

**B.E/B.TECH DEGREE EXAMINATIONS:JUNE 2013**

Second Semester

**EEE231: ELECTRICAL AND ELECTRONIC CIRCUITS**

(Common to CSE & IT)

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Calculate the output voltage of the following circuit.
  - a) 5 V
  - b) 6V
  - c) 3 V
  - d) 10 V
2. What is the minimum number of  $8\Omega$  resistors arranged in series that would be necessary to keep the current in a circuit with 12 V battery less than 0.45 A?
  - a) 2
  - b) 4
  - c) 8
  - d) 16
3. A  $12\Omega$  resistor, a 40Mf, and an 8mH coil are in series across an ac source. The resonant frequency is
  - a) 28.1 Hz
  - b) 281 Hz
  - c) 2810 Hz
  - d) 10 KHz
4. The form factor is the ratio of
  - a) peak value to rms value
  - b) average value to rms value
  - c) rms value to average value.
  - d) peak value to average value
5. Which of the following ratings is true?
  - a) Si diodes have higher PIV and narrower temperature ranges than Ge diodes
  - b) Si diodes have higher PIV and wider temperature ranges than Ge diodes
  - c) Si diodes have lower PIV and narrower temperature ranges than Ge diodes
  - d) Si diodes have lower PIV and wider temperature ranges than Ge diodes
6. Each diode of full wave centre-tapped rectifier conducts for :
  - a)  $360^\circ$
  - b)  $270^\circ$
  - c)  $90^\circ$
  - d)  $180^\circ$
7. Junction Field Effect transistors(JFET) contain how many diodes?
  - a) 4
  - b) 3
  - c) 2
  - d) 1



- (ii) If the total power dissipated in the network is 16 watts, find the value of R and (7)  
the total current in Figure 2.

**(OR)**

- b) Determine the power output of each voltage source, using Kirchoff's laws for the network shown. All resistances are in ohms Figure 3.

22. a) Calculate the (i) form factor and (ii) peak factor of a half rectified sine wave.

**(OR)**

- b) (i) A network having two parallel branches,  $Z_1 = 10 + j20$  and  $Z_2 = 15 - j15$ . The (8)  
voltage applied to the network is 200 V. Find the total power supplied by the network and the powerfactor of the network.

(ii) An RLC series circuit has  $R=50\ \Omega$ ,  $L=0.05\ \text{H}$  and  $C=20\ \text{Mf}$ . Voltage applied to this circuit is 200 volts, the frequency being variable. Find the maximum capacitor voltage. (6)

23. a) (i) What is a PN junction? How is it formed? (7)  
(ii) Explain the operation and V-I characteristics of a diode under forward bias. (7)

**(OR)**

- b) (i) How a Zener diode can be used as a voltage regulator? (4)  
(ii) Show that a full-wave rectifier is twice as efficient as a half-wave rectifier. (10)

24. a) (i) How a transistor is used as an amplifier. (4)  
(ii) Explain the working of different types of MOSFET with the help of suitable diagrams. (10)

**(OR)**

- b) (i) Compare JFET with BJT. (6)  
(ii) Explain with the output characteristics, how a phototransistor responds to the incident Light? (8)

25. a) (i) Draw the circuit diagram of an op-amp differentiator and derive an expression for the output in term of the input. (8)  
(ii) What is a dc voltage follower? How such a device can be simulated using op-amp? (6)

**(OR)**

- b) Draw the circuit diagram of Crystal oscillator and explain its function.

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