

University of Mumbai
SMART GRIG

Course Code: EEDLO8042

Course Name: Smart Grid

MCQ

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Power quality monitoring and analysis in the smart grid is done using
Option A:	past time data
Option B:	utilizes real - time data
Option C:	uses off line data
Option D:	does not need any data
2.	One Nation, One Grid, One _____.
Option A:	Current
Option B:	Frequency
Option C:	Phase
Option D:	Voltage
3.	Among the following, what is not the function of Smart grid.
Option A:	Interoperability is achieved smoothly among the grid
Option B:	Real time monitoring of Grid conditions
Option C:	Solve automatically grid disturbances
Option D:	Plug and Play ability to connect new generation plants to the grid
4.	In relation to Smart home and building Automation, BAC is _____.
Option A:	Building Automation and control systems
Option B:	Bus Architecture for Communication
Option C:	Basic Automation and Communication
Option D:	Broad Area Communication
5.	The _____ provides framework and roadmap for smart grid interoperability standards.
Option A:	National Institute of Smart Grid
Option B:	National Institute of Micro grid
Option C:	National Institute of Standard and Technology
Option D:	National Institute of Electrical and Electronic Advancements
6.	Following are some Smart Home and Building Automation standards
Option A:	SPBRG, PS, PIC18, ATMEL, SCADA, PLC, ES
Option B:	ZHA, BACnet, KNX, LonWorks, OneNet, X10, INSTEON
Option C:	Zigbee, LAN, MAN, WAN, HAN, DG, COAXLine
Option D:	TCP/IP, IITC, COXZa, COHA, multiSIM, Netauto, I-on
7.	Following is NOT a type of IED.
Option A:	Protective Relaying Device
Option B:	Circuit Breaker Controllers
Option C:	Capacitor Bank Switches
Option D:	microcontroller based embedded systems,

8.	WAMS is _____-.
Option A:	Wide area Automation and Management System
Option B:	Wide Area Measurement System
Option C:	Wide Area Management System
Option D:	West Automatic Management System
9.	Recloser Controller and voltage regulators are _____.
Option A:	LEDs
Option B:	MCDs
Option C:	IEDs
Option D:	FASs
10.	Pumped Hydro power stations are looked as
Option A:	Frequency regulators for the grid
Option B:	voltage regulators for the grid
Option C:	bulk power suppliers
Option D:	conventional generating stations
11.	Pumped Hydro power stations are treated as
Option A:	reserve power capacities
Option B:	voltage regulators for the grid
Option C:	bulk power suppliers
Option D:	conventional generating stations
12.	_____ is the condition in which a distributed generator (DG) continues to power a location even though electrical grid power is no longer present.
Option A:	Islanding
Option B:	Anti-islanding
Option C:	Microgriding
Option D:	Brown out
13.	Which of the following is true in the grid connected operation of the AC Microgrid?
Option A:	Battery charging, PV at MPPT, diesel generator regulating the voltage and frequency
Option B:	Battery charging, PV at off MPPT, diesel generator regulating the voltage and frequency
Option C:	Battery charging, PV at MPPT, diesel generator off
Option D:	diesel generator regulating the voltage and frequency
14.	VAR compensators are treated as
Option A:	simply as active power controller
Option B:	simply as reactive power controller
Option C:	enhancing the power flow controller
Option D:	one of the power conditioning technology for improvement in power quality
15.	For power quality and reliability, fast response, soft transfer, isolation
Option A:	are the requirements of distributed generation integration
Option B:	are the requirements of conventional generation
Option C:	are not the requirements of distributed generation integration
Option D:	are not the requirements of PSS for distributed generation integration

16.	_____ is a one that is able to tolerate a fault and continue generating powered with a certain degree of power quality even when dealing with some typical faults such as dip voltage.
Option A:	Self-healing system
Option B:	Flexible AC transmission system
Option C:	Resilient system
Option D:	outage management system
17.	Isolation transformers, voltage regulators are treated as
Option A:	Power conditioning equipment's
Option B:	disturbing network power quality equipment's
Option C:	simply as equipment's serving their purpose
Option D:	simply as source of power
18.	The main responsibility of Application layer in TCP/IP protocol architecture is
Option A:	routing packets from source to destination across multiple layers
Option B:	allow users to access network resources
Option C:	transmits raw bits as signals between nodes
Option D:	provides reliable and application independent process to process delivery of messages
19.	The main responsibility of Network layer in TCP/IP protocol architecture is
Option A:	encapsulation of IP packets coming from the internet layer into frames, frame synchronization
Option B:	allow users to access network resources
Option C:	transmits raw bits as signals between nodes
Option D:	provides reliable and application independent process to process delivery of messages
20.	The Smart Grid domains and subdomains use variety of private and non-private _____ communication channels
Option A:	Wired
Option B:	Wireless
Option C:	wired and wireless
Option D:	optical and coaxial
21.	In DC voltage bus the following parameter is known
Option A:	DC power
Option B:	Voltage
Option C:	Reactive power
Option D:	Frequency
22.	Full form of the SCADA is
Option A:	Supervisory control and digital acquisition
Option B:	Supervisory control and data acquisition
Option C:	Supplementary control and data acquisition
Option D:	Supplementary control and digital acquisition

