

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



- Q-5 Attempt all questions (14)**
- (a) Obtain an expression for the equivalent star network resistance for a given delta network. **07**
- (b) State and explain Ohm's law. Give its limitations. **07**
- Q-6 Attempt all questions (14)**
- (a) Explain the following terms with diagrams for sinusoidal AC quantities. **07**
- i) In-phase ii) Lagging iii) Leading
- (b) An alternating e.m.f. is represented by $e=200\sin314t$ volt. Determine **07**
- i) Maximum value ii) Frequency in Hertz iii) Time Period iv) Angular Frequency
- Q-7 Attempt all questions (14)**
- (a) Explain the two wattmeter method for the measurement of power for a balanced three phase circuit. **07**
- (b) Derive the relationship between the voltage and current for purely resistive AC circuit. Draw the waveforms and phasor diagram for voltage and current. **07**
- Q-8 Attempt all questions (14)**
- (a) Derive the emf equation $e = 4.44 fN\phi_m$ for a single phase transformer Where f = frequency of supply, N = number of turns either primary or secondary side, ϕ_m = maximum flux in the core. **07**
- (b) A single phase transformer has 400 primary turns 1000 secondary turns. The net cross-sectional area of the core is 60 cm^2 . If the primary winding to be connected to a 50 Hz supply at 520 V (rms), Calculate, **07**
- i) Peak value of the flux density in the core
- ii) Voltage induced in the secondary winding.

