

**B.E/B.TECH DEGREE EXAMINATIONS: DEC 2014**

(Regulation 2009)

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)**

- When the resistors  $R_1$ ,  $R_2$  and  $R_3$  are connected in series, then the equivalent resistance  $R_{eq}$  is
  - $R_{eq} = R_1 + R_2 + R_3$
  - $R_{eq} = 1/R_1 + 1/R_2 + 1/R_3$
  - $R_{eq} = R_1 \times R_2 \times R_3$
  - $R_{eq} = R_1 / R_2 / R_3$
- In a parallel circuit current value is \_\_\_\_\_ and the voltage value is \_\_\_\_\_
  - different, constant
  - constant, different
  - both are constant values
  - both are different values
- In a sinusoidal waveform the reciprocal of time period is \_\_\_\_
  - Amplitude
  - frequency
  - Voltage
  - Current
- Resonance occurs at
  - $X_L = X_C$
  - $X_L > X_C$
  - $X_L < X_C$
  - $X_L = 1/X_C$
- Diode is used as
  - current source
  - voltage source
  - photo diode
  - Rectifier
- The peak inverse voltage (PIV) value of half wave rectifier is
  - $V_m$
  - $2V_m$
  - $V_m/2$
  - $4V_m$
- If  $I_B = 1$  mA,  $\beta = 50$  for a transistor,  $I_E$  is
  - 51 mA
  - 50 mA
  - 101 mA
  - 49 mA

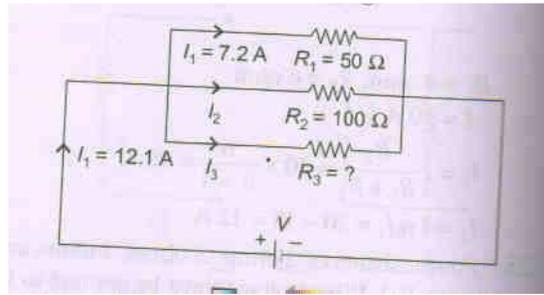
8. JFET acts as a current source when it is operating
- |                    |   |
|--------------------|---|
| a) at $V_{GS} = 0$ | b) along the horizontal part of drain curve |
| c) at $V_{GS} < 0$ | d) along linear part of drain curve         |
9. Oscillator is similar to
- |               |               |
|---------------|---------------|
| a) Rectifier  | b) Amplifier  |
| c) d.c source | d) a.c source |
10. For a practical differential amplifier
- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| a) $A_d$ is large and $A_c$ is small | b) $A_d$ is small and $A_c$ is large |
| c) both $A_d$ and $A_c$ are large    | d) both $A_d$ and $A_c$ are small    |

**PART B (10 x 2 = 20 Marks)**

11. State ohm's law with its limitations.
12. Define Kirchoff's laws.
13. What is power factor? And also mention their types.
14. Define Q factor of resonant circuit.
15. What is the peak inverse voltage of diode?
16. Draw the VI characteristics of zener diode.
17. Determine value of the base current of a common base configuration whose current amplification factor is 0.92. Emitter current is 1mA.
18. What is pinch off voltage?
19. State barkhausen criteria.
20. Define CMRR.

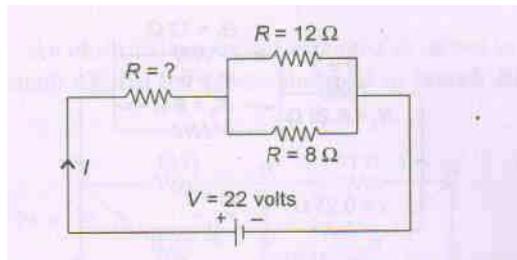
**PART C (5 x 14 = 70 Marks)**

21. a) (i) Four resistors of  $2\Omega$ ,  $3\Omega$ ,  $4\Omega$  and  $5\Omega$  respectively are connected in parallel. (7)  
 What voltage must be applied the group in order that power of 100 watts. May be absorbed; also find current flowing through the circuit.
- (ii) A  $50\ \Omega$  resistor is in parallel with a  $100\ \Omega$  resistor. The current in  $50\ \Omega$  resistor is 7.2 A. What is the value of third resistance to be added in parallel to make the line current as 12.1 A? (7)

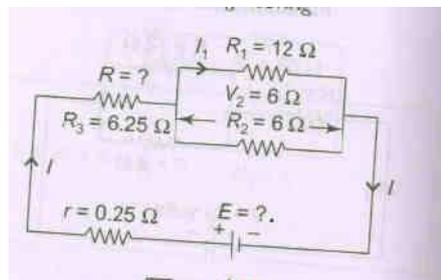


(OR)

- b) (i) A resistance  $R$  is connected in series with a parallel circuit comprising two resistors  $12$  and  $8$  respectively. The total power dissipated in the circuit is  $70$  watts when the applied voltage is  $22$  volts. Calculate the value of  $R$ . (7)



- (ii) Two resistors  $12 \Omega$  and  $6 \Omega$  are connected in parallel and this combination is connected series with a  $25 \Omega$  resistance and a battery which has an internal resistance of  $0.25 \Omega$ . Determine the emf of the battery if P.D. across  $6 \Omega$  is  $6$  volts. (7)



22. a) (i) Define the following terms and derive their values for sinusoidal wave form. (4)
- Form factor
  - Peak factor
- (ii) Explain the Sinusoidal response of a) Pure resistive circuit b) Pure inductive circuit c) Pure capacitive circuit. (10)

(OR)

- b) Derive the expressions for current, resonant frequency,  $Q$  factor of the circuit, bandwidth and draw the resonance curve for a series resonance circuit?

23. a) Illustrate the construction, working of full-wave rectifier and also mention its

efficiency, transformer utilization factor, peak inverse voltage and ripple factor values.

**(OR)**

b) Explain the working of a PN junction diode in forward and reverse bias conditions and also sketch V-I characteristics.

24. a) With neat circuit diagram explain the working of CE configuration of a NPN transistor with the input and output characteristic curves.

**(OR)**

b) Illustrate the operation of n-channel JFET with its output and transfer characteristics.

25. a) Explain the operation of RC phase shift oscillator and derive the expression for frequency of oscillation.

**(OR)**

b) Analyze the operation of non-inverting comparator circuit with its transfer characteristics.

\*\*\*\*\*