

**B.TECH. SEM -II (CHEMICAL/ ELECTRONICS / BIO MEDICAL
/ E & TC) 2014 COURSE (CBCS) : SUMMER - 2018**

SUBJECT: FUNDAMENTALS OF ELECTRICAL ENGINEERING

Day: **Monday**
Date: **11/06/2018**

S-2018-2218

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

N.B.:

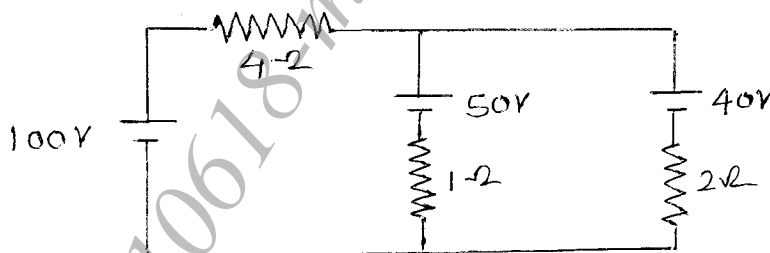
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

- Q1.**
- a) Explain concept of potential and potential difference. (05)
- b) A coil has resistance of $40\ \Omega$ at 25°C . When it's temperature is increased to 110°C the resistance increases to $50\ \Omega$. Calculate the temperature coefficient of resistance of coil material at 25°C . (05)

OR

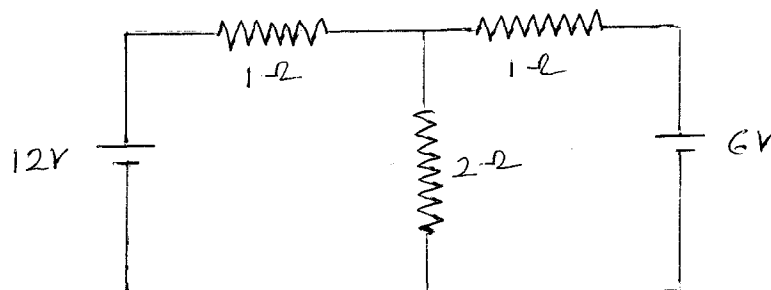
- a) State Ohm's Law. Explain effect of temperature on resistance. (05)
- b) A copper coil when connected to a 40 volt supply, initially takes current of 4 A & has a mean temperature of 20°C . After sometime the current flowing in the coil fall to 3.90 Amp, supply voltage remains same. The mean temperature of coil is then 34°C . Determine the temperature coefficient of resistance of 0°C & 20°C . (05)

- Q.2**
- a) State & explain superposition Theorem. (04)
- b) Using superposition theorem calculate the current flowing in $1\ \Omega$ resistance for the network shown below. (06)



OR

- a) State & explain Thevenin's theorem. (04)
- b) Using Thevenin's theorem determine current flowing through $2\ \Omega$ resistance in the network shown below. (06)



P.T.O.

- Q.3** a) Obtain expression for equivalent capacitance in series. (05)
- b) Three capacitors values $2\mu\text{F}$, $4\mu\text{F}$ & $6\mu\text{F}$ have an applied voltage of 60V across their series combination. Determine the voltage on each of the capacitor. (05)

OR

- a) Obtain expression for energy stored by a capacitor. (05)
- b) Two capacitors $2\mu\text{F}$ & $4\mu\text{F}$ are connected in
1) Parallel 2) Series across 100V d.c. source. Determine -
i) Energy stored in each capacitor.
ii) Equivalent capacitance of their combination. (05)

- Q.4** a) Explain B-H curve. (05)
- b) Explain principle of operation of single phase transformer. (05)

OR

- a) Explain Faraday's Law of electromagnetic induction. (05)
- b) Discuss about losses in transformer. (05)

- Q.5** a) Define form factor & peak factor. (04)
- b) The waveform of a voltage has form factor of 1.15 & peak factor of 1.5. If the maximum value of voltage is 4500 V, calculate average value & R.M.S. value of the voltage. (06)

OR

- a) Explain concept of impedance & admittance. (04)
- b) A 100 ohm resistance is carrying a sinusoidal current given by $3\cos\omega t$
Determine:-
i) Instantaneous power taken by resistance.
ii) Average power. (06)

- Q.6** a) What is necessity of earthing? (05)
- b) Draw basic layout of distribution system. (05)

OR

- a) What are different types of wiring system? Explain one in detail. (05)
- b) Explain with neat diagram Incandescent lamp. (05)

* * * *