

what will be the equation of resultant current in the circuit, maximum value of current rms value of current, average value of current.

5. (a) Explain construction and working of moving iron instruments.
 - (b) Explain working and construction of single phase transformer also derive e.m.f. equation of transformer.
 - (c) In a 25 KVA, 2000V/200V transformer the iron and copper losses are 200W and 400W respectively. Calculate efficiency at half load and 0.8 power factor. Determine also the maximum efficiency and the corresponding load.
- Ans: 1. 2000V 2. 200V 3. 25 KVA*
6. (a) Why synchronous motor is not self starting?
 - (b) Explain the starting methods of single phase induction motor.
 - (c) A 4 pole D. C. shunt generator with lap connected armature supplies a load of 100 A of 200 V. The armature resistance is 0.1Ω and the shunt field resistance is 80Ω . Find the total armature current and e.m.f. generated.

No. of Printed Pages : 04

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

PAPER ID : 43301

Roll
No.

1

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B. Tech. Examination 2023-24

(Odd Semester)

BASIC ELECTRICAL ENGINEERING

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION-A

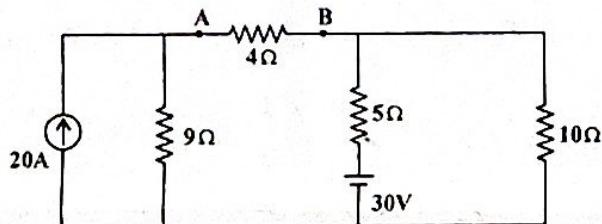
1. Attempt all parts of the following : $8 \times 1 = 8$
 - (a) Define active and passive elements.
 - (b) Define linear and non-linear elements.
 - (c) What is form factor?
 - (d) What is r.m.s. values?
 - (e) Write two applications of autotransformer.
 - (f) Define iron loss.

- (g) Write torque equation of D. C. motor.
 (h) Define slip.

SECTION-B

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

- (a) Find the current in 4Ω resistance with the help of Thevenin's theorem.



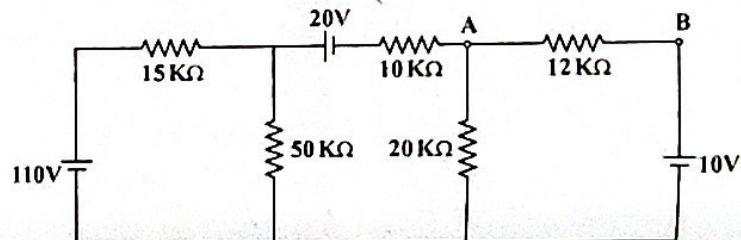
- (b) In a pure inductive circuit prove that the voltage leads the current by an angle 90° and the power consumed is zero.
 (c) Describe the construction and working of dynamometer type instrument.
 (d) Explain working and construction of D. C. motor.

SECTION-C

Note :- Attempt all questions. Attempt any two parts from each question.

$$5 \times 8 = 40$$

3. (a) How delta connected network converted in equivalent star connected network?
 (b) State and prove maximum power transfer theorem.
 (c) Find the Norton's equivalent ckt as seen by 12Ω resistance :



4. (a) For LCR series circuit derive an expression for resonant frequency and also prove that :

$$W_r = \sqrt{W_1 W_2}$$

- (b) Explain the power and power factor measurement of a 3 phase circuit by two wattmeter method.
 (c) A circuit contains four currents simultaneously:

$$I_1 = 100 \sin 500t, I_2 = 200 \sin (500t + \frac{\pi}{3})$$

$$I_3 = -50 \cos 500t, I_4 = 150 \sin (500t - \frac{\pi}{4})$$