

**ADDITIONAL EXAM. COMMON FOR CIVIL/  
COMPUTER/ELECTRICAL/IT/MECHANICAL /PRODUCTION  
B.TECH. SEM. - I (CBCS 2014 COURSE) : WINTER- 2019  
SUBJECT: FUNDAMENTALS OF ELECTRICAL ENGINEERING**

Wednesday 01/01/2020  
10:00 AM-01:00 PM

W-11252-2019  
Max. Marks: 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labelled diagrams wherever necessary.
- 4) Assume suitable data if necessary.

**Q.1** a) Explain following terms: (05)  
i) EMF ii) Potential difference iii) Current iv) Resistance  
v) Ohm's Law

b) Explain resistance temperature coefficient (R.T.C). (05)

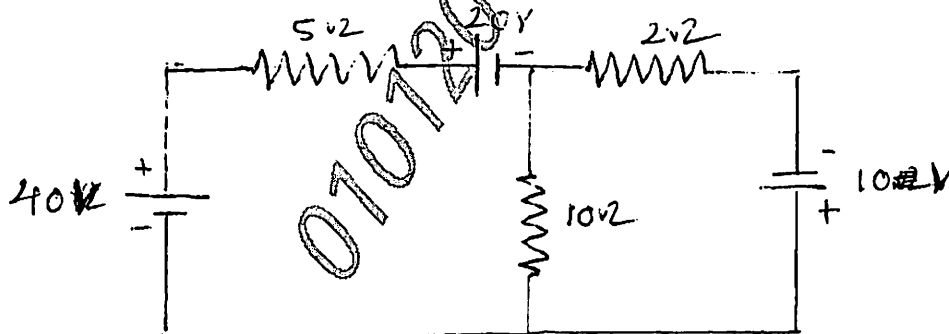
OR

a) At  $0^{\circ}\text{C}$ , a specimen of copper wire has its resistance equal to 4 mill ohm and its temperature coefficient of resistance equal to  $(1/234.5)$  per  $^{\circ}\text{C}$ . Find the values of its resistance and temperature coefficient of resistance at  $70^{\circ}\text{C}$ . (05)

b) How to convert energy from one form to another? Explain mechanical to electrical energy conversion. (05)

**Q.2** a) State and explain superposition theorem. (05)

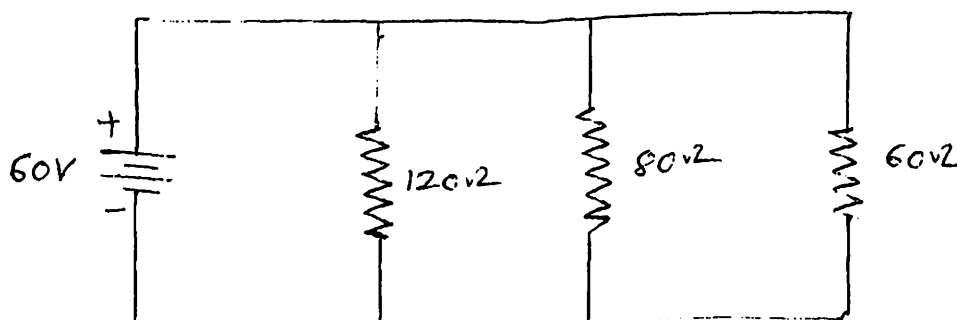
b) Find current in  $2\ \Omega$  resistance by using superposition theorem. (05)



OR

a) State and explain maximum power transfer theorem. (05)

b) Verify KCL for the circuit shown. (05)



- Q.3 a) Explain electric flux intensity. (05)
- b) Explain discharging of capacitor. (05)
- OR**
- a) Explain battery types, explain any one in detail. (05)
- b) The plate area of a parallel-plate capacitor is 0.01 sq.m. The distance between the plate is 2.5 cm. The insulating medium is air. Find its capacitance. What would be its capacitance, if space between the plates is filled with an insulating material of relative permittivity 5? (05)
- Q.4 a) Explain B-H curve. (05)
- b) An iron ring has its mean length of flux path as 60 cm and its cross-sectional area as 15 square cm. Its relative permeability is 500. Find the current required to be passed through a coil of 300 turns wound uniformly around it to produce a flux density of 1.2 Tesla. What would be flux density with the same current, if the iron ring is replaced by air core? (05)
- OR**
- a) Compare electric and magnetic circuit. (05)
- b) Explain Faraday's Law of electromagnetic induction. (05)
- Q.5 a) Explain following terms: (05)
- i) Form factor ii) Peak factor iii) Power factor iv) Admittance.
- b) Explain relationship between line and phase quantities for star connection. (05)
- OR**
- a) Explain following terms: (05)
- i) Impedance ii) Active power iii) Reactive power iv) Apparent power
- b) Explain relationship between line and phase quantities for delta connection. (05)
- Q.6 a) Draw and explain basic layout of distribution system. (05)
- b) Draw and explain fluorescent lamp. (05)
- OR**
- a) What is necessity of earthing? (05)
- b) Draw and explain Mercury vapour lamp, (05)

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