23.	Renewable energy is generated from
Option A:	Natural resources
Option B:	Artificial resources
Option C:	Nuclear resources
Option D:	does not require any source
24.	Power quality is the ability of a system
Option A:	to operate causing disturbance or damage to loads and components
Option B:	to operate without causing disturbance or damage to loads and components
Option C:	to lose synchronism of the synchronous machines
Option D:	None of the above
25.	Which statement from the following is not true for OMS, _____?
Option A:	Prediction of location of transformer, fused, recloser or breaker that opened upon failure.
Option B:	Prioritizing restoration efforts and managing resources based upon criteria such as locations of emergency facilities, size of outages, and duration of outages.
Option C:	Providing information on extent of outages and number of customers impacted to management, media and regulators.
Option D:	It is a networking system using mesh topology to interact with consumers and utilities.
26.	OMS is _____.
Option A:	Outage measurement system.
Option B:	Outage management system.
Option C:	Outlet Measurement system
Option D:	Outlet Measurement scheme
27.	The function of Calculation of estimation of restoration times, Management of crews assisting in restoration, Calculation of crews required for restoration is performed by _____.
Option A:	Outage Management system
Option B:	smart meters
Option C:	sensors
Option D:	SCADA
28.	_____ supply the required data for the smart grid which helps the grid in providing an automated response.
Option A:	Smart meters
Option B:	Sensors
Option C:	Actuators
Option D:	PLC
29.	Which statement is NOT true for main purposes of FA ?
Option A:	FA aims to automate feeder switching.
Option B:	FA controls voltages and active/reactive powers of feeders.
Option C:	FA stands for Frequency Automation
Option D:	FA stands for Feeder Automation.

30.	The difference between AMI and AMR is that metering devices of AMI can also be remotely controlled by system operator.
Option A:	AMI uses one-way communication; AMR uses Two-way communication.
Option B:	AMI is Automatic whereas AMR is non automatic.
Option C:	Metering devices of AMI can also be remotely controlled by system operator and cannot be remotely controlled in AMR.
Option D:	AMI uses processors AMR uses PIC.
31.	PMU is _____.
Option A:	Power Measurement Unit
Option B:	Phasor Management Unit
Option C:	Power Metering Unit
Option D:	Phasor Making Unit
32.	Renewable energy options are meant to provide the smart grid with:
Option A:	non enhancement of functionality of electric vehicles and plug - in hybrids
Option B:	Utilization of vehicle battery packs as energy storage devices
Option C:	complete solution to demand-supply of power
Option D:	source reactive power fully
33.	Compressed Air Energy Storage (CAES) utilities use
Option A:	electricity generated during off - peak hours (i.e., storage hours) to compress air
Option B:	electricity generated during peak hours (i.e., storage hours) to compress air
Option C:	does not need electricity to compress air
Option D:	use air at atmospheric pressure only
34.	Compressed Air Energy Storage (CAES) utilities has low efficiency because
Option A:	the electricity generated is of low magnitude
Option B:	running losses of the system are very high
Option C:	they need extra reheating energy needed to turn on the turbines
Option D:	electric generator losses are higher
35.	Line voltage distortion in the form voltage notches is caused by
Option A:	switching devices used in electrical control system
Option B:	speeding motors
Option C:	speeding generators
Option D:	AVRs
36.	electromagnetic interference (EMI) caused by high-frequency; low-voltage signals superimposed on the standard signal in a line is described as
Option A:	under voltages
Option B:	voltage notch
Option C:	flicker
Option D:	electrical noise
37.	EMI adversely affects
Option A:	telecommunication processes
Option B:	transformer operation
Option C:	generator operation
Option D:	does not affect anything

38.	A Home Area Network is an integrated system of
Option A:	circuit breakers at generating stations
Option B:	reactors at substation
Option C:	Plug-in hybrid/electric vehicles
Option D:	excitation control of generators
39.	The functions of the Neighborhood Area Network are
Option A:	is to transfer consumption readings from smart meters
Option B:	not to facilitate diagnostic messages
Option C:	is not to carry firmware upgrades
Option D:	is to communicate with generating stations
40.	IP based networks
Option A:	disables bandwidth sharing among applications
Option B:	reduces reliability
Option C:	enable dynamic routing capabilities
Option D:	skips data packets
41.	Power quality is a major concern because of the
Option A:	sensitivity of digital and modern control equipment to distortion/PQ deterioration
Option B:	it does not cause disturbance or damage to loads and components
Option C:	synchronous machines operate in synchronism
Option D:	bus voltages are maintained
42.	Power quality monitoring and analysis in the smart grid
Option A:	past time data
Option B:	utilizes real - time data
Option C:	uses off line data
Option D:	does not need any data
43.	which of the following is not a property associated with power quality of smart grids
Option A:	Self-healing
Option B:	Frequency monitoring and control
Option C:	load forecasting
Option D:	Asset management
44.	Fiber optic is an example for
Option A:	Home Area Networks
Option B:	Industry Area Networks (IAN)
Option C:	Wide Area Networks (WAN)
Option D:	Neighborhood Area Networks
45.	A sensor that takes some predefined action when it senses the appropriate input (light, heat, sound, motion, touch etc.) are called as _____.
Option A:	smart sensors
Option B:	Pneumatic sensor
Option C:	piezoelectric sensor
Option D:	hydraulic sensors

