KUMARAGURU
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B.E / B.TECH DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

Second Semester

U15EET212 : ELECTRICAL AND ELECTRONIC CIRCUITS

(Common to CSE / IT)

COURSE OUTCOMES:

CO1: Define & identify the basic electrical quantities and also able to calculate approximately the voltage, current parameters in DC circuits using basic laws.

CO2: Understand the phasor representation of various AC circuit parameters and acquire knowledge on fundamentals of three phase ac circuits.

CO3: Differentiate the various semiconductor diodes and rectifiers

CO4: Summarize the characteristics of different types of transistors

CO5: Apply the achieved basic knowledge about oscillators and op-amp to different dc applications.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the following   CO1 [K_2]

A. Resistance	1. Watt hour
B. Conductance	2. Mho
C. Energy	3. Ohm

    a)   A-1, B-2, C-3   b)   A-3, B-2, C-1

    c)   A-3, B-1, C-2   d)   A-2, B-3, C-1

2. Identify the element for which Ohm's Law is not applicable   CO1 [K_1]

    a)   Iron box   b)   Motor winding

    c)   Diode   d)   Incandescent bulb

3. Assertion (A): Power factor depends on the load.   CO2 [K_3]

    Reason (R): Active power consumption of the load is due to the resistance.

    a)   A and R are true and related   b)   A is true and R is not true

    c)   A is not true and R is true   d)   A and R are not true

4. For sinusoidal voltage, arrange the following in sequence of values with increasing order;   CO2 [K$_2$]

  A. Average value   B. RMS value   C. Peak value

  a)   B-C-A   b)   A-B-C

  c)   C-B-A   d)   B-A-C

5. Identify the devices operating in forward conduction mode   CO3 [K$_2$]

  [A. Half wave rectifier   B. Full wave rectifier   C. Zener regulator]

  a)   A and B   b)   A and C

  c)   B and C   d)   A and D

6. Assertion (A): The output ripple frequency of full wave rectifier is 100 Hz for the input   CO3 [K$_2$]

  supply of 50 Hz.

  Reason (R): In full wave rectifier, both the half cycles appear in the output.

  a)   A and R are true and related   b)   A is true and R is not true

  c)   A is not true and R is true   d)   A and R are not true

7. Identify the current controlled devices   CO4 [K$_1$]

  A. MOSFET   B. SCR   C. BJT

  a)   A and B   b)   A and C

  c)   B and C   d)   A and D

8. Match the following for transistors   CO4 [K$_2$]

  A. CE configuration   1. Impedance matching

  B. CB configuration   2. Audio frequency circuits

  C. CC configuration   3. High frequency circuits

  a)   A-2, B-3, C-1   b)   A-1, B-3, C-2

  c)   A-3, B-2, C-1   d)   A-3, B-1, C-2

9. _____ is operating as a source   CO5 [K$_2$]

  a)   Amplifier   b)   Oscillator

  c)   Rectifier   d)   Comparator

10. Identify the correct sequence for increasing circuit complexity   CO5 [K$_2$]

  [A. Transistor Amplifier   B. Operational amplifier   C. Integrator]

  a)   B-C-A   b)   A-B-C

  c)   C-B-A   d)   B-A-C

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Two resistors of 2Ω and 4Ω are connected in series to a battery of 12V. Calculate the power consumed in 4Ω resistor   CO1 [K₃]

12. State Kirchhoff's current Law   CO1 [K₁]

13. Define RMS value of alternating voltage   CO2 [K₁]

14. Calculate the power factor of an AC circuit with a load of impedance, **3+4j Ω**   CO2 [K₃]

15. Draw the V-I characteristics of PN junction diode   CO3 [K₂]

16. List the applications of optical diodes   CO3 [K₃]

17. What is meant by biasing of transistor?   CO4 [K₂]

18. Give examples for voltage controlled devices   CO4 [K₁]

19. Draw the circuit of LC feedback oscillator   CO5 [K₂]

20. State the applications of operational amplifiers   CO5 [K₃]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. (i) Two filament lamps of resistances **100Ω** and **200Ω** are connected in parallel and supplied from **200V** source. Calculate the power consumed by the **100Ω** lamp.   (10)   CO1   [K₃]

     (ii) Write the equations for three phase voltages   (4)   CO2   [K₂]

22. Determine the current flowing through **5 Ω** resistor using loop current method.   CO1   [K₃]
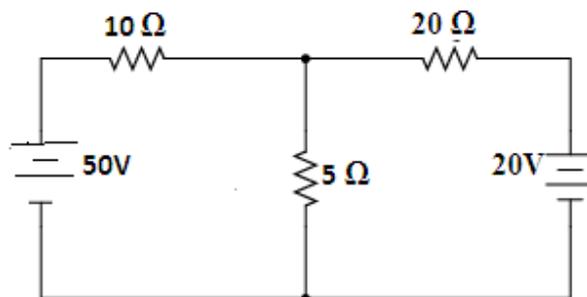
23. Describe the resonance in series RLC circuit with relevant diagrams and equations   CO2   [K₂]

24. Draw the circuit of full wave rectifier and explain the operation with waveforms   CO3   [K₂]

25. (i) Describe common emitter amplifier with circuit diagram   (10) CO4 [K₂]

    (ii) Draw the structure of MOSFET   (4) CO4 [K₂]

26. (i) Draw the circuit and explain the operation of relaxation oscillator   (7) CO5 [K₂]

    (ii) Describe the operation of circuit and differentiator   (7) CO5 [K₂]

27. Compare

    (i) Diode and SCR   (7) CO3   [K₃]

    (ii) Amplifier and oscillator   (7) CO5

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