

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Fundamental of Electrical Engineering

Subject Code: 4TE01FEE1

Branch: B.Tech (All)

Semester: I

Date: 16/03/2019

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.

Q-1 Attempt the following questions: (14)

- 1) The resistivity of the conductor depends on _____ of the conductor.
A) Area B) Length C) Type of material D) None of these
- 2) Resistance of metallic conductor is _____ propotional to its area.
A) Directly B) Inversly
- 3) How many coulombs of charge flow through a circuit carrying a current of 10 A in 1 minute?
A) 10 B) 600 C) 6000 D) 1200
- 4) The unit of permeability is _____.
A) Henry/Metre B) Weber C) Henry D) Metre/ Henry
- 5) A capacitor carries a charge of 0.1 C at 5 V. Its capacitance is _____.
A) 0.2 F B) 0.5 F C) 0.05 F D) 0.02 F
- 6) To obtain a high value of capacitance, the permittivity of dielectric medium should be _____.
A) Low B) Zero C) High D) Unity
- 7) If a pure inductor is connected across the ac source, the average power taken by the inductor is _____ Watt
A) A few B) Zero C) Hundred D) Maximum
- 8) The peak value of sine wave is 100 V. Its rms value is _____.
A) 63.7 V B) 141.4 V C) 100 V D) 70.71 V
- 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) At higher frequencies, the value of capacitive reactance_____
- A) Decreases B) Remains same C) Increases D) Depends on applied voltage
- 11) In series RLC circuit what is the power factor just below the resonance frequency?
- A) Lagging B) Leading C) Unity D) Zero
- 12) In a balanced 3-phase delta connected system, Line voltage is equal to Phase Voltage.
- A) True B) False
- 13) A transformer transforms_____.
- A) Voltage B) Current C) Frequency D) Voltage and Current
- 14) For a step up transformer, transformation ratio K is _____
- A) =0 B) >1 C) =1 D) < 1

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

- Q-2 Attempt all questions (14)**
- (a) Define temperature co-efficient of resistance. Prove that $\alpha_t = \frac{\alpha_0}{1 + \alpha_0 t}$, where $\alpha_0 =$ (14)
temperature co-efficient of resistance at 0°C . (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 (07)
equation of induced emf $e = N \frac{d\phi}{dt}$. Where N= Number of turns in a coil, ϕ = flux in
the coil.
- (b) Derive the expression of inductance for the coupled coil connected in series (07)
- Q-4 Attempt all questions (14)**
- (a) Define capacitance. Derive an expression of total capacitance for n number of (07)
capacitors when connected in series.
- (b) Derive the expression of energy $E = \frac{1}{2} CV^2$ stored in a electric field of the (07)
capacitor. Where, C=capacitance of capacitor, V= Voltage across the capacitor.



