Reg. No.										

B.E/B.TECH (FULL-TIME) DEGREE END SEMESTER EXAMINATIONS – NOV/DEC 2012

COMPUTER SCIENCE AND ENGINEERING

THIRD SEMESTER (REGULATION 2008)

EC9213 ELECTRONIC DEVICES AND CIRCUITS

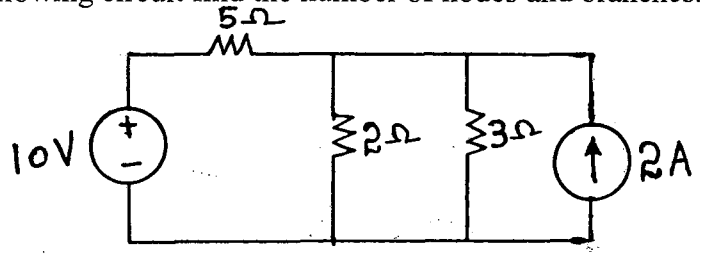
Time: 3 Hours **Max Marks: 100**

Answer ALL Questions

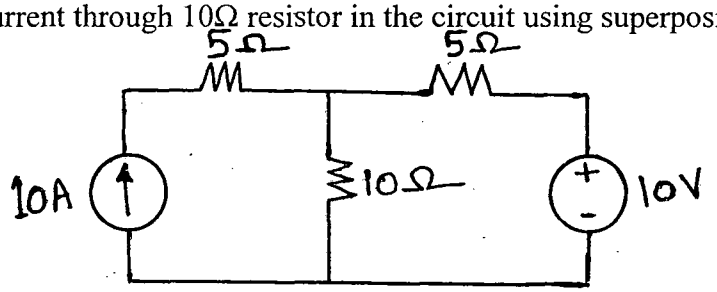
PART – A (10 x 2 = 20 Marks)

1. A 30-ohm resistance is connected in parallel with a resistor R whose ohmic value is unknown. If the total current taken is 10.5 amps when the circuit voltage is 210 V, Calculate R

2. For the following circuit find the number of nodes and branches.



3. Find the current through 10Ω resistor in the circuit using superposition theorem.



4. A resistor R is connected in parallel, with another of value of 20 Ω. This combination is then connected to a 120 volts source through a 4 Ω resistor. For what value of R will its power be a maximum. Find this maximum power.

5. Define drift and diffusion currents for a semiconductor.

6. Define transconductance and drain resistance of a JFET

7. What is meant by early effect?

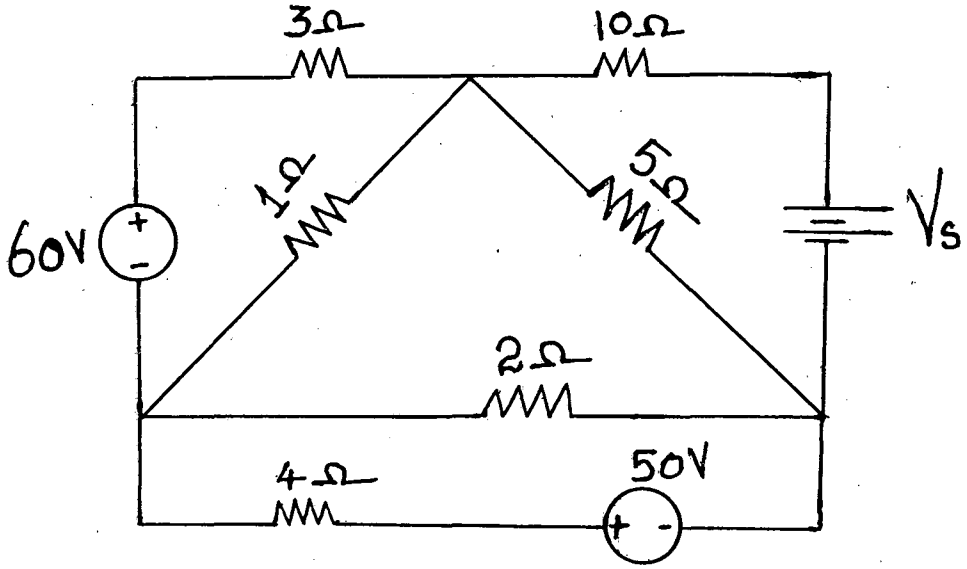
8. The current gain of a transistor in CE mode is 49. Calculate its common-base current gain. Find the base current when the emitter current is 3 mA.

