BEME103

Model Question Paper -1 with effect from 2022-23(CBCS Scheme)

USN | | | | | | | | | | |

First Semester B.E. Degree Examination

Elements of Mechanical Engineering

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Steam table is permitted.

		Module – 1	Marks
Q.1	(a)	Briefly **explain** role of Mechanical Engineering in Industries and society.	6
	(b)	**Find** the enthalpy of 1kg of steam at 12 bar when, steam is 22% wet. Use the steam table. Assume the specific heat of the superheated steam as 2.25 kJ/kg-K.	4
	(c)	**Explain** the working principle of Solar power plant with neat sketch and **justify** the necessity of solar power plant.	10
		OR	
Q.2	(a)	**Explain** the formation of steam with T-h diagram.	10
	(b)	**Explain** the working principle of Hydel power plant with neat sketch.	10
		Module – 2	
Q.3	(a)	**Explain** any two taper turning methods in lathe with suitable sketch.	10
	(b)	**Explain** CNC components with suitable sketch and list advantages and disadvantages	10
		OR	
Q.4	(a)	**Explain** with neat sketch of Boring and counter sinking operation	8
	(b)	**List** milling operations and **explain** any two with suitable sketches.	8
	(c)	What is 3D printing? **List** different 3D printing processes	4
		Module – 3	
Q.5	(a)	**Differentiate** between 4 stroke petrol and diesel engine	10
	(b)	**Explain** the working principal of VCR refrigeration system.	
		OR	
Q.6	(a)	A single cylinder 4 stroke engine has bore =180mm, stroke=200mm and rated speed=300rpm. Torque on the brake drum = 200N-m, Mean effective pressure = 6 bar. It consumes 4kg of fuel per hour. The calorific value of fuel=42,000 kJ/kg. **Determine** BP, IP, FP, break thermal efficiency and mechanical efficiency.	10
	(b)	**Explain** the selection of good refrigerants on the basis of properties.	10

Module – 4			
Q.7	**(a)**	A compound gear train is formed by 4 gears A, B, C and D having 20, 30, 40 and 60 teeth respectively. A is keyed to the driver shaft and D is keyed to the driven shaft. B and C are compounded gears. B meshes with A and C meshes with D. **Sketch** the arrangement using simple circles. If A rotates at 180 rpm, **calculate** the speed of D?.	8
	(b)	What are the advantages of V-belts over flat belt?	4
	(c)	**Explain** Gas welding process with suitable sketch	8
OR			
Q.8	**(a)**	**Derive** an expression for length of belt in open belt drive system.	10
	(b)	**Differentiate** soldering, brazing and welding processes	10
Module – 5			
Q.9	**(a)**	**Explain** the advantages and disadvantages of Electric Vehicles.	10
	(b)	With neat sketch **explain** Robot anatomy and joints	10
OR			
Q.10	**(a)**	**Explain** the components of Hybrid vehicles	10
	(b)	**Explain** the applications of Robots	10

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Programme Outcome**
Q.1	(a)	L2	CO1	PO1, PO2
	(b)	L3	CO4	PO1, PO2
	(c)	L3	CO1	PO1, PO2
Q.2	(a)	L2	CO1	PO1, PO2
	(b)	L2	CO1	PO1, PO2
Q.3	(a)	L2	CO2	PO1, PO2
	(b)	L2	CO2	PO1, PO2
Q.4	(a)	L2	CO2	PO1, PO2
	(b)	L2	CO2	PO1, PO2
	(c)	L1	CO2	PO1, PO2
Q.5	(a)	L3	CO2	PO1, PO2
	(b)	L2	CO2	PO1, PO2
Q.6	(a)	L3	CO4	PO1, PO2
	(b)	L2	CO2	PO1, PO2
Q.7	(a)	L3	CO4	PO1, PO2
	(b)	L2	CO3	PO1, PO2
	(c)	L2	CO3	PO1, PO2
Q.8	(a)	L3	CO3	PO1, PO2
	(b)	L3	CO3	PO1, PO2
Q.9	(a)	L2	CO3	PO1, PO2
	(b)	L2	CO3	PO1, PO2
Q.10	(a)	L2	CO3	PO1, PO2
	(b)	L2	CO3	PO1, PO2

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering:L_1	Understanding: L_2	Applying:L_3
	Higher order thinking skills		
	Analyzing: L_4	Evaluating : L_5	Creating: L_6