

U.S.N.								
--------	--	--	--	--	--	--	--	--

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2025 Semester End Main Examinations

Programme: B.E.

Semester: I / II

Branch: Common to all Branches

Duration: 3 hrs.

Course Code: 18ME1ESEME / 18ME2ESEME

Max Marks: 100

Course: Elements of Mechanical Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			CO	PO	Marks
1	a)	Compare Renewable and Non- Renewable sources of energy with examples.	<i>CO1</i>	<i>PO1</i>	04
	b)	Explain the working of Reaction steam turbine with a Pressure Velocity Diagram	<i>CO2</i>	<i>PO2</i>	08
	c)	Explain with a schematic, how a parabolic type of collector is used in solar energy conversion.	<i>CO2</i>	<i>PO1</i>	06
OR					
2	a)	With a neat sketch, explain the working of an open cycle and closed cycle gas turbine plant	<i>CO1</i>	<i>PO2</i>	10
	b)	With the help of temperature-enthalpy diagram, explain the formation of steam at constant pressure.	<i>CO2</i>	<i>PO1</i>	10
UNIT - II					
3	a)	Explain the working of a domestic refrigeration system with a neat sketch.	<i>CO1</i>	<i>PO1</i>	10
	b)	List any 4 properties of ideal refrigerants	<i>CO2</i>	<i>PO2</i>	04
	c)	Differentiate between Vapour Compression and Vapour absorption Refrigerator (any 6)	<i>CO1</i>	<i>PO1</i>	06
OR					
4	a)	With the help of a P-V diagram explain the working of a four stroke Diesel Engine.	<i>CO3</i>	<i>PO1</i>	10
	b)	A single cylinder 4-stroke engine runs at 1000 rpm and has a bore of 115 mm and a stroke of 140 mm. The brake load is 60 N at 600 mm radius and the mechanical efficiency is 80%. Calculate brake power and mean effective pressure.	<i>CO3</i>	<i>PO2</i>	10

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - III						
5	a)	Classify welding processes with examples and explain the working of Arc welding with a neat sketch.	CO5	PO1	10	
	b)	With a neat sketch, explain the Taper turning by swiveling the compound rest and offsetting the tailstock method.	CO5	PO2	10	
OR						
6	a)	Explain the working of a radial drilling machine with neat sketch.	CO6	PO1	08	
	b)	With a neat sketch explain surface grinding and cylindrical grinding operations.	CO6	PO2	08	
	c)	Explain with neat sketch Tapping and Counter sinking operations	CO6	PO1	04	
UNIT - IV						
7	a)	List the different types of Gear Drives	CO4	PO2	06	
	b)	A compound gear train is formed by 4 gears A, B,C and D. Gear A meshes with gear B and gear C meshes with gear D. Gears B and C are compounded . A is connected to the drive shaft and D is connected to the driven shaft and power is transmitted $T_A = 15, T_B = 30, T_C = 20, T_D = 40$. If gear A were to rotate at 400 rpm. Calculate the speed of D. represent the gear arrangement schematically.	CO4	PO1	06	
	c)	Deduce an expression of Velocity ratio for a Compound gear train	CO5	PO1	08	
OR						
8	a)	Classify bearings and explain its features and applications of radial and Thrust ball bearings with a neat sketch.	CO4	PO2	10	
	b)	How are Lubricants classified and explain each with examples?	CO4	PO2	06	
	c)	Explain how open and cross belt drives function with neat sketches.	CO4	PO1	04	
UNIT - V						
9	a)	Define mechatronic systems and explain closed loop control systems with neat sketch and example.	CO5	PO1	10	
	b)	With the help of block diagram explain the working of open loop system. What are the advantages and disadvantages of this Mechatronics systems?	CO5	PO2	10	
OR						
10	a)	Describe the general steps followed in Additive manufacturing process.	CO4	PO1	08	
	b)	Explain DLP process of Additive manufacturing?	CO4	PO1	08	
	c)	List any four applications of Additive manufacturing process.	CO4	PO2	04	
