Code: 15A02301 **R15**

B.Tech II Year I Semester (R15) Regular Examinations November/December 2016

ELECTRICAL CIRCUITS – II

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Draw the transient response in a RC circuit for a step voltage input.
(b) Write equation for voltage in a RLC series circuit.
(c) Define reactive power.
(d) Calculate the reactance of a coil of inductance 0.32H when it is connected to a 50 Hz supply.
(e) Define Fourier series.
(f) Define tree.
(g) Define graph.
(h) What is a filter network?
(i) Draw a circuit which acts as a low pass filter.
(j) What is Laplace transform?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 A circuit consists of a 10 μF capacitor connected in series with a 25K Ohm resistor with a switchable 100 V d.c supply. When the supply is connected, calculate: (i) The time constant. (ii) The maximum current. (iii) The voltage across the capacitor after 0.5s.

OR

3 The winding of an electromagnet has an inductance of 3H and a resistance of 15 Ohms. When it is connected to a 120 V d.c. supply, calculate: (i) The steady state value of current flowing in the winding. (ii) The time constant of the circuit. (iii) The value of the induced e.m.f. after 0.1s.

UNIT – II

4 Three loads, each of resistance 30 Ohms are connected in star to a 415 V three-phase supply. Determine: (i) The system phase voltage. (ii) The phase current. (iii) The line current.

OR

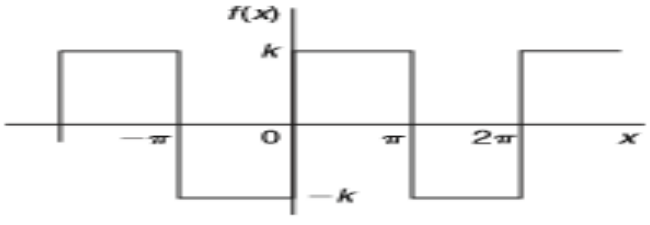
5 Three identical coils each of resistance 30 Ohms and inductance 127.3mH are connected in delta to a 440 V, 50 Hz, three-phase supply. Determine: (i) The phase current. (ii) The line current.

UNIT – III

6 Obtain a Fourier series for the periodic function f(x) defined as:

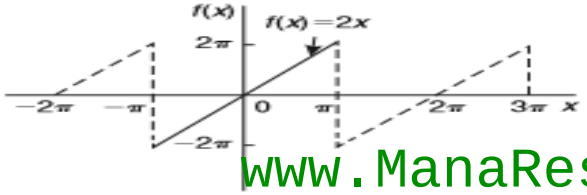
f (x)= −k, when –π < x < 0
+k, when 0 < x < π

The function is periodic outside of this range with period 2π



OR

7 Determine the Fourier series to represent the function f (x)=2x in the range −π to +π



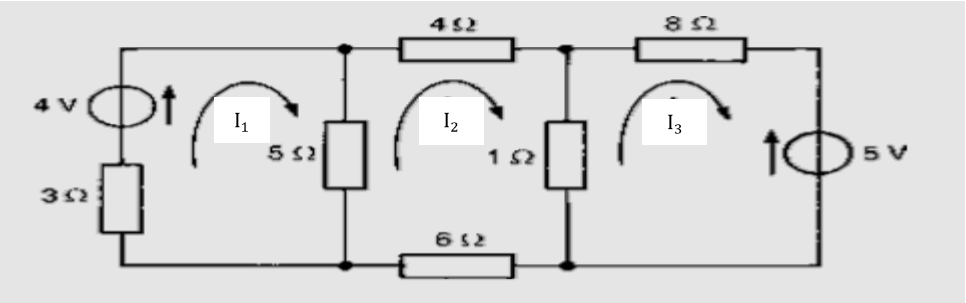
Contd. in page 2

Code: 15A02301

R15

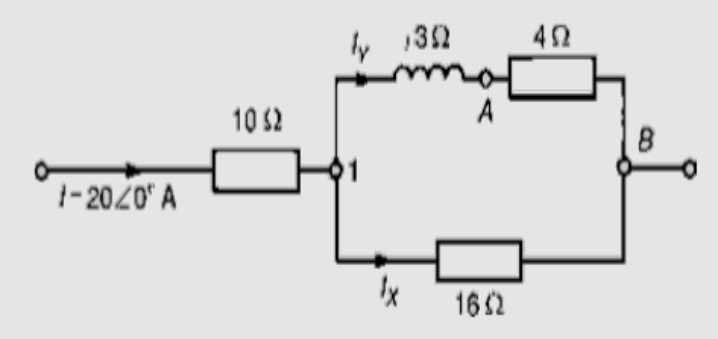
UNIT – IV

8 Use mesh-current analysis to determine the current flowing in: (i) 5 Ohms resistance. (ii) 1 Ohm resistance of the d.c. circuit shown in figure below.



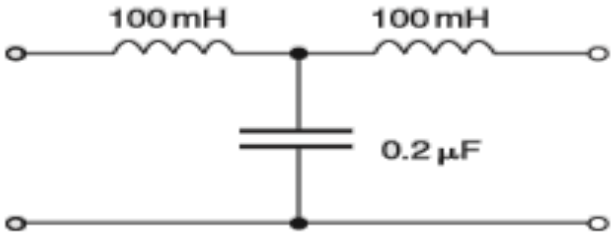
OR

9 For the network shown in figure below, determine the voltage V_{AB}, by using nodal analysis.



UNIT – V

10 Determine the cut-off frequency and the nominal impedance of the low-pass filter sections shown in figure below.



OR

11 A low pass π section filter has a nominal impedance of 600 Ohms, cut off frequency 2 MHz. Find the frequency at which the characteristic impedance of the section:

(a) 600 Ohms.
(b) 1K Ohms.

*****