

Hall Ticket No:

Question Paper Code: AEEB14



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER

B.Tech IV Semester End Examinations (Regular), May – 2020

Regulation: IARE–R18

ELECTRICAL POWER GENERATION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

- 1 a) Explain the function of the following in thermal power plant and explain the principle of operation of each: i. Boiler ii. Turbine iii. Condenser iv. Alternator v. Economizer vi. Electrostatic precipitator vii. Super-heater viii. Cooling tower. [7M]
- b) Write the important considerations in the site selection of thermal power plant in modern power system? [7M]
- 2 a) Write the important considerations in the site selection of thermal power plant in modern power system? [7M]
- b) Explain about control rod, moderator, heat exchanger and cooling system in nuclear power plant. [7M]

UNIT – II

- 3 a) (i) Write the advantages and disadvantages of Hydro electric power plant? [7M]
(ii) Write the factors to be considered for selection of site for hydropower plant?
(iii) Derive water power equation.
- b) Explain the Impulse turbine and Reaction turbines used in Hydro electric power station? [7M]
- 4 a) Compare merits and de-merits of Hydro electric power station with thermal power plant? [7M]
- b) Explain surge tank and penstock in Hydro electric power station? [7M]

UNIT – III

- 5 a) Explain why it is necessary to develop non-conventional method of generating Electrical energy? [7M]
- b) Write the important differences between renewable and non renewable source. [7M]
- 6 a) Write the important advantages of renewable and non renewable source. [7M]
- b) Write a short note on Photovoltaic effect, semiconducting materials, band gap theory, and photo emission of electrons in solar system? [7M]

UNIT – IV

- 7 a) Explain various components used in Wind energy system also write the important Wind energy systems in India? [7M]
- b) State and briefly explain the factors that are determine the output power form wind energy system? [7M]
- 8 a) Explain how the variations of wind velocity and its directions are taken care in Wind energy systems? [7M]
- b) Explain the betz criterion and also write the main applications of wind energy? [7M]

UNIT – V

- 9 a) Give detailed comparison of initial costs of different power plants? [7M]
- b) What are load factor and diversity factors. [7M]
- 10 a) What are the different factors affecting economical operation of power plant ? [7M]
- b) Explain about yearly load curve and demand factors. [7M]



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COURSE OBJECTIVES (COs):

The course should enable the students to:

I	Demonstrate various conventional power generation systems including major subsystems.
II	Understand hydroelectric power generation systems along with pumped storage plants and hydraulic turbines .
III	Apply knowledge of solar and wind power generation systems in design and implementation to obtain clean energy.
IV	Illustrate the economic aspects of power generation and power tariff methods.

COURSE OUTCOMES (COs)

CO 1	Discuss the principles and operation of thermal and nuclear power plants.
CO 2	Demonstration of working of hydro power plant and its importance in the power system.
CO 3	Describe the principle, operation of photovoltaic effect and layout of solar power plant.
CO 4	Discuss the construction and working principle of wind energy systems.
CO 5	Explain about economic aspects of power generation.

COURSE LEARNING OUTCOMES (CLOs):

Students, who complete the course, will have demonstrated the ability to do the following:

AEEB14.01	Demonstrate the layout and working principle of thermal power plant.
AEEB14.02	Analyze the principle and operation of different energy conversion systems.
AEEB14.03	Classify the various types of renewable energy sources.
AEEB14.04	Compare the various hybrid energy systems in electrical system.
AEEB14.05	Use the renewable energy sources to meet the constraints in electrical and electronics engineering field.
AEEB14.06	Explain the working of hydro power plant and its importance in the power system
AEEB14.07	Discuss the principles and operations of photovoltaic effect.
AEEB14.08	Describe the layout and working of solar power plant in electrical systems.
AEEB14.09	Build the flow chart of maximum power point tracking system.
AEEB14.10	Illustrate the principle of various types of solar concentrators.
AEEB14.11	Demonstrate the construction and working principle of wind energy systems.
AEEB14.12	Discuss the principle and operation of induction generator in wind energy system.
AEEB14.13	Demonstrate the importance of wind energy system and types of turbines.
AEEB14.14	Generalize the construction and working of nuclear power plant in power systems.
AEEB14.15	Illustrate the effect of non-renewable energy sources on the environment.

MAPPING OF SEMESTER END EXAMINATION QUESTIONS COURSE LEARNING OUTCOMES:

SEE QUESTION No.		COURSE LEARNING OUTCOMES		CO'S	BLOOM TAXONOMY LEVEL
1	a	CO1	Demonstrate the layout and working principle of thermal power plant.	CO1	Understand
	b	CO1	Demonstrate the layout and working principle of thermal power plant.	CO1	Remember
2	a	CO1	Demonstrate the layout and working principle of thermal power plant.	CO1	Understand
	b	CO1	Demonstrate the layout and working principle of thermal power plant.	CO1	Understand
3	a	CO2	Analyze the principle and operation of different energy conversion systems.	CO2	Remember
	b	CO2	Analyze the principle and operation of different energy conversion systems.	CO2	Understand
4	a	CO2	Compare the various hybrid energy systems in electrical system.	CO2	Understand
	b	CO2	Compare the various hybrid energy systems in electrical system.	CO2	Understand
5	a	CO3	Describe the layout and working of solar power plant in electrical systems.	CO3	Remember
	b	CO3	Describe the layout and working of solar power plant in electrical systems.	CO3	Understand
6	a	CO3	Build the flow chart of maximum power point tracking system.	CO3	Understand
	b	CO3	Describe the layout and working of solar power plant in electrical systems.	CO3	Understand
7	a	CO4	Demonstrate the importance of wind energy system and types of turbines.	CO4	Understand
	b	CO4	Demonstrate the importance of wind energy system and types of turbines.	CO4	Understand
8	a	CO4	Demonstrate the importance of wind energy system and types of turbines.	CO4	Understand
	b	CO4	Demonstrate the importance of wind energy system and types of turbines.	CO4	Remember
9	a	CO4	Generalize the construction and working of nuclear power plant in power systems.	CO4	Understand
	b	CO5	Generalize the construction and working of nuclear power plant in power systems.	CO5	Understand
10	a	CO5	Generalize the construction and working of nuclear power plant in power systems.	CO5	Understand
	b	CO5	Generalize the construction and working of nuclear power plant in power systems.	CO5	Understand

Signature of Course Coordinator

HOD, EEE