

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)  
**BSc DEGREE EXAMINATION DECEMBER 2018**  
(First Semester)

Branch - **ELECTRONICS**

**ELECTRIC CIRCUITS**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer ALL questions

ALL questions carry-EQUAL marks (10 x 1 = 10)

The term 'ground' spoken in connection with an electronic circuit means

- (i) a direct connection to earth through a wire.
- (ii) a common connection for all components.
- (iii) a short circuit.
- (iv) negative battery terminal.

Kirchoff s voltage law is concerned with

- (i) IR drops
- (ii) battery EMF's
- (iii) Junction voltage
- (iv) both (i) and (ii)

An Ideal constant-voltage source has \_\_\_\_\_ resistance.

- (i) negative
- (ii) zero
- (iii) high
- (iv) None of these

If two identical 3A, 4Ω Norton equivalent circuits are connected in parallel with like polarity to like, the combined Norton equivalent circuit is

- (i) 6A, 4Ω
- (ii) 6A, 2Ω
- (iii) 3A, 2 Ω
- (iv) 6A, 8Ω

What is the average value of a sine wave over a full cycle?

- (i)  $V_m$
- (ii)  $V_m/\sqrt{2}$
- (iii) zero
- (iv)  $\sqrt{2}V_m$

In a pure resistor, the voltage and current are,

- (i)  $30^\circ$
- (ii)  $45^\circ$
- (iii)  $75^\circ$
- (iv)  $15^\circ$

Apparent power is expressed in

- (i) volt-amperes
- (ii) watts
- (iii) VAR
- (iv) volt-amperes (or) watts

What is the phase angle of the series RLC circuit at resonance?

- (i) zero
- (ii)  $90^\circ$
- (iii)  $45^\circ$
- (iv)  $80^\circ$

The current in the neutral wire of a balanced three phase. Four wire star connected load is given by

- (i) zero
- (ii) 3 times the current in each phase
- (iii)  $\sqrt{3}$  times the current in each phase
- (iv) All the above

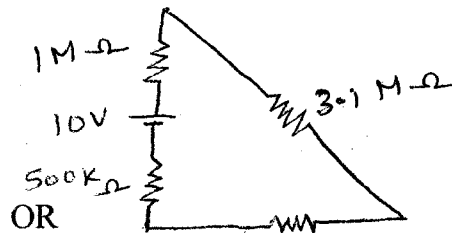
10 Two wattmeter method of a power measurement can be used to measure power is

- (i) Balanced circuit
- (ii) Unbalanced circuit
- (iii) (i) or (ii)
- (iv) (i) and (ii)

**SECTION - B (25 Marks)**

Answer ALL questions  
ALL questions carry EQUAL Marks (5x5 = 25)

- 11 a What is the current in the circuit shown in figure. Determine the voltage across each resistor.

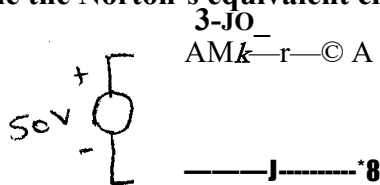


- b Sketch a circuit diagram of star and delta conversion and explain its operation.
- 12 a Explain the following: Mesh analysis.  
OR  
b With neat circuit diagram, explain super position theorem.
- 13 a Discuss the function of the sine wave with suitable diagram.  
OR  
b Explain the operation of phase relation in a pure resistor.
- 14 a Give the theory about Bandwidth of a RLC circuit with its necessary circuit.  
OR  
b Write a short note on Average Power.
- 15 a What is Poly-phase? Explain its operation.  
OR  
b Two wattmeter method is used to measure power in a three phase load. The wattmeter are 400w and -35w. Calculate  
(i) Total active power (ii) Power factor (iii) Reactive power.

**SECTION -C (40 Marks)**

Answer ALL questions  
ALL questions carry EQUAL Marks (5 x 8 = 40)

- 16 a Describe the function of DC response of an RL circuit.  
OR  
b Define Ohm's Law & explain it with suitable diagram.
- 17 a Draw the circuit diagram of Thevenin's network & explain it.  
OR  
b Determine the Norton's equivalent circuit for the circuit.



- 18 a Compare the voltage and current values of a sine wave.  
OR  
b Explain the operation of series RL circuit with suitable diagram.
- 19 a Explain the following: (i) The quality factor (Q) (ii) Its effect on Bandwidth.  
OR  
b Discuss about Apparent Power and Power factor.
- 20 a Point out the main working principles of three phase voltages.  
OR  
b Draw the circuit diagram and explain the operation of phase measurement in a single phase circuit by Wattmeter.