

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Fundamental of Electrical Engineering

Subject Code: 4TE01FEE1

Branch: B.Tech (All)

Semester: 1

Date: 30/11/2018

Time: 02:30 To 05:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1 Attempt the following questions:

(14)

- 1) Unit of charge is _____
A) Ampere B) Coulomb C) Joule D) Volt
- 2) Resistance of metallic conductor is proportional to its length.
A) True B) False
- 3) Unit of resistivity is _____
A) Weber B) Ohm C) Ohm-metre D) Ohm/metre
- 4) The unit of permeability is _____.
A) Henry/Metre B) Weber C) Henry D) Metre/ Henry
- 5) If the distance between the plate of capacitor increases, its capacitance _____.
A) Increases B) Remains constant C) Decreases D) None of the above
- 6) Which one of the below is not a valid formula?
A) $V = \frac{Q}{C}$ B) $C = \frac{Q}{V}$ C) $Q = CV$ D) $C = \frac{V}{Q}$
- 7) The average value of a sine wave over a full cycle is _____.
A) 0.707 B) 0 C) 0.636 D) 0.318
- 8) The ratio of rms. value to average value is called peak factor.
A) True B) False
- 9) If $e_1 = A \sin \omega t$ and $e_2 = B \sin(\omega t + \phi)$, then
A) e_1 leads e_2 by ϕ B) e_2 lags e_1 by ϕ C) e_2 leads e_1 by ϕ D) e_1 is in phase with e_2



- 10) In a purely inductive circuit, voltage across inductor leads the current by_____
- A) 45° B) 180° C) 90° D) 30°
- 11) The average power consumed by a purely capacitive circuit is zero.
- A) True B) False
- 12) In a balanced 3-phase star connected system, the equation for three phase power is given by_____
- A) $V_{ph}I_{ph} \cos \phi$ B) $2V_{ph}I_{ph} \cos \phi$ C) $3V_{ph}I_{ph} \cos \phi$ D) $\sqrt{3}V_{ph}I_{ph} \cos \phi$
- 13) A transformer is a _____equipment.
- A) Rotating B) Static C) Both rotating and static D) None of the above
- 14) For a step down transformer, transformation ratio K is _____
- A) >1 B) =1 C) =0 D) < 1

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- (a) Derive an expression of equivalent resistance for 'n' number of resistances connected in series. Give the advantages of series connection. **07**
- (b) Explain the effect of temperature on the resistance of the following. **07**
- i) Pure metals ii) Semiconductors
- iii) Electrolytes iv) Insulators

Q-3 Attempt all questions (14)

- (a) State Faraday's first law and second law electromagnetic induction. Derive the equation of induced emf $e = N \frac{d\phi}{dt}$. Where N= Number of turns in a coil, ϕ = flux in the coil. **07**
- (b) Give any seven comparisons between magnetic circuit and electrical circuit. **07**

Q-4 Attempt all questions (14)

- (a) Define capacitance. Derive an expression of total capacitance for n number of capacitors when connected in parallel. **07**
- (b) Derive the expression for the energy $E = \frac{1}{2}CV^2$ stored in a charged capacitor. **07**
- where C is the capacitance and V is the voltage across the capacitor.



