Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Examination June 2022 (2019 scheme)

Course Code: MET204

Course Name: MANUFACTURING PROCESS

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks) Marks

1		How do patterns differ from casting?	(3)
2		What is the role of core and chill in casting process?	(3)
3		Explain any two destructive tests performed on welded joints.	(3)
4		What is shielded metal arc welding?	(3)
5		What is thread rolling? Compare it with thread cutting.	(3)
6		Sketch a typical rolling process and define (a) neutral point; (b) lagging and leading zones; (c) forward and backward slip.	(3)
7		What is open die forging?	(3)
8		Differentiate between direct extrusion and indirect extrusion.	(3)
9		What is stretch forming?	(3)
10		Describe any three sheet metal operations.	(3)

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	What are the steps involved in a sand casting process?	(7)
	b)	Sketch and explain the components of a gating system in casting process.	(7)
12	a)	Explain the salient features of investment casting process.	(7)
	b)	Two solids of the same material, one a cube and the other a sphere, are cast. Volume of the cube of side 'a' and that of the sphere of radius 'r' are equal. Find the ratio of the solidification time of the cube to that of the sphere.	(7)

Module -2

13	a)	Sketch and explain the basic regions in a typical fusion welded joint.	(8)
	b)	How is welding performed in a thermit welding process?	(6)

14 a) What are the components in oxy-acetylene welding operation? How is the flame adjusted in gas welding? (8)

b) Resistance flash welding using 30 V power supply is done to join two pipes each having inner diameter 100 mm and outer diameter 110 mm. At the interface, 1 mm of material melts from each pipe which has a resistance of 42.4 Ω. If the unit melt energy is 64.4 MJ/m^3, find the time required for welding. (6)

Module -3

15 a) Narrate the features of (i) four high rolling mill (ii) planetary rolling mill (iii) cluster rolling mill. (6)

b) If μ is the coefficient of friction between metal and roll surface and R is the radius of the roll, obtain an expression for maximum possible reduction in a single pass. (8)

16 a) Define (i) true stress; (ii) flow stress; (iii) average flow stress (6)

b) What is yield criterion? Explain Tresca and von Mises yield criteria. (8)

Module -4

17 a) Differentiate between hot working and cold working of metals. Compare the relative merits and demerits of hot working and cold working. (6)

b) Distinguish between drop forging and press forging. (8)

18 a) Differentiate between wire drawing and deep drawing. (6)

b) Applying the slab method, obtain an expression for forging pressure under plane strain conditions with sliding friction. (8)

Module -5

19 a) What is 3-2-1 principle? (6)

b) List the different locating methods and explain any two of them. (8)

20 a) Explain spring back which is observed in sheet metal bending. (6)

b) What are the main principles of clamping? Give a classification of clamps used. (8)

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