

Unit-V

Train Lighting Systems

1. The primary requirement of train lighting is:

- A) High fuel consumption**
- B) Reliable and continuous illumination**
- C) Frequent battery replacement**
- D) Low passenger capacity**

Answer: B) Reliable and continuous illumination

2. Train lighting systems must provide:

- A) Constant illumination despite speed variations**
- B) Illumination only when the train is moving**
- C) Lighting only during daytime**
- D) Variable brightness with speed**

Answer: A) Constant illumination despite speed variations

3. In train lighting systems, batteries are mainly used to:

- A) Increase train speed**
- B) Store energy and provide lighting when the generator output is insufficient**
- C) Reduce coach weight**
- D) Operate brakes only**

Answer: B) Store energy and provide lighting when the generator output is insufficient

4. One special requirement of train lighting is:

- A) Resistance to vibration and shocks**
- B) High heat generation**
- C) Large wiring losses**
- D) Frequent maintenance**

Answer: A) Resistance to vibration and shocks

5. The objective of obtaining unidirectional polarity constant output is:

- A) To provide a stable DC supply to lamps and batteries**
- B) To increase AC frequency**
- C) To reduce coach capacity**
- D) To stop battery charging**

Answer: A) To provide a stable DC supply to lamps and batteries

6. In the Single Battery System, the battery is connected:

- A) Permanently across the load**
- B) In series with the load only**
- C) Across the generator only**
- D) Across the transformer only**

Answer: A) Permanently across the load

7. The Single Battery System is mainly used to:

- A) Maintain nearly constant voltage across lamps**
- B) Increase train acceleration**
- C) Reduce passenger load**
- D) Operate traction motors**

Answer: A) Maintain nearly constant voltage across lamps

8. A disadvantage of the Single Battery System is:

- A) Overcharging and undercharging of battery may occur**
- B) No battery is required**
- C) High efficiency always**
- D) No voltage regulation needed**

Answer: A) Overcharging and undercharging of battery may occur

9. In the Double Battery Parallel Block System:

- A) Only one battery is used**
- B) Two batteries operate alternately in charging and discharging modes**
- C) No generator is required**
- D) AC lamps are used directly**

Answer: B) Two batteries operate alternately in charging and discharging modes

10. The main advantage of the Double Battery Parallel Block System is:

- A) Better voltage regulation and battery life**
- B) No maintenance required**
- C) No charging system required**
- D) Lower illumination level**

Answer: A) Better voltage regulation and battery life

11. Coach wiring refers to:

- A) Wiring arrangement provided inside railway coaches**
- B) Track wiring only**
- C) Overhead transmission wiring**
- D) Station wiring only**

Answer: A) Wiring arrangement provided inside railway coaches

12. Coach wiring should be designed for:

- A) Safety and reliability
- B) High voltage drop
- C) Frequent failures
- D) High power losses

Answer: A) Safety and reliability

13. The supply used for electrified railway traction in India is generally:

- A) 750 V DC
- B) 1.5 kV DC
- C) 25 kV AC, 50 Hz
- D) 11 kV AC

Answer: C) 25 kV AC, 50 Hz

14. When lighting is obtained from a 25 kV AC supply, the voltage is first:

- A) Increased further
- B) Rectified directly without reduction
- C) Stepped down through a transformer
- D) Converted to DC by batteries only

Answer: C) Stepped down through a transformer

15. In train lighting using a 25 kV AC supply, a rectifier is used to:

- A) Convert AC to DC
- B) Convert DC to AC
- C) Increase frequency
- D) Reduce current only

Answer: A) Convert AC to DC

16. Modern railway coaches commonly use:

- A) LED lighting systems
- B) Carbon filament lamps

- C) Arc lamps only
- D) Oil lamps

Answer: A) LED lighting systems

17. The battery voltage commonly used in train lighting systems is:

- A) 12 V only
- B) 24 V only
- C) 110 V DC (commonly in coaches)
- D) 440 V AC

Answer: C) 110 V DC (commonly in coaches)

18. The train lighting generator is generally driven by:

- A) Wind energy
- B) Axle of the coach
- C) Solar panels only
- D) Traction motor only

Answer: B) Axle of the coach

19. A major advantage of LED lamps in railway coaches is:

- A) Higher power consumption
- B) Lower efficiency
- C) Long life and low energy consumption
- D) High maintenance cost

Answer: C) Long life and low energy consumption

20. The purpose of voltage regulation in train lighting systems is to:

- A) Maintain constant illumination
- B) Increase train speed
- C) Reduce coach capacity
- D) Increase battery weight

Answer: A) Maintain constant illumination

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Fill in the Blanks – Train Lighting Systems (20 Questions with Answers)

- 1. Train lighting systems must provide continuous illumination even when the train is _____.**
Answer: stationary
- 2. One special requirement of train lighting is high _____ against vibration and shock.**
Answer: reliability
- 3. The electrical equipment used in railway coaches should be _____ in weight.**
Answer: light
- 4. Train lighting systems generally use a _____ as a standby power source.**
Answer: battery
- 5. The battery used in railway coaches is charged by an axle-driven _____.**
Answer: alternator
- 6. A major requirement of train lighting is obtaining a _____ polarity output.**
Answer: unidirectional
- 7. In a single battery system, one battery supplies power to the entire _____.**
Answer: coach
- 8. The single battery system is comparatively _____ in construction.**
Answer: simple
- 9. In the double battery parallel block system, two batteries are connected in _____.**
Answer: parallel
- 10. The double battery system provides better voltage _____ than a single battery system.**
Answer: regulation
- 11. In coach wiring, lamps are generally connected in _____.**
Answer: parallel
- 12. Parallel connection ensures that failure of one lamp does not affect the _____ lamps.**
Answer: other
- 13. Railway coach wiring includes protective devices such as _____.**
Answer: fuses
- 14. Modern railway coaches increasingly use _____ lamps due to their high efficiency.**
Answer: LED

15. In electrified railways, lighting can be supplied from the _____ line.
Answer: traction
16. The traction supply commonly used in Indian Railways is _____ kV AC.
Answer: 25
17. The 25 kV AC supply is stepped down using a _____.
Answer: transformer
18. After transformation, the AC supply is converted into DC using a _____.
Answer: rectifier
19. The purpose of the rectifier is to provide _____ current for coach lighting.
Answer: direct
20. Train lighting systems are designed to maintain illumination under varying _____ conditions.
Answer: operating

Additional Practice Fill in the Blanks

21. The coach battery serves as an emergency power _____.
Answer: source
22. The alternator output varies with train _____.
Answer: speed
23. Constant output polarity is necessary for proper battery _____.
Answer: charging
24. The main objective of train lighting is passenger _____ and safety.
Answer: comfort
25. A transformer used with 25 kV AC supply reduces the voltage to a _____ value.
Answer: suitable