

328612(28)

B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(Branch : Et & T)

ADVANCED ELECTRONIC CIRCUITS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) is compulsory from each questions. Attempt any two parts from (b), (c) and (d).

Unit - I

1. (a) What are the advantages and limitation of R-2R ladder network type DAC over Binary-weighted resistor type DAC?

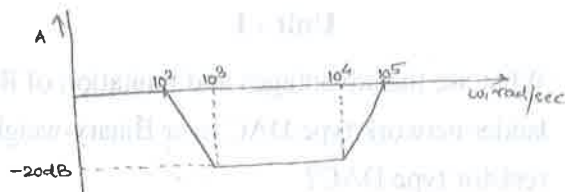
2

[2]

- (b) Explain the operation of 3-bit R-2R type DAC and derive the expression for the output voltage. 7
- (c) Explain Dual-slope type ADC with the help of block diagram. 7
- (d) Explain the operation of successive approximation type ADC with the help of block diagram. 7

Unit - II

2. (a) Define bilinear transfer function. 2
- (b) Design a circuit to provide a set of three phase 60 Hz voltage each separated by 120° and equal in magnitude. Assume $C = 1 \mu\text{f}$. 7
- (c) Explain Biquad circuit with circuit diagram and also derive an expression for frequency response. 7
- (d) For the Bode plot given below, find the transfer function and design the corresponding filter. Use all capacitors of value of $0.01 \mu\text{f}$. 7



328612(28)

[3]

Unit - III

3. (a) What is RC-CR transformation. 2
- (b) Describe the sallen and key circuit with three design strategies. 7
- (c) Define sensitivity. Explain the sensitivity analysis of sallen and key circuit. 7
- (d) If $\alpha_{\max} = 0.25 \text{ dB}$, $\alpha_{\min} = 18 \text{ dB}$, $f_p = 1000 \text{ Hz}$, $f_s = 1400 \text{ Hz}$ for Butterworth LPF. Determine order of filter, Half power frequency, attenuation at passband and attenuation at the edge of stopband. 7

Unit - IV

4. (a) Define Lock Range and capture Range. 2
- (b) Discuss the various application of PLL. 7
- (c) With the help of functional diagram explain the operation of PLL 565. 7
- (d) A PLL has a VCO with $K_0 = 25 \text{ KHz/v}$ and $F_c = 50 \text{ KHz}$. The amplifier gain is $A = 2$ and the phase detector has a maximum output voltage swing

328612(28)

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of +0.7 volt. Find the Lock range of PLL.
Assume filter gain equal to unity. 7

Unit - V

- 5. (a) Define multiplier. 2
- (b) Discuss the various application of analog multiplier. 7
- (c) Explain the basic method of performing analog multiplication. 7
- (d) Explain the various characteristics of multiplier. 7