

Scheme – I
Sample Test Paper - I

Program Name : **Electrical Engineering Group**
Program Code : **EE/EP/EU**
Semester : **SIXTH**
Course Title : ***Emerging Trends in Electrical Engineering***
Marks : **20**

22628

Time: 30 Minutes

Instructions:

- (1) All questions are compulsory.
- (2) Select your answer from given options
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.

Q.A Attempt the following questions. (12 Marks)

1. Internet of things is natural extension of -----
 - a. Smart Factory
 - b. Computer
 - c. SCADA
 - d. I3.0
2. IOT is evolved from ----- communication
 - a. B2B
 - b. M2B
 - c. M2H
 - d. M2M
3. Data speed in 4G is _____.
 - a. 10Mbps
 - b. 64Kbps
 - c. 2 Mbps
 - d. 2.4 Kbps
4. Electrical power and locomotives are the inventions of
 - a. First revolution
 - b. Second revolution
 - c. Third Revolution
 - d. Fourth revolution
5. Electric grid is a single entity with
 - a. Multiple generation plants and transmission network
 - b. Conventional generation plants and transmission network
 - c. Multiple generation plants and distribution network
 - d. Multiple generation plants, transmission and distribution network
6. Objective of Smart grid is...
 - a. Smart utilization of all the available resources.
 - b. Best utilization of all the available resources
 - c. optimum utilization of all the available resources
 - d. all of the above

7. Third stage in evolution of Smart Grid is....
 - a. Preliminary stage
 - b. Elementary stage
 - c. Evolutionary stage
 - d. Post evolutionary stage
8. Self-healing is the significant feature of
 - a. Conventional grid
 - b. Smart grid
 - c. Micro grid
 - d. Macrogrid
9. Which of following is features of a smart city?
 - a. Preserving and developing open spaces
 - b. Promoting Rapid Transit system
 - c. Providing Online services
 - d. All of above
10. Electronic service delivery is _____ part of smart solutions.
 - a. E governance
 - b. Water management
 - c. Energy management
 - d. Urban mobility
11. Greenfield Development means
 - a. Implementing greenery in city
 - b. Implemented in city area
 - c. Implemented around city area
 - d. None of above
12. Which of following is not included in Smart City Mission?
 - a. Mumbai
 - b. Nashik
 - c. Kolhapur
 - d. Aurangabad

Q.B Attempt the following questions.

(08 Marks)

1. Sequence of devices in IoT architecture from bottom layer to top layer is
 - a. Sensors->things->IoTgateway->Edge IT-> Data Center/ Cloud
 - b. Things ->Sensors ->IoTgateway->Edge IT-> Data Center/ Cloud
 - c. Things ->Sensors -> Edge IT->IoTgateway-> Data Center/ Cloud
 - d. Data Center/ Cloud-> Edge IT ->IoTgateway->Sensors->Things
2. A micro-grid is designed for a _____ usually for a certain community while the smart grid is designed for the _____ electrical system.
 - a. small scale, whole
 - b. medium scale, whole
 - c. large scale ,whole
 - d. small scale, partial

3. Plug-in-Hybrid Electric Vehicle (PHEV) is charged from _____ .
 - a. Power grid
 - b. IC Engine of vehicle
 - c. Both A and B
 - d. Either A or B
4. Hybrid Electric Vehicle _____ drive system.
 - a. Single
 - b. Two
 - c. Both A and B
 - d. None of the above

Scheme – I
Sample Test Paper - II

Program Name : **Electrical Engineering Group**
Program Code : **EE/EP/EU**
Semester : **SIXTH**
Course Title : ***Emerging Trends in Electrical Engineering***
Marks : **20**

22628

Time: 30 Minutes

Instructions:

- (1) All questions are compulsory.
- (2) Select your answer from given options
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.

Q.A Attempt the following questions.

(12 Marks)

1. Motor control involves....
 - a) Starting the motor.
 - b) Stopping the motor.
 - c) Direction and speed controls of the motor.
 - d) All of the above.

