END SEMESTER/RETEST 2020
Elements of Electrical Engineering
EL-304
Full Marks: 70
Time: 3 hours
Figures in the margin indicate full marks for the question
PART-A
MARK-25
All Questions are compulsory

1. Fill in the blanks with appropriate word: 1x10=10

(i) 1 Weber = _____ lines of force.

(ii) The direction of induced emf can be found by ____ law.

(iii) 1 KWh = ____Kcal.

(iv) The unit of Magnetising force(H) is _____ .

(v) Ohm's law is valid for _____ temperature.

(vi) The value of form factor is _____

(vii) 1 B.O.T. = _____ Kcal.

(viii) Leakage coefficient is the ration between _____ and _____.

(ix) Reciprocal of conductivity is called _____.

(x) Absolute permittivity of air is _____.

2. Find True or False: 1x10=10

(i) An ammeter is connected across the current path.

(ii) Magnetic flux density is directly proportional to Magnetising force.

(iii) Magnetic flux flows from N-pole to S-pole with a bar magnet.

(iv) A magnetic field is produced around a current carrying conductor.

(v) The electric field just outside a charged conductor is normal to conductor surface.

(vi) The electric field at any point inside a conductor is zero.

(vii) A potentiometer is actually a variable resistor.

(viii) Peak factor is the ratio between rms value and average value.

(ix) In purely capacitive circuit, the current lags the voltage by 90^0.

(x) Frequency is the reciprocal of time period.

3. Choose the correction option: 1x5=5

(i) The unit for inductance is ____

a. Ohm,

b. Henry,

c. A/m

d. A/s.

(ii) If either the inductance or the rate of change of current is doubled, the induced e.m.f?

a. Remains constant

b. Becomes zero,

c. Doubles,

d. Becomes half

(iii) In any A.C. circuit always

a. Apparent power is more than actual power.

b. Reactive power is more than apparent power.

c. Actual power is more than reactive power.

d. Reactive power is more than actual power.

(iv) The inductance of a coil can be increased by

a. Increasing core length

b. Decreasing the number of turns.

c. Decreasing the diameter of the former.

d. Choosing core material having high relative permeability.

(v) Power factor of an electrical circuit is equal to

a. R/Z

b. Cosine of phase angle difference between current and voltage.

c. Ratio of useful current to total current.

d. All of the above.

PART-B

MARK-45

Answer any 5 questions

4.

a. Define: **1x3=3**

i. Instantaneous value

ii. Amplitude

iii. Form factor

b. An alternating current is given by I = 10sin 314t. Calculate i) frequency, ii) time period, iii) value of current after 0.1s, iv) peak factor. **6**

5.

a. What are the active materials of lead acid cell ? **4**

b. Describe the internal construction of lead acid battery. **5**

6.

a. What are the indications of a fully charged battery ? **5**

b. Establish a relation between Kwh and Kcal. **4**

7. State and explain Faraday's laws of electromagnetic induction. **9**

8. Write short notes on:

a. Magnetic hysteresis and hysteresis loop. **6**

b. Lenz's law of Electromagnetic Induction. **3**

9. a. Define phasor. **3**

b. What is resonance and its poblems ? **6**

10. Explain Principle of D. C. motor, Construction. What is Back emf ? **7+2=9**

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