i) A moving coil ammeter has a uniform scale with 50 divisions and gives a full scale reading of 10Amp. The instrument can read upto $\left(\frac{1}{5}\right)^{th}$ of a scale division. What is the resolution of instrument in mA? **[05]**

ii) A 0 – 100V voltmeter has a guaranteed accuracy of 2% of full scale reading. The voltage measured by the voltmeter is 75V. What is the percentage limiting error?

b) The three resistors R_1 , R_2 and R_3 have the following ratings: $R_1 = 25\Omega \pm 4\%$, $R_2 = 65\Omega \pm 4\%$, $R_3 = 45\Omega \pm 4\%$. If the resistors are connected in series, then what is limiting error produced in equivalent resistance? What is equivalent resistance? **[05]**

OR

Draw neat labelled diagram of PMMC instrument and explain its principle of operation with different torques in instrument. State its advantages and limitations. Write down deflecting torque equations. **[10]**

Q.3 a) Draw neat diagram of Kelvin's double bridge and write down balance equation. What are the advantages of Kelvin's bridge over Wheatstone's Bridge? **[06]**

b) What are the difficulties in measurement of high resistance? **[04]**

P.T.O.

OR

- a) Draw neat diagram of megger and explain its principle of operation. [06]
- b) Draw diagram and explain principle of operation of ohm meter. [04]
- Q.4** a) Define and explain the following terms: [04]
i) Line regulation ii) Load regulation
- b) Explain various front panel controls of CRO. [06]

OR

- a) With neat diagram and necessary waveforms explain operation of diode bridge rectifier. [06]
- b) Explain how CRO can be used for measurement of voltage and frequency. [04]
- Q.5** a) Draw and explain input and output characteristics of BJT in CE configuration. [06]
- b) Compare BJT and JFET. [04]

OR

- a) Prove that current gain, $\beta_{dc} = \frac{\alpha_{dc}}{1 - \alpha_{dc}}$. [05]
- b) Explain operation and working of N channel JFET. [05]
- Q.6** a) Draw and explain Wien bridge oscillator. [05]
- b) Explain how transistor can be operated as a switch. [05]

OR

- a) Explain in brief working of monostable multivibrator. [04]
- b) With neat diagram and necessary waveform, explain class A power amplifier. [06]

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