



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING**

**MAKE UP EXAMINATION – JAN 2023**

**Date:**30-JAN-2023

**Time:** 1:00PM to 4:00PM

**Max Marks:** 100

**Weightage:**50%

**Course Code:** EEE101

**Course Name:** Elements of Electrical Engineering

**Program** : B.Tech

**Instructions:**

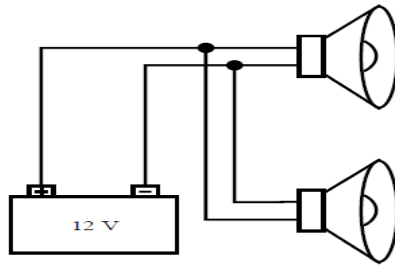
- (i) Read the all questions carefully and answer accordingly.
- (ii) Draw the sketches neatly.
- (iii) Scientific / Nonprogrammable Calculators are permitted.

**Part A [Memory Recall Questions]**

**Answer all the Questions. Each question carries TWO marks. (10Qx 2M= 20M)**

1. In a series circuit, all components are connected end-to-end, forming a single path for current flow. In a parallel circuit, all components are connected across each other, forming exactly two sets of electrically common points. Which of the following statements are true both for a series and parallel DC Circuit.
  - (a) Elements have Individual currents (b) Currents are additive (c) Voltages are additive.
  - (d) Powers are additive (C.O.No.1) [Knowledge level]
  
2. The power due to the reactive component of current is known as reactive power which flows in an AC circuit but does not do any useful work. The reactive power of an R-L series circuit is given by –
  - (a)  $VI \sin \phi$  (b)  $VI \cos \phi$  (c)  $VI \tan \phi$  (d)  $VI$  (C.O.No.1) [Knowledge level]
  
3. Magnetic field in the electrical machines can be produced by both permanent and electromagnets depending on the application and feasibility. But the Magnetic field in a large practical D.C. generator is produced by
  - a) Electromagnets (b) Permanent magnets (c) Both (a) and (b)
  - d) None of the above (C.O.No.2) [Knowledge level]
  
4. For application in electric locomotives or for traction purposes, the most suitable motor is
  - (a) DC series motor (b) Differentially compounded motor (c) Cumulatively compounded motor (d) None of these (C.O.No.2) [Knowledge level]





12. In a DC Motor, the presence of back emf make the machine self regulating. Explain the concept of back EMF and its significance. Also give the expression for armature current.

(C.O.No.2) [Comprehension]

13. It is required to measure electrical energy utilized in kWh for a manufacturing industry. Identify the meter which records the number of units of electricity consumed. With a neat diagram, show the constructional features and working of meter that can be used.

(C.O.No.3) [Comprehension]

14. Develop the lay out and wiring Diagram for a part of the House with the following data:  
A room with two lamps, one Fan and one socket

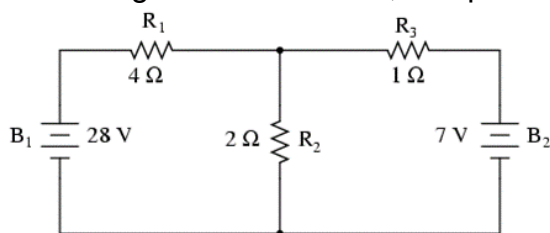
(C.O.No.4) [Comprehension]

### Part C [Problem Solving Questions]

Answer all the Questions. Each question carries TEN marks.

(4Qx10M=40M)

15. For the figure shown below, compute the voltage drop across the resistor  $R_3$  ( $1\Omega$ ).



(C.O.No.1) [Application]

16. The lamp load used in the laboratory takes a current of 2 A lagging 60 degrees when a voltage of 200V, 50Hz is applied. Identify the resistance and inductance of the coil.

(C.O.No.1) [Application]

17. A DC motor used in an electric locomotive has 6 pole and develops back emf of 480 V. The armature current is 100 A and the flux per pole is 30 milli weber in the machine. The armature is wave connected and has 800 conductors. Obtain speed and the gross torque developed by the armature.

(C.O.No.2) [Application]

18. A 50kVA single phase transformer has primary and secondary turns of 300 and 20 turns respectively. The primary winding is connected to 220V, 50Hz supply. List and compute unknown parameters from the given data.

(C.O.No.2) [Application]