CBCS Scheme

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15EE46

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Operational Amplifiers and Linear IC's

Time: 3 hrs. Max. Marks: 80

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Standard resistance and capacitance data table may be used.
3. 741 Datasheet allowed.

Module-1

1 a. Draw the block diagram of Op-Amp and explain. **(08 Marks)**

b. In the circuit of AC inverting amplifier $R_{in} = 50\Omega$, $C_i = 0.1\mu F$, $R_1 = 100\Omega$, $R_F = 1k$, $R_L = 10k$ and supply voltages = ± 15V. Determine the bandwidth of the amplifier. (uGB = 10^6, K = 0.909 for 741 IC). **(08 Marks)**

OR

2 a. Derive the closed loop voltage gain equation for the voltage series feedback amplifier. **(08 Marks)**

b. The circuit of peaking amplifier is to provide a gain of 10 at a peak frequency of 16KHz. Determine the values of all components. **(08 Marks)**

Module-2

3 a. Derive the gain equation for first order low pass Butterworth filter. **(08 Marks)**

b. With diagram, explain the adjustable output regulator. **(08 Marks)**

OR

4 a. Explain in detail the all pass filter. **(08 Marks)**

b. Design an adjustable positive voltage regulator using LM317 for output voltage varying from 4 to 12V and output current of 1A. **(08 Marks)**

Module-3

5 a. Design a RC phase shift oscillator for an output frequency of 5 KHz. Use LM741 with ± 15V power supply. **(08 Marks)**

b. With circuit diagram and necessary derivation for load current, explain voltage – to – current converter with grounded load. **(08 Marks)**

OR

6 a. Explain the oscillator amplitude stabilization with necessary figures. **(08 Marks)**

b. Design a non inverting Schmitt trigger circuit to have uTP = +3V and LTP = –5V. Use 741 Op-Amp with V_{CC} = ± 15V. **(08 Marks)**

Module-4

7 a. Explain the precision full wave rectifier circuit as a combination of half wave rectifier and summing circuit. **(08 Marks)**

b. With neat circuit explain three bit R – 2R DAC. **(08 Marks)**

OR

8 a. With diagram explain the working of Op-Amp sample and hold circuit. **(08 Marks)**

b. Explain the dual slope ADC with the necessary figure. **(08 Marks)**

Module-5

9 a. With block diagram, explain phase locked loop in detail. **(08 Marks)**

b. Sketch the circuit diagram of an Op-Amp monostable multivibrator, draw the circuit waveforms and explain its operation. **(08 Marks)**

OR

10 a. Write a note on applications of PLL IC 565. **(08 Marks)**

b. Explain the Astable multivibrator circuit operation using Op-Amp. **(08 Marks)**

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