

Roll No. | Total No. of Pages : 04

EE-1860

B. Tech. (Second Semester)

EXAMINATION, 2019

ELECTRICAL ENGINEERING

Time : Three Hours

Maximum Marks : 100

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

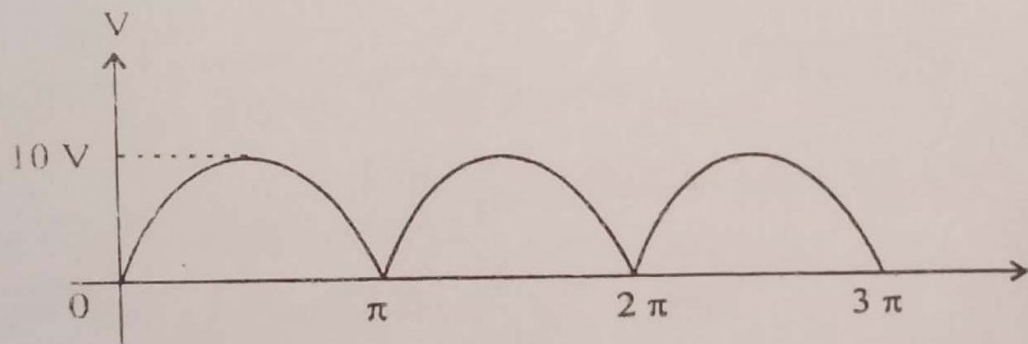
Note : Attempt any *ten* questions. Each question carries 4 marks.

$$10 \times 4 = 40$$

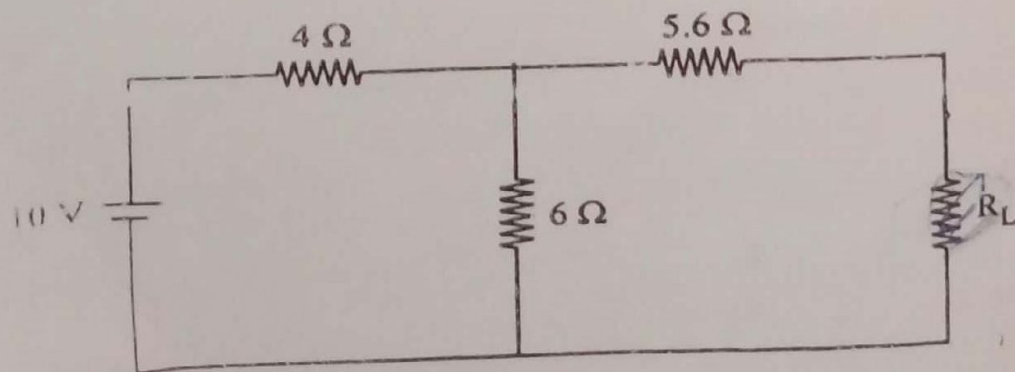
1. Explain the active power, power factor and reactive power.
2. Differentiate synchronous and induction motor.
3. Explain the Superposition theorem.
4. Derive the expression of maximum efficiency of transformer.
5. Explain the B-H curve.

(A-32) P. T. O.

6. Explain the line current, line voltage and phase current and phase voltage for 3- ϕ A. C. circuit.
7. Explain bandwidth and quality factor.
8. Find the R. M. S. value for the following wave form :



9. In the given Network find the value of R_L and the power transferred to it under the maximum power transfer condition.



(A-32)

10. Draw the phasor diagram of series RLC circuit and explain it.

11. Draw the speed torque characteristic of D. C. shunt motor.

12. Explain core type and shell type transformer.

13. Explain the working of commutator. *dc to AC*

14. A 4-pole D. C. machine has a wave wound armature with 47 slots each containing 6 conductors. The flux per pole is 25 mWb. Find :

$$n = 20 \quad A = 47 \quad \phi = 25 \quad Z = 6$$

(a) The speed when the EMF generated is 250 V.

$$e = \frac{N \phi \omega}{60 A} \quad e = \frac{N \phi \omega}{60 A}$$

(b) No. of commutator segments.

15. A 3- ϕ slip ring, 4-pole induction motor has rotor frequency 2.0 Hz while connected to 400 V, 3- ϕ , 50 Hz supply, determine slip and rotor speed.

$$50 = \frac{N \phi \omega}{60 A}$$

$$\frac{50 \times 60 \times 47}{4 \times 6 \times 25} = N$$

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 20 marks.

$$3 \times 20 = 60$$

1. Explain the working of synchronous motor, its V-curves and its applications in detail.

(A-32) P. T. O.

2. (a) An A. C. current is give as $500 \sin 628 +$ mA. Find the :

(i) Frequency

(ii) I_{\max}

(iii) I_{rms}

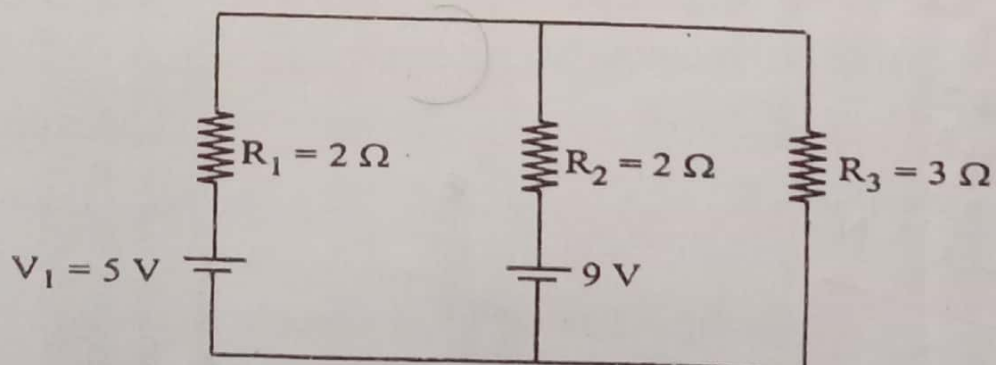
(iv) I_{av}

(b) Explain the star connection and line and phase voltage of star connection.

3. Explain the working of PMMC and induction type energy meter.

4. Derive the expression of maximum power and the EMF equation of transformer .

5. Explain the Thevenin theorem and find the value of current through R_3 in case.



6. Draw the general layout of electrical power system and function of its elements.