Roll No. 22GITA-42

# GLOBAL INSTITUTE OF TECHNOLOGY

**B. Tech. I Semester I Mid Term Exam 2022**

**1FY3-07/ Basic Mechanical Engineering**

**Branch** : Common for Sec-A & B

**24/12/22/ Saturday**

**Time: 3 Hours** **Maximum Marks: 70**

**Attempt all questions**

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. **No supplementary sheet shall be issued in any case.**

**Part A (Answer should be given up to 25 words only)**

**All questions are compulsory**

Q.1 Define thermal equilibrium with examples. (CO1)

Q.2 Write the statements of II$^{nd}$ law of thermodynamics. . (CO1)

Q.3 Differentiate between sensible heat and latent heat. (CO1)

Q.4 Differentiate between point function and path function (CO1)

Q.5 Differentiate between Boiler accessories and boiler mountings. (CO2)

Q.6 Differentiate between conventional and non-conventional power plants. (CO2)

Q.7 Classify the boilers on at least five different scales. (CO2)

Q.8 Differentiate between COP and efficiency of the system. (CO2)

Q.9 Mention the different fields of Mechanical Engineering. (CO1)

Q.10 Compare between different types of thermodynamic system with examples.(CO1) **10 x 2 = 20**

**Part B Analytical/Problem solving questions**

**Attempt all questions (word Limit 100)**

Q.1 Differentiate between fire tube boilers and water tube boilers. (CO2)

Q.2 List any five accessories and mountings and explain their working. (CO2)

Q.3.Draw nuclear reactor and explain its working. (CO2)

Q.4. Draw and Explain the following processes on p-V and T-s chart. (CO1)

(i) Isothermal, (ii) Isochoric, (iii) Isobaric and (iv) Isentropic.

Q.5 Write and explain Zeroth law and Third law of thermodynamics. (CO1) **5 x 4 =20**

**Part C (Descriptive/Analytical/Problem Solving/Design Question)**

**Attempt all questions**

Q.1 Draw schematic diagram of steam turbine power plant and explain the working of condenser and cooling tower. (CO2)

Q.2 Draw and explain any water tube boiler, also support with three reason to use it. (CO2)

Q.3 A piston and cylinder machine contains a fluid system which passes through a complete cycle of four processes. During a cycle, the sum of all heat transfers is -170kJ. The system completes 100 cycles per minute. Complete the following table showing the method for each item, and compute the net rate of work output in kW. (CO1)

| Process | Q (kJ/min) | W (kJ/min) | ΔU (kJ/min) |
|---|---|---|---|
| a-b | 0 | 2170 | ------ |
| b-c | 21000 | 0 | ------ |
| c-d | -2100 | ------- | -36600 |
| d-a | ------- | ------- | ------- |

**3 x 10 =30**