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EX-405(N)

B. E. (Fourth Semester)

EXAMINATION, June, 2011

(Electrical & Electronics Engg. Branch)

ELECTRONIC DEVICES AND CIRCUITS-II

[EX-405(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt one question from each Unit. Total five questions are to be attempted. All questions carry equal marks. Assume any missing data.

Unit-I

1. (a) For the circuit shown in fig., show that the output voltage is : 10

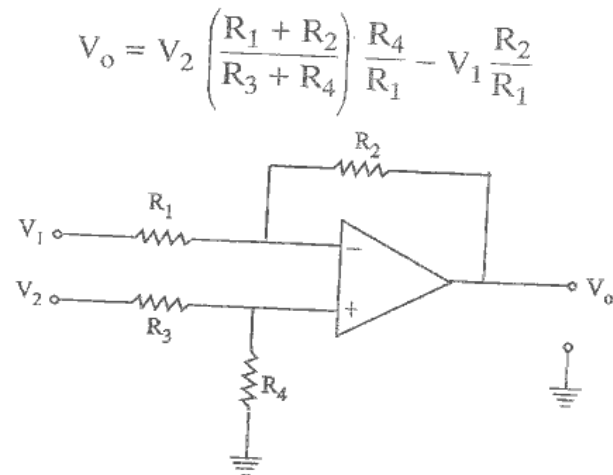


Fig. 1

P. T. O.

- (b) Define the following terms in connection with an OP-AMP : 10

- (i) CMRR
- (ii) Input offset voltage
- (iii) Output offset voltage
- (iv) Slew rate

Or

2. (a) Explain the working of an OP-AMP. as inverting amplifier in close loop and derive an expression for the output. 10
- (b) Explain V_o in terms of V_1 and V_2 . 10

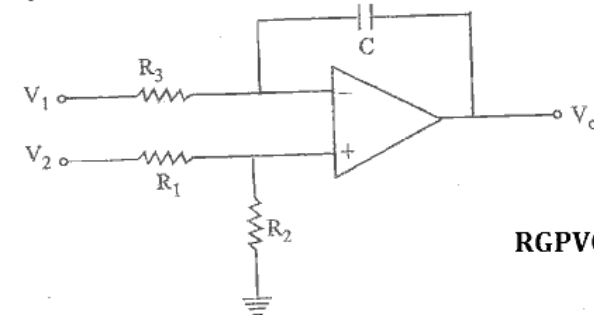


Fig. 2

Unit-II

3. (a) Answer the following questions : 10
- (i) How many resistors and capacitors are required in a first order and second order LP active Butterworth filter ?
 - (ii) How do the values of the resistance and the capacitive reactance compare at the cut off frequency of a first order active filter ?
 - (iii) What is the centre frequency in a BP and a notch filter ?

- (b) Design a Butterworth low pass filter which has a cut off frequency of 1 kHz, the gain is required to drop by at least - 56 dB at 10 kHz. 10

Or

4. (a) What is an active filter ? Give the advantages of an active filter over a passive filter. 10
- (b) Design a second order band pass Butterworth filter which has a centre frequency of 1 kHz and a bandwidth of 100 Hz, the gain at the centre frequency is required to be 2. 10

Unit – III

5. (a) Explain the working principle of moving coil and ribbon microphone. 10
- (b) Discuss various types of sound recording. 10

Or

6. (a) Write a short note on moving coil loud speaker. What is the necessity of cross over networks ? 10
- (b) Write short notes on the following : 5 each
- (i) Woofer
- (ii) Tweeter

Unit – IV

7. (a) Derive an expression for the efficiency of a two-cavity klystron amplifier, starting from basic principles. 10
- (b) What is a PIN diode ? Describe the construction of a PIN diode and also its characteristics. 10

Or

8. (a) Explain the construction, fabrication and encapsulation of Gunn diodes. 10

- (b) A reflex klystron operates under the following conditions : 10

$$V_o = 500 \text{ V}$$

$$R_{sh} = 20 \text{ k } \Omega$$

$$f_r = 8 \text{ GHz}$$

$L = 1 \text{ mm}$ is the spacing between repeller and cavity. The tube is oscillating at f_r at the peak on $n = 2$ mode or $1\frac{3}{4}$ mode. Assume that the transit time through the gap and through beam loading effect can be neglected :

- (i) Find the value of repeller voltage v_R .
- (ii) Find the d. c. necessary to give microwave gap of voltage of 200 V.
- (iii) Calculate the electronic efficiency.

Unit – V

9. (a) Explain briefly the characteristic of MOS logic and write a note on CMOS logic. 10
- (b) Write the important features of digital IC families. 10

Or

10. (a) Compare TTL and DTL logic families. 10
- (b) (i) Differentiate between NMOS and PMOS logic family. 5
- (ii) Write a short note on transistor as a switch. 5