

15

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**  
ORGANISATION OF ISLAMIC COOPERATION (OIC)  
DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING

Mid-Semester Examination  
Course Number: IPE 4521  
Course Title: Manufacturing Process

Winter Semester: 2022 - 2023  
Full Marks: 75  
Time : 1 hour 30 Minutes

There are 3 (three) questions. Answer all the questions. Marks of each question and the corresponding CO and PO are written in the brackets.

1. a) What is pattern? List the different types of patterns, hence write short notes on any five types of patterns with pictorial representation. (10)  
(CO1)  
(PO1)
- b) Explain detailed steps of the Lost Wax Casting procedure with proper illustration. (10)  
(CO1)  
(PO1)
- c) Explain the conceptual difference in-between manufacturing and production. (05)  
(CO1)  
(PO1)
2. a) What are the differences between soldering and brazing? Write a short note on the different types of brazing operations with necessary diagrams. (12)  
(CO1)  
(PO1)
- b) Briefly explain the different techniques of metal transfer in the GMAW process. Mention the characteristics of these techniques. (08)  
(CO1)  
(PO1)
- c) Mention some advantages and disadvantages of cold and hot chamber die casting process. (05)  
(CO1)  
(PO1)
3. a) Explain the mechanism of Arc welding process, hence show the impact of using DCEN, DCEP, and AC power supply in an Arc welding process. (08)  
(CO2)  
(PO2)
- b) Explain the working principle of plasma arc welding with necessary illustration, mention advantages and disadvantages of this method. (08)  
(CO2)  
(PO2)
- c) Mention some applications of resistance seam welding, resistance projection welding, and flash welding. (04)  
(CO1)  
(PO1)
- d) Consider a situation in which a welding operation is being performed with 20 volts, 200 A, and the cross-sectional area of the weld bead is 30 mm<sup>2</sup>. Estimate the welding speed if the workpiece and electrode are made of titanium. Where the specific energy of titanium is 14.3 J/mm<sup>3</sup>. Use an efficiency of 75%. (05)  
(CO2)  
(PO2)