C13

B. Tech. EXAMINATION, 2020

(Third Semester)

(B Scheme) (Re-appear Only)

(EE, EEE)

EE203B

NETWORK ANALYSIS-I

Time : 2½ Hours]   [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** :   Attempt *Four* questions in all. All questions carry equal marks.

1. (a) A circuit consists of three parallel branches. The branch currents are given as $i_1 = 10 \sin wt$; $i_2 = 20 \sin (wt + 60)$ and $i_3 = 7.5 \sin (wt - 30)$. Find the resultant current and express it in the form $i = I_m(wt + \phi)$. If the supply frequency is 50 Hz, calculate the resultant current when (a) $t = 0$, (b) $= 0.001s$.

(b) State and explain maximum power transfer theorem with an example.

2. Find the current through the $(3 + j4)$ ohm impedance in the network by superposition theorem and verify the result by Nodal analysis :
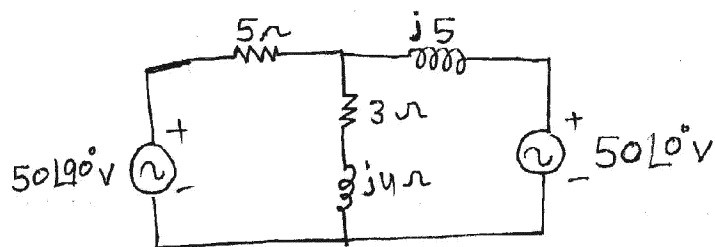

3. (a) A balanced star connected load is supplied by a 415v; 50 Hz three phase

system. Current in each phase is 20 A and lags 30° behind its phase voltage find the (a) phase voltage (b) power (c) circuit parameters. Also power consumed when the same load is connected in delta across the same supply.

(b) Explain p-spice model for poly-phase circuits.

4. (a) A certain wave form has a form factor of 1.2 and a peak factor of 1.5. If the maximum value is 100, find the RMS value and average value.

(b) Derive an expression for line and phase voltages and currents relationship in case of delta connection.

5. For the network shown in fig. a sinusoidal voltage source v = 150 sin (500t + θ) volts is applied at a time when θ = 0. Find the expression for the current $i(t)$.
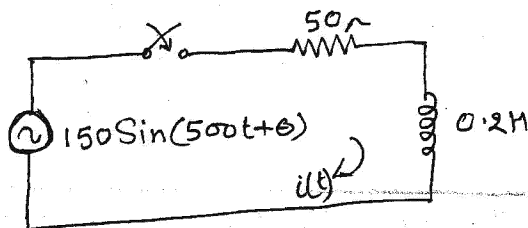
6. Find Laplace transform of the waveform shown in Fig. :
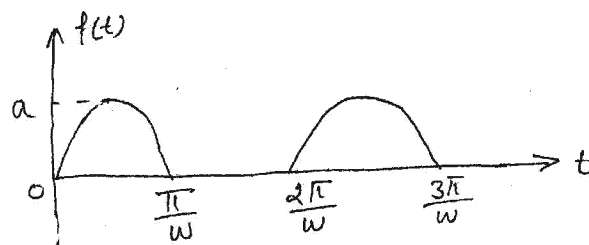
7. Find trigonometric Fourier series of wave form shown in fig. draw the mangitude and phase spectrum :
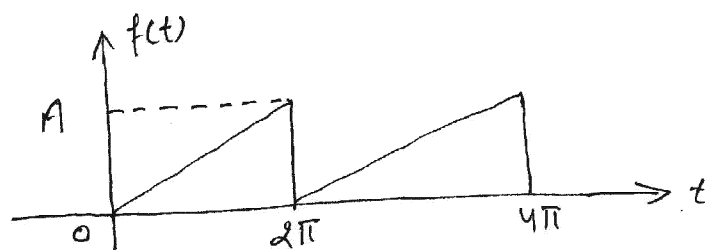
8. Evaluate the Fourier series coefficient of the continuous time period signal :

$$x(t) : X(t) = 1 + \sin wt + 2\cos wt + \cos[2wt + \pi/4]$$