

SMART Grid MCQs - Unit 4 and 5

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1 UNIT-4 1 mark MCQ

1. What is the primary function of a Power Quality Conditioner (PQC)?

- A. Increase the power factor
 - B. **Improve the quality of power delivered to loads**
 - C. Convert AC to DC power
 - D. Store electrical energy
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2. Which component is used for passive shunt compensation in power quality management?

- A. Transformers
 - B. **Capacitors**
 - C. Inductors
 - D. Resistors
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3. What does THD stand for in the context of power quality?

- A. Total Harmonic Distribution
 - B. **Total Harmonic Distortion**
 - C. Transient Harmonic Distortion
 - D. Terminal Harmonic Distribution
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4. What is the main purpose of a Power Quality Audit?

- A. To measure the efficiency of power generation
 - B. **To assess and improve the quality of power in a network**
 - C. To check the physical condition of power lines
 - D. To calculate the power losses in transmission
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5. Which standard is commonly used for power quality?

- A. IEEE
 - B. IEC
 - C. ANSI
 - D. **All of the above**
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6. What does EMC stand for in the context of smart grids?

- A. Electric Metering Company
 - B. **Electromagnetic Compatibility**
 - C. Electronic Machine Control
 - D. Energy Management Consortium
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7. Which device is primarily used to mitigate voltage sags and swells?

- A. **DVR (Dynamic Voltage Restorer)**
 - B. UPS (Uninterruptible Power Supply)
 - C. PFC (Power Factor Corrector)
 - D. RCC (Reactive Current Controller)
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8. What type of power quality problem is typically caused by the switching of large loads?

- A. Harmonics
 - B. **Voltage dips**
 - C. Flicker
 - D. Frequency variations
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9. What is the effect of harmonics on electrical systems?

- A. Increased power factor
 - B. **Reduced transmission efficiency**
 - C. Enhanced system stability
 - D. Improved voltage regulation
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10. What does a Web-based Power Quality Monitoring System primarily monitor?

- A. Internet speed
 - B. **Power quality parameters like voltage, current, and frequency**
 - C. Web traffic
 - D. Server performance
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11. Which topology is typically used for mitigating harmonics in power systems?

- A. Star topology
 - B. Ring topology
 - C. Bus topology
 - D. **Matrix converters**
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12. What is the main benefit of using UPQC (Unified Power Quality Conditioner)?

- A. It only improves power factor
- B. It provides backup power
- C. **It simultaneously handles multiple power quality issues**

D. It reduces power consumption

13. What role does IEEE play in power quality management?

- A. Provides financial assistance
 - B. **Sets guidelines and standards**
 - C. Manufactures power quality devices
 - D. Monitors power plants
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14. What is the typical cause of flicker in power systems?

- A. High impedance in circuits
 - B. **Fluctuating loads**
 - C. Over-voltage conditions
 - D. Under-frequency operations
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15. Which of the following is not a type of power quality conditioner?

- A. DVR
 - B. UPS
 - C. PFC
 - D. **Transformer**
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16. What does the term "sag" refer to in power quality?

- A. A temporary increase in voltage
 - B. A permanent drop in voltage
 - C. **A temporary drop in voltage**
 - D. A permanent increase in voltage
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17. Which device is used for active shunt compensation?

- A. **DSTATCOM**
 - B. Capacitor banks
 - C. Voltage regulators
 - D. Circuit breakers
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18. What is the main purpose of harmonic filters?

- A. To increase the harmonics
 - B. To stabilize voltage fluctuations
 - C. **To reduce harmonic distortions in the network**
 - D. To monitor power usage
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19. What does a Power Quality Audit typically include?

- A. Only data gathering

- B. Only site visits
 - C. **Recommendations based on standards**
 - D. Installation of new equipment
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20. Which phenomenon is described by the term "Interharmonic"?

- A. Frequencies that are integer multiples of the fundamental frequency
 - B. **Frequencies that are non-integer multiples of the fundamental frequency**
 - C. Frequencies that are below the fundamental frequency
 - D. Frequencies that are above the fundamental frequency
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1.1 UNIT-4 2marks MCQs

21. Which type of power quality conditioner is specifically designed to correct short-term voltage sags and swells?

- A. Static Var Compensator (SVC)
 - B. **Dynamic Voltage Restorer (DVR)**
 - C. Active Power Filter (APF)
 - D. Unified Power Quality Conditioner (UPQC)
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22. What is the impact of harmonic distortion on industrial equipment?

- A. Increased operational efficiency
 - B. Reduced maintenance requirements
 - C. **Increased heating effects leading to potential damage**
 - D. Enhanced power factor
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23. In a Power Quality Audit, which standard is specifically used to evaluate harmonic levels?

- A. **IEEE 519**
 - B. IEC 61000
 - C. ANSI C84.1
 - D. IEEE 1459
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24. What is the role of DSTATCOM in smart grids?

- A. To provide backup power during outages
 - B. **To manage and compensate for reactive power dynamically**
 - C. To convert AC to DC power
 - D. To monitor power usage remotely
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25. How does a Unified Power Quality Conditioner (UPQC) differ from other PQCs?

- A. It only corrects for voltage sags
- B. **It integrates functions of both series and shunt active power filters**

- C. It is used exclusively for residential applications
 - D. It cannot handle high power loads
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26. What is the significance of using MPLS technology in the communication infrastructure of smart grids?