9. List the ideal characteristics of ideal Op-Amp.

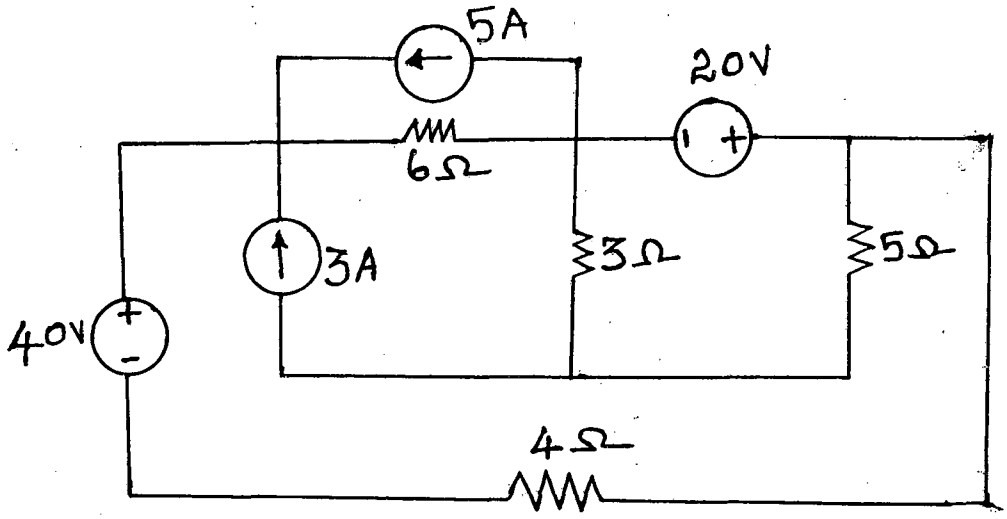
10. Define CMRR.

PART - B (5 x 16 = 80 Marks)

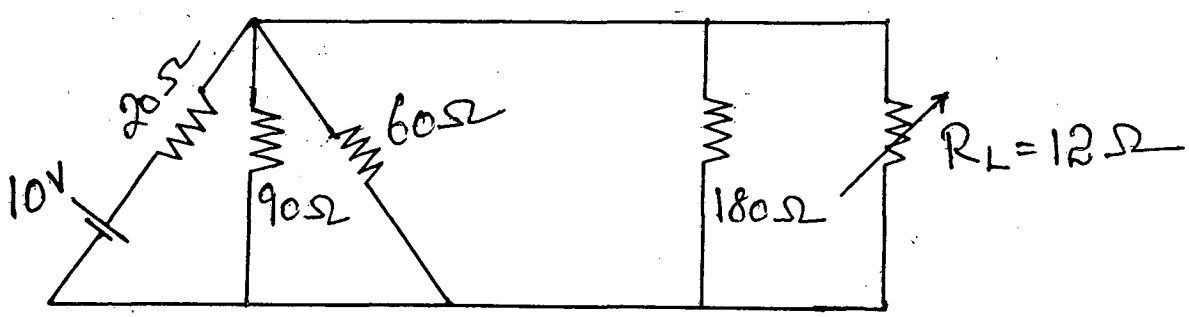
11. (a) (i) Find V_s which gives 50V across the 10Ω resistor using mesh method. (8)



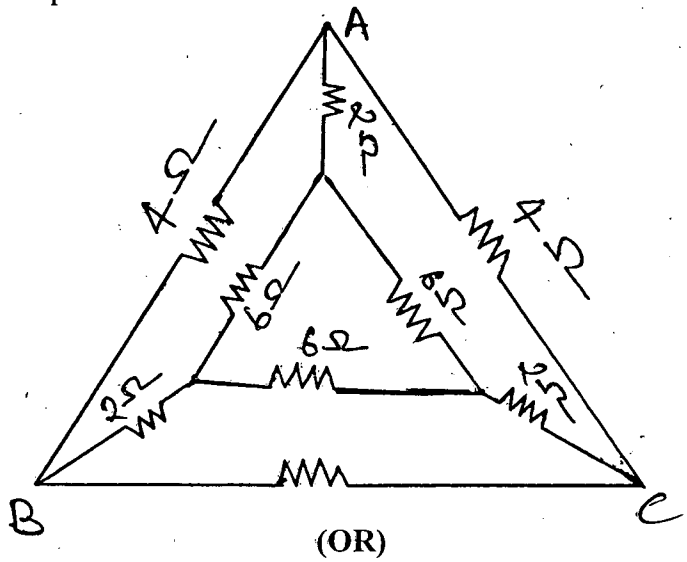
11. (a) (ii) For the network shown below, write the node-basis equations and determine the power dissipated in 5Ω resistor. (8)



