MODEL PAPER – FORMATIVE ASSESSMENT-1
C-23-EE-303
BOARD DIPLOMA EXAMINATION, (C-23)
DEEE – THIRD SEMESTER EXAMINATION
EE-303 :AC circuits & Transformers

Time: 90 Minutes   Total Marks: 40M

PART-A   **(1 x 4) + (4 x 3) = 16M**

Instructions: Answer all five questions.
First question carries four marks and remaining each question carries three marks.
Answers should be brief and straight to the point and shall not exceed five simple sentences

1.(a) If instantaneous voltage e=100Sin (50t), its RMS value is _____.   CO1
 (b) The polar form of 3-j4 is _____.   CO1
 (c) The relation between voltage and current in a pure inductance is _____.   CO2
 (d) The phase angle between any two phases in a three phase system is 120
   degrees. True / False.   CO3

2. Define (a) frequency (b) Form Factor related to A.C. quantity.   CO1
3. A sinusoidal current wave is given by i= 100sin 100 πt .Determine (i) Average value and
 (ii) R.M.S value   CO1
4. Define resonance of a RLC series circuit.   CO2
5. List any three advantages of 3-phase system over single phase system.   CO3

PART-B   **3X8=24 MARKS**

Instructions: Answer all three questions.
Each question carries eight marks.
The answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

6.(a)Derive the Average value, RMS value and form factor of a fullwave rectified sinewave.   CO1
                                              (OR)
 (b) Perform the following where A=6+j8,B=8-j10   CO1
     (i)A+B   (ii) A-B   (iii) AXB   (iv) A÷B

7.(a) A coil of resistance 6Ω and an inductance of 0·03 H is connected across of 50 V, 60 Hz supply.
    Find   the (i) current, (ii) phase angle, (iii) power factor and (iv) power.   CO2
                                              (OR)
 (b) A resistance of 50 Ω,inductance of 100mH and a capacitance of 100 µF are connected in series
     across 200volt,50Hz supply.Determine (i) Impedence (ii) current flowing through the circuit (iii)
     power factor (iv) power in watts.   CO2
8.(a) Each phase of delta connected load comprises a resistor of 60Ω and capacitance of 40 µF in
     series.Calculate line and phase currents, total power when the load is connected to a 440V, 3-
     phase, 50Hz supply.   CO3
                                              (OR)
 (b)) Derive the equation for power and power factor of a three-phase balanced load using two-
     wattmeter method.   CO3

MODEL PAPER – FORMATIVE ASSESSMENT-2
C-23-EE-303
BOARD DIPLOMA EXAMINATION, (C-23)
DEEE – THIRD SEMESTER EXAMINATION
EE-303 :AC circuits & Transformers

Time: 90 Minutes   **Total Marks: 40M**

PART-A   **(1 x 4) + (4 x 3) = 16M**

 Instructions: Answer all five questions.
First question carries four marks and remaining each question carries three marks.
Answers should be brief and straight to the point and shall not exceed five simple sentences

1.(a) For step down Transformers, the transformation ratio is less than 1 : (True / False)   CO4
   (b) The condition for maximum efficiency of Transformer is_____.   CO4
   (c) Any one advantage of autotransformer is_____.   CO5
   (d) Any one method of cooling of power transformer is _____.   CO5

2. Define all-day efficiency of a transformer.   CO4
3. Distinguish between shell-type and core-type transformers in any three aspects.   CO4
4. State the advantages of 3-phase transformer over single phase transformer.   CO5
5. List the special transformers.   CO5

PART-B   **3X8=24 MARKS**
Instructions: Answer all three questions.
Each question carries eight marks.
The answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

6.(a) Explain the working principle of transformer.   CO4
                              (OR)
   (b) Derive the EMF equation of a single-phase transformer.   CO4

7.(a) Draw the equivalent circuit diagram refers to primary for a 4 kVA,
     200/400 V and 50 HZ $1 - \phi$ transformer from the test results as follows:
     OC Test : 200 V, 0·8 A, 80 W on LV Side
     SC Test : 20 V, 10 A, 100 W on HV Side   CO4
                              (OR)
   (b) Draw the Vector diagram of a practical transformer on load for unity power factor and lagging

     power factor.   CO4

                              CO4
8.(a)State the need for parallel operation of three phase transformers and also state the conditions
     for parallel operation of three phase transformers.   CO5
                              (OR)
   (b))Explain the function of each part in a power transformer.   CO5

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Time: 3 hours   Total marks: 80

PART-A   **10 X 3 = 30**

Instructions:

i.   **Answer all questions.**
ii.   **Each question carries three marks.**
iii. **Answers should be brief and straight to the point and shall not exceed five simple sentences**

1.   State the relation between number of poles, speed and frequency   CO1

2.   Define the terms related to A.C. quantity (i) RMS value and (ii) peak factor.   CO1

3.   The given two vectors are A=30+j52 and B= 30-j52. Perform the functions.   CO1

      (i) A+B   (ii) A x B

4.   Define resonance of series circuit and state the formula for resonance frequency.   CO2

5.   A resistance of 4Ω is connected in series with an inductance of 0.02H across the supply of 200V, 50Hz.

      Find current in the circuit.   CO2

6.   List any three advantages of 3-phase system over single phase system.   CO3

7.   State the concept of phase sequence.   CO3
8.   Classify the transformers based on number of phases.   CO4

9.   Define all-day efficiency of a transformer.   CO4

10.   List the special transformers   CO5

PART-B   **5 X 10 =50M**

Instructions:

i.   **Answer any five questions.**
ii.   **Each question carries ten marks.**
iii. **The answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.**

11. Derive an expression for impedance, current, phase angle, power and power factor of an AC

circuit consisting of resistance and a pure capacitor in series.   CO2

12. A resistance of 50Ω, inductance of 100 mH and a capacitance of 100 μF

     are connected in series across 200volt, 50Hz supply. Determine

     (i) Impedance (ii) current flowing through the circuit (iii) power factor

     (iv) power in watts.   CO2

13. Derive the equation for power and power factor of a three-phase balanced load using two-

      wattmeter method.   CO3

14. Each phase of delta connected load comprises a resistor of 60Ω and capacitance of 40 μF in

     series. Calculate line and phase currents, total power when the load is connected to a 440V,

     3-phase, 50Hz supply.   CO3

15. Draw the equivalent circuit diagram refers to primary for a 4 kVA,

     200/400 V and 50 HZ $1 - \phi$ transformer from the test results as follows:

     OC Test : 200 V, 0·8 A, 80 W on LV Side

     SC Test : 20 V, 10 A, 100 W on HV Side   CO4

16. Draw the Vector diagram of a practical transformer on load for unity power factor and

      lagging   power factor.   CO4

17. Draw a legible sketch of Power transformer and explain the function of each part.   CO5

18. State the necessity of cooling of power transformers and list methods of cooling of power

      transformers.   CO5