Question Paper

Exam Date & Time: 09-May-2018 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES III SEMESTER B.S. (ENGG.) END - SEMESTER THEORY EXAMINATIONS APRIL - 2018 DATE: 09 MAY 2018 TIME: 9:30 AM TO 12:30 PM

D.C and A.C CIRCIUT ANALYSIS [EE 232]

Duration: 180 mins.

Marks: 100

Answer 5 out of 8 questions.

¹⁾ Use source transform to convert the circuit in Fig. 1A, to a ⁽¹⁰⁾ single voltage source in series with a single resistance.



B)

Obtain the equivalent resistance R_{ab} for the circuit in ⁽¹⁰⁾ Fig.1B.



²⁾ In the network shown in Fig.2A, find the voltage V₁, V₂, V₃ ⁽¹⁰⁾ _{A)} using node voltage analysis

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^{B)} In the network shown in Fig.2B, find ix using mesh current ⁽¹⁰⁾ analysis.





- Determine the voltage Vb in the circuit shown Fig.3A. (10)
- A)

3)



^{B)} A supply of 200V, 50 Hz is connected to a 20 ohms resistor ⁽¹⁰⁾ in series with a choke coil as shown in Fig.3B. The reading of the voltmeter across the resistor is 100 V and voltage across the coil is 150 V. Calculate a) the power factor of the circuit, b) the total power consumed, c) the power consumed in the coil.



- ⁴⁾ A 10 ohms resistor is connected in series with a 100uF (10) capacitor to a 230V, 50 Hz supply. Find a) the impedance,
 - b) current c) power factor and voltage across the capacitor.
 - ^{B)} An *emf of v= 400sin 418t* is applied to a circuit. The (10) current is i = 20 sin(418t 60). Find the circuit components, frequency of the input voltage and power factor.
 - In the circuit of Fig.5A, find the voltage V_X using (10) superposition theorem.



B)

5)

In the circuit of Fig.5B, find a) Thevenin's equivalent circuit, ⁽¹⁰⁾ b) Norton's equivalent circuit and c) Power dissipated in a 5 ohms resistor connected between the terminal A and B.



In the circuit of Fig.6A, find the voltage Vx and verify (10) reciprocity theorem.

6)

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Also determine the expressions for active, reactive and

apparent powers.

7)

8)

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