12. (a) (i) Find using Thevenin's Theorem the current flowing in a 12Ω resistor. (8)

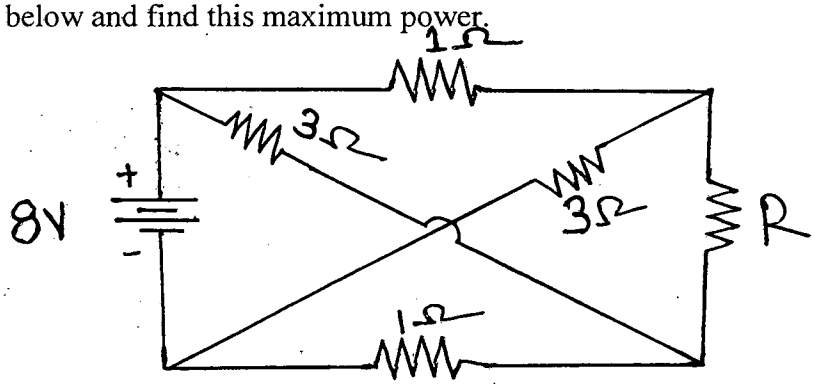


12.(a) (ii) Find the equivalent resistance between B and C for the circuit shown below (8)

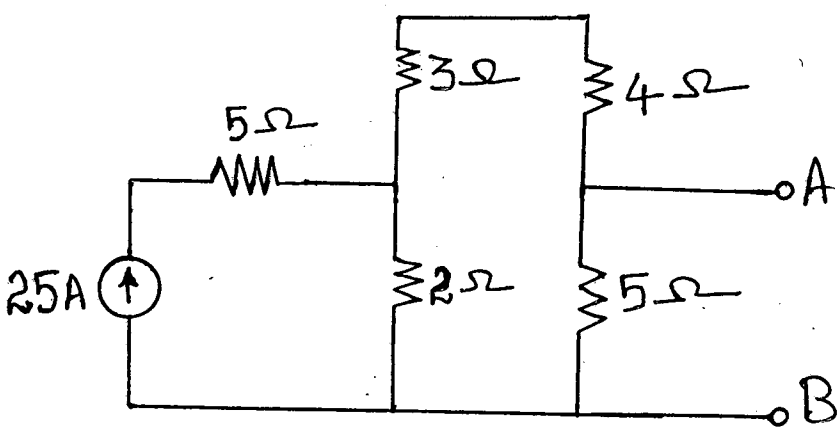


(OR)

12.(b) (i) Find the value of R for which it receives maximum power in the circuit of shown below and find this maximum power. (8)



12.(b)(ii) Find by Norton's Theorem, the current in the arm AB (8)



13. (a) (i) What do you understand by depletion region at p-n junction? What is the effect of forward and reverse biasing of p-n junction on the depletion region? (4)

13.(a) (ii) Derive the expression for the current gain, input impedance, Voltage gain and output admittance of a small signal transistor CE amplifier in terms of the h-parameters (12)

(OR)

13.(b) (i) Explain the construction and operation of Enhancement MOSFET and its characteristics. (12)

13.(b) (ii) Distinguish between the FET and BJT. (4)

14. (a) (i) Explain the working principle of full wave rectifier and derive the following : I_{dc} and V_{dc} , I_{rms} and V_{rms} , Ripple factor, Peak Inverse Voltage and Efficiency (12)

14.(a) (ii) Describe the working of capacitor input filter and draw its output waveform (4)

(OR)

14.(b) (i) Determine the quiescent current and collector to emitter voltage for a silicon transistor with $\beta = 50$ in self biasing arrangement. Draw the circuit with a given component value with $V_{cc} = 20$ V, $R_c = 2$ KΩ, $R_E = 100$ Ω, $R_1 = 100$ KΩ and $R_2 = 5$ KΩ. (4)

14.(b) (ii) Discuss the frequency response of an CE amplifier. How the bandwidth of an amplifier cab be improved? (12)

15. (a) (i) Explain the working of binary-weighted resistor D/A converter. (8)

15.(a) (ii) With a circuit diagram explain the operation Differentiator and Integrator using operational amplifier. (8)

(OR)

15.(b) (i) Explain the operation of the inverting and non-inverting amplifier and design the amplifier with gain of 10. (8)

15.(b) (ii) Discuss the first order High pass filter with its frequency response and design the circuit with cut-off the frequency of 5KHz (8)
