

[illegible]

Total No. of Pages: 02
Total No. of Questions: 9

B.Tech (EE, ECE, ETE) (Sem.-3rd)
NETWORK ANALYSIS & SYNTHESIS

Subject Code: BTEC 303

Paper ID: A1127

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATE:

1. Section-A is **compulsory**. Consisting of **ten** questions carrying **two** marks each.
2. Section-B contains **five** questions carrying **five** marks each and student has to attempt any **four** questions.
3. Section-C contains **three** questions carrying **ten** marks each and student has to attempt any **two** questions.

SECTION-A (Compulsory)

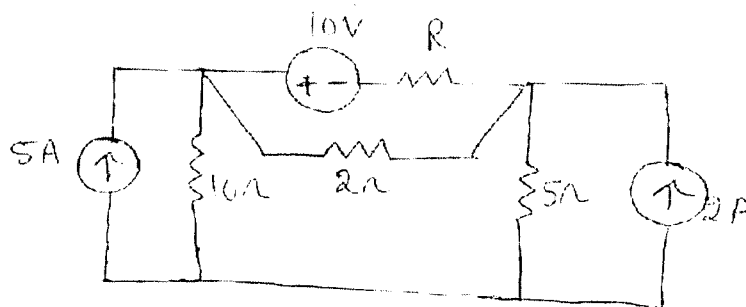
(10x2=20)

1.
 - a) Draw the symbol for dependent and independent current sources.
 - b) Define ramp and impulse function mathematically.
 - c) Define Kirchhoff's current law.
 - d) State Norton's theorem.
 - e) If the damping ratio is zero then what will be the effect on the system's response.
 - f) Obtain the Laplace transform of $e^{-\theta t} \cos \omega t$ where θ being a constant.
 - g) Define initial value theorem.
 - h) Define transfer function.
 - i) Define natural response of a network.
 - j) Define a positive real function.

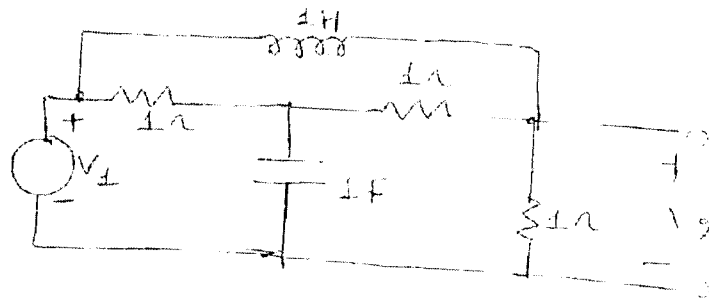
SECTION - B

(4x5=20)

- Q2 Obtain the maximum amount of power transfer in R from the sources using theorem of maximum power transfer in the network shown below:



- Q3 State and explain Thevenin's theorem.
- Q4 Find the transfer function of the network shown in fig below. Also sketch pole zero configuration.



- Q5 Find the second Foster form of the admittance function. $Y(s) = \frac{S(S+9)}{10(S^2+4)(S^2+25)}$
- Q6 Synthesize the network having driving point impedance $Z(s) = \frac{2s^3 + 10s^2 + 10s}{s^4 + 4s^2 + 3}$ in the first Cauer form.

SECTION - C

(2x10=20)

- Q7 State and explain superposition theorem.
- Q8 (i) State and prove convolution theorem.
(ii) Obtain Z parameters for the network shown below:



- Q9 (i) For the given network function, draw the pole zero diagram and find the time domain response $i(t)$.

$$I(s) = \frac{s^2 + 4s + 3}{s^2 + 2s}$$

- (ii) Synthesize $Y(s) = \frac{7s + 5}{3s + 9}$

2x10=20

---END---