



KERALA AGRICULTURAL UNIVERSITY

B.Tech.(Food Engg) 2018 Admission

II Semester Final Examination- June 2019

Elen.1201

BASIC ELECTRICAL ENGINEERING (2+1)

Marks: 50

Time: 2 hours

(10x1=10)

I A Fill up the blanks

- 1 Energy stored by a coil is doubled when its current is increased by _____ percent
- 2 In a series RC circuit as frequency increases current _____.
- 3 The r.m.s. value of sinusoidal 100 V peak to peak is _____ volt
- 4 Resistance of a wire is r ohms. The wire is stretched to double its length, then its resistance in ohms is _____.
- 5 A star circuit has each element of resistance R/2. The equivalent delta elements will be _____.
- 6 The power factor of a purely resistive circuit is _____.

B Answer the following.

- 7 Define dynamically induced emf.
- 8 Define form factor of an alternating quantity.
- 9 $Y = BC + AC$. Draw the logic gate for this expression
- 10 Draw the V-I characteristics of ideal diode.

II Write Short notes on any FIVE of the following

(5x2=10)

- 1 Derive the ripple factor of a full-wave rectifier.
- 2 Kirchhoff's current law.
- 3 Active and passive element with an example.
- 4 An NPN transistor has collector current 4mA and base current $10 \mu\text{A}$. Calculate α and β values of the transistor, neglecting the reverse sat current I_{CBO}
- 5 Convert the Boolean expression in logic gate $F = X + \overline{Y} + \overline{Z} + X.Y$
- 6 Mutual inductance.
- 7 Define Demorgan's theorems.

III Answer any FIVE of the following.

(5x4=20)

- 1 A three phase load consists of three similar inductive coils, each of resistance 50Ω and inductance 0.3 H. The supply is 415 V, 50Hz. Calculate (a) line current (b) power factor when the load is connected in star.
- 2 Find the voltage across 1 and 2 using nodal analysis of the circuit as shown in Fig.1

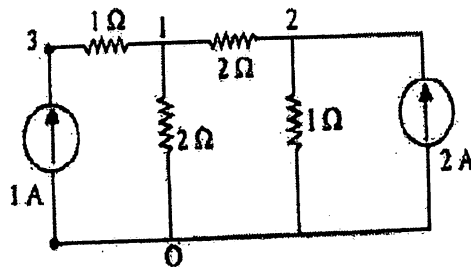
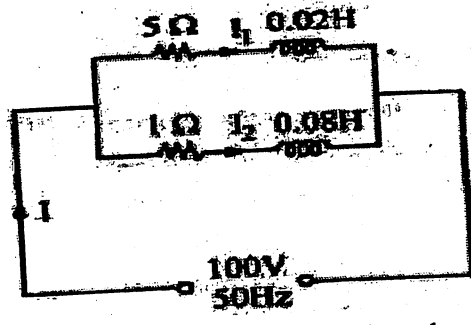


Fig.1

- 3 Solve the expression $X + (Y.Z) = (X+Y).(X+Z)$

- 4 Find the net impedance and total current in the parallel circuit shown below.



- 5 An NPN transistor used for voltage divider biasing has the following parameters $\alpha = 0.985$, $V_{BE} = 0.3V$, $V_{CC} = 16V$. If the operating point Q is at $I_C = 2mA$, $V_{CE} = 6V$, then calculate R_1 & R_C for $R_2 = 20k\Omega$.

- 6 CB operation of transistor.
 7 Difference between p type and n type semiconductors.

IV

Answer any ONE of the following

(1x10=10)

- 1 With a neat sketch, explain the working principle of half-wave rectifier and derive the expression for efficiency & output voltage
- 2 State and explain Thevenin's theorem with circuit diagram.
