

--	--	--	--	--	--	--	--	--	--



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech VI Semester End Examinations (Regular), November– 2020

Regulation: IARE–R16

## ELEMENTS OF MECHANICAL ENGINEERING

**Time: 2 Hours**

(CE)

**Max Marks: 70**

**Answer any Four Questions from Part A**

**Answer any Five Questions from Part B**

### PART – A

1. Write a short note on prime movers and their classification? [5M]
2. Summarize the terms enthalpy and entropy with neat sketches. [5M]
3. Describe vapour compression refrigeration system with neat sketch. [5M]
4. List and describe any one type of robot configuration. [5M]
5. Describe different welding methods with a neat sketch. [5M]
6. Explain the following terms i)Path ii)Processes [5M]
7. Elaborate different types of composites. [5M]
8. Explain plane milling with a neat sketch. [5M]

### PART – B

9. Describe terms with neat sketch i) System ii) Surroundings iii) Control volume. [10M]
10. A balloon of flexible material is to be filled with air from a storage bottle until it has a volume of  $0.9 \text{ m}^3$ . The atmospheric pressure is  $1.013 \times 10^5 \text{ N/m}^2$ . Determine the work done by the system comprising the air initially in the bottle, given that the balloon is light and require no stretching. [10M]
11. Describe Babcock and Wilcox boiler with a neat sketch and list out the advantages. [10M]
12. Discuss any four accessories used in steam boilers with a neat sketch. [10M]
13. Elucidate the working of a four-stroke diesel engine with a neat sketch? [10M]
14. A single cylinder 4-stroke engine of bore 300 mm and stroke of 450 mm develops a power of 10kW. The engine consumed 3.44 kg/hr of fuel and rotates at a speed of 200 rpm. The mean effective pressure of the engine is taken as 3 bar. Find the indicate power and brake thermal efficiency of the engine considering Calorific value of the fuel as 41800 kJ/kg. [10M]
15. Illustrate the terms turning and facing operations with a neat sketch. [10M]
16. Describe the differences between mechanization and automation. [10M]
17. Paraphrase the working principle of tungsten inert gas welding (TIG) with a neat sketch. [10M]
18. Describe in detail about the applications of composite in aircrafts. List the merits and demerits of composites compared to other materials. [10M]