



Elen.1201

KERALA AGRICULTURAL UNIVERSITY  
B.Tech.(Food Engg) 2018 Admission  
II Semester Final Examination- June 2019

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  $\mu$ A. Calculate  $\alpha$  and  $\beta$  values of the transistor, neglecting the reverse sat current  $I_{CBO}$
- 5 Convert the Boolean expression in logic gate  $F = \overline{X+Y} + \overline{Z+X.Y}$
- 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  $50\Omega$  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

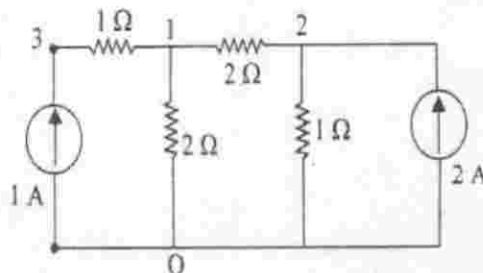
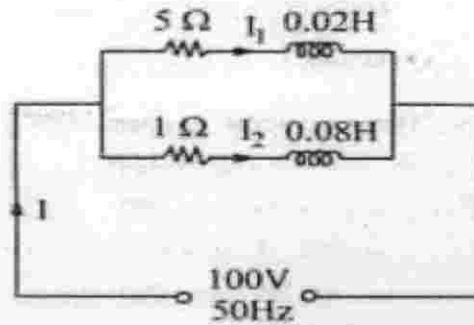


Fig.1

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

P.T.O

- 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.

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