AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD
DEPARTMENT OF Electrical & Electronics Engineering

Sessional Test 2

Program: B.Tech
Session: 2024-25
Subject: Fundamentals of Electrical Engg.
Max. Marks: 50

Semester: II
Section: S11-S20
Subject Code: BEE201
Time: 2 Hours

OBE Remarks:

Q.No	1	2	3	4	5	6	7	8	9	10	11	12
CO No.	CO2	CO2	CO3	CO3	CO3	CO2	CO2	CO2	CO3	CO3	CO2	CO3
Bloom's Level* (L1 to L6)	L3	L2	L2	L2	L2	L3	L3	L3	L2	L2	L3	L3
Weightage CO2: 26.5							Weightage CO3: 23.5				

*Bloom's Level: L1: Remember. L2: Understand. L3: Apply, L4: Analyze, L5: Evaluate, L6: Create

Note: Answer **all** the sections with all the questions

Section-A (2*5=10)

1. A resistance of 15Ω, choke coil of 0.05H and the capacitor of 0.03F are connected in series. Find the impedance of the circuit if frequency is 50 Hz.
2. Why the power in a capacitor is zero?
3. Write any 4 points of analogy between electric and magnetic circuits.
4. Why a transformer cannot be operated on DC?
5. Why the power rating of a transformer is in VA?

Section-B (5*5=25)

6. Define form factor and peak factor, find these factors for a half wave rectified waveform.

7. A coil is connected in series with a variable capacitor C. The supply voltage is 10 V at 1000rad/sec. The current in the circuit is maximum when C=10 microfarad. The current is 0.707 times the maximum current when C=12.5 microfarad. Find:
   (i) Inductance and resistance of the coil.
   (ii) Q factor of the coil at 1000rad/sec.
   (iii) maximum current in the circuit.

8. An impedance of $(2+j6)\ \Omega$ is connected in series with two impedances of $(10+j4)$ & $(12-j8)\ \Omega$ which are in parallel. The circuit is connected to 200V,50 Hz supply. Find:

   (i) total circuit impedance
   (ii) supply current & power factor
   (iii) total power supplied by the source

9. Derive the emf equation of a transformer. Why the frequency of two sides is same?

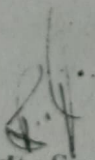10. Explain the working principle of transformer. Compare core and shell type transformer.

11. Derive the relation between line and phase quantities for a **delta** connected balanced load.
A 3-phase voltage source has a phase voltage of 120V and supplies **star** connected load having impedance (36+j48) Ω/phase. Calculate:
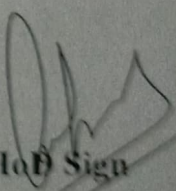
    (a) Line voltage
    (b) line current
    (c) power factor
    (d) 3 phase power supplied to the load

12. A transformer on **no load** has core loss of 50W, draws a current of 2A and has induced emf of 230V. Determine:

    (i) no load power factor
    (ii) core loss current and magnetizing current.
       Also calculate the no load circuit parameters of the transformer. Neglect winding resistance and leakage flux.

Faculty Sign

HoD Sign