B.Tech. 2019 2nd Sem.

JAMIA HAMDARD
Department of Food Technology
School of Interdisciplinary Science and Technology
New Delhi-110062
Examination: Even Semester 2019

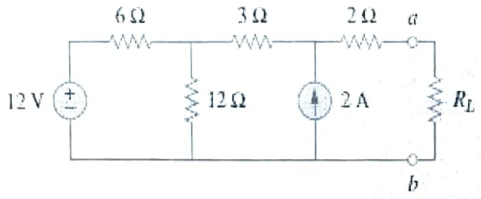
Paper Name: Electrical Science **Paper Code: BFTC-203**
Time: 3 Hours **Maximum Marks: 70**
Note: Use of mobile phones are not allowed
Please follow proper numbering while answering the questions

SECTION A

All questions of this section are compulsory, Each question carries 5 marks

Q1) State Ohm's Law ? Explain Kirchoff's Current Law (KCL) and Kirchoff's Voltage Law (KVL) by giving examples.

Q2)State ''Maximum Power Transfer Theorem''. Find the value of Load Resistance (R_L) in the circuit such that maximum power transfer takes place, also find maximum power.



Q3) The voltage and current through a circuit element are-

v=100 sin (314t+45°) volts i=100 sin (314t+315°) amperes

(i) Identify the circuit element whether 'Inductive' or 'Capacitive' by drawing its phasor diagram and find its value also.
(ii) Obtain expression for power.

Q4) What is a ''Resonance'' in an AC circuit? Draw its Phasor Diagram and also Derive the expression for Resonant Frequency in a series RLC circuit.

Q5) What is an 'Auto-Transformer'? Explain the Losses present in the transformer?

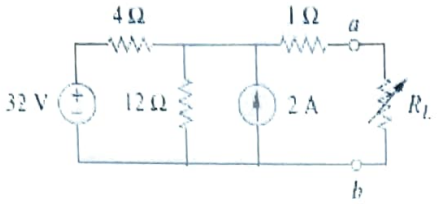
Q6) Differentiate between "Spring Control" and "Gravity Control" of Indicating Instruments.

P.T.O

SECTION B

Attempt any FOUR Questions from this section, Each question carries 10 marks

Q1)State Thevenin's Theorem. Also find Thevenin's Equivalent circuit across terminals ab as shown in figure i.e find V_{th} , R_{th} and I across R_L, when R_L=6 ohm,16 ohm and36 ohm.



Q2) What do you mean by Bandwidth (BW) of AC circuits? Derive it's expression. If the Bandwidth of a resosnant circuit is 10 KHz and lower cut off frequency f_L =120 KHz, find upper cut off frequency?

Q3)Explain Principle, Construction and Working of ''Attraction Type Moving Iron instruments'' and ''Repulsion Type Moving Iron instruments'' ?

Q4) Explain Permanent Magnet Type moving coil instrument? A moving coil instrument has a resistance of 2 ohm and reads upto 250 V when a resistance of 500 ohm is connected in series with it. Find current range of the instrument when it is used as an ammeter with the coil connected across a shunt resistance of 2 milliohm.

Q5) What is a "Transformer''? Explain its Principle, Construction and Working. The turns ratio of a transformer is 100/300, the primary winding is connected to a source of 3.3 kV, 50Hz supply. The load impedance (Z_L=110+j45) is connected across the secondary terminals. Calculate the following:

(i) Value of maximum flux in the core
(ii) Primary and secondary currents

Q6) Explain Principle, Construction and Working of a DC Generator. In case of a DC Generator , what will be the change in EMF induced, if flux is reduced by 20% and speed is increased by 20%.