3RD SEM./ ELE & MECH/ ELE. AND ETC./ELECTRICAL / EE(I&C) /ELECTICAL[PT]. / 2022(W)

Th-2 Circuit and Network Theory

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

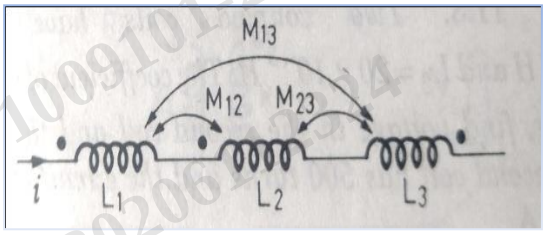
a. What is magnetizing force? Also state its SI unit.

b. What do you mean by mesh analysis of AC networks?.

c. State the Thevenin's theorem.

d. Define (i) Q-factor (ii) Selectivity in series circuit

e. Find the total inductance of three series connected coupled coils as shown below with L_1=1H; L_2=2H; L_3= 5H,
M_{12}=0.5H;M_{23}=1H;M_{13}=1H



f. Give an example of (i) Passive Element (ii) Non linear Element

g. What do you mean by phase sequence in polyphase system?

h. What is impedance and impedance triangle?

i. Define filter. Give an example

j. What are short-circuit admittance parameters?

2. Answer **Any Six** Questions 6 x 5

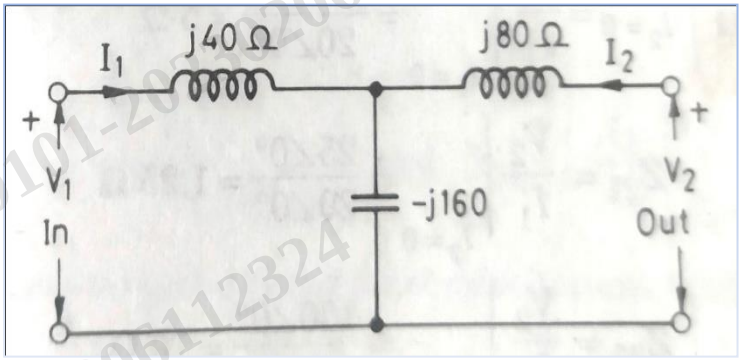
a. Explain the hysteresis loop of magnetic materials in details with a neat diagram.

b. How the 3-phase power is measured by two wattmeter method?

c. Describe briefly about π section of a circuit network.

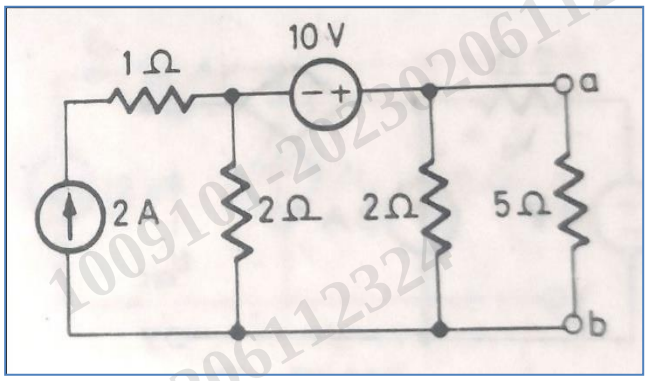
d. Write a short note on hybrid (h) parameters

e. Find the open circuit parameters of the following two port network.



f. Explain the sinusoidal response of series R-C circuit.

g Find the current in 5Ω resistor using Norton's theorem across a-b terminals of the network shown below.



3	Derive the relation between phase and line quantities in star connection.	10
4	Write short notes on (i) Source Transformation technique (ii) Dot Convention.	10
5	Explain the transient response of series R-L-C circuit having DC Excitation.	10
6	Write short notes on (i) Constant K low pass filter (ii) Star to delta transformation	10
7	Explain the series and parallel magnetic circuits in details with neat diagrams.	10