S.No. : 714

BEE 3101

No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33301

Roll No. [redacted]

B. Tech. Examination 2022-23

(Odd Semester)

BASIC ELECTRICAL ENGINEERING

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

(a) Define bilateral and unilateral elements with example.

(b) State and explain Kirchhoff's voltage law.

(c) Define Q-factor.

(d) What will be the RMS value of voltage for $V = 416 \sin \omega t$ waveform.

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(e) What are the application of auto transformer?

(f) Define hysteresis loss.

(g) Define power factor.

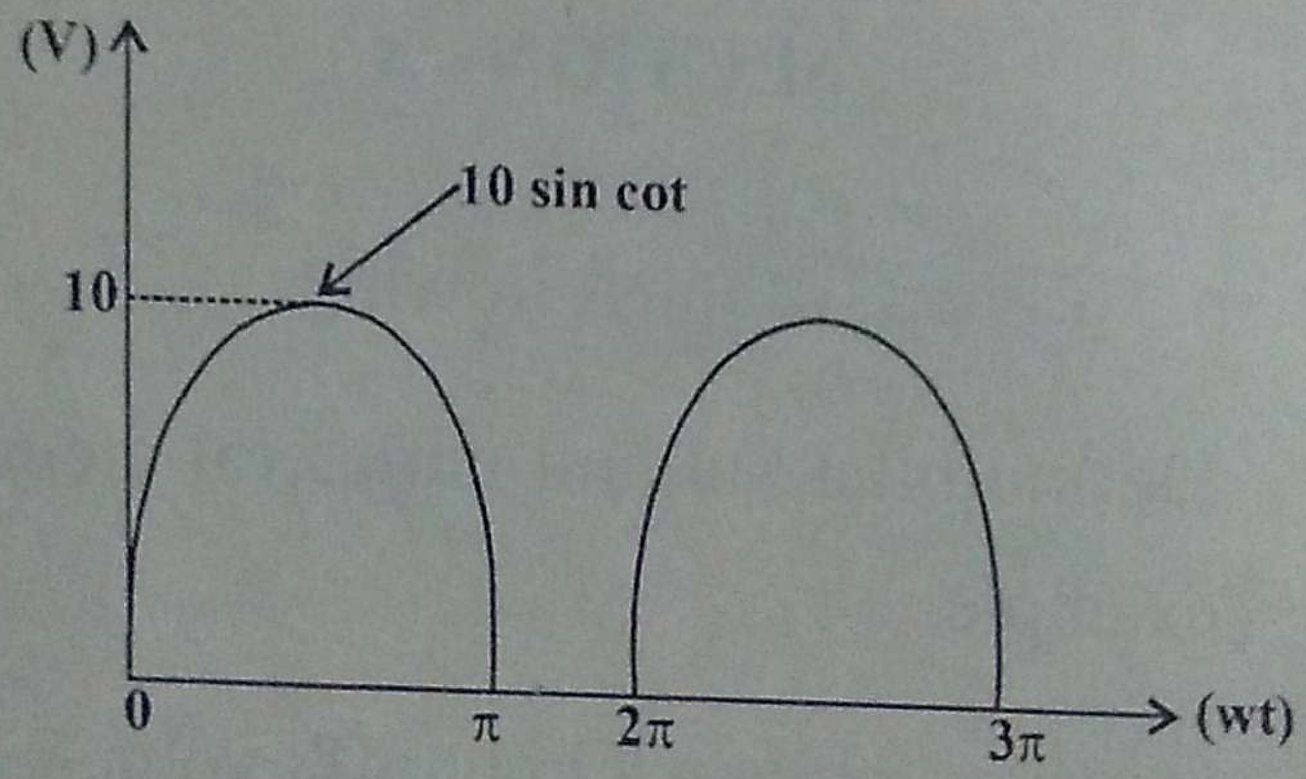
(h) List two application of synchronous motors.

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Develop the relationship for delta to star and star to delta transformation.

(b) Find average and r.m.s. value of following wave form :



(c) Describe PMMC type instruments in detail. Also discuss its advantages and disadvantages.

