SVERI's College of Engineering, Pandharpur,
Department of Electrical Engineering

B.Tech, LY-Sem II AY 2022-23
Subject: Smart Grid Technology(SGT)

Faculty Name: Dr. M. P. Thakre
Topic: Grid Integration

Q. No.	Questions	(a)	(b)	(c)	(d)	Ans
1	The two critical factors to consider when selecting a battery charger are …….	the system voltage	the maximum rate of charge of the batteries	both	None of these	c
2	A battery charger converts the …… for the purpose of battery charging.	AC to DC	DC to AC	both	None of the above	a
3	Major issues that arise when designing a system include that	the load placed on the system is not constant	that the amount of energy available from the renewable energy source is variable	that technology that bests suits site should be implemented	All of these	d
4	The terms …… are useful in calculating equivalent sums of money for an interest period.	interest	interest period	interest rate	All of these	d
5	In hybrid system …… energy is only work as a backup source.	diesel	Solar	wind	tidal	a

6	Advantages of parallel configuration over other system configurations are ……	that the system load can be met in the most optimal way	diesel efficiency can be maximized	diesel generator maintenance can be minimized	All of these	d
7	The …... configuration allows all energy sources to supply the load separately at low or medium demand, as well as supplying quick load from combined sources.	series	parallel	both	None of the above	b
8	The ……. prevents overcharging of the battery bank from PV generator when the PV power exceeds the load demand and the batteries are fully charged.	charge controller	CB	Drive	None of the above	a
9	Hybrid systems can address limitations in terms of …….	fuel flexibility	efficiency	reliability	All of these	d
10	The design and structure of a hybrid energy system obviously take into account …...	the types of renewable energy sources available locally	the consumption the system supports	both	None of the above	c
11	Usually, one of the energy sources in hybrid power system is…….	conventional one (which necessarily does not depend on renewable energy resource) powered by a diesel engine,	the other(s) would be renewable viz. solar photovoltaic, wind or hydro.	None of the above	both	a

12	The term hybrid power system is used to describe …….	any power system combines two or more energy conversion devices,	two or more fuels for the same device	both	None of the above	c
13	Distributed generation and storage enable ….	collection of energy from many sources	may lower environmental impacts	improve security of supply	All of these	d
14	DER systems typically use ……	renewable energy sources	Conventional energy sources	Both	None of the above	a
15	DER systems are	decentralized	modular	flexible	All of these	d
16	Microgrid Components are	Distributed Generation	Loads	Controller	All of these	d
17	The static switch has the ability to ….. island the micro-grid from disturbances such as faults.	autonomously	manually	Both	None of the above	a
18	Micro-grid has two critical components which are	The static switch	the micro-source	Both	None of the above	c
19	A micro-grid allows communities to be more energy ……	Independent	Dependent	Both	none of the above	a
20	A switch can separate the micro-grid from the main grid by …… and it then functions as an island.	automatically	manually	both	None of the above	c

21	A micro-grid connects to the grid at ……. that maintains voltage at the same level as the main grid.	middle	PCC	Starting point	Ending point	b
22	Micro-grid Key Attributes are	Grouping of interconnected loads and distributed energy resources	Can operate in island mode or grid connected if desired	Acts as a single controllable entity to the grid	All of these	d
23	If desired, a microgrid can connect and disconnect from the grid to enable it to operate in…...	grid connected	island mode	Both	None of these	c
24	The parameters that define the quality of electrical power.	Voltage	Current	Frequency	All of these	d
25	Oscillatory transient is …... in polarity.	Bidirectional	Unidirectional	both	None of the above	a
26	Impulsive transient is _____ in polarity.	Bidirectional	Unidirectional	both	None of the above	b
27	Which one is the short time reduction in the rms voltage between 0.1 to 0.9 p. u for duration of 0.5 cycles to 1 minute?	Voltage distortion	Voltage sag	Voltage degradation	Voltage swell	b
28	Which of the following is not a source of harmonic current?	Capacitor switching	Inductive load	Resistive load	None of these	c

29	Variation of input voltage sufficient in duration to allow visual observation of a change in electric light source intensity is called as …...	harmonics	distortion	noise	flicker	d
30	Ratio of the RMS of the harmonic content of a periodic wave to the RMS of the fundamental content of the wave, expressed as a percent. This is called as	crest factor	distortion factor	power factor	form factor	b

