B.E./B.TECH. DEGREE EXAMINATIONS: NOVEMBER 2009

Second Semester

U07EC203: Electrical and Electronic Circuits

(Common to B.E. Computer Science and Engineering & B.Tech. Information Technology Branches)

Time: Three hours   **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. A 100 ohm resistor is needed in an electric circuit to carry a current of 0.3A. Which of the following resistor would you select?

   A) 100 ohm, 1W   B) 100 ohm, 5W   C) 100 ohm, 7.5 W   D) 100 ohm, 10W

2. Kirchoff's voltage law applies to circuits with

   A) linear elements only

   B) non linear elements only

   C) linear, non linear, active & passive elements

   D) linear, non linear, active & passive, time varying as well as time invariant elements

3. In a series RLC circuit the voltages across resistance, inductance and capacitance are 80V, 160V and 100V respectively. The voltage across the circuit will be

   A) 80 V   B) 100V   C) 140V   D) 340 V

4. Power factor of an AC circuit is given by

   A) R/Z   B) P/S   C) KW/KVA   D) Any of the above

5. Efficiency of half wave rectifier is

   A) 81.2%   B) 50%   C) 40.6%   D) 75%

6. Which of the following used for voltage regulation?.

   A) P-N junction diode   B) Zener diode

   C) NPN transistor   D) Vacumm tube

7. Current amplifier factor (α) of the common base connection of the transistor is the ratio of

   A) $\dfrac{\Delta I_C}{\Delta I_E}$ B) $\dfrac{\Delta I_C}{\Delta I_B}$ C) $\dfrac{\Delta I_B}{\Delta I_E}$ D) $\dfrac{\Delta I_B}{\Delta Ic}$

8. The transistors are always operated in the region _____ Knee voltage

   A) Above   B) Below   C) At   D) Zero

9. _____ is a non rotating electronic device which converts DC power into AC power of any desired frequency.

   A) Signal generator   B) Oscillator   C) SCR   D) MOSFET

10. Crystal oscillators are used to maintain for

    A) Constant frequency   B) Constant voltage

    C) Variable frequency   D) Variable voltage

PART B (10 x 2 = 20 Marks)

11. State ohm's law.

12. Define electric current.

13. Define RMS value of current.

14. State the effects of series resonance.

15. What are the types of extrinsic semiconductors?

16. Draw the V-I characteristics of P-N junction when it is in forward bias.

17. What are the 3 possible connections of transistors?

18. Define output resistance of transistor amplifier.

19. What are the essential components of transistor oscillator?

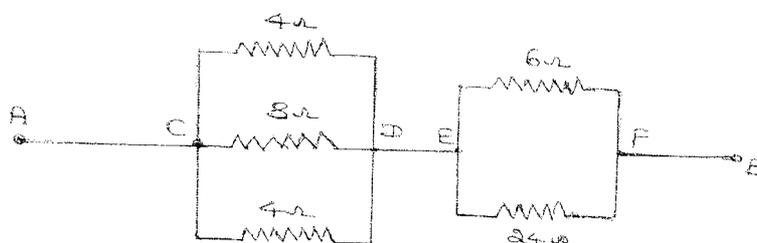20. What are the advantages of phase shift oscillator?

PART C (5 x 14 = 70 Marks)

21. a) i) Illustrate Kirchoff's laws with an example.

    ii) A battery having an emf of 12V is connected across terminals AB circuit shown in fig. Find:

    1) Current following in each resistance.
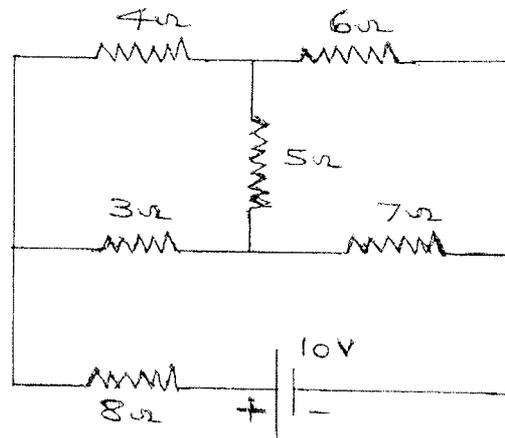
    2) Total power absorbed by the circuit.

b) Calculate the current in 5 Ω resistor shown in figure using Kirchoff's laws.

22. a) Find the average value, RMS value, form factor and peak factor for
   i) half wave rectified alternating current.
   ii) Full·wave rectified alternating current.

(OR)

b) Derive the expression for the following with respect to resonance in series RLC circuit.
   i) Resonant frequency, f_r
   ii) Q factor
   iii) Band width

23. a) Explain about full wave bridge rectifier with neat circuit diagram. Also derive its efficiency.

(OR)

b) Explain about different types of filter circuits employed for filtering the AC ripples.

24. a) Explain about various types of obtaining biasing of transistor from one source of DC supply, V_{CC}.

(OR)

b) i) Discuss about different characteristics of common emitter connection of transistor. (8)

ii) Define the following JFET parameters: (6)
   1) AC drain resistance, r_d
   2) Trans conductance, g_m
   3) Amplification factor, μ

25. a) i) Explain the principle of an oscillator with block diagram. (7)

ii) Draw and explain the circuit operation of Hartley oscillator. (7)

(OR)

b) Draw and explain the practical differentiator using OPAMPS.

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