

**B.TECH. SEM -II (CHEMICAL/ ELECTRONICS / BIO
MEDICAL / E & TC) 2014 COURSE (CBCS) : WINTER -
2017**

SUBJECT: FUNDAMENTALS OF ELECTRICAL ENGINEERING

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

Time: **10.00 AM TO 01.00 PM**
Max Marks : 60

W-2017-2010

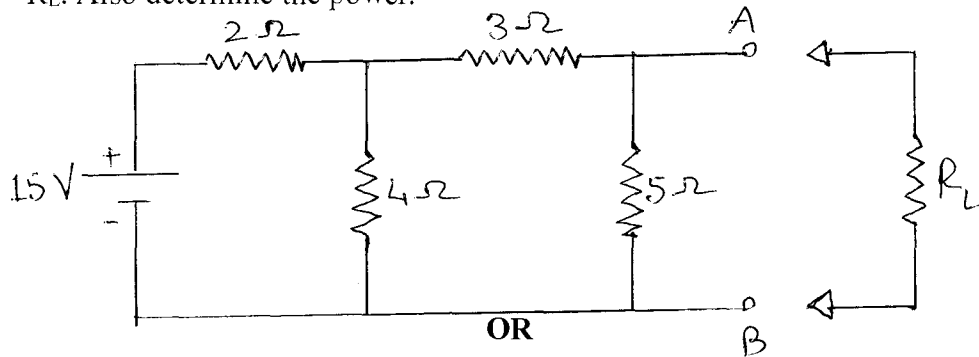
N.B.:

- 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.

- Q1.** a) Explain effect of temperature on R.T.C. (05)
- b) At the instant of switching of a 40 Watt lamp on a 230 volt supply, the current is observed to be 2.5A. The R.T.C. of filament is $0.0048/^\circ\text{C}$ at 0°C . The ambient temperature is 27°C . Find the working temperature of the filament & current taken during normal operation. (05)

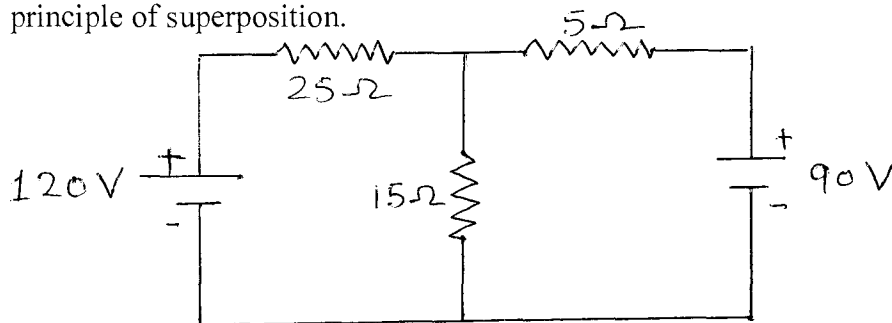
OR

- a) Define resistance & explain the factors affecting resistance value. (04)
- b) A Coil has resistance of 18 ohm when temperature is 20°C & 22 Ohm when its temperature is 50°C . Find the rise in temperature when resistance becomes 24 ohm. The room temperature is 18°C . (06)
- Q.2** a) State & explain Maximum power transfer theorem. (04)
- b) The ladder network shown in figure is to be terminated in a load resistance R_L . Determine the value of R_L that will result in maximum power transfer to R_L . Also determine the power. (06)



OR

- a) State & explain superposition theorem. (04)
- b) Calculate the current in the $15\ \Omega$ resistance for the network shown below by principle of superposition. (06)



P.T.O.

- Q.3** a) Obtain expression for electric field intensity. (04)
- b) The plate area of a parallel-plate capacitor is 0.01 square meter. The distance between the plates is 2.5 cm. The insulation medium is air. Find its capacitance. What would be its capacitance, if the space between the plates is filled with an insulating material of relative permittivity 5? (06)

OR

- a) What are different types of batteries? Explain construction of any one type. (05)
- b) Obtain expression for equivalent capacitance in parallel. (05)

- Q.4** a) Compare electric & magnetic circuit. (05)
- b) Define following terms in connection with magnetic circuit. (05)
- i) Magnetic Flux ii) Flux Density iii) Magnetic field strength
iv) Magnetic field intensity v) Permeability

OR

- a) Explain construction of single phase transformer. (05)
- b) How to determine efficiency & regulation of transformer by direct load test? (05)

- Q.5** a) Define following terms: (05)
- i) Instantaneous value ii) Cycle iii) Time period
iv) Frequency v) Amplitude
- b) An alternating Voltage is mathematically expressed as (05)
- $$v = 141.42 \sin\left(157.08t + \frac{\pi}{12}\right) \text{ volts. Find R.M.S. value, frequency \& periodic time.}$$

OR

- a) Explain concept of active & reactive power. (05)
- b) Obtain relationship between line & phase quantities for star connection. (05)

- Q.6** a) Explain with neat diagram sodium vapour lamp. (05)
- b) List different wiring accessories. (05)

OR

- a) What is necessity of earthing? (05)
- b) What are different types of wiring system? Explain one in detail (05)

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