D 10603 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5B 12—NETWORK THEORY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Differentiate between ideal voltage source and practical voltage source.
2. Define Independent source.
3. A 100 Ω resistor is connected to a 220 V, 50 Hz a.c. supply.

   What is the r.m.s. value of current in the circuit ?
4. What is a linear network ? Give linear network elements.
5. Define steady state response.
6. Obtain the equivalent resistance of two resistors connected in parallel.
7. Define Time constant of a RL circuit.
8. Define Magnetic coupling.
9. What is transient response of RL series circuit ?
10. Define Power Factor.
11. Differentiate between peak value and peak to peak value of alternating current.
12. What is the complex impedance of a series of RC circuit ?
13. Differentiate between reactive power and average power.

Turn over

14. Explain the significance of quality factor.

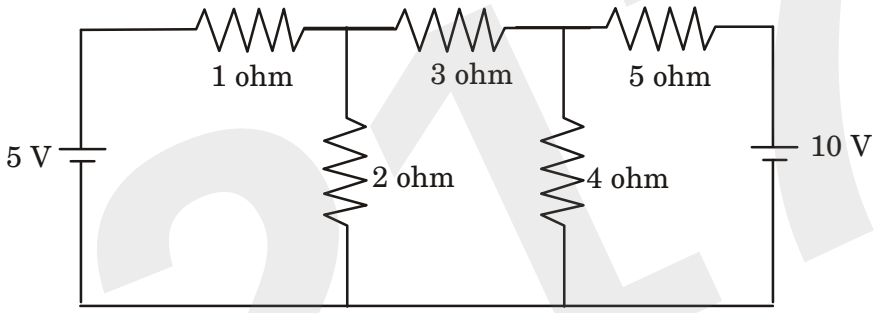
15. Define Resonance. What is the condition for resonance for an RLC series circuit ?

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Find the value of the currents 11, 12 and 13 flowing clockwise in the first, second and third mesh respectively.



17. What is Capacitance ? Derive the expression for total capacitance : (i) a number of capacitors connected in series ; (ii) number of capacitors connected in parallel.

18. Explain the star network with phasor diagram.

19. Sketch the DC response of RC circuit and response curve.

20. Calculate the current through a 250 mH inductor after charging through a series-connected resistor with 100 Ω of resistance for 6 milliseconds, powered by a 12 volt battery.

21. A d.c. voltage of 100 V is suddenly applied to a circuit consisting of 100 capacitor connected in series. The capacitor is initially uncharged. Find the voltage across the capacitor at the time of switching on the d.c. source.

22. Derive the expression of quality factor of parallel RLC circuit.

23. What is resonance ? Derive the expression for resonant frequency of series RLC circuit.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. (a) Explain different types of Sources. Differentiate between ideal and practical sources.

(b) Explain mesh and node analysis with the help of examples.

25. (a) Explain the current voltage relation in R-L series circuit.

(b) Explain the current voltage relation in E-C series circuit.

26. Explain the construction of a practical parallel resonant circuit. Derive the expression for the resonant frequency of a parallel resonant circuit.

An alternating voltage is given by V = 230 sin 314*t*. Calculate : (i) Frequency ; (ii) Maximum value ; (iii) Average value ; and (iv) RMS value.

27. (a) Explain about Star and Delta connected three-phase balanced circuits.

(b) Derive the equations to convert : (i) Delta network to Star network ; and (ii) Star network to a Delta network.

(2 × 10 = 20 marks)