

Hall Ticket Number :											
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R-17

Code: 7G288

IV B.Tech. II Semester Regular Examinations July 2021

Energy Auditing and Demand Side Management

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks	CO	Blooms Level
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UNIT-I

1.	What is an energy audit? Explain the significance of energy audit.	14M	CO1	L1
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OR

2.	Discuss in detail about Energy index, Cost index, pie-charts and load profiles.	14M	CO1	L2
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UNIT-II

3.	Explain in detail how to conserve electrical energy and explain some of the means to conserve energy.	14M	CO1	L2
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OR

4.	List the types of energy conservation methods and discuss their merits and demerits	14M	CO1	L1
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UNIT-III

5.	Describe the constructional details and characteristics of energy efficient motor. What are the factors affecting the efficiency of motor? Write merits and demerits of energy efficient motors.	14M	CO2	L3
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OR

6.	Discuss in detail about good lighting system design and practice.	14M	CO2	L2
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UNIT-IV

7.	Explain in detail about data loggers and thermocouples.	14M	CO3	L2
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OR

8.	Discuss the depreciation methods followed for economical methods with examples.	14M	CO3	L3
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UNIT-V

9.	a) Define 'demand side management' and state its features.	7M	CO4	L1
	b) Explain any two DSM techniques in detail.	7M	CO4	L2

OR

10.	Discuss management and organization of energy conservation awareness programs	14M	CO4	L2
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R-17

Code: 7G284

IV B.Tech. II Semester Regular Examinations July 2021

Fundamentals of HVDC & FACTS Devices

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Compare the power transfer capacities of AC and DC transmission systems when an existing AC line is converted into DC line, with following conditions: i) Same current and insulating level. ii) Same percentage losses and insulating level	7M	1	3
b) With the help of neat sketches, explain different types of HVDC links of a typical HVDC converter station	7M	1	2
OR			
2. Explain the operation of 3-phase 12 pulse converter bridge with neat diagram? Draw the relevant current and voltage waveforms?	14M	1	3
UNIT-II			
3. Explain in detail, the converter control characteristics of HVDC systems.	14M	2	2
OR			
4. a) Give a detailed account of design aspects of the double tuned filter	7M	2	6
b) What are the various sources of harmonics generation in a HVDC line?	7M	2	1
UNIT-III			
5. a) Explain in detail how power flow in an AC parallel path can be controlled with the help of FACTS devices.	7M	3	2
b) List out the possible benefits from the FACTS controllers	7M	3	1
OR			
6. a) Distinguish between simultaneous method and sequential method in power flow analysis.	7M	3	2
b) Explain briefly Modeling of DC/AC converters.	7M	3	2
UNIT-IV			
7. a) Explain how the voltage stability enhancement achieved with series capacitive compensation.	7M	4	2
b) With neat wave forms, explain the operating characteristics of the TSSC.	7M	4	2
OR			
8. Compare the performance of SVC and STATCOM from the point of view of transient stability improvement	14M	4	2
UNIT-V			
9. a) Explain the operation of UPFC with relevant diagrams.	7M	4	2
b) Explain the control structure of UPFC	7M	4	2
OR			
10. a) Explain the advantages of combined shunt-series compensators over individual compensators.	7M	4	2
b) Draw the schematic diagram of the Unified power flow controller and write its operating principle?	7M	4	2

END

Code: 7G286

IV B.Tech. II Semester Regular Examinations July 2021
Reliability Engineering & Applications to Power Systems
 (Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO Blooms Level

UNIT-I

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|--|----|-----|----|
| 1. a) What is meant by random variable and explain difference between random variable and ordinary variable. | 5M | CO1 | L1 |
| b) Explain about Poisson distribution with the help of graphs. | 9M | CO1 | L2 |

OR

- | | | | |
|--|----|-----|----|
| 2. a) Derive the expression for expected value of Binomial Distribution. | 7M | CO1 | L2 |
| b) There are four boxes A, B, C, D in which there are fuses. The percentages of defective fuses in each box are given in table. Find the probability that the picked fuse is good. | | | |

Box. No	No. of fuses	% of defective fuses
A	1200	15
B	500	20
C	800	10
D	1500	12

7M CO2 L5

UNIT-II

- | | | | |
|---|----|-----|----|
| 3. a) Explain how the network is reduced by using the Decomposition method. | 7M | CO3 | L4 |
| b) A system consists of 5 components which are connected in parallel,
(i) Find out the system reliability if each component has reliability of 0.92.
(ii) Find out the system reliability if at least 2 out of 5 must work for success. | 7M | CO2 | L5 |

