



Shree H. N. Shukla College of Science Rajkot

B.Sc. (Sem. - IV) (CBCS)

[401-PHYSICS]

UNIT TEST (2018-19)

[Time: 1:00 Hour]

[21/01/2019]

[Total Marks: 30]

Q-1 (A) Give the following answer

[05]

- 1) Write an expression of impedance for L-R Series circuit,
- 2) In series C-R Circuit, voltage _____ the current.
- 3) Cycles/ second is unit of _____.
- 4) Define: Phase.
- 5) Write a formula of capacitor and inductances.

Q-1 (B) Give the following answer (Any One)

[02]

1. Draw the circuit & Phase diagram of L-R series circuit and derive the equation of current.
2. What is the resonance frequency of a series L-C circuit if $L = 200 \mu\text{H}$ and $C = 200 \text{ pF}$?

Q-1 (C) Give the following answer (Any One)

[03]

1. A Coil having $L = 0.14 \text{ H}$, 135V supply calculated the parameters,
(i) X_L , (ii) Z , (iii) I , (iv) V_R , (v) angle Φ (vi) Power factor and (vii) power absorbed.
2. A series R-L-C circuit has $R = 5\Omega$, $L = 200\mu\text{H}$ and $C = 0.4\mu\text{F}$. If it is connected across an a.c. voltage source of 10 v at $\omega = 10^5 \text{ radian/second}$, determine
(i) Current, (ii) power factor, (iii) power absorbed.

Q-1 (D) Give the following answer (Any One)

[05]

1. Explain L-R-C Series circuit with circuit diagram and phase diagram.
2. Explain L-R-C parallel circuit with circuit & phase diagram.

Q-2 (A) Give the following answer

[05]

1. What is analog & digital signal?
2. What is logic gate?
3. NAND gate is a combination of which gate?
4. What is Boolean algebra?

Q-2 (B) Give the following answer (Any One)

[02]

1. Convert into binary number: $(51)_{10}$
2. convert into decimal number: $(10101)_2$

Q-2 (C) Give the following answer (Any One)

[03]

1. Explain OR function with a 2-input OR gate.
2. Prove that: $(A+B+C).(A+B)$

Q-2 (D) Give the following answer (Any One)

[05]

1. Explain NAND gate as a universal gate.
2. State and Prove De-Morgan's Theorem.