



B.Tech II Semester Supplementary Examinations, June 2024

Fundamentals of Mechanical Engineering
 (Common to CE & ME)

Maximum Marks: 70

Date: 26.06.2024 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks		(10X2M=20 Marks)	CO	Bloom Tx
1	Define process in Thermodynamics.		1	L1
2	Define Bio-fuel.		1	L1
3	Determine the relation between Cp and Cv of gases?		2	L1
4	What is a steam calorimeter?		2	L1
5	Why carnot cycle is practically impossible.		3	L1
6	Write difference between petrol engine and diesel engine		3	L1
7	Why cooling of air compressor during compression is essential?		4	L1
8	Why air condition is required in air craft.		4	L1
9	Give name of different parts of the coupling.		5	L1
10	Compare flat belt drive with "V" belt drive.		5	L1

Part-B

Answer All the following questions.		(5X10M=50Marks)		
11	a) Explain the limitations of First law of thermodynamics in detail? [5] b) An engine has thermal efficiency of 30%. The engine rejects 1000 MJ/hr. Calorific value of fuel is 30000 kJ/Kg. Determine power output and fuel consumed by the engine. [5]		1	L2
OR				
12	Describe some few words about Fossil, Nuclear, Solar and Hydel Fuels. [10]		1	L2
13	a) Derive the equations of boyle's law. [5] b) A gas occupies a volume of 0.1 m ³ at a temperature of 30°C and a pressure of 1.5 bar. Find the temperature of gas, it is compressed to pressure of 7.5 bar and occupies a volume of 0.04 m ³ . [5]		2	L2
OR				
14	Describe the process formation of steam from ice at 0°C and what is meant by internal energy of steam. [10]		2	L2

15	With the help of a neat sketch explain the working of any one type of ignition system of petrol engine. [10]	3	L2
OR			
16	Compare and contrast four stroke cycle engines with two stroke cycle engines. [10]	3	L2
17	Explain various types of centrifugal pump. [10]	4	L2
OR			
18	single acting single stage reciprocating air compressor of 15kw at 240 RPM takes in air at 1bar and deliver it at 8bar.Index of compression curve is 1.35.Find diameter of cylinder and stroke length at an average piston speed of 180 m/min neglecting clearance. [10]	4	L2
19	What is clutch? How it differs from brake when multi plate clutches are used? [10]	5	L2
OR			
20	a) Derive the expression for power transmitted by the belt. [5] b) What are the abrasive materials and state their applications. [5]	5	L2