d) Explain the operation of V/I and I/V converter.

OR

Draw the circuit of a second order Butterworth low pass filter and derive its transfer function.

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Roll No .....

EI/IC-404 (Old)

B.E. IV Semester

Examination, June 2016

Electronic Circuits

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Mention the three basic networks that are connected around the basic amplifier to implement feedback concept.

b) State the effect on input and output resistance of amplifier on current shunt feedback is employed.

c) Draw the block diagram of voltage shunt feedback amplifier and write the expression for input and output resistances.

d) A negative feedback amplifier has a open loop gain of 60,000 and a closed loop gain of 300. If the open loop upper cut off frequency is 15 kHz, estimate the closed loop upper cut off frequency. Also, calculate the total harmonic distortion with feedback if there is 10% harmonic distortion without feedback.

OR

Draw the block diagram of voltage series amplifier and derive for A V, R if, R of. Draw a two stage amplifier with voltage series feedback.

2. a) Differentiate oscillator and amplifier.

   b) In a Hartley oscillator if L1 = 0.2mH and L2 = 0.3mH and C = 0.003μF. Calculate its frequency of oscillations.

   c) What are the factors which affect the frequency stability of an oscillator?

   d) Draw circuit diagram of RC phase shift oscillator and explain its operation by deriving expression for frequency of oscillation.

OR

A colpitts oscillator is designed with C1=100 pF and C2=750 pF. The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 950 kHz and 2050 kHz.

3. a) What is the need for cascading amplifiers?

   b) What is the difference between small signal equivalent and hybrid π equivalent circuit.

   c) Draw the circuit diagram of constant current source and explain its working.

   d) Derive the voltage gain of two stage cascode amplifier with a neat circuit diagram and equivalent circuit.

OR

Derive CMRR of differential amplifier with its equivalent circuit.

4. a) Define Slew Rate and Gain Bandwidth Product.

   b) Define Input Offset voltage and Output Offset Voltage.

   c) Draw the unity gain amplifier. State any two applications of it.

   d) Determine the output voltage of the differential amplifier having input voltages V1 = 1mV and V2 = 2mV. The amplifier has a differential gain of 5000 and CMRR 1000.

OR

With circuit and waveforms explain the application of OPAMP as :

   i) Integrator

   ii) Voltage series Feedback Compensation

5. a) List the specifications of active filters and its applications.

   b) If the supply voltage (V_{cc}) to 555 timers is 10V, find the minimum and maximum value of the voltage across the capacitor connected to trigger input, when it is configured in Astable mode.

   c) Design a low pass filter with a cut off frequency of 1 kHz and with a pass band gain of 2.

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