Punjab Engineering College Chandigarh
(Deemed to be university)

PEC
EXPLORE·INNOVATE·EXCEL

Mid-Term Examination

March 2019

Programme: **B.Tech – Electronics (G1 & G2)**　　　　Year/Semester: **2nd**
Course Name: **Introduction to Manufacturing**　　　Course Code:**ESC103**
Maximum Marks: **30**　　　　　　　　　　　　　　　Time allowed: **1½ Hours**

Notes:
- All questions are compulsory.
- Unless stated otherwise, the symbols have their usual meanings in context with subject. Assume suitably and state, additional data required, if any.
- The candidates, before starting to write the solutions, should please check the question paper for any discrepancy, and also ensure that they have been delivered the question paper of right **course code**.

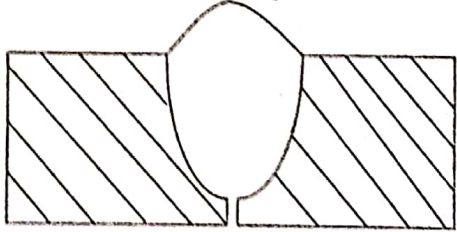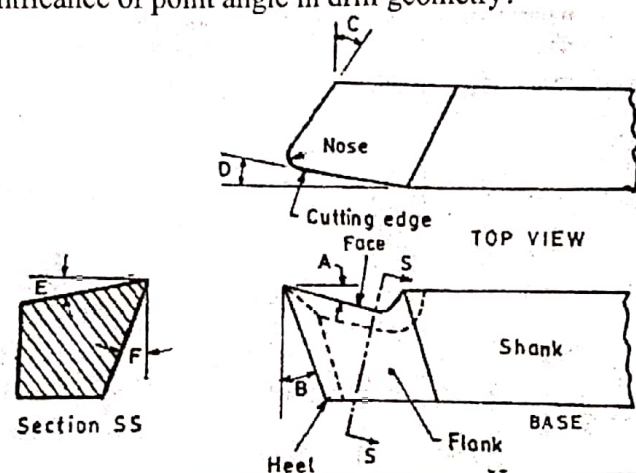| Q. No		Marks
1	a) What is the difference between toughness and stiffness? b) What safety precautions are to be taken while lifting a load of 30 kg? c) Why open blows and misrun occurs? d) State difference between normalizing and annealing? e) Explain any two properties of moulding sand.	2 × 5=10
2	A 0.87 % Carbon steel of 20 mm diameter has to be heat treated in order to induct the following properties (a) Hardness (b) Softness (c) Toughness (d) Machinability. Give a detailed explanation of the processes to be used. With the help of schematic diagram, show the difference between the four processes w.r.t temperature and time.	5
3	(a) A sectional view of the sand mould has been shown in the figure below. Design a pattern to develop cavity of this shape and mention the steps in withdrawing this pattern. (b) What effect is produced when *metal is not properly heated in upsetting forging?* *Explain with suitable diagram. Differentiate between the cold working and hot working*	5
4	In a particular casting method, sand sticks to the heated pattern to form a hard sand shell. With neat schematic diagrams, explain this casting technique in detail.	5
5	a) Explain the stress strain curve for ductile materials. How is this curve different from stress strain curve for glass? b) What process is suitable for fabrication of Crank shaft and connecting rod? What is the limitation of this process?	5

Programme: B.E.(Electronics)
Course Name: Introduction to Manufacturing
Maximum Marks: 80

Year/Semester: 2019
Course Code: ESC 103
Time allowed: 3.0 Hours

Notes:

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Q. No		Marks
1	a) Differentiate between manufacturing and production. b) Define the mechanism of plastic deformation with suitable diagram. c) Name three invariant reactions in iron carbon diagram. d) What two relative motions are generally needed to produce surfaces? e) What does R_a value measurement signify? What method is used to finish longer tubular parts?	$2 \times 5 = 10$
2	(a) Explain the casting method used for making cylindrical pipes. (b) A zinc alloy coating is done on steel pipes to protect them from corrosion. Explain the technique and the steps involved in this process. (c) Different types of taper turning operation. Explain the compound rest method with suitable diagram.	$3 + 4 + 3 = 10$
3	a) What terminology to be used for bead geometry as shown in figure. What surface treatment is required before arc welding operation? b) Crack the code of electrode E 3 2 5 411 P. What are but joint edge preparations methods in welding process? c) Explain the geometry of the plan milling cutter with suitable diagram.	$4 + 4 + 2 = 10$
4	(a) Explain the following forming operations 1. Swaging 2. Cogging 3. Fullering 4. Edging 5. Hemming 6. Lancing (b) How is a circular washer made with the help of a progressive and compound die? Explain the operations involved during complete cycle.	$6 + 4 = 10$

5	a. What non-conventional machining process is use for drill the 0.2 mm hole in to aluminum plate having a thickness of 50 mm. explain the working principle with suitable diagram? a) What are the different types of sands used in casting and state its constituents.		$6 + 4 =$ 10
6	(a) A 5 mm thick sheet has to be made into a thickness of 1 mm using a certain manufacturing process. The properties of the sheet should minimally change during the entire process. Explain the process in detail including the heat treatment to be given to it. Show step by step schematically how this heat treatment would affect grain size, hardness, strength and ductility of the sheet during the entire process. (b) How carbon film resistors are made? What are the applications of the resistors? List the various types of resistors.		$6 + 4$

7	(a)A HSS single point cutting tool has been shown in the figure below. Name the angles from A to F shown in the schematic representation.
	 (b) State the application of these machining operations
	     1. Knurling
	     2. Counter boring
	     3. Counter sinking
	     4. Chamfering
	 (c) What is the significance of point angle in drill geometry?
	
			$6 + 2 +$ $2 = 10$

8	a) What is the full form of PET, HDPE, PP and PVC in context to plastics? b) A Coca Cola PET bottle consists of two main components – bottle and the cap. Starting from mould making, illustrate with the help of a neat sketch how is plastic bottle manufactured and how would be caps for these plastic bottles manufactured. Explain the process in detail.		$2 + 8 =$ 10