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**PRESIDENCY UNIVERSITY
BENGALURU**

SET B

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024**

Semester : Semester VII - 2020

Course Code : EEE3034

Course Name : Smart Grid Technologies

Program : B.Tech.

Date : 08-JAN-2024

Time : 9:30AM - 12:30 PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

5 X 4M = 20M

1. What are the four primary factors that determine the size of a battery?
(CO1) [Knowledge]
2. IEEE 1547 is a series of standards to provide criteria and requirements of interconnection of distributed generation resources into the power grid. Mention the main provisions of IEEE 1547. Write 4 points.
(CO2) [Knowledge]
3. Mention the operation and features of Superconducting Magnetic Energy Storage. Also, provide two disadvantages of the same.
(CO2) [Knowledge]
4. What are the key reasons for advocating the widespread adoption of smart meters in our energy infrastructure, and how does their implementation contribute to enhancing the efficiency, reliability, and sustainability of our energy systems?
(CO3) [Knowledge]
5. Within the smart grid framework, there is a heightened real-time communication between the distribution domain and the operations domain to effectively manage power flows. Could you identify and elaborate on all the participants involved in the distribution domain in this context?
(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

6. Draw the equivalent circuit of a simple battery and a super capacitor. Also, write down the modelling equation for both the equivalent circuit. Mention any 5 factors considered during cell selection.
(CO2) [Comprehension]

7. What is the definition of a SCADA system, and could you elaborate on the significance of each component within the Master Station of a SCADA system, highlighting their respective roles and importance?
(CO3) [Comprehension]
8. Explain the SCADA system data flow architecture with neat and labelled diagram.
(CO3) [Comprehension]
9. Draw a neat labelled diagram of networking of AMI. Explain all the components of AMI network.
(CO4) [Comprehension]
10. What is the role of utility, and could you provide a list of ten functions that illustrate its significance in the context of economic theory and consumer behavior?
(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 15M = 30M

11. What are the factors influencing battery performance, and can you elaborate on a minimum of ten of these factors, providing detailed explanations to support your discussion?
(CO3) [Application]
12. How do conventional metering and smart metering differ, and could you elucidate the distinctions by providing a well-labeled functional block diagram of a smart meter along with a comprehensive explanation of each component?
(CO4) [Application]