Printed Page:- 04

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 (2024 - 2025)

Subject: 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. In India largest thermal power station is located at (CO1,K1) 1

(a) Kota

(b) Sarni

(c) Chandrapur

(d) Neyveli

1-b. In Rankine cycle the work output from the turbine is given by (CO1,K1) 1

(a) Change Of Internal Energy Between Inlet And Outlet

(b) Change Of Enthaply Between Inlet And Outlet

(c) Change Of Entropy Between Inlet And Outlet

(d) Change Of Temperature Between Inlet And Outlet

1-c. Which of the following can also be called as Non Condensing steam turbine?(CO2, K1) 1

(a) Back Pressure Steam Turbine

(b) Impulse Steam Turbine

(c) Extraction steam turbine

(d) None of the mentioned

1-d. Which type of transportation system is ideal for transporting coal directly to the point of consumption? (CO2,K1) 1

(a) Road Transportation

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(b) Sea Or River Transportation
(c) Transportation By Rail
(d) Transportation By Air

1-e. What is the air standard cycle for a Gas-Turbine called? (CO3,K1) 1
(a) Reheat Cycle
(b) Rankine Cycle
(c) Brayton Cycle
(d) Diesel Cycle

1-f. Which of the following is a type of Gas Turbine Plant? (CO3,K1) 1
(a) Single Acting
(b) Double Acting
(c) Open
(d) None Of The Mentioned

1-g. With respect to the load centre which location is suitable for establishment of nuclear power plant? (CO4,K1) 1
(a) Load Centre
(b) Near Load Centre But At Reasonable Distance
(c) Far Away From Load Centre
(d) Near Chemical Industries

1-h. Which of the following is not a type of primary resource? (CO4,K1) 1
(a) Crude Oil
(b) Coal
(c) Hydrogen Energy
(d) Sunlight

1-i. Metal detectors installed at airports and other places for security purpose are based on the principle of -(CO5,K1) 1
(a) Electromagnetic Induction
(b) Electromagnetic Difference
(c) Potential Difference
(d) Potential Energy

1-j. What are the main parts of an AC Generator? (CO5, K1) 1
(a) Stator
(b) Rotor
(c) Both 1 & 2
(d) None Of These

2. Attempt all parts:-

2.a. What is the function of deaerator in a thermal power plant? (CO1,K2) 2

2.b. How can steam turbines be classified? (CO2,K2) 2

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2.c.	Define compressor stall. (CO3,K2)	2
2.d.	What are conventional and non-conventional energy source? (CO4,K2)	2
2.e.	Write any four electrical & non electrical measurements in power plants (CO5,K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Discuss the energy scenario of power generation technology in India. (CO1,K2)	6
3-b.	Discuss the Rankine cycle in detail. (CO1, K2)	6
3-c.	Classify various modern ash-handling systems. (CO2,K2)	6
3-d.	What are the uses of ash and dust? (CO2, K2)	6
3.e.	Why air filteration required only in gas power plant ? (CO3, K2)	6
3.f.	Draw and discuss about the Pyranometer. (CO4,K3)	6
3.g.	What are causes of electrical faults? (CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Draw layout diagram and explain the working principal of thermal power plant. (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.	Discuss all the safety aspects which are associated with fuel oil system in power plant.(CO2,K3)	10
5-b.	Discuss the source and selection criteria for raw water used in power plant.(CO2,K3)	10

6. Answer any one of the following:-

6-a.	Air enters the compressor of a turbine power plant operating on Brayton cycle at 101.325 KPa, 27 ^{o}C and the pressure ratio in the cycle being 6. If the turbine works equal 2.5 times the compressor work, determine the maximum temperature in the cycle and the cycle efficiency. Take Cp = 1.005 KJ/Kg K and $\Upsilon = 1.4$(CO3,K4)	10
6-b.	Explain in detail about different type of compressor used in gas turbine power plant. (CO3,K2)	10

7. Answer any one of the following:-

7-a.	Define solar energy, Give its application, merits and demerits. (CO4,K2)	10
7-b.	With a neat diagram, explain how wind energy can be converted into electrical energy. (CO4,K3)	10

8. Answer any one of the following:-

8-a.	Explain bus bar arrangement in power plant.(C05,K3)	10
8-b.	Difference between conventional pressure measurment instruments and	10

transducer. (CO5,K3)

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