(8)

B.E/ B.Tech (Full Time) Degree Arrear Examinations, NOV/DEC 2013
Computer Science Engineering Branch
Third Semester
EC294 Electronic Devices & Circuits/ EC9213 Electronic Devices and Circuits
Regulation 2004/2008

Time:3 Hours **Answer all Questions** **Max. Marks 100**

Part A (10X2=20)

1. Apply voltage division and determine the voltage across 30 Ω resistor for the circuit shown in Fig.1.
2. Replace the two current sources shown in Fig.2 by one equivalent current source.

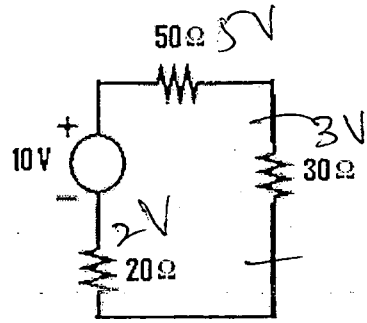

Figure 1.

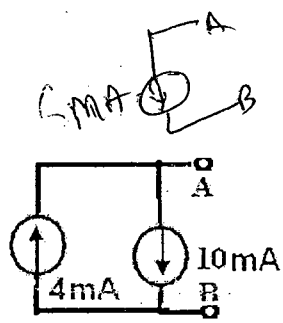

Figure 2.

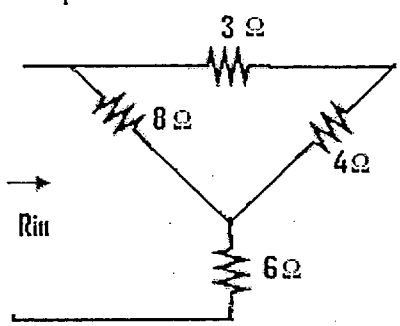

Figure 3.

3. State superposition principle.
4. Determine the equivalent resistance Rin for the circuit shown in Fig.3.
5. What is meant by cut-in voltage for pn junction diode.
6. What is known body effect in MOSFET?
7. What is meant by unity gain bandwidth of an amplifier?
8. Define transconductance of MOSFET.
9. Draw a negative feedback operational amplifier to derive an output voltage $V_{out} = -6V_{in}$, here V_{in} is the input voltage of the operational amplifier.
10. Draw an integrator circuit using opamp.

PART B (5X16=80)

11. Using nodal analysis determine the voltage V_1 for the circuit shown in Fig.4 and determine the power dissipated by the 3KΩ resistor. (16)

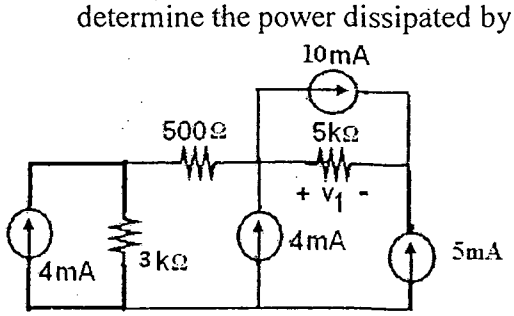

Figure 4.

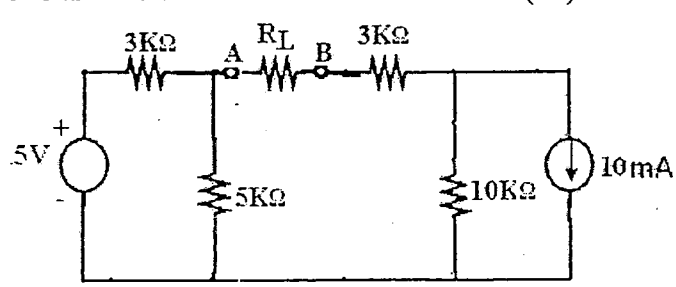

Figure 5.

12 a i. State Thevenins theorem. (4)

ii. Determine the thevenin equivalent circuit looking into the terminal A,B for the circuit shown in Fig.5. (12)

(OR)

12 b i. State Maximum power transfer theorem. (4)

ii. Determine the value of R_L for the circuit shown in Fig.6. so that maximum power is transferred. (12)

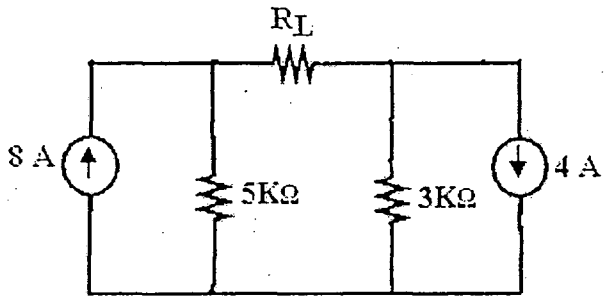

Figure 6.

13 a i. Explain the load regulation characteristic of zener diode. (4)

ii. Derive the collector current equation of BJT in active region and derive its h parameter model. (12)

(OR)

13 b i. Derive the current equation of an n-channel MOSFET under various region of operation condition. (8)

ii. Explain the various region of operation of n-channel JFET. (8)

14 a Explain the principle of operation of CE amplifier with voltage divider biasing and derive its voltage gain. (16)

(OR)

14 b Derive the voltage gain of CS amplifier by drawing its small signal equivalent model and explain its frequency response. (16)

15 a i. Describe the functionality of an opamp used as a first order low pass and high pass filter with appropriate circuit diagram. (8)

ii. With necessary derivation show that operational amplifier can be used as a summing and subtractor amplifier (8)

(OR)

15 b i. Derive the gain of an operational amplifier used in inverting and noninverting negative feedback configuration. (8)

ii. Explain the principle of operation of inverted R/2R ladder DAC. (8)