Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: B.Tech
Sub_Code:REL7D003

7th Semester Regular/Back Examination: 2025-26
SUBJECT: Smart Grid
BRANCH(S): CSE, EEE, ELECTRICAL, ELECTRICAL & C.E, IT
Time: 3 Hours
Max Marks: 100
Q.Code: U456

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Define Smart Grid.
b) State two differences between conventional grid and smart grid.
c) What is Automatic Meter Reading (AMR)?
d) What is the role of GIS in Smart Grid?
e) What is an Outage Management System (OMS)?
f) State two applications of PMU.
g) What is SMES?
h) What is Pumped Hydro Storage?
i) Name two Power Quality issues in Smart Grid.
j) What is a Fuel Cell?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Discuss the architecture of Smart Grid.
b) Discuss opportunities and challenges of Smart Grid.
c) Explain Smart Meters and their advantages.
d) Explain Substation Automation with suitable examples.
e) Describe Wide Area Measurement System (WAMS).
f) Explain protection and control issues in Micro-grid.
g) Discuss the need and application of Micro-grids.
h) Describe integration issues of renewable energy sources in Smart Grid.
i) Discuss advantages and disadvantages of Distributed Generation.
j) Explain variable speed wind generators.
k) Explain about power quality audit.
l) Describe Battery and SMES energy storage systems.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3	Explain Substation Automation, Feeder Automation, and Intelligent Electronic Devices (IEDs) with neat block diagrams and applications.	**(16)**
Q4	Explain PMU and WAMS in detail. Discuss their role in wide-area protection and control.	**(16)**
Q5	Discuss integration of renewable energy sources in Smart Grid and the associated Power Quality issues.	**(16)**
Q6	Explain Power Quality and EMC issues in Smart Grid. Describe Power Quality conditioners and monitoring.	**(16)**