

Total No. of Questions : 6

Total No. of Printed Pages : 7

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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.I 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) $\phi = +90^\circ$
 (c) $\phi = 45^\circ$ (d) $\phi = -90^\circ$

- (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—

$$(a) \quad T\alpha \frac{1}{\phi}$$

$$(b) \quad T\alpha \frac{1}{I_a}$$

(c) $T\alpha \phi.I_a$

$$(d) \quad T\alpha \frac{\phi}{I_a}$$

(4)

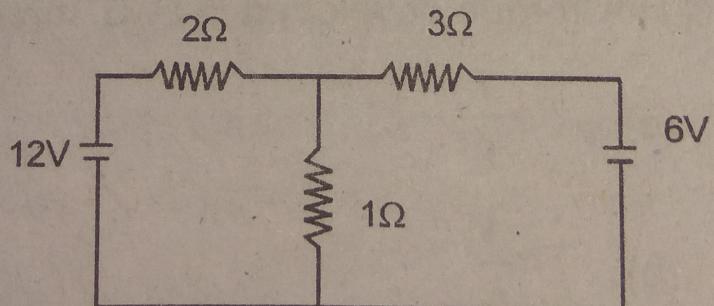
(ix) The speed of a d.c. motor is—

- (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) $N_S = \frac{120f}{P}$
 (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



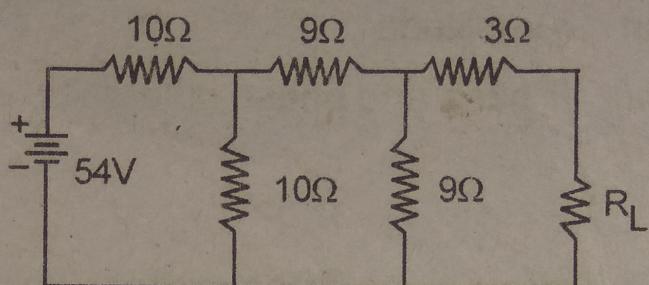
(b) State and explain KCL & KVL. 5

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—
- Frequency
 - Amplitude
 - 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
- Impedance
 - Current
 - 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