.

Printed Page:-4 **Subject Code:- AME0513**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: V - THEORY EXAMINATION (2025 - 2026)
Subject: Thermal Power Plant Engineering

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*
1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*
2. *Maximum marks for each question are indicated on right -hand side of each question.*
3. *Illustrate your answers with neat sketches wherever necessary.*
4. *Assume suitable data if necessary.*
5. *Preferably, write the answers in sequential order.*
6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

1-a. The proper indication of incomplete combustion is (CO1,K1) 1

(a) High Co Content In Flue Gases At Exit
(b) High Co2 Content In Flue Gases At Exit
(c) High Temperature Of Flue Gases
(d) The Smoking Exhaust From Chimney

1-b. In fuel cell, the_____energy is converted into electrical energy. (CO1,K1) 1

(a) Mechanical
(b) Chemical
(c) Heat
(d) Sound

1-c. What is the disadvantage of natural draught? (CO2,K1) 1

(a) It Has Less Life
(b) It Has More Maintenance Cost Of Cleaning And More Capital Cost To Build The Chimney
(c) The Available Draught Decreases With Increasing Outside Air Temperature
(d) All Of The Mentioned

1-d. Where should coal be dumped?(CO2,K1) 1

(a) On Solid Ground
(b) In The Water
(c) By Mixing With Other Form Of Fuels
(d) Near The Plant

.

1-e. What are turbo-compound engines? (CO3,K1) 1

(a) Turbines Run At Exhausts Of Otto And Diesel Cycles
(b) Combination Of Turbofan And Turbojet Engines
(c) Combination Of Turboprop And Turbofan Engines
(d) None Of The Mentioned

1-f. For how many days is radioactive solid waste kept is kept under water at 6m deep for initial cooling? (CO3,K1) 1

(a) 15 Days
(b) 50 Days
(c) 30 Days
(d) 100 Days

1-g. Which of the following is a circulating fluid in evacuated flat-plate solar collectors? (CO4,K1) 1

(a) Water
(b) Steam
(c) Nitrogen
(d) Hydrogen

1-h. What does OTEC stand for? (CO4,K1) 1

(a) Ocean Thermal Energy Cultivation
(b) Ocean Thermal Energy Conversion
(c) Ocean Techno Energy Conservation
(d) Ocean Thermal Energy Consumption

1-i. Which of following is not a components of an AC generator? (CO5,K1) 1

(a) Field
(b) Armature
(c) Prime Mover
(d) Starter

1-j. Rotor thrust measurement is done in order to _____ (CO5,K1) 1

(a) Monitor Thrust
(b) Monitor Bearing Wear
(c) Monitor Thrust & Bearing Wear
(d) None Of The Mentioned

2. Attempt all parts:-

2.a. Define average load and peak load for a power plant. (CO1,K2) 2

2.b. Define critical speed of turbine?(CO2,K2) 2

2.c. Why flame detectors are required? (CO3,K1) 2

2.d. What are the main hurdles in the development of tidal energy? (CO4,K1) 2

2.e. Why pollution monitoring instruments are necessary in power plants? (CO5,K2) 2

SECTION-B 30

3. Attempt all parts:-

3.a. Answer any one of the following:-

3.a.(i)	What is boiler? Gives its classification. (CO1,K2)	6
3.a.(ii)	Differentiate between Mechanical draught cooling tower and Natural cooling tower. (CO1,K2)	6

3.b. Answer any one of the following:-

3.b.(i)	What do you mean by turbine cold, warm, hot and very hot start up? (CO2,K2)	6
3.b.(ii)	How are dust collector classfied? (CO2.K2)	6

3.c. Answer any one of the following:-

3.c.(i)	Why air filteration required only in gas power plant ? (CO3, K2)	6
3.c.(ii)	What are the drawbacks of Poor Inlet Filtration system. (CO3,K2)	6

3.d. Answer any one of the following:-

3.d.(i)	What are the main advantages of flat plate solar collector? (CO4,K2)	6
3.d.(ii)	With the help of a schematic diagram , Explain the working of solar water heating? (CO4, K3)	6

3.e. Answer any one of the following:-

3.e.(i)	What is piping and instrument diagrams.(CO5,K2)	6
3.e.(ii)	What is generator? Give its classification.(CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Discuss in breif about the types of coal quality available in India. (CO1,K2)	10
4-b.	What is FBC system? Give its classification and why it is better than pulverization system. (CO1,K2)	10

5. Answer any one of the following:-

5-a.	What is the requirement of chemical dosing and filtration in water treatment plant? (CO2,K2)	10
5-b.	Discuss the source and selection criteria for raw water used in power plant. (CO2,K2)	10

6. Answer any one of the following:-

6-a.	A gas turbine is supplied with gas at 5 bar and 1000 K and expands it adiabatically to 1 bar. The mean specific heat at constant pressure and constant volume are 1.0425 kJ/kg K and 0.7662 kJ/kg K respectively. (i) Draw the temperature-entropy diagram to represent the processes of the simple gas turbine system. (ii) Calculate the power developed in kW per kg of gas per second and the exhaust gas temperature. (CO3,K3)	10
6-b.	Derive an expression for optimum pressure ratio for maximum work output in ideal Brayton cycle.(CO3,K3)	10

7. Answer any one of the following:-

7-a.	Explain the working of a solar cooker. What is the role of a glass sheet and black coated surface of a box type solar cooker? (CO4,K3)	10
7-b.	Give classification of renewable and non renewable energy resources.(CO4,K2)	10

8. Answer any one of the following:-

.

8-a.	What are the functions of bolt and gaskets in pipe fitting? And also discuss about the material used for development of gaskets.(CO5,K2)	10
8-b.	Explain bus bar arrangement in power plant.(C05,K3)	10