OR

- | | | | |
|---|----|-----|----|
| 4. a) Discuss in detail about the causes of failure and types of failures. | 7M | CO4 | L4 |
| b) Consider two identical independent units with a failure rate of 0.052 f/h. It is desired to have a mission time of 30 hrs. Compare the reliabilities of the system if these units are placed in series and parallel. | 7M | CO2 | L5 |

UNIT-III

- | | | | |
|---|----|-----|----|
| 5. a) Define absorbing state. Derive the expression to find out the number of time intervals a system would have been spent in that state before reaching to the absorbing state. | 7M | CO5 | L4 |
| b) Consider the two component repairable system with non-identical transitional rates. The state transitions are as follows: | | | |

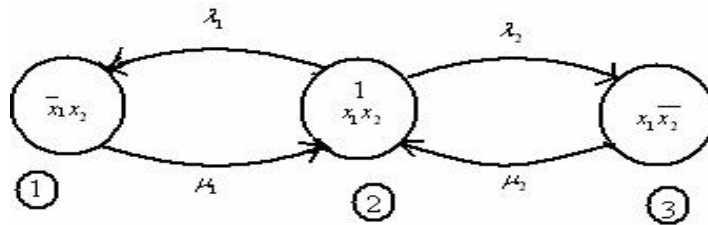
From state	To state	Transition state
1	2	0.1
	3	0.2
2	1	0.3
	4	0.5
3	1	0.4
	4	0.6

State 4 is an absorbing state. Find the number of time intervals that would have spent in the states of the system before it reaches to the absorbing state.

7M CO2 L5

OR

6. a) Discuss about the reliability evaluation of repairable systems. 7M CO5 L5
- b) For the following state space diagram as shown in figure.



Write the transition intensity matrix 'T' and derive the steady state probabilities and state frequencies.

7M CO2 L3

UNIT-IV

7. a) Discuss about recursive relation for capacitive model building sequential addition method. 7M CO5 L6
- b) Explain in detail about the cumulative probability of non-identical generating units. 7M CO5 L5

OR

8. a) Discuss about the concept of unit addition and unit removal with an example. 7M CO5 L2
- b) A generating system consists of two 50 MW units and one 40 MW unit each having forced outage rate of 0.06. The peak load specified over a 100 hour period is 150 MW. The load duration curve for this period is a straight line from 100% to 50% load points. What is the value of LOEE for this period? 7M CO2 L5

UNIT-V

9. a) Discuss about the evaluation of various reliability indices in radial distribution system with the help of necessary equations. 7M CO6 L5
- b) Explain about the Common Mode Failures for 4-state model with its complete state space diagram of catastrophic components. 7M CO6 L6
- OR**
10. a) Derive the general expressions for basic probability indices for series configurations for 'n' components in series. 7M CO3 L5
- b) Write short notes on
- (i) Temporary and transient failures
 - (ii) Common mode failures
- 7M CO5 L2

END

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R-17

Code: 7G283

IV B.Tech. II Semester Regular Examinations July 2021

Renewable Energy Sources

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Compare and contrast the availability of conventional and nonconventional energy sources	7M	1	2
b) Write a brief note on the working principle of any two instruments used for measuring solar radiation	7M	1	2
OR			
2. a) Explain in brief about extraterrestrial and terrestrial solar radiation	7M	1	2
b) Elucidate the principle of operation of sun shine recorder	7M	1	2
UNIT-II			
3. a) How are the concentrating collectors classified based on their operating principle?	7M	2	3
b) Describe the process of photovoltaic energy conversion	7M	2	2
OR			
4. Energy storage is very important in case of solar energy collection. Explain the necessity of energy storage methods and various methods in which energy is stored	14M	2	4
UNIT-III			
5. a) Derive the expression for Power in wind clearly stating the assumptions.	7M	3	3
b) Explicate in brief the performance characteristics of wind machines	7M	3	3
OR			
6. a) Discuss the advantages and disadvantages of WECS	7M	3	2
b) Explain the different modes of wind power generation	7M	3	3
UNIT-IV			
7. Illustrate in detail the thermal energy conversion and how it is the working principle behind OTEC energy?	14M	3	4
OR			
8. a) Briefly present the outline of tidal energy estimation	7M	3	2
b) Explain in detail the factors affecting wave energy	7M	3	2
UNIT-V			
9. a) Differentiate between anaerobic and aerobic digestion	7M	3	2
b) Write a short note on combustion characteristics of bio gas and economic aspects of bio gas	7M	3	2
OR			
10. Describe in detail the various Geothermal Resources and types of wells used for harnessing Geothermal energy	14M	3	3

END