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Q. No.	Questions	(a)	(b)	(c)	(d)	Ans
1.	Smart Grid Technology comprises the following:	AMI, PLM, OMS, Renewable Integration, Micro grid	DR/DSM, Distribution Automation, Energy Efficient Systems	All of the above	None of the above	c
2.	The benefit of smart grid are	Promoting energy independence	Improving power quality	Improved security	All of the above	d
3.	PLM means	Peak Load Management	Plant Load Management	Power Leakage Management	Plant Leakage Management	a
4.	OMS means	Overall Maintenance System	Overall Management System	Outage Management System	Outage Maintenance System	c
5.	The smart grid will help consumers manage their electricity bill.	False	True	-	-	b
6.	What is the role of Big data in smart grid architecture of IoT?	Store data	Manage data	Collect data	Security	a
7	Smart Grid technologies are aimed at improvement of	Only Power Transmission System	Only Power Distribution system	Both Power Transmission & Distribution System	Neither Power Transmission nor Power Distribution system	c

8	Smart Grid goals include all but the following:	Potentially reducing our carbon footprint	Assimilate all cultures, all categories of consumers	Introducing advancements and efficiencies yet to be envisioned	Maintaining grid affordability	b
9	In a Smart Grid ECO System, a normal consumer is expected to be able to turn to	a non-consumer	a careful consumer	a Prosumer	Both careful consumer and Prosumer	d
10	Electric vehicles plugged into the grid could potentially help stabilize grids during peak usage times.	True	False	-	-	a
11	ICT stands for _____	Internet and Communication Technology	Internet and Communication of Things	Information and Communication Technology	Information and Communication of Things	c
12	What is the example for smart grid edge device for utility?	Smart Meters	Smart Home	Smart Car	Smart Collage	a
13	What is the role of Cloud in smart grid architecture of IoT?	Store data	Security	Collect data	Manage data	d
14	The major advantages of RTU is	High accuracy	Flexible communications to IEDs	Simple	Cheaper	b
15	The first PMU pilot project was set up in northern region in the year ___	2010	2009	2011	2006	a
16	Plug-in hybrid electric vehicles contain	electric motor	combustion engine	both an electric motor and combustion engine	None of the above	c
17	Monitor target of the smart _____ includes sensor objects in the power link.	Data layer	Smart network layer	Smart Application layer	Perception layer	d
18	What is the role of Gateway in smart grid architecture of IoT?	Security	Collect data	Manage data	Store data	b
19	According to the analysis on IoT application frame work, smart grid is divided into _____ layers.	5 layers	4 layers	3 layers	2layers	c
20	V2G stands for	Vehicle to Grid	Voltage to ground	Voltaic cell to ground	Voltmeter to grid	a

21	Electrochemical double-layer capacitors (DLC), also known ___	Polarized capacitors	Dielectric capacitors	Electrolytic capacitors	Super Capacitors	d
22	Components of Home & Building Automation	Controllers	Temperature Sensor	Both Controllers and Temperature Sensor	None of the above	c
23	Types of Smart Sensors are ____	Optical Sensor	Infrared detector array	Integrated multi sensor	All of the above	d
24	OMS identifying the location of ___ or ___ that operated to interrupt a circuit or portion of a circuit	Fuse & breaker	Relay & fuse	Isolators & relay	CB & relay	a
25	The self-healing of smart grid can automatically avoid or mitigate	power outages	power quality problems	Both power outages & power quality problems	None	c
26	Smart Grid Research Laboratory project is placed in___	Mumbai	Bangalore	Delhi	Ahmadabad	b
27	Challenges for Smart Grid are ___	Ageing and outdated Infrastructure	Inadequate resources	Smart consumers	All of the above	d
28	Smart sensor is a combination of ___	Both battery and amplifier	Both sensor and actuator	Both transducer and sensor	None	b
29	In smart grid, real-time pricing (RTP) is considered as an effective measure of ___	Demand-side management	Supply side management	Both (a) & (b)	None	a
30	The research on self-healing can be divided into two areas,	Generation & transmission grid	Transmission grid and end users	Transmission grid and distribution grid.	Generation & distribution grid.	c

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Topic: Communication Technology for Smart Grid

Q. No.	Questions	(a)	(b)	(c)	(d)	Ans
1	AMI means	Automated Metering Instrument	Alternate Metering Instrument	Advanced Metering Infrastructure	Advanced Metering Instrument	c
2	AMI mainly consists of ……	smart meters	bidirectional communication network	metering data management system	All of these	d
3	….. is considered to be the first step in smart grid construction.	AMI	WAN	ZigBee	HAN	a
4	The main functions of AMI are …..	Bidirectional communication	Supporting the time-of-use power price and demand side management	Self-healing function for the communication network	All of these	d
5	Typical communications architecture for smart metering is consists of ……	Wide Area Network (WAN)	Neighborhood Area Network (NAN)	Home Area Network (HAN).	All of these	d
6	A HAN uses	wired or wireless communications	networking protocols	Both	None of these	c
7	The services provided by …. for the convenience of the household can include scheduling and remote operation of household appliances as well as household security systems.	HAN	NAN	WAN	None of these	a

8	The NAN stands for	Near area network	Neighborhood area network	New area network	None of these	b
9	Energy management functions provided by HAN includes	energy monitoring and display	controlling the HVAC system	controlling smart appliances and smart plugs	All of these	d
10	The …… should also facilitate diagnostic messages, firmware upgrades and real-time or near real-time messages for the power system support.	NAN	WAN	HAN	None of these	a
11	The communication technology used for the …… is based on the volume of data transfer.	WAN	LAN	HAN	NAN	d
12	If …… technology which has a data transfer rate of 250 kb/s is used, then each household would use the communication link only a fraction of a second per day to transfer energy consumption data to the data concentrator.	ZigBee	CLOUD	PMU	Wi-Fi	a
13	The …… acts as a relay between the smart meters and the gateway	Data collector	data concentrator	Data receiver	None of these	b
14	The core of a meter data management system is a …...	information	database	data	None of these	b
15	…… were connected with multi-drop serial links to the station computer for monitoring and to allow remote interrogation.	Isolator	CB	Relays	Node	c
16	The configuration of a modern substation automation system comprises of	station level	bay level	process level	All of these	d

17	The …… includes the substation computer, the substation human machine interface and the gateway to the control centre.	bay level	process level	station level	None of these	c
18	The …. includes all the controllers and intelligent electronic devices.	process level	bay level	station level	None of these	b
19	The …. consists of switchgear control and monitoring, current transformers (CTs), voltage transformers (VTs) and other sensors.	process level	bay level	station level	None of these	a
20	The data collected from the …… is processed for control and maintenance by SCADA software that resides in the station computer.	Relay	IEDs	CB	None of these	b
21	IED stands for	Intelligent Electric Device	Intelligent Electronic Device	Important Electronic Device	None of these	b
22	An IED consists of	a signal processing unit	a microprocessor with input and output devices	a communication interface	All of these	d
23	…… is a wireless LAN technology designed to connect mobile or fixed devices using low-power, short-distance radio transmission.	ZigBee	Bluetooth	Wi-Fi	Wi-Max	b
24	…… defines two network architectures called Piconet and Scatternet.	Bluetooth	Wi-Fi	ZigBee	Wi-Max	a
25	A …… device can be a Full Function Device (FFD) or a Reduced Function Device (RFD).	Wi-Fi	Bluetooth	ZigBee	Wi-Max	c

26	The coverage of …… extends up to 50 km with peak data rates of 75 Mbps for fixed connections and up to 15 Mbps for mobile connections.	Wi-Fi	Bluetooth	Wi-Max	ZigBee	c
27	Wi-Max stands for	World Inter for Microwave Access	Worldwide Interoperability for Microwave Access	Worldwide Inter for Micro Access	None of the above	b
28	…… requires only occasional transmission of recorded energy data	AMR	AMI	HAN	None of these	a
29	…… requires frequent bi-directional communication (perhaps every 30 minutes).	LAN	AMI	AMR	None of these	b
30	…… is a messaging protocol in the Application layer and provides communication between devices connected over several buses and networks.	Modbus	LAN	WAN	HAN	a