

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), April-May 2015

B. Tech in All Branches, Semester 2nd



Roll No.....

EE201: Electrical & Electronics Engineering

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. Stored energy of an inductance is dependent upon its
 - (a) instantaneous voltage only
 - (b) instantaneous current only
 - (c) instantaneous voltage and history of its current
 - (d) instantaneous current and history of its voltage
- ii. At a particular instant, an inductance of 1 h carries a current of 2 A, while the voltage across is 1 V. the energy stored in the inductance in joules is
 - (a) 0.5
 - (b) 1
 - (c) 1.5
 - (d) 2
- iii. Three resistances of value R ohms each are connected in star. Its equivalent delta will comprise three resistances of value
 - (a) R/3 each
 - (b) 3R each
 - (c) R each
 - (d) 3R, R, R/3
- iv. We have assigned a frequency of 50 Hz to power system because it
 - (a) can be easily obtained
 - (b) gives best result when used for operating both lights and machinery
 - (c) leads to easy calculations
 - (d) none of the above
- v. The average value of 2A dc current is
 - (a) 1A
 - (b) 4A
 - (c) 2A
 - (d) 3A
- vi. In a pure resistive a.c. circuit, the frequency of power curve is that of the circuit frequency.
 - (a) half
 - (b) same
 - (c) twice
 - (d) thrice
- vii. The Thevenin/Norton equivalent of a network cannot be found if
 - (a) it contains voltage source only
 - (b) it contains current sources only
 - (c) it contains voltage/current sources but not dependent sources
 - (d) it contains voltage/current sources and/or dependent sources
- viii. The capacitive reactance of a circuit is frequency.
 - (a) independent of
 - (b) directly proportional to
 - (c) equal to
 - (d) inversely proportional to
- ix. The value of j^5 is equal to

(a) $\sqrt{-1}$

(b) $-\sqrt{-1}$

(c) 1

(d) -1

x. If a phasor is multiplied by j , then

(a) only its direction changes

(d) only its magnitude changes

(c) both magnitude and direction changes

(d) none changes



Q.2 Short answer type questions (4 questions @ 2.5 marks)

10

i. Can we verify ohm's law by using a filament lamp?

ii. Can you list three differences between a d.c. circuit and an a.c. circuit?

iii. The power factor of the circuit is the same whether current i leads or lags the voltage by ϕ . Explain.

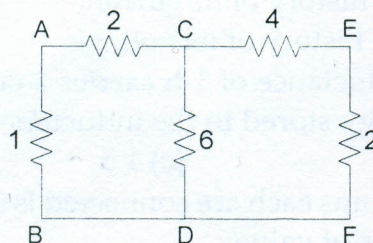
iv. What is the principle of operation of a transformer?

Q.3A Show the duality between series and parallel circuit by giving atleast five points.

05

Q.3B

05



Find the equivalent resistance of the circuit given in the figure between the following points:

(i) A and B

(ii) C and D

(iii) E and F

(iv) A and F

(v) A and C.

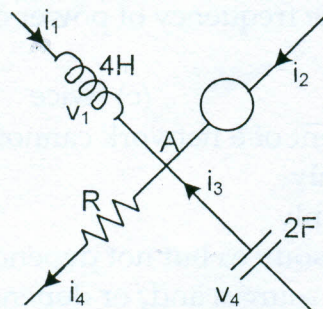
Numbers represent resistances in ohm.

Q.4A How many laws were given by Kirchhoff's? Describe them with examples.

05

Q.4B

05



In the network shown in figure, the currents and voltages are as under:

$$i_2 = 5e^{-2t}, i_4 = 3 \sin t \text{ and } v_3 = 4e^{-2t}$$

Using KCL, find voltage V_1 .

Q.5A How are alternating voltage and current generated? Write down the relating equations also.

05

Q.5B Find out the RMS value, average value, form factor and amplitude factor for the half-wave rectified wave.

05

- Q.6A Draw the voltage triangle, impedance triangle, waveforms and relating equations for current, voltage and power when alternating voltage applied through R-L series circuit. 05
- Q.6B Draw the voltage triangle, impedance triangle, waveforms and relating equations for current, voltage and power when alternating voltage applied through R-C series circuit. 05
- OR
- Q.6B What do you mean by resonance in R-L-C series circuit? How resonance affects different parameters of the circuit? Also show graphical representation for it. 1+2
+2
- Q.7A What do you mean by resonance in R-L-C parallel circuit? How resonance affects different parameters of the circuit? Also show graphical representation for it. 1+2
+2
- Q.7B Draw the voltage triangle, impedance triangle, waveforms and relating equations for current, voltage and power when alternating voltage applied through R-L parallel circuit. 05
- OR
- Q.7B Draw the voltage triangle, impedance triangle, waveforms and relating equations for current, voltage and power when alternating voltage applied through R-C parallel circuit. 05
- Q.8A Define transformer. Also mention its working principle and types. Which tests are conducted on transformer to find out losses? 10
- Q.9A What is machine? What are the types of machine? What is the difference between motor and generator? 10
- Q.9B Write a note on construction and working of DC motor. Also give types of motor. 10
- OR
- Q.9B Can we measure power of three phase circuit with two wattmeter? If yes than how, if no then why. 10

