6/11/13

(7)

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.

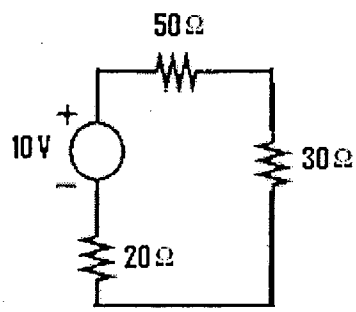

Figure 1.

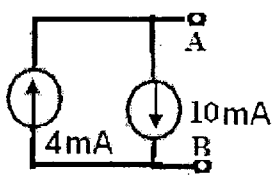

Figure 2.

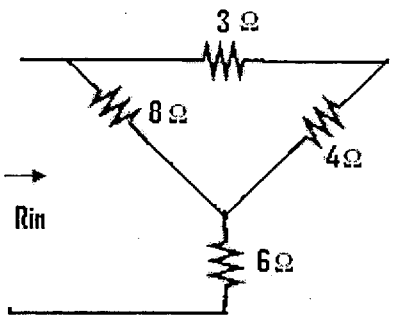

Figure 3.

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)

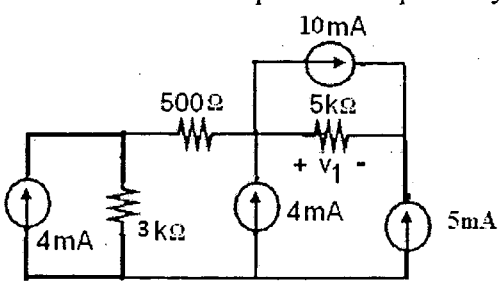

Figure 4.

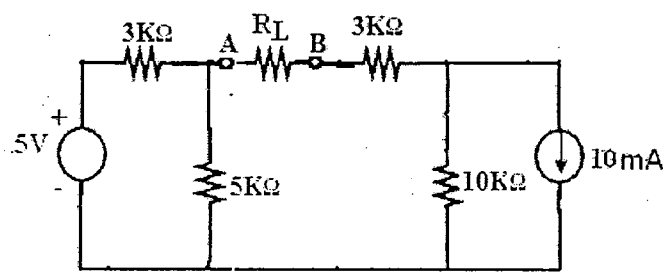

Figure 5.

(ii) Explain the principle of operation of a LVDT and plot the transfer characteristics. An ac LVDT has the following data, Input = 6.3V, Output = 5.2V, range±0.5in. Determine the output voltage vs core position for a core movement going from +0.45 in. to -0.30 in (8)

(or)

(b) (i)Discuss the principle of operation of strain gauges and derive guage factor.(10)

(ii) A resistance strain gauge with gauge factor of 2 is connected to a steel member, which is subjected to a strain of 1×10^{-6}. If the original resistance value of gauge is 130 Ω, calculate the change in resistance. (6)

13. (a) Explain with derivation the working of bridge circuit for the measurement of

(i) Measurement of low Q factor (<10). (8)

(ii) A capacitor is tested by a schering bridge which forms one arm AB of the bridge. The other arms are AD –a non-inductive resistance of 100Ω; DC - a non-reactive resistance of 300 Ω in parallel with a capacitor of 0.5μF; BC – a standard loss free capacitor of 100pF.The supply frequency is 50Hz. The bridge is balanced. Calculate the capacitor value and the power factor of the capacitor under test. (8)

(or)

(b) Explain the following in detail

(i) Computer based data acquisition system (8)

(ii) Spectrum analyzer (8)

14. (a) (i) Explain the structure of IEEE-488 general purpose interfacing bus. (8)

(ii) Explain the working principle of digital frequency meter (8)

(or)

(b) (i) Explain with diagram the operation of successive approximation and dual slope DVM. (8)

(ii) Discuss in detail the operation of multi - range digital multimeter (8)

15. (a) (i) Describe with block diagram the operation of a digital storage CRO. State the functions of each block. (8)

(ii) Write in brief about virtual instrumentation. (8)

(or)

(b) Write short notes on (i) Strip chart recorder (ii) X-Y recorders (16)