

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2141908

Date: 12/06/2017

Subject Name: Manufacturing Processes -II

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	Answer each of the following in one sentence:	14
	1 What is 'yield' of a casting?	
	2 Why a riser must freeze later than casting?	
	3 What is significance of a core print?	
	4 What is purpose of 'runner extension'?	
	5 Why oxy-acetylene gas cutting is not preferred for cutting non-ferrous metals?	
	6 Define a welding arc.	
	7 What is the method of arc initiation in MIG welding?	
	8 Explain why a flux or a gas shielding is not used in resistance spot welding.	
	9 What type of deformative stresses is causing wire drawing?	
	10 What is the difference between punching and blanking?	
	11 What is springback?	
	12 What is coining of metal blanks?	
	13 What types of different forms that can be produced by extrusion of thermoplastics?	
	14 What are the processes used for producing metal-matrix composites?	
Q.2	(a) What are the factors playing a major role in manufacturing process selection? Explain the role played by the factors with an example from the practice.	03
	(b) For each of the following applications, suggest the most suitable major manufacturing process or processes (like welding, casting). Justify your answer with a major reason.	04
	i. A worm gear (with Phosphorous Bronze rim and Gray cast iron center)	
	ii. A crane hook	
	iii. A plastic beverage bottle	
	iv. A lathe bed.	
	(c) With the help of neat sketches, explain compression moulding process used to manufacture plastic products in the context of characteristics of the process, process parameters, capabilities and applications.	07
	OR	
	(c) What are the processing steps in making the ceramic parts? With the help of a general block diagram, explain how a ceramic part is made from raw material. How and why the processing is different than that of processing of metals and alloys?	07
Q.3	(a) A U-bend shows wrinkles in the flat portion present between	03

	bends. What can be the probable cause? Suggest suitable remedy with due justification.	
(b)	Compare main features, limitations and applications of open die forging and closed die forging.	04
(c)	Compare characteristics, advantages and disadvantages between hot working and cold working, hence bring out that when hot working shall be used and when cold working shall be used with examples.	07
OR		
Q.3	(a) What types of product forms that are produced by rolling? Sketch each of them.	03
	(b) Compare forward and backward extrusion processes used for forming metals and alloys in context of characteristic features, and applications.	04
	(c) Explain the characteristic features of a deep drawing operation in context of the state of stresses in the different parts of a drawn cup, process variables and their effect and probable failures.	07
Q.4	(a) What is the effect of clay content and water content on the compressive strength and permeability of the moulding sand?	03
	(b) With the help of neat sketches explain match plate pattern, skeleton pattern and their applications.	04
	(c) Compare capabilities of sand casting and investment casting in context of weight (size), as cast dimensional accuracy, economic quantity. Hence bring out the applications of both processes.	07
OR		
Q.4	(a) Explain how and why chills improve the effective feeding distance in castings.	03
	(b) What is gating ratio? What is pressurized and non-pressurized gating system? What type of gating ratio should be chosen for Aluminum alloys? For steels? Why?	04
	(c) Explain principle of centrifugal casting process, its capabilities and applications. How the impurities are taken care of?	07
Q.5	(a) What is the choice of current and polarity that results with higher penetration in shielded metal arc welding? Why?	03
	(b) Explain how a weld (coalescence) is formed in friction welding. Hence state advantages, disadvantages and applications of friction welding.	04
	(c) Explain Submerged arc welding process in the light of its characteristic features, type of current and type of power source used, process variables and their effect and applications.	07
OR		
Q.5	(a) What is the choice of welding speed for an overhead position compared to downhand position welding? Why?	03
	(b) What is difference between brazing and soldering? Hence state their applications.	04
	(c) Explain LASER beam welding process in the light of its characteristic features, capabilities and applications.	07
