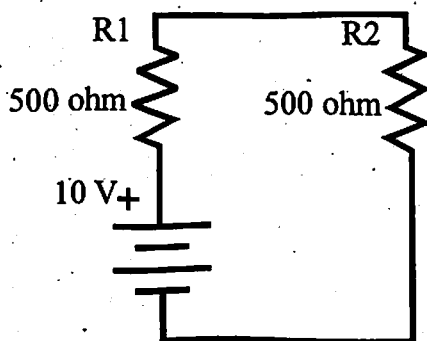


U.G. 1st Semester Examination - 2024**PHYSICS****[Skill Enhancement Course (SEC)]****Course Code : PHY-SEC-T-01****(Electrical Circuit and Network Skills)****[NEP-2020]**

Full Marks : 35

Time : $1\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***GROUP-A**

1. Answer any five questions : $1 \times 5 = 5$
- a) Give one example each of electrical components which obey and disobey Ohm's Law.
 - b) What is the unit of power in electrical systems?
 - c) Find the voltage across R_1

*[Turn over]*

- d) What is the advantage of using three-phase AC source?
- e) Explain the role of a fuse in electrical protection.
- f) What is the role of a capacitor in an AC circuit?
- g) What is the purpose of a step-down transformer?
- h) What is power factor of an ideal source?

GROUP-B

2. Answer any two questions: $5 \times 2 = 10$
- a) Explain the working principle of half-wave and full-wave rectifiers, including L and C filters.
 - b) Highlight the significance of power factor in saving energy and money.
 - c) What can we measure by CRO and how it works?
 - d) Write the working principle of circuit breakers, miniature circuit breaker and its types.

GROUP-C

3. Answer any two questions: $10 \times 2 = 20$
- a) Discuss single-phase and three-phase alternating current sources, including principles of generation, waveform, and benefits of three-phase systems.

- b) Explain in detail the function and operation of step-up and step-down transformers.
- c) Design and explain the wiring setup for star and delta connections, highlighting their applications.
- d) Discuss the working principle and importance of miniature circuit breakers in household.