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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Third Semester, B.E. - Mechanical Engineering

Semester End Examination; March / April - 2022

Manufacturing Process - I

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Explain the steps involved in casting processes.

CO2: Distinguish between various casting processes.

CO3: Explain special types of welding processes.

CO4: Analyze shear angle using Merchants circle diagram. Explain various types of cutting tool materials.

CO5: Estimate Tool life and Describe Mechanism of machines.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*

*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.*

Q. No.		Questions	Marks	BLs	COs	POs
		I : PART - A	**10**			
I	a.	What is the function of sprue and riser in a casting process?	2	L1	CO1	PO1
	b.	What is the difference between semi-centrifugal casting process and centrifuging process?	2	L1	CO2	PO1
	c.	What is explosive welding?	2	L1	CO3	PO1
	d.	Write any two factors that affect the temperature in metal cutting.	2	L1	CO4	PO1
	e.	What are the two forms of tool wear?	2	L1	CO5	PO1
		II : PART - B	**90**			
		UNIT - I	**18**			
1	a.	With a neat sketch, explain the following types of patterns: i) Split pattern ii) Loose Piece pattern	9	L2	CO1	PO1
	b.	Discuss the materials used for patterns with their advantages and disadvantages.	9	L2	CO1	PO2
	c.	Discuss the classification of furnaces based on the type of metal it can melt and the source of heat.	9	L2	CO1	PO1
		UNIT - II	**18**			
2	a.	Briefly explain the ingredients of green sand and no-bake sand mixture.	9	L2	CO2	PO2
	b.	With a neat sketch, explain two types of risers.	9	L2	CO2	PO1
	c.	With a neat sketch, explain the steps involved in making carbon dioxide mould.	9	L2	CO2	PO1

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	UNIT - III	**18**		
3 a.	With a neat sketch, explain seam welding process.	9	L2	CO3 PO1
b.	Briefly explain the various methods that can be used to minimize the effect caused by shrinkage in welds.	9	L2	CO3 PO2
c.	Briefly explain the effects and control of residual stresses in the weld metal.	9	L2	CO3 PO1
	UNIT - IV	**18**		
4 a.	Briefly explain the various chip formed during metal cutting.	9	L2	CO4 PO1
b.	A mild steel bar is turned on a lathe with a cutting tool having rake angle 10º and with a cutting speed of 200 mpm. If the width of cut is 3 mm and uncut thickness is 0.3 mm, determine; i) The shear angle ii) Cutting force and thrust force iii) Machining constant for the mild steel work piece The maximum shear stress is 400N/mm^2 and coefficient of the friction is 0.5.	9	L3	CO4 PO2
c.	Briefly explain the desirable properties of cutting tool material.	9	L2	CO4 PO1
	UNIT - V	**18**		
5 a.	Explain the effect of cutting parameters on the tool life.	9	L2	CO5 PO2
b.	Explain with a neat sketch, hydraulic shaper quick return mechanism.	9	L2	CO5 PO1
c.	In machining a mild steel work piece with carbide tool, the life of the tool was found to be 1 hr and 40 minutes at a spindle speed of 50 mpm. Determine the tool life, if it has to operate at a speed of 30% higher than the initial cutting speed. Also calculate the speed, if the tool is required to have a life of 2 hrs and 45 minutes. Assume Taylor exponent $n = 0.28$.	9	L3	CO5 PO2

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