U.S.N.										

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

Autonomous Institute Affiliated to VTU

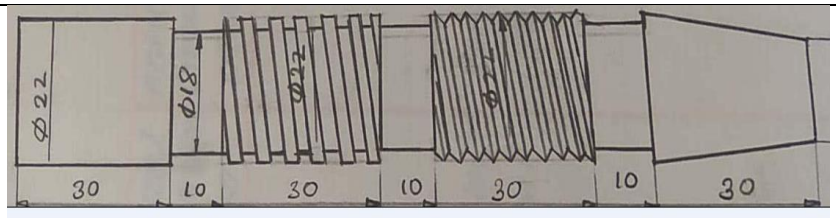
February / March 2024 Semester End Main Examinations

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.

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 - I	*CO*	*PO*	Marks
1	a)		Explain the working and construction of a helio-thermal process in which solar energy is harnessed by tracking system.	*CO1*	*PO1*	**06**
	b)		With the help of temperature-enthalpy diagram define the following terms related to the formation of steam: Sensible heat, Latent heat, Amount of Superheat, Saturation temperature, Dryness fraction, Enthalpy of wet steam.	*CO1*	*PO1*	**08**
	c)		Explain the working of Pelton wheel turbine with a neat sketch.	*CO2*	*PO1*	**06**
			OR			
2	a)		Distinguish the principle of reaction and impulse steam turbine with appropriate pressure-velocity diagram.	*CO2*	*PO1*	**10**
	b)		Classify the hydraulic turbines. With the help of neat sketch explain the working of Francis turbine.	*CO2*	*PO1*	**10**
			UNIT-II			
3	a)		Define the following terminologies: (a) Ton of refrigeration, (b) COP	*CO2*	*PO1*	**02**
	b)		Why a 4-stroke diesel engine is called as CI engine? Explain its working with PV diagram.	*CO2*	*PO1*	**10**
	c)		Explain the principle of operation of a domestic refrigeration.	*CO2*	*PO1*	**08**
			UNIT - III			
4	a)		Draw a neat sketch of an metal joining process where electricity is necessary and temperatures of the order of 5000°C could be achieved.	*CO1*	*PO1*	**04**
	b)		Identify the operations to be performed to obtain the piece of component shown in the fig below and explain those operations.	*CO1*	*PO1*	**10**

						
		c)	Differentiate welding and soldering in terms of; the process temperature, filler & flux materials used, joint strength, Heat affected zone and applications.	*CO1*	*PO1*	**06**
			OR			
	5	a)	Draw a neat figure of Lathe and label its Part.	*CO2*	*PO1*	**08**
		b)	Classify Lathe machine. List the specifications of lathe with a line diagram.	*CO2*	*PO1*	**06**
		c)	Explain the construction and working of radial drilling machine with a neat sketch.	*CO2*	*PO1*	**06**
			UNIT - IV			
	6	a)	If the two pulleys are to rotate in opposite direction what kind of belt arrangement would be used? Sketch and explain.	*CO3*	*PO1*	**04**
		b)	Explain with a neat sketch the working of an anti-friction bearing.	*CO3*	*PO1*	**06**
		c)	In a Gear train, B and C are compounded. C is in mesh with D. D and E are compounded. E and F are in mesh. If F is the driven gear rotating at 240 rpm clockwise, determine the speed and direction of rotation of gear A. Sketch the gear arrangement schematically. Number of teeth of each gear is given as: A-60, B-30, C-50, D-50, E-30, F-50.	*CO3*	*PO1*	**06**
		d)	What is need of lubrication give the four reasons.	*CO2*	*PO1*	**04**
			UNIT - V			
	7	a)	Explain open loop and closed loop control system with example.	*CO2*	*PO1*	**04**
		b)	To create regular hexagonal prism Describe the steps involved in additive manufacturing. Process.	*CO2*	*PO1*	**06**
		c)	Discuss about Advantages of additive manufacturing.	*CO2*	*PO1*	**06**
		d)	Explain the construction and Process of Stereo lithography.	*CO2*	*PO1*	**04**

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