

S.No. : 6

BEE 2201

No. of Printed Pages : 05

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

PAPER ID : 23302

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No.

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B. Tech. Examination 2021-22

(Even Semester)

BASIC ELECTRICAL ENGINEERING

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

- (a) Give the statement of Millman's theorem.
- (b) What are the Kirchhoff's current and voltage laws?
- (c) What do you understand by the term 'Form Factor'?

[P. T. O.

- (d) An alternating voltage is expressed by :

$$E = 141.7 \sin (157 t)$$

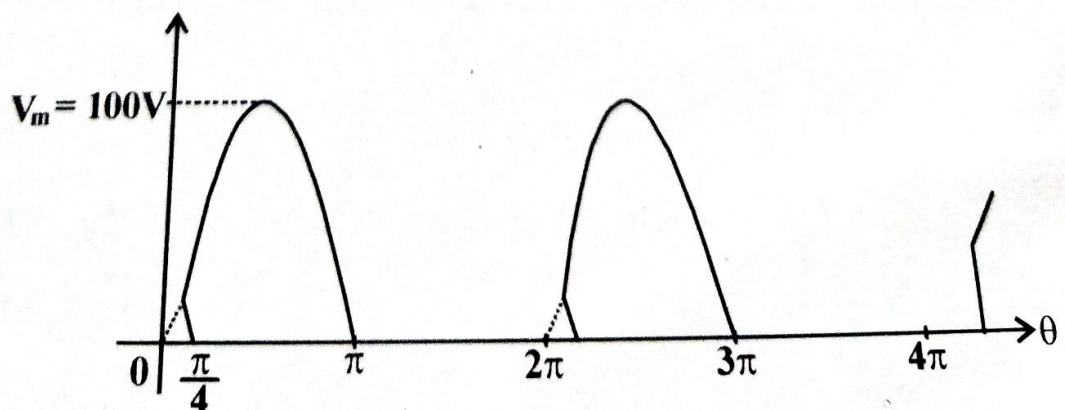
the rms voltage and frequency will be.

- (e) What is the effect of eddy current?
- (f) When is indicating instruments said to be dead beat?
- (g) Write two applications of D. C. series motor.
- (h) Explain the term 'slip' in induction motor.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

- (a) State and prove maximum power transfer theorem and also prove that maximum efficiency is 50%.
- (b) Find the average value of the sinusoidal waveform shown in given figure. The maximum value is 100 V :



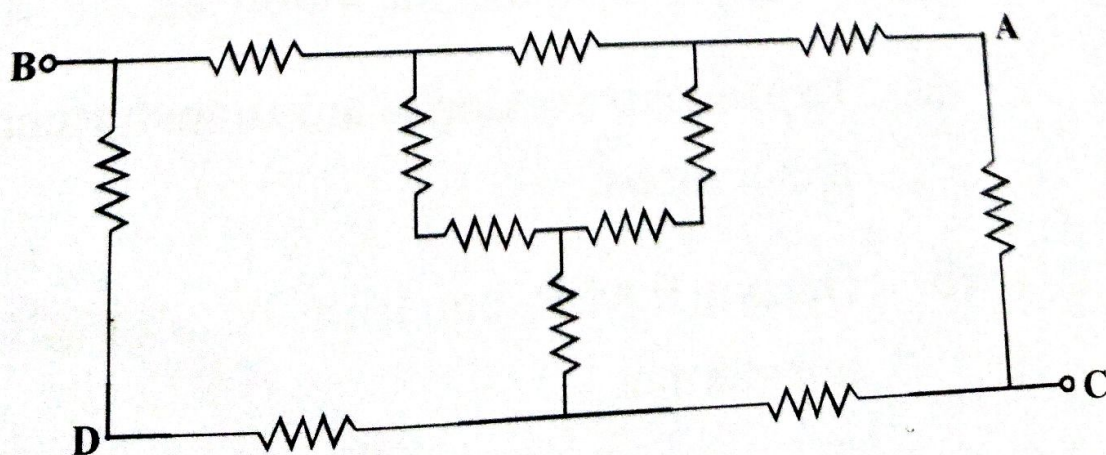
- (c) Explain the construction and working of PMMC type instrument. What are their advantages and disadvantages.
- (d) Derive e.m.f. equation of a d.c. generator. What will be the change in e.m.f. induced if the flux is reduced by 20% and the speed is increased by 20%?

SECTION – C

Note :- Attempt all questions from this section.

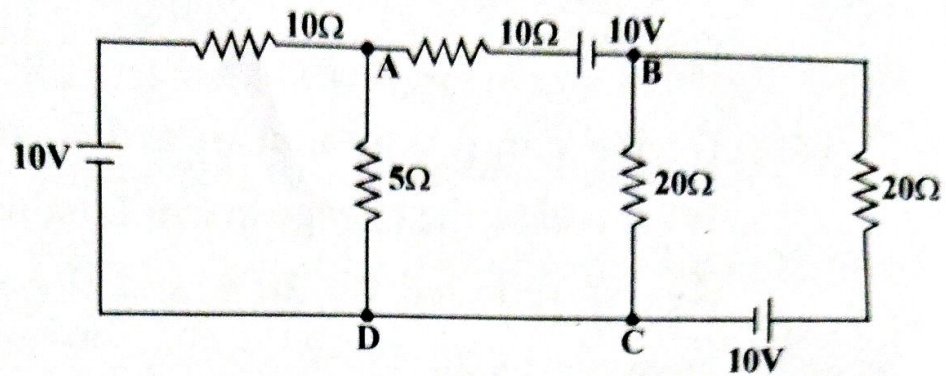
3. Attempt any two parts of the following : $5 \times 2 = 10$

- (a) State and explain superposition theorem to solve network problems.
- (b) Calculate the value of resistance in between B & C using star/delta transformation.
(The value of each resistance is 20Ω) :



[P. T. O.]

- (c) Calculate the current in branch AB, using Nodal analysis :



4. Attempt any two parts of the following : $5 \times 2 = 10$

- (a) Explain two watt meter method for the measurement of three phase power.
- (b) For star connected system in 3-phase circuit, prove that :

$$V_L = \sqrt{3} V_{Ph}, I_L = I_{Ph}$$

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

5. Attempt any two parts of the following : $5 \times 2 = 10$

- (a) Explain the working of auto transformer and its applications.
- (b) Derive E.M.F. equation of a single phase transformer.

- (c) Explain the working of energy meter and its application.
6. Attempt any two parts of the following : $5 \times 2 = 10$
- (a) State the advantages and disadvantages of a synchronous motor.
- (b) Single phase induction motor is not self starting. Explain.
- (c) An 8-pole lap wound armature rotated at 350 rpm is required to generate 260 V. The useful magnetic flux per pole is 0.05 wb. If armature has 120 slots. Calculate the number of conductors per slot.

