

Unit	Contents	Page No
1	Casting	1
	1.1. Sand Casting	1
	1.2. Pattern Making	1
	1.3. Types of Pattern	1
	1.4. Pattern Material	2
	1.5. Types of Moulding Sand Machine Testing	5
	1.6. Methods	9
	1.7. Deformation of Toughness Test	10
	1.8. Cores	12
	1.9. Types of Core Making Methods	12
	1.10. Moulding Process	14
	1.11. Moulding Machines	16
	1.12. Melting Furnace	16
	1.13. Special Casting Process	19
	1.14. Pressure Die Casting	22
	1.15. Centrifugal Casting	24
	1.16. Cold Chilling CO ₂ Process	26
	1.17. Stir Casting	27
	Questions	31
2	Welding	33
	2.1. Classification of Welding	33
	2.2. Gas Welding Technique	35
	2.3. Gas Tungsten Arc Welding	36
	2.4. Gas Metal Arc Welding	37
	2.5. Submerged Arc Welding	38
	2.6. Electro Slag Welding	40
	2.7. Resistance Welding	41
	2.8. Spot Welding	42
	2.9. Butt Welding	43
	2.10. Flash Butt Welding	43
	2.11. Seam Welding	44

2.12. Percussion Welding	44
2.13. Projection Welding	45
2.14. Stud Welding	46
2.15. Plasma Arc Welding	46
2.16. Thermit Welding	49
2.17. Electron Beam Welding	50
2.18. Laser Light Amplification by the Stimulated Emission of Radiation	52
2.19. Friction Welding	53
2.20. Friction Stirrs Welding	55
2.21. Diffusion Welding	56
2.22. Brazing	58
2.23. Brazing Methods	59
2.24. Soldering	60
2.25. Classification	60
2.26. Defects in Welding	61
Questions	66
3 Bulk Deformation Processes	68
3.1. Introduction	68
3.2. Hot Working Process	68
3.3. Types of Hot Working Process	69
3.4. Cold Working	70
3.5. Classification of Cold Working Process	71
3.6. Cold Working Process	71
3.7. Embossing	72
3.8. Metal Spinning (Cold Drawing)	73
3.9. Coining	73
3.10. Knurling	74
3.11. Comparison Between Hot Working and Cold Working	76
3.12. Forging Process	76
3.13. Press Forging	78
3.14. Upset Forging	79

3.15. Roll Forging	80
3.16. Types of Forging Machine	81
3.17. Air and Steam Hammers	81
3.18. Mechanical Hammers	82
3.19. Pneumatic Hammers	83
3.20. Power Presses	84
3.21. Typical Forging Operations	84
3.22. Drawing Down	85
3.23. Punching	86
3.24. Forge Welding	87
3.25. Piercing	87
3.26. Swaging	88
3.27. Flattering	88
3.28. Fullering	88
3.29. Rolling of Metal	89
3.30. Flat Strip Rolling	89
3.31. