QPC: RN18001286 AR - 18 Reg. No.

GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

BELPE7041 – Smart Grid

(Electrical Engineering)

Time: 3 hrs Maximum: 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) (2 x 10 = 20 Marks)

Q.1. Answer ***ALL*** questions		[CO#]	[PO#]
a.	AMI means (i)Automated Metering Instrument (ii) Alternate Metering Instrument (iii) Advanced Metering Infrastructure (iv) Advanced Metering Instrument	3	1
b.	Opportunities of smart grid (i) Cyber Security in future (ii) Optimal Power Flow (iii) Defence Model (iv) All the above	2	2
c.	Technologies for Smart Grid (i)Manual Restoration (ii) Lack of real time monitoring (iii) Distribution Automation (iv) None of the above	1	2
d.	Which of the following types of loading pattern are prone to cause voltage instability in the micro grid? (i) Constant power loads (ii) Voltage dependent loads (iii) Frequency dependent loads (iv) All of the above	1	2
e.	Smart Grid goals include all but the following (i) Potentially reducing our carbon footprint (ii) Introducing advancements and efficiencies yet to be envisioned (iii) Assimilate all cultures, all categories of consumers (iv) Maintaining grid affordability	1	1
f.	Smart meter is an important element in building the smart grid. These advanced meters (i) Allows companies to give consumers more information about their electricity usage, and communicate current electricity prices (ii) Can send data to and from electric companies and their customers (iii) Measure electricity usage in real time (iv) All of the above	2	2
g.	According to SWOT analysis which is not a strength of smart grid (i) Anticipates compromises (ii) Self-Healing (iii) Manual Platform (iv) Load Management	3	2
h.	Smart Grid goals include all but the following (i) Potentially reducing our carbon footprint (ii) Introducing advancements and efficiencies yet to be envisioned (iii) Assimilate all cultures, all categories of consumers (iv) Maintaining grid affordability	3	2
i.	Which of the following control is essentially works in the decentralized fashion? (i) Local control (ii) Secondary control (iii) Central and Emergency control (iv) Global control	3	2
j.	Smart Grid technologies are aimed at improvement of (i) Only Power Transmission System (ii) Only Power Distribution system (iii) Both Power Transmission & Distribution System (iv) Neither Power Transmission nor Power Distribution system	4	2

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions	[CO#]	[PO#]
a. Explain about the role of thermal constraints in smart grid	1	2
b. What are the main advantages of smart grid?	1	2
c. What is Peak curtailment	1	2
d. What are the main challenges to upgrade a conventional grid to smart grid?	1	2
e. What is real time pricing	2	1
f. What is Automatic meter reading	3	2
g. Explain about Outage management system	2	1
h. List out any two advantages of Outage management system	2	2
i. What is the role of smart sensors in case of Smart grid?	3	2
j. What is the role of Intelligent Electronics devices role in smart grid?	3	2

PART – C: (Long Answer Questions) **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	[CO#]	[PO#]
3. a. Explain the technical features of Variable speed wind generators	7	4	2
b. Explain about the main fundamental features of Smart grid	8	3	1
(OR)			
c. What is the need of the smart grid and elaborate with various constraints?	7	4	2
d. Explain the advantages and disadvantages of Distributed generation	8	3	1
4. a. Explain the operation of WAMS with its benefits	7	3	2
b. Explain the concept of micro grids and its operation	7	3	2
(OR)			
c. Write short notes on a) Battery energy storage b) SMES	8	4	2
d. Explain about the protection and control systems of micro grid	7	4	2
5. a. Distinguish between conventional grid and smart grid	7	3	2
b. Explain about Outage management system along with overall benefits	8	3	2
(OR)			
c. What is IED and how it will monitor smart grid operation	7	4	2
d. Explain about Power Quality issues of Grid connected Renewable Energy Sources	8	4	2
6. a. Explain about Power Quality Conditioners for micro-grid	8	4	2
b. Explain about Web based Power Quality monitoring	7	4	2
(OR)			
c. What is the importance of Power Quality Audit in Smart grid?	7	3	2
d. Explain about Power Quality and EMC in smart Grid and how it can be solved?	8	1	2

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