Roll No. | 2 | 2 | B | T | C | S | 0 | 2 | 4 | 9 | | | |

SHAMBHUNATH INSTITUTE OF ENGINEERING AND TECHNOLOGY

FUNDAMENTAL OF MECHANICAL ENGINEERING (BME101)

B. Tech. (I-SEMESTER)

FIRST SESSIONAL EXAMINATION, ODD SEMESTER, (2022-2023)
Branch: ME, EC, CIVIL, EE, CS

Time –1hr 30 min **Maximum Marks – 30**

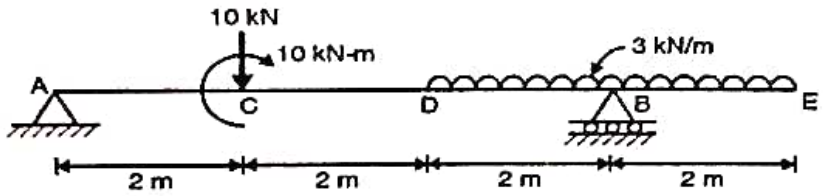
SECTION – A

1. Attempt all questions in brief.

Q.No.	QUESTION	Marks	CO	BL
a.	Define Poisson's ratio.	2	CO1	L1
b.	State polygon law of forces.	2	CO1	L1
c.	Discuss the terms used in IC engine- TDC, BDC, stroke and Bore.	2	CO2	L1
d.	Write any six components of IC Engine.	2	CO2	L1

SECTION – B

2. Attempt any one part of the following:

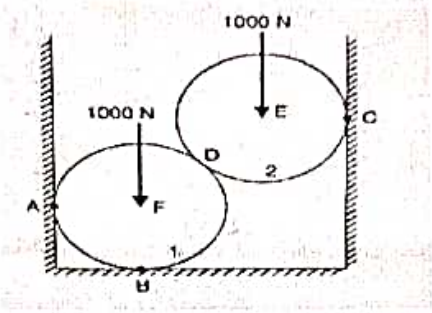
Q.No.	QUESTION	Marks	CO	BL
a.	Derive the following expression for the elastic constant $E = 2G(1+\mu)$.	5	CO1	L3
b.	An overhanging beam carries the loads as shown in Fig (1). Calculate the reaction at the supports.  Fig(1)	5	CO1	L3

3. Attempt any one part of the following:

Q.No.	QUESTION	Marks	CO	BL
a.	Compare the following- (a) 4 stroke Engine and 2 strokes Engine. (b) SI Engine and CI Engine	5	CO2	L2
b.	With a neat sketch explain the working of 4-stroke SI Engine.	5	CO2	L2

SECTION - C

4. Attempt any one part of the following:

Q.No.	QUESTION	Marks	CO	BL
a.	State the varignon's principle. Also give the proof of varignon's principle.	6	CO1	L1
b.	Two spheres, each of weight 1000 N and of radius 25 cm rest in a horizontal channel of width 90 cm as shown in Fig (2). Find the reactions on the points of contact A, B and C.  Fig (2).	6	CO1	L3

5. Attempt any one part of the following:

Q.No.	QUESTION	Marks	CO	BL
a.	What do you understand by hybrid electric vehicle (HEV)? What are the components of HEV? Also state its advantages.	6	CO2	L2
b.	Write short notes on electric vehicles.	6	CO2	L2

Bloom's Taxonomy Level (BL) :-

Remember (L1), Understanding(L2), Apply (L3), Analyze (L4), Evaluating(L5), Creating(L6)

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SHAMBHUNATH INSTITUTE OF ENGINEERING AND TECHNOLOGY

FUNDAMENTALS OF MECHANICAL ENGINEERING (BME 101)

B. Tech. (I-SEMESTER)

SECOND SESSIONAL EXAMINATION, ODD SEMESTER, (2022-2023)

Branch: ME, EC, CIVIL, EE, CS

Time –2hr **Maximum Marks – 45**

SECTION – A

1.Attempt all questions in brief. **(6*2 = 12)**

Q.No.	QUESTION	Marks	CO	BL
a.	Derive a relation between COP of a heat pump and refrigerator.	2	3	LI
b.	Explain ton of refrigeration.	2	3	L1
c.	Write any four properties of fluid.	2	4	L1
d.	Define specific gravity of a fluid.	2	4	L1
e.	What is Prony Brake Dynamometer?	2	5	L1
f.	Define circular pitch, module in relation to toothed gears.	2	5	L2

SECTION - B

2. Attempt any one part of the following. **(1*5 = 05)**

Q.No.	QUESTION	Marks	CO	BL
a.	Explain the working of a domestic refrigerator with a neat sketch	5	3	L2
b.	Explain the following terms— (a) Dew point temperature (b) Comfort condition (c) Humidity ratio (d) Relative humidity (e) Wet bulb temperature	5	3	L2

3. Attempt any one part of the following. **(1*5 = 05)**

Q.No.	QUESTION	Marks	CO	BL
a.	Derive an expression for continuity equation for a three dimensional flow.	5	4	L6
b.	What is turbine? Explain the working of Francis turbine with diagram.	5	4	L2

4. Attempt any one part of the following. **(1*5 = 05)**

Q.No.	QUESTION	Marks	CO	BL
a.	Explain the construction and working of optical pyrometer.	5	5	L3
b.	Define mechatronics .What are the evolution levels of mechatronics and its Application?	5	5	L2

SECTION – C

5. Attempt any ONE part of the following: **(1*6 = 6)**

Q.No.	QUESTION	Marks	CO	BL
a.	Explain the construction and working of window air conditioner.	6	3	L2
b.	Name any four psychometric processes and represent them on the psychometric chart.	6	3	L1

6. Attempt any ONE part of the following: **(1*6 = 6)**

Q.No.	QUESTION	Marks	CO	BL
a.	Explain the construction and working of a reciprocating pump with a neat sketch.	6	4	L4
b.	Explain the principle and working of suspended hydraulic lift with the help of a neat sketch.	6	4	L4

7. Attempt any ONE part of the following: **(1*6 = 6)**

Q.No.	QUESTION	Marks	CO	BL
a.	Explain the various errors in measurement and the practices which are needed to minimize them.	6	5	L2
b.	Explain the working of bourdon tube pressure gauge with neat sketch.	6	5	L2

Bloom's Taxonomy Level (BL):-

Remember (L1), Understanding (L2), Apply (L3), Analyze (L4), Evaluating (L5), Creating (L6)