

Day: Friday  
Date: 31/05/2019

S-2019-2539

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) Draw neat diagram wherever necessary.

Q.1 a) Derive resistance temperature coefficient (RTC). (05)

b) A coil has resistance of 18 Ohm when temperature is  $20^{\circ}\text{C}$  & 22 Ohms when its temperature is  $50^{\circ}\text{C}$ . Find the rise in temperature when resistance becomes 24 Ohms. The room temperature is  $18^{\circ}\text{C}$ . (05)

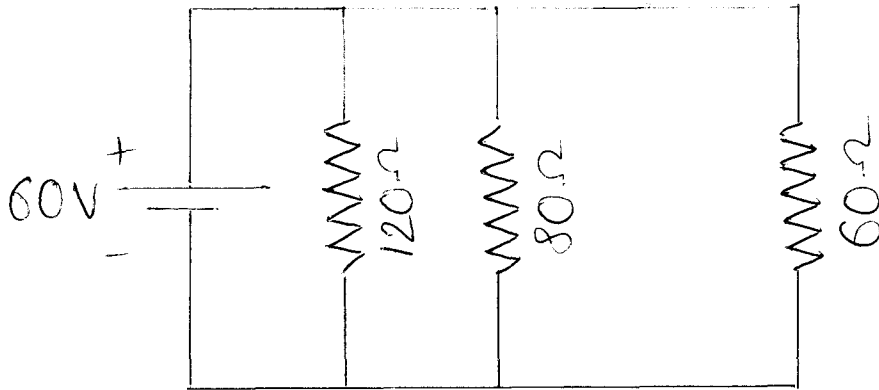
OR

Q.1 a) Define resistance & explain factors affecting resistance value. (05)

b) How long it will take to raise the temperature of 880 gms of water from  $16^{\circ}\text{C}$  to boiling point. The heater takes 2 Amps at 220 V supply has efficiency 90%. (05)

Q.2 a) State & explain Kirchoff's current & voltage law. (05)

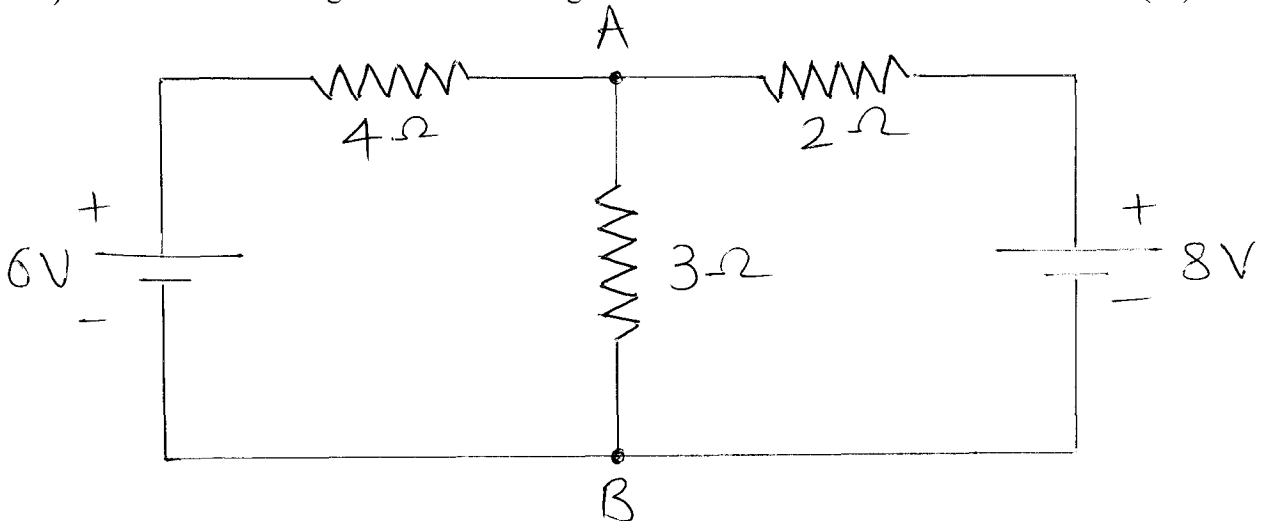
b) Verify the Kirchoff's current law for the circuit shown below. (05)



OR

Q.2 a) State & explain Thevenin's theorem. (05)

b) Find current through branch AB using Thevenin's theorem. (05)



- Q.3 a)** Derive equivalent capacitance connected in parallel. (05)
- b)** Obtain the expression for energy stored in capacitor. (05)
- OR**
- Q.3 a)** Explain types of batteries (any one) (05)
- b)** Explain electric field intensity & electric field strength. (05)
- Q.4 a)** Explain magnetic effects of electric current. (05)
- b)** Explain Faradays laws of electromagnetic induction. (05)
- OR**
- Q.4 a)** An iron ring made up of three parts has  $\ell_1=10\text{cm}$ ,  $a_1 = 5\text{cm}^2$ ,  $\ell_2 = 8\text{cm}$ ,  $a_2= 3\text{cm}^2$ ,  $\ell_3=6\text{cm}$ ,  $a_3= 2.5\text{cm}^2$ . It is wound with a coil of 250 turns. Calculate the current required to produce a flux of 0.4 mWb in the ring.  $\mu_{r1}=2670$ ,  $\mu_{r2}=1050$ ,  $\mu_{r3}=650$ . (05)
- b)** Compare electric & magnetic circuit. (05)
- Q.5 a)** Explain concept of impedance & admittance. (05)
- b)** A sinusoidal current of frequency 25 Hz has a maximum value of 100A. How long will it take for the current to attain value of 20A and 50A starting from zero. Sketch the wave form & show the times & currents. (05)
- OR**
- Q.5 a)** Explain concept of phase & phase difference in alternating quantities. (05)
- b)** A 50Hz sinusoidal current has peak factor 1.4 & form factor 1.1. Its average value is 20A. The instantaneous value of current is 15A at  $t= 0$  sec. Write the equation of current & draw its waveform. (05)
- Q.6 a)** What is earthing? Explain any one type in brief. (05)
- b)** What are the factors influencing the tariff of electric supply. (05)
- OR**
- Q.6 a)** Draw & explain Metal Halide lamp. (05)
- b)** Draw basic layout of distribution system. (05)

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