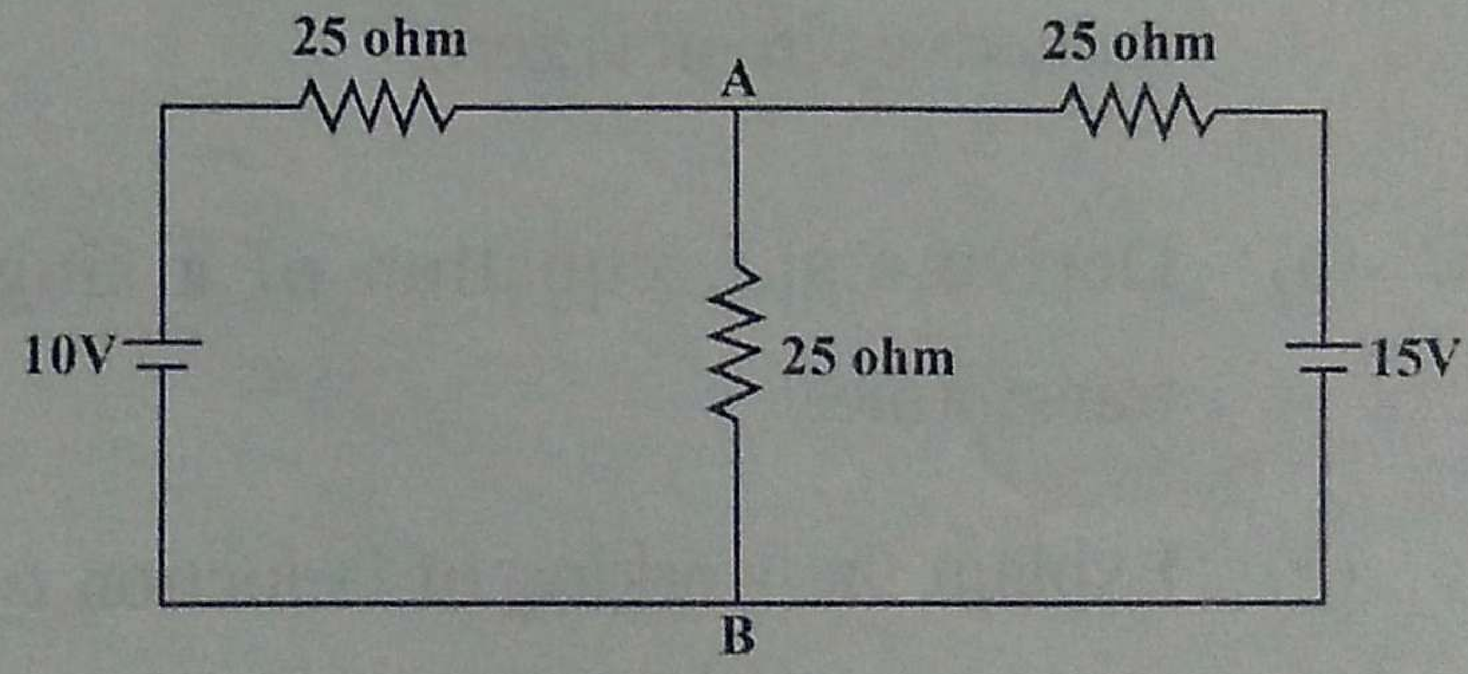
(d) Explain why 1-ϕ induction motor is not self starting. Explain any two methods to start it.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each question. 5×8=40

3. (a) State and prove maximum power transfer theorem.

(b) State and explain Thevenin theorem. Calculate the current in branch AB in given circuit, using Thevenin theorem :



(c) State and explain Norton's theorem to solve network problems. Mention two advantages of Norton's theorem.

4. (a) Discuss the resonance in R-L-C series circuit show that the resonant frequency :

$$f_r = \sqrt{f_1 \cdot f_2}$$

(b) A choke coil having a resistance of 15 ohm and inductance of 0.05 H is connected in series with a condensor of 150 μF. The whole circuit has been connected to 250 volt, 50 Hz. Calculate :

(i) Impedance

(ii) Current

(iii) Power factor

(c) Prove that the average power consumed in pure inductive circuit is zero.

5. (a) Derive e.m.f. equation of a single phase transformer.

(b) Explain the working of induction type single phase energy meter with neat diagram.

(c) State Flemings left hand, Fleming right hand and Lenz law.

6. (a) Enumerate all the parts of DC machine. State the material and function of each part.

(b) Derive the e.m.f. equation of d.c. generator.

(c) A 4-pole generator having wave-wound armature winding has 51 slots each slot contains 20 conductors. What willbe the voltage generated in the machine when driven at 1500 rpm assuming the flux per pole to be 7.0 m Wb?

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