

Total No. of Questions : 6

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B.E. (IInd Sem.) (CGPA) Civil Engg. Examination-2015

BASIC ELECTRICAL & ELECTRONICS ENGG.

Paper : CE-203

Time Allowed : Three Hours

Maximum Marks : 60

Note : Attempt all questions.

Attempt all part of a question in sequence.

Internal choice in each unit is given.

Q.1 Choose the correct answer—

(i) When three coil are connected in star across 400 V supply. The each coil have resistance of 10Ω and inductance of 0.02 H. The line current will be —

- (a) 5.9 A lagging
- (b) 5.9 A leading
- (c) $5.9\sqrt{3}$ lagging
- (d) $5.9\sqrt{3}$ leading

(2)

(ii) The real power absorbed in each phase of circuit is—

(a) $\sqrt{3} V_p I_p \cos \phi$

(b) $\sqrt{3} V_L I_C \cos \phi$

(c) $V_p I_p \cos \phi$

(d) $\sqrt{3} V_L I_L$

(iii) The law relates to emf and voltage drops in a circuit at any closed path—

(a) $\Sigma E - \Sigma IR = 0$

(b) $\Sigma E + \Sigma IR = 0$

(c) No option is true

(iv) The unit of m.m.f. in a magnetic circuit is given by—

(a) Weber

(b) Amp

(c) Amptum

(d) Wb/m^2

(3)

(v) The power factor angle of a purely inductive circuit is—

- (a) $\phi=0$ (b) $\phi=+90^0$
(c) $\phi=45^0$ (d) $\phi=-90^0$

(vi) The hysteresis loss in case of transformer is proportional to—

- (a) $P_e \propto f$ (b) $P_e \propto \sqrt{f}$
(c) $P_e \propto f^2$ (d) $P_e = f^{1.5}$

(vii) The condition of maximum efficiency of a transformer is—

- (a) Copper losses < Iron losses
(b) Copper losses > iron losses
(c) Copper losses = iron loss
(d) Copper losses should remain constant

(viii) The Torque developed in D. C. motor is—

- (a) $T \propto \frac{1}{\phi}$
(b) $T \propto \frac{1}{I_a}$
(c) $T \propto \phi \cdot I_a$
(d) $T \propto \frac{\phi}{I_a}$

(4)

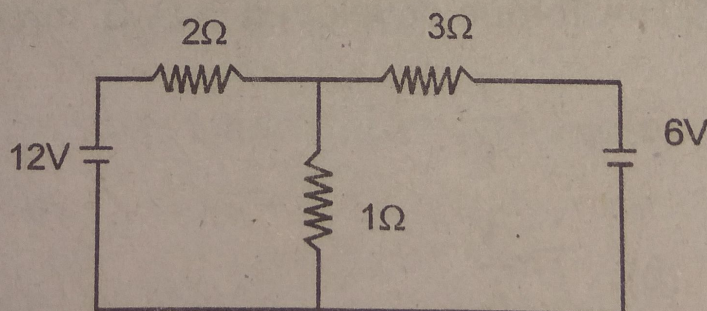
(ix) The speed of a d.c. motor is—

- (a) $N \propto \phi$
- (b) $N \propto \frac{1}{\phi}$
- (c) $N = \text{constant}$
- (d) $N \propto \phi^{1.5}$

(x) The relation between frequency, speed and number of poles is given by—

- (a) $N_s = \frac{120 f}{P}$
- (b) $f = \frac{PN_s}{120}$
- (c) $n_s = \frac{2f}{P} \text{ rps}$
- (d) Any one (a), (b) or (c)

Q.II (a) Solve the network by Mesh current method—5



(b) State and explain KCL & KVL.

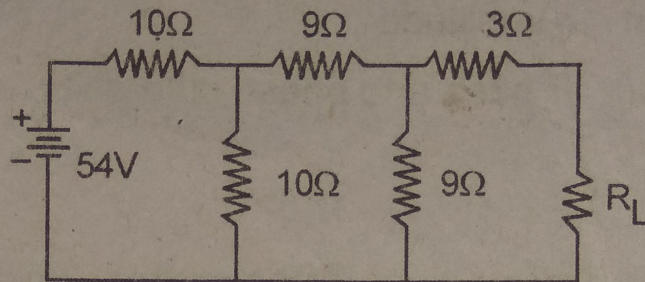
5

or

(a) State and explain superposition theorem. 4

(5)

- (b) Determine the current flowing through R_L when load resistance is 3Ω . 6



Q.III (a) Define the following terms— 4

- (i) Magnetic flux
- (ii) m.m.f.
- (iii) Permeability
- (iv) Reluctance

- (b) Give the analogy between electric and magnetic circuits. 6

or

- (a) What do you understand by magnetic leakage and fringing. 4

- (b) Define hysteresis loop of magnetic material. 6

Q.IV (a) Derive relation between line voltage and phase voltage of three phase star connection.

(6)

(b) Define the following terms—

- (i) Frequency
- (ii) Amplitude
- (iii) Phase and phase difference

or

(a) Explain two Wattmeter method for measurement of power in a 3ϕ circuit.

(b) A choke coil has a resistance of 10Ω and inductance of $0.05H$ is connected in series with $100\mu F$. The whole circuit is connected 200 Volts, 50 Hz supply. Calculate— 5

- (i) Impedance
- (ii) Current
- (iii) Powerfactor

Q.V (a) Explain the working principle of a reformer. 5

(b) A transformer has a maximum efficiency of 98% at $15KVA$ at unity p.f. It is loaded as follows—

12 hrs 2 kw at pf = 0.5

6 hrs 6 kw at pf = 0.8

6 hrs 18 kw at pf = 0.9

Calculate all day efficiency of transformer.

(7)

Q.VI (a) Explain the constructional features of a D. C. Machine. 5

(b) Explain diagram of self excited dc generator.5

or

(a) Describe various methods of speed control of d.c. motors. 5

(b) Draw and explain characteristics of d.c., shunt motor. 5