- A. It simplifies the physical wiring of the network
 - B. **It provides a mechanism for data packet labeling to streamline data flows**
 - C. It exclusively enhances the security of data
 - D. It reduces the need for IP addressing
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2 UNIT-5 1 mark MCQ

27. What is the main purpose of using WAN in smart grids?

- A. To connect devices within a home
 - B. To connect high-speed internet across cities
 - C. **To connect different substations and control centers over long distances**
 - D. To connect computers within an office
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28. Which technology is typically used in HAN (Home Area Network)?

- A. Ethernet
 - B. Wi-Fi
 - C. **ZigBee**
 - D. MPLS
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29. What is the primary benefit of Cloud Computing in smart grids?

- A. Increased physical security
 - B. **Reduced operational costs**
 - C. Enhanced graphical user interfaces
 - D. Faster internet speeds
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30. What does BPL stand for in the context of smart grids?

- A. Best Practice Licensing
 - B. **Broadband over Power Line**
 - C. Binary Power Line
 - D. Basic Power Layout
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31. Which protocol is fundamental for IP-based smart grid applications?

- A. SMTP
- B. FTP
- C. HTTP

D. **TCP/IP**

32. What is the main feature of a smart grid?

- A. One-way communication
 - B. Manual control of devices
 - C. **Two-way communication**
 - D. Use of non-renewable energy sources
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33. What is the role of a web service in smart grid applications?

- A. To provide entertainment content
 - B. **To facilitate machine-to-machine interaction over the internet**
 - C. To monitor employee activities
 - D. To offer online shopping
-

34. Which of the following is a characteristic of smart grid communication technology?

- A. Low bandwidth
 - B. Analog communication
 - C. **High security and encryption**
 - D. Manual data handling
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35. What does LAN stand for?

- A. Large Area Network
 - B. **Local Area Network**
 - C. Long Area Network
 - D. Low Area Network
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36. What is the primary use of MPLS in smart grids?

- A. To provide multimedia streaming
 - B. **For high-performance telecommunications networks**
 - C. To offer low-speed data transmission
 - D. For residential internet access
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37. What does Cyber Security protect against in smart grids?

- A. Unauthorized physical access
 - B. Damage to hardware only
 - C. **Data breaches and cyber-attacks**
 - D. Electrical faults
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38. What is the main advantage of using fiber optics in WAN for smart grids?

- A. Low cost

- B. High thermal conductivity
 - C. **High bandwidth and security**
 - D. Easy installation
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39. Which technology allows for real-time, two-way communication in smart grids?

- A. Analog telephone systems
 - B. Postal services
 - C. **Cloud computing**
 - D. Broadcast radio
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40. What is the primary function of IP-based protocols in smart grids?

- A. To manage payroll systems
 - B. **To ensure proper data packet delivery over the network**
 - C. To enhance the aesthetic interface of applications
 - D. To reduce the cost of electricity
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41. What role does the HAN play in a smart grid?

- A. Connects global networks
 - B. **Manages home-based devices and energy consumption**
 - C. Provides backup power solutions
 - D. Monitors outdoor lighting systems
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42. What is a significant feature of cloud computing beneficial for smart grids?

- A. Manual scaling of resources
 - B. **On-demand resource provisioning**
 - C. Limited access to applications
 - D. Single-user access
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43. Which aspect of smart grids does BPL enhance?

- A. Water distribution
 - B. **Internet access through electrical outlets**
 - C. Gas metering
 - D. Manual meter readings
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44. What is the primary purpose of using web services in smart grids?

- A. To increase web traffic
 - B. **To facilitate interoperable machine-to-machine communication**
 - C. To provide social media features
 - D. To enhance graphic design
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45. Which technology is essential for the operation of smart meters in HAN?

- A. Bluetooth
 - B. **ZigBee**
 - C. Ethernet
 - D. Coaxial cable
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46. What is the primary benefit of implementing Cyber Security measures in smart grids?

- A. To increase the physical robustness of the grid
 - B. **To protect against data theft and ensure data integrity**
 - C. To enhance the aesthetic appeal of the grid
 - D. To reduce the operational costs
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2.1 UNIT-5 2marks MCQs

47. In the context of smart grids, what is the primary security concern addressed by implementing robust cyber security measures?

- A. Physical theft of grid components
 - B. **Unauthorized access and manipulation of electrical data and systems**
 - C. Accidental data deletion by users
 - D. Overloading of data servers
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48. How does cloud computing enhance the functionality of smart grids in terms of data management?

- A. By providing unlimited data storage space
 - B. **By facilitating real-time data analysis and scalability of computing resources**
 - C. By reducing the physical size of data centers
 - D. By eliminating the need for internet connectivity
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49. What is the critical advantage of implementing IP-based protocols in smart grid communications?

- A. They allow for the use of traditional telephone lines
 - B. **They enable interoperability and standardization across different network technologies**
 - C. They provide direct power supply to grid components
 - D. They eliminate the need for encryption
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50. Considering the integration of HAN, LAN, and WAN, which network specifically addresses the issue of long-distance communication in smart grids?

- A. Home Area Network (HAN)
 - B. Local Area Network (LAN)
 - C. **Wide Area Network (WAN)**
 - D. Metropolitan Area Network (MAN)
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