

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Electrical Engineering) SEMESTER - 1 Summer 2026 (Supply.)

Course :Bachelor of Technology (Electrical Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 1

Subject Code & Name: 24AF1000ES106B - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours]

[Total Marks : 60

Instructions to the Students:

1. Each question carries 12 marks.
2. Question No. 1 will be compulsory and include objective-type questions.
3. Candidates are required to attempt any four questions from Question No. 2 to Question No.6
4. Use of non-programmable scientific calculators is allowed.
5. Assume suitable data wherever necessary and mention it clearly.

Q1. Objective type questions. (Compulsory Question)

12

- 1 The resistance temperature coefficient indicates:
A) Resistance value B) Change in resistance with temperature
C) Current carrying capacity D) Power consumption
- 2 Which transmission system is economical for long-distance bulk power transmission?
A) DC Transmission B) AC Transmission
C) Both same D) None
- 3 Power factor is the ratio of:
A) Active Power to Apparent Power B) Reactive Power to Active Power
C) Voltage to Current D) Resistance to Reactance
- 4 Which battery has the highest energy density?
A) Lead Acid B) NiCd C) Li-ion D) Dry Cell
- 5 A relay is primarily used for:
A) Power generation B) Protection and control
C) Voltage measurement D) Energy storage
- 6 A PN junction diode conducts in forward bias when:
A) P-side is negative B) N-side is positive
C) P-side is positive D) Both terminals are grounded
- 7 The efficiency of a half-wave rectifier is approximately:
A) 40.6% B) 81.2% C) 50% D) 100%
- 8 Ripple factor of a full-wave rectifier is:
A) 1.21 B) 0.482 C) 0.707 D) 2.0
- 9 A Zener diode is mainly operated in:
A) Forward bias B) Reverse breakdown region
C) Cut-off region D) Active region
- 10 The relation between α and β is:
A) $\beta = \alpha/(1-\alpha)$ B) $\alpha = \beta^2$ C) $\alpha = 1/\beta$ D) $\beta = \alpha^2$

- 11 A transistor used as a switch operates between:
 A) Active and cut-off B) Cut-off and saturation
 C) Active and saturation D) Reverse and forward
- 12 De Morgan's theorem is useful for:
 A) Circuit simplification B) Power measurement
 C) Voltage regulation D) Amplification
- Q2. Solve the following.
- A) Explain the effect of temperature on resistance and define temperature coefficient of resistance. 6
- B) Explain the generation, transmission and distribution of electrical energy with a neat block diagram. 6
- Q3. Solve the following.
- A) Explain the construction, operation, and V-I characteristics of a PN junction diode. 6
- B) Explain the construction and operation of a Bridge Rectifier. State its advantages over a Full-Wave Rectifier. 6
- Q4. Solve Any Two of the following.
- A) Explain the construction, working, and applications of MCB 6
- B) Describe different wire gauges used in domestic and industrial wiring applications. 6
- C) Explain the construction and working of Nickel-Cadmium (NiCd) battery. write its chemical reaction during charging and discharging. 6
- Q5. Solve Any Two of the following.
- A) Explain power factor and methods of power factor improvement. 6
- B) Derive efficiency and ripple factor of Half-Wave and Full-Wave Rectifiers. 6
- C) Explain the working of capacitor filter and choke-input filter used in rectifier circuits. 6
- Q6. Solve Any Two of the following.
- A) State and prove De Morgan's Theorems with suitable examples 6
- B) Compare CB and CE transistor configurations with suitable characteristics. 6
- C) Explain basic logic gates with truth tables and symbols. 6

*** End ***