Total No. of printed pages = 4

EI-304/EEE/3rd Sem/Cv,Me,ETC,Auto, IT,Agri,Ch/2017/M

ELEMENTS OF ELECTRICAL ENGINEERING

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *four* from the rest.

1. Fill in the blanks : 1×14=14

(a) No load test is carried out on a transformer to determine ..... .

(b) The p.f of purely capacitive circuit is ..... .

(c) 1 kWh is equal to ..... .

(d) In an AC circuit, the ratio of kW/kVA represents ..... .

(e) In an a.c circuit RMS value / Average value is called ..... .

[Turn over

(f) The practical unit of capacitance ..... .

(g) Direction of induced emf in a generator can be ascertained by ..... rule.

(h) The capacity of cell measured in ..... .

(i) One complete set of positive and negative values of alternating quantities is called ..... .

(j) Unit of force in S.I system of units ..... .

(k) The average emf of lead acid cell is ..... .

(l) Current transformer are used with low range ammeter to measure ..... .

(m) An electric generator convert mechanical energy to ..... energy.

(n) In purely capacitive circuit the power absorbed is equal to ..... .

2. (a) Explain the term conductor and insulator. Mention their important properties. 3+3=6

(b) Deduce a relation between kWh and kcal. 4

(c) Two resistors of 4Ω and 6Ω are connected in parallel. If the total current is 30 amp, find the current through each resistor. 4

4. (a) Deduce emf equation of d.c generator. 6

(b) What are the different types of d.c generator ? Draw the electrical symbol for each type of d.c generator. 4+4=8

5. (a) Define : 2×3=6

(i) RMS value

(ii) Instantaneous value

(iii) Amplitude.

(b) An alternating current is given by i = 14.14 sin 377t. Find : 2+3+3=8

(i) RMS value of current

(ii) Frequency

(iii) The instantaneous value of current when time is 3 ms.

6. (a) Differentiate between core type and shell type transformer. 4

(b) Derive the relation between transformation ratio, turns ratio and current ratio. 4

(c) A 40 kVA, 3300/240 volt, 50 Hz single phase transformer has 660 turns on the primary. Determine : 6

(i) Number of turns in secondary

(ii) Maximum value of flux in the core.

7. (a) Define 'slip' of an induction motor. 2

(b) An 8-pole, 50 Hz induction motor has full load speed 725 rpm. What is the percentage slip at full load ? 4

(c) Write short notes on any *two* : 4+4=8

(i) R-L-C series circuit

(ii) Auto transformer

(iii) Kirchhoff's laws

(iv) Principle of DC motor.