

**P.E.S. College of Engineering, Mandya - 571 401***(An Autonomous Institution affiliated to VTU, Belagavi)***Second Semester, B.E. - Semester End Examination; July / Aug. - 2022****Elements of Mechanical Engineering****(Common to all Branches)***Time: 3 hrs**Max. Marks: 100***Course Outcomes***The Students will be able to:**CO1: Explain the formation of steam and working principle of steam and gas turbines.**CO2: Classify and Explain the working principles of different types of IC engines and calculate some of their performance parameters.**CO3: Classify different types of lathes and drilling machines and explain their working principles and different operations performed by them.**CO4: Classify different types of Milling and Grinding machines and explain their working principles and different operations performed by them.**CO5: Explain the working principles of different joining processes like welding, brazing and soldering. Identify different types of belt drives.***Note: I) PART - A is compulsory. Two marks for each question.****II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.**

Q. No.	Questions	Marks
<b>I : PART - A</b>		<b>10</b>
I a.	Define the following:	
	i) Subcooled liquid      ii) Enthalpy	2
b.	Define the following:	
	i) Compression ratio      ii) Thermal efficiency	2
c.	Define the terms; i) Ton of refrigeration and ii) Joule-Thomson effect.	2
d.	Write the difference between;	
	i) Three Jaw and four jaw chuck	2
	ii) Drilling and boring	
e.	i) Primary application of oxidizing flame is _____	2
	ii) Filler material in the case of arc welding is made of _____	
<b>II : PART - B</b>		<b>90</b>
<b>UNIT - I</b>		<b>18</b>
1 a.	Give the classification of boilers and their application.	9
b.	With a neat diagram, explain the pressure- temperature relationship in water.	9
c.	Explain the principle of reaction turbine. With a neat sketch, explain the construction and working of Parson's turbine	9
<b>UNIT - II</b>		<b>18</b>
2 a.	Give a detailed classification of IC Engines.	9
b.	Explain the performance parameters of IC engines	9
c.	With sketches and P-V diagram explain the working of a four stroke diesel engine.	9

**UNIT - III****18**

- 3 a. Differentiate between positive displacement pump and roto dynamic pump. Explain with a neat diagram, working principle of a positive displacement pump. 9
- b. Explain the working principle, advantages and disadvantages of centrifugal pumps. 9
- c. Explain with a neat sketch the principle of vapour compression refrigeration. 9

**UNIT - IV****18**

- 4 a. With a neat sketches, explain the following lathe operations:
- i) Cylindrical turning 9
- ii) Facing
- iii) Taper turning
- b. With a neat sketch, explain the twist drill nomenclature. 9
- c. Explain; i) Up milling (ii) Down milling (iii) Cylindrical grinding 9

**UNIT - V****18**

- 5 a. Explain the principles of welding, brazing and soldering with applications. 9
- b. Explain the different Oxy-acetylene gas flames with sketches. 9
- c. Derive an expression for length of an open belt drive. 9

**\* \* \* \***