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SEAT No. :

PD4

[Total No. of Pages : 2

[6408]-104

F.E. (Insem)

BASIC ELECTRICAL ENGINEERING

(2019 Pattern) (Credit System) (Semester - II) (103004)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Answer Q.1 or Q. 2, Q. 3 or Q. 4.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Assume suitable data wherever necessary.*
- 5) *Use of non-programmable calculator is allowed.*

Q1) a) Compare magnetic & electric circuit for similar & dissimilar points. [7]

b) Obtain the expression for coefficient of coupling (k) between two magnetically coupled coils. Comment on k, when, [8]

i) Two coils are tightly coupled and

ii) Magnetically isolated.

OR

Q2) a) Compare dynamically induced emf & mutually induced emf. [7]

b) Two magnetically coupled coils. A and B have 3000 and 3600 turns respectively. When independently considered, current of 10A in coil A produces flux of 5 mWb in it and current of 12A in coil B produces flux of 7.5 mWb in it. The 80% of the flux produced by coil A links with coil B. [8]

Calculate :

i) Self-inductance of each coil

ii) Mutual inductance.

iii) Coefficient of Coupling

iv) EMF induced in coil B if current in coil A is uniformly reversed in 0.5 seconds.

P.T.O.

Q3) a) Define the following terms : Waveform, cycle, frequency, periodic time, amplitude, average value. RMS value. [7]

b) Sinusoidal voltage is represented by $v = 282.82 \sin (314.15 t)$. [8]

Calculate :

i) Maximum value of voltage

ii) RMS value of voltage

iii) Average value of voltage

iv) Frequency

v) Peak Factor

vi) Form Factor

vii) Time required for voltage to achieve 200 V first time after passing through zero and increasing positively

OR

Q4) a) Derive expression for relationship between RMS value and Maximum value of symmetrical sinusoidal voltage. Also sketch the waveform representing the relationship. [7]

b) Three capacitors having capacitances $2 \mu\text{F}$, $4 \mu\text{F}$ & $6 \mu\text{F}$ are connected in parallel across 200 V DC supply. [8]

Calculate :

i) Equivalent capacitance

ii) Charge on each capacitor

iii) Voltage across each capacitor &

iv) Total energy stored.

