SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:[02]
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May 2018
Reappear.

B.Tech || ECE || 3rd Semester

Network Analysis and Synthesis

Subject Code: BTEC-304A / 303

2011 Batch onwards

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

(a) State and prove maximum power transfer theorem.
(b) Taking one example, explain nodal method for solving a network.
(c) Define Unit step signal and unit ramp signal.
(d) Differentiate between independent and dependent energy sources.
(e) Define poles and zeros of a network function.
(f) How are filters classified?
(g) What is objective of using network theorems?
(h) What is the need of Laplace Transform?
(i) What are the properties of a positive real function?
(j) Draw the circuit diagram of constant-k low pass and High pass filter.

PART B (8×5)

Q. 2. State and prove the Norton's theorem with the help of a suitable example and also write limitations. COa

OR

What is signal? Explain the classification of signals with the help of examples. COa

Q. 3. State and Explain Convolution theorem with the help of example. COb

OR

What is Laplace transform? State and prove all the properties of Laplace transform. COb

Q. 4. Explain different types of Interconnections of Two port Networks. COc

OR

Check the positive realness of the following functions: COc

(i) $s^2 + s + 6 / s^2 + s + 1$ (ii) $s^2 + 6s + 5 / s^2 + 9s + 14$

Q. 5. What is a filter? Give the properties of filter. Classify the filters depending upon the and α, βrelationship between the arm impedances. Derive the expressions for characteristic impedance of a low pass filter in the pass band and stop band. COd

OR

Define composite filter. Draw the block diagram of composite filter and explain each stage in detail. COd

Q. 6

An impedance function is given by $Z(s) = (s + 1)(s + 4)/s(s+2)(s+5)$

Find the RC Representation of (a) Foster –I and II forms

(b) Cauer – I and II forms

OR

What is transfer function? Explain the poles and zeros and their restrictions.