Printed Pages:02 **Sub Code: KOE-071**

Paper Id: 231164 **Roll No.** | | | | | | | | | | |

B.TECH
(SEM VII) THEORY EXAMINATION 2022-23
FILTER DESIGN

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

(a) Why we use Analog Filters?
(b) Give few applications of Op-amp.
(c) What are passive elements?
(d) Define frequency response.
(e) What is the use of band pass filters?
(f) Give few applications of Integrators.
(g) What is the difference between first order and second order filters.
(h) Define low pass filter.
(i) What is the Chebyshev polynomial?
(j) How do you find the Chebyshev coefficient?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

(a) Explain the working of Non-Inverting operational amplifiers. Also give its applications.
(b) What is frequency transformation in filter design? How can you obtain a band pass filter from given low pass filter at normalized frequency?
(c) What is a Butterworth low pass filter? How do you calculate the order of a Butterworth filter?
(d) What do you understand by filters with arbitrary transmission zeros. What are poles in Butterworth filter?
(e) What is an Elliptic / Cauer Filter? Give few advantages and applications of Cauer filters.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) What is a filter? Why it is important? Explain ideal response and response of practical filter.
(b) Explain Op-amp. Discuss the application of Op-amp resistor circuits.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain with suitable example; how you can convert a low pass filter into a band stop filter using frequency transformation?
(b) The IC 741 is connected as non-inverting amplifier with closed loop gain of 20. Calculate its bandwidth.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Draw the magnitude response and pole location diagram of all the second order filters.
(b) Discuss biquads filters. Explain how the frequency response of a biquads filter can be calculated?

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the frequency warping in Bilinear transformation.
(b) What are the main features of Butterworth filters? Explain cascade design.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is inverse Chebyshev filter? What are properties of Chebyshev filter?
(b) What are the characteristics of Elliptical Response? Compare it with Chebyshev and inverse Chebyshev response.