46.	to qualify as a smart sensor, the sensor and _____ must be part of same physical unit.
Option A:	micro processor
Option B:	actuators
Option C:	multiplexer
Option D:	data converter
47.	The _____ enable real-time fault detection and isolation via bidirectional digital communication links.
Option A:	Plugin vehicles
Option B:	Smart Appliances
Option C:	Smart Sensors
Option D:	Solar panels
48.	A Plug in Hybrid Electric Vehicle is a hybrid electric vehicle _____.
Option A:	whose battery can be recharged only by its on-board engine and generator.
Option B:	whose battery can be recharged only by solar power.
Option C:	whose battery can be recharged by plugging it into an external source of electric power source as well as by its on-board engine and generator.
Option D:	whose battery can be recharged only by plugging it into an external electric power source
49.	The main data resources and controllable devices of Feeder Automation function are
Option A:	ADC, DAC, Mux, demux
Option B:	Adder, Integrator, Differentiator, ALUs
Option C:	OPAMPs, Amplifiers, Switches, Transducers, LVDTs
Option D:	line reclosers, load break switches, sectionalizers, capacitor banks and line regulators.
50.	Using a PMU, it is simple to detect
Option A:	Correlation between Voltage and Current
Option B:	Harmonics and faulty IEDs
Option C:	Abnormal phase angles
Option D:	abnormal waveform shapes
51.	Digital Protective relays are _____.
Option A:	IEDs
Option B:	Fast
Option C:	PMUs
Option D:	FMUs
52.	Which of the following is not the microgrid ancillary service during the grid connected mode
Option A:	Frequency control support
Option B:	congestion management
Option C:	improving power quality
Option D:	Black start

53.	In a typical AC microgrid which of the following helps to regulate voltage and frequency in the islanded mode of operation?
Option A:	PV connected inverter
Option B:	Diesel Generator
Option C:	Grid
Option D:	PMSG wind
54.	which of the following is true in the case of under excited synchronous generator?
Option A:	Absorbs reactive power
Option B:	Operates at unity power factor
Option C:	Injects reactive power
Option D:	operates at leading power factor
55.	electromagnetic interference (EMI) caused by high-frequency; low-voltage signals superimposed on the standard signal in a line is described as
Option A:	under voltages
Option B:	voltage notch
Option C:	flicker
Option D:	electrical noise
56.	EMI adversely affects
Option A:	telecommunication processes
Option B:	transformer operation
Option C:	generator operation
Option D:	does not affect anything
57.	In power quality issues battery and flywheel storage systems are treated as
Option A:	simply as storage elements
Option B:	simply as source of power
Option C:	Power conditioning equipment's
Option D:	disturbing network power quality equipment's
58.	The main responsibility of Internet layer in TCP/IP protocol architecture is
Option A:	routing packets from source to destination across multiple layers
Option B:	allow users to access network resources
Option C:	transmits raw bits as signals between nodes
Option D:	provides reliable and application independent process to process delivery of messages
59.	The main responsibility of physical layer in TCP/IP protocol architecture is
Option A:	routing packets from source to destination across multiple layers
Option B:	allow users to access network resources
Option C:	transmits raw bits as signals between nodes
Option D:	provides reliable and application independent process to process delivery of messages
60.	The main responsibility of Transport layer in TCP/IP protocol architecture is
Option A:	routing packets from source to destination across multiple layers
Option B:	allow users to access network resources
Option C:	transmits raw bits as signals between nodes
Option D:	provides reliable and application independent process to process delivery of messages

Descriptive Questions

	10 marks each
1.	Write a short note on Wi-Max type of communication
2.	Compare microgrid and smart grid
3.	Explain the Cloud Computing Technology
4.	Write a short note on home and building automation
5.	Write a short note on Intelligent Electronic Devices
6.	Elaborate on smart substation
7.	Explain the advantages of Distributed Energy Resources
8.	Discriminate Home Area Network, Neighborhood Area Network, and Wide Area Network
9.	List out the energy storage elements and explain anyone of them
10.	Explain the barriers of smart grid
11.	Explain the concept of resilient and self-healing grid
12.	What is a smart meter?
13.	What are the Clean Development Mechanism (CDM) opportunities in smart grid?
14.	Write a note on home and building automation
15.	Elaborate on Wide Area Measurement Systems (WAMS)
16.	Write a brief note on Distributed Energy Resources (DER)
17.	Explain the Bluetooth and ZigBee communication technologies
18.	What are IP based protocols?