



R20 Regulation

Subject code:306HC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech VI Semester Regular Examinations, June/July 2023

SMART GRID TECHNOLOGIES
OPEN ELECTIVE
(CSE(DS))

Maximum Marks: 70

Date:03.07.2023 Duration: 3 Hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10 X 2 Marks=20 Marks)

- 1 Define Smart Grid.
- 2 Write the significance of smart grid over conventional grid.
- 3 What does Geographic Information Systems GIS do?
- 4 What is an IED relay?
- 5 List out the needs of energy management in micro grid.
- 6 What is fuel cell and how it works?
- 7 Mention the three main challenges faced by renewable energy?
- 8 Define power quality audit.
- 9 List out the main purpose of a HAN.
- 10 What is BPL in smart grid?

Part-B

Answer All the following questions. (5 X 10 Marks=50 Marks)

- 11 (a) Do we really need smart grids? Justify. (5 Marks)
(b) Explain the working principles of automatic meter reading system. (5 Marks)

OR

- 12 (a) How does a Plug-in hybrid electric vehicles work? Explain. (5 Marks)
(b) How does substation automation work? Explain. (5 Marks)

- 13 Discuss about the architecture of Intelligent Electronic Devices (10 Marks)

OR

- 14 (a) Write short notes about the components of WAMS? (5 Marks)
(b) What are the components of Phase Measurement Unit in smart grid? (5 Marks)

- 15 (a) Mention the characteristics and the types of micro-grid? (5 Marks)
(b) Explain the plastic solar cell technology with neat diagram. (5 Marks)

OR

- 16 (a) Why do we use thin-film in solar cells? Justify. (5 Marks)
(b) How do you incorporate renewable energy? Explain. (5 Marks)

- 17 (a) How can power quality be improved in smart grid? List out its methods. (5 Marks)
(b) Explain the EMC in power system with suitable neat diagram. (5 Marks)

OR

- 18 (a) Why do we need power quality conditioner? Explain. (5 Marks)
(b) Briefly explain web based power quality Monitoring. (5 Marks)

- 19 (a) Describe the importance of advanced metering infrastructure. (5 Marks)
(b) Which type of communication is provided by Wi-Max? Explain. (5 Marks)

OR

- 20 (a) How cloud computing helps in smart grid? Explain. (5 Marks)
(b) What are the different communication protocols used in smart grid? (5 Marks)