B.TECH
(SEM I) THEORY EXAMINATION 2020-21
FUNDAMENTALS OF MECHANICAL ENGINEERING & MECHATRONICS

Time: 3 Hours ***Total Marks: 100***

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	What are Internal Combustion engines?	2	2
b.	Explain Poisson's ratio.	2	1
c.	Explain COP of refrigerator.	2	6
d.	What are Newtonian and Non-Newtonian Fluids?	2	3
e.	Differentiate between accuracy and precision?	2	4
f.	Explain pressure control valves?	2	5
g.	Differentiate between open loop and closed loop?	2	5
h.	Define Hooks law?	2	1
i.	What is Tolerance? Explain.	2	4
j.	What is Scavenging process?	2	2

SECTION B

2. Attempt any *three* of the following:

a.	With a neat sketch explain the working of a two stroke SI engine.	10	2
b.	Differentiate between Hole basis and Shaft basis system with neat diagrams.	10	4
c.	What are hydraulic pumps? Enlist the various types of pumps.	10	3
d.	Explain the working of a domestic refrigerator with a neat sketch.	10	2
e.	What are Autotronics, bionics and avionics? Write their applications?	10	5

SECTION C

3. Attempt any *one* part of the following:

a.	With a neat sketch explain the working of a four stroke CI engine.	10	2
b.	Explain the various errors in measurement and the practices which are needed to minimize them.	10	4

4. Attempt any *one* part of the following:

a.	State Pascal's Law and give examples where it is applied.	10	3
b.	Draw the stress strain diagram for ductile and brittle material.	10	1

5. Attempt any *one* part of the following:

a.	What are hydraulic turbines? How are the classified? Write their advantages and disadvantages?	10	3
b.	Write short notes on the types of beams.	10	1

6. Attempt any *one* part of the following:

a.	Explain the construction and working of window air condition.	10	2
b.	What are control systems? Enumerate the elements of control system.	10	4

7. Attempt any *one* part of the following:

a.	Define Mechatronics. Write the advantages, disadvantages and application of Mechatronics.	10	5
b.	What are sensors and transducers? Enumerate the various types of sensors and transducers.	10	5