2. Identify the component/s of the motor-supply circuit.
 - a) Circuit-breaker.
 - b) Fuse.
 - c) Power Contacts.
 - d) All of the above

3. Fuse is used in the circuit to...
 - a) Protect the circuit components from short circuit faults
 - b) Limit the starting current.
 - c) Disconnect the circuit from supply mains in the event of any fault
 - d) All of the above

4. Overload relay protects the motor from...
 - a) Over-voltage condition
 - b) Over-current condition
 - c) Excessive speeding
 - d) Undesirable oscillations

5. NO contact means...
 - a) Number One contact
 - b) Neutral On contact
 - c) Normally On contact
 - d) Normally Open contact

6. Red push-button is generally used to...
 - a) Start the motor
 - b) Accelerate the motor
 - c) Decelerate the motor
 - d) Stop the motor

7. Green push-button is generally used to...
 - a) Start the motor
 - b) Accelerate the motor
 - c) Decelerate the motor
 - d) Stop the motor

8. In PPA the party which generates the electrical power is
 - a) Seller
 - b) Buyer
 - c) Operator
 - d) Organizer

9. Duration of PPA is generally
 - a) Upto Six Months
 - b) One Year
 - c) 1-2 Years
 - d) 5-20 Years

10. Cross-subsidies can be defined as
 - a) A mechanism of charging consumer at different tariffs.
 - b) A mechanism of identifying types of consumer.
 - c) A mechanism of penalizing consumer for electrical theft.
 - d) A mechanism of charging consumer at different tariffs.

11. Flat-rate tariff , Volumetric tariff, multi-part tariffs are
 - a) Types of subsidies
 - b) Slabs of billing
 - c) Key factors for Tariff Design
 - d) Types of consumers

12. Unit of the Average billing rate is (1M)
 - a) kVAh
 - b) INR /kWh
 - c) kWh/INR
 - d) INR

Q.B Attempt following questions. (08 Marks)

1. IMCC requires...
 - a) Effective communication networks with high bandwidths
 - b) Extensive process data
 - c) Components for Proper diagnostic features
 - d) All of the above

2. A relay is said to be intelligent if it has the feature/s of
 - a) Built-in network communication
 - b) Programming facility to set the protective parameters
 - c) Diagnostics
 - d) All of the above

3. Which of following is not a function of ABT
 - a) Facilitating grid discipline;
 - b) Facilitating trading in capacity and energy; and
 - c) Facilitating merit order dispatch as and when made effective
 - d) Facilitating consumers to purchase energy

4. Basic purpose of ToD tariff is to
 - a) Shift the load from off-peak to peak hours
 - b) Shift the load from peak to off-peak hours
 - c) Keep tariff rate different for day
 - d) Attract consumers to consume more energy

Scheme – I
Sample Question Paper

Program Name : Electrical Engineering Group
Program Code : EE/EP/EU
Semester : SIXTH
Course Title : Emerging Trends in Electrical Engineering
Marks :70

22628

Time:90 Minutes

Instructions:

- (1) All questions are compulsory.
- (2) Select the correct option.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.A) Attempt of the following: - (36 Marks)

- 1) IoT, Cyber Physical Systems, AI and Machine learning is characterized by
 - a. First revolution
 - b. Second revolution
 - c. Third Revolution
 - d. Fourth revolution

- 2) The objective of industry 4.0 is
 - a. Increase efficiency
 - b. Reduce complexity
 - c. Enabled self-controlling
 - d. All above

- 3) Which series of events best describes the transformations of the first three industrial revolutions?
 - a. Mechanization of production; introduction of mass production; the digital revolution
 - b. Mechanization of production; invention of steamships and railroads; the digital revolution
 - c. Discovery of electricity; the growth of mass production; the digital revolution
 - d. Mechanization of production; the agrarian revolution; the digital revolution

- 4) Key impact of the Third Industrial Revolution is
 - a. Agrarian societies become more urban.
 - b. The world became less reliant on animals and humans for energy creation.
 - c. Mass production created more jobs for skilled workers.
 - d. Electronics and information technology began to automate production.

- 5) IIoT means
 - a. Information Internet of things.
 - b. Industrial Internet of things.
 - c. Innovative Internet of things.
 - d. Itemized Internet of things

- 6) Which of the following is first and most commonly used smart, interactive IoT device?
- Smart Watch
 - ATM
 - Health Tracker
 - Video Game.
- 7) Third stage in evolution of Smart Grid is....
- Preliminary stage
 - Elementary stage
 - Evolutionary stage
 - Post evolutionary stage
8. Which of the following plays crucial role in optimization of cost of energy?
- Macro grid
 - Micro grid
 - Smart grid
 - Conventional grid
9. Distributed generation plays significant role in macro grid to improve
- increasing the power demand on the grid
 - increasing the transmission line losses
 - increasing the reliability factor of supply
 - increasing the cost of power generation
10. A key feature of a micro-grid is its ability.....from the utility seamlessly during grid disturbance
- not to separate and isolate itself
 - to separate and isolate itself
 - to separate but not to isolate itself
 - not to separate and isolate itself
11. Smart grid an electric grid that uses information and communication technology
- To gather data and act on information
 - To gather data only
 - To gather the information only
 - To gather data and not to act on information
12. ISGTF abbreviation stands for
- India Smart Grid Task Force
 - International Scout And Guide Fellowship
 - International Smart Grid Task Force
 - India Standard Grid Task Force
13. Retrofitting in smart city means _____
- Increase area of city
 - Decrease area of city
 - Make existing area more efficient and livable
 - Increase infrastructure base

14. Smart metering is part of _____.
- a Water management
 - b Energy management
 - c A and B
 - d None of above
15. The role of Electric Vehicles in Energy transition is _____
- a Reduce oil consumption
 - b Increase Energy security
 - c Reduce carbon emission
 - d. All of above
16. BMS Controller measures _____ parameters.
- a. Voltage
 - b. Current
 - c. Temperature
 - d. Voltage, Current and Temperature
17. Permanent magnets are not present in _____ motor.
- a. AC Induction
 - b .BLDC
 - c. Both A and B
 - d. Brushed DC Motor
18. A fuel cell vehicle emits _____ .
- a. Water
 - b. Heat
 - c. Both A and B
 - d. Carbon
19. Motor control involves....
- a. Starting the motor.
 - b. Stopping the motor.
 - c. Direction and speed controls of the motor.
 - d. All of the above.
20. Identify the component/s of the motor-supply circuit.
- a. Circuit-breaker.
 - b. Fuse.
 - c. Power Contacts.
 - d.** All of the above.
21. Contactor is
- a. Manually operated switch
 - b. Protection device
 - c. Electromagnetic coil
 - d.** Electromagnetically operated circuit breaker

22. NC contact means...
- Neutral Cut contact
 - Normally Cut contact
 - Normally Closed contact
 - d.** No Closed contact
23. Green push-button is generally used to...
- Start the motor
 - Accelerate the motor
 - Decelerate the motor
 - d.** Stop the motor
24. Motor Control Centre (MCC) is....
- Compact assembly
 - Modular assembly
 - Integration of motor control & distribution components
 - d.** All of the above
25. VFD stands for....
- Very Fast Drive
 - Variable Fastest Drive
 - Variable Frequency Drive
 - d.** Voltage Frequency Drive
26. Motor rotation of three-phase induction motor can be reversed by
- Interchanging R & Y phases
 - Interchanging Y & B phases
 - Interchanging B & R phases
 - d.** Any one of the above
27. PLC stands for...
- Phase Load Centre
 - Programmable Logic Controller
 - Phase Locked Contactor
 - d.** Programmable Load Contactor
28. Overload relay protects the motor from
- Over-voltage condition
 - Over-current condition
 - Excessive speeding
 - d.** Undesirable oscillations
29. Duration of PPA is generally
- Upto Six Months
 - One Year
 - 1-2 Years
 - 5-20 Years
30. Cross-subsidies can be defined as
- A mechanism of charging consumer at different tariffs.
 - A mechanism of identifying types of consumer.
 - A mechanism of penalizing consumer for electrical theft.
 - A mechanism of charging consumer at different tariffs.

30. Flat-rate tariff , Volumetric tariff, multi-part tariffs are
- Types of subsidies
 - Slabs of billing
 - Key factors for Tariff Design
 - Types of consumers
31. FAC Charges is the amount
- that utilities apply on bills based on kWh use of the consumer
 - that utilities apply on bills based on p.f. of the consumer.
 - that utilities apply on bills based on the MD of the consumer.
 - that utilities apply on bills based on varying price of fuel or Coal
32. Electricity rates charged to the consumer as agreed in
- PPA
 - MOU
 - National Power Policy
 - None of the above
33. Aggregate Revenue Requirement (ARR) is prepared by
- DISCOM
 - State Government
 - Central Government
 - Central Electricity Authority
34. Availability Based Tariff (ABT)is introduced by
- National Thermal Power Corporation
 - State Distribution Companies
 - Central Electricity Regulatory Commission (CERC)
 - Maharashtra Electricity Regulatory Commission (MERC)
35. Time of Day (TOD) tariff give incentive to consumer during
- Off-peak times
 - Peak times
 - Off-peak and peak times
 - Complete day time
36. kVAh based tariff is applicable to consumers
- All consumers
 - Consumer having load below 20kW
 - Consumer having load above 20kW
 - It is not depends on consumer load

Q.B) Attempt the following:

(34 Marks)

1. The following applications are included under smart lighting:
 - i. Smart bulbs
 - ii. Smart dimmers.
 - iii. Smart flash mount lighting.
 - a. Only i
 - b. Only ii
 - c. Only iii
 - d. i, ii and iii.
2. A micro-grid is designed for a _____ usually for a certain community while the smart grid is designed for the _____ electrical system.
 - a. small scale, whole
 - b. medium scale, whole
 - c. large scale, whole
 - d. small scale, partial
3. A localized grouping of electricity generations, energy storages, and loads is termed as?
 - a. Macro grid
 - b. Micro grid
 - c. National grid
 - d. State grid
4. Micro Grid can be operated said to be in islanded mode when.....
 - a. it function synchronously
 - b. it functions autonomously.
 - c. it function asynchronously
 - d. it stops functioning.
5. Pan city development is related to provide smart solutions for _____
 - a Existing infrastructure of city
 - b. New infrastructure of city
 - c. Outside of city
 - d. New city
6. Bhandi Bazar Project in Mumbai is an example of _____.
 - a. Retrofitting
 - b. Redevelopment
 - c. Greenfield development
 - d. Pan city development
7. Which of following is features of a smart city?
 - a. Preserving and developing open spaces
 - b. Promoting Rapid Transit system
 - c. Providing Online services
 - d. All of above
8. Which of following is not included in Smart City Mission?
 - a. Mumbai
 - b. Nashik
 - c. Kolhapur
 - d. Aurangabad

9. Plug-in-Hybrid Electric Vehicle (PHEV) is charged from _____ .
 - a. Power grid
 - b. IC Engine of vehicle
 - c. Both A and B
 - d. Either A or B
 10. A combination starter is a single enclosure comprising...
 - a. Motor starter
 - b. Fuse
 - c. Circuit breaker or disconnecting switch
 - d. All of the above
 11. Intelligent MCC is smart MCC because.
 - a. It has multiple feeders
 - b. It has a common power busbar
 - c. It has multiple combination starters
 - d. It has communication capable motor management device
 12. IMCC requires...
 - a. Effective communication networks with high bandwidths
 - b. Extensive process data
 - c. Components for Proper diagnostic features
 - d. All of the above
 13. A relay is said to be intelligent if it has the feature/s of
 - a. Built-in network communication
 - b. Programming facility to set the protective parameters
 - c. Diagnostics
 - d. All of the above
 14. Average billing rate consist of (2M)
 - a. Fixed and Energy charges
 - b. O & M charges
 - c. Labor charges
 - d. Transmission charges
 15. Which following parameter not use for determination of ARR
 - a. Interest on Loan
 - b. Depreciation
 - c. Income Tax
 - d. Profit
 16. Objective of Availability Based Tariff is
 - a. To maintain Grid frequency
 - b. Available energy as per consumer demand
 - c. Supply energy when it is available
 - d. Make Availability of energy at high cost
 17. Which of following in not a function of ABT
 - a. Facilitating grid discipline;
 - b. Facilitating trading in capacity and energy; and
 - c. Facilitating merit order dispatch as and when made effective
 - d. Facilitating consumers to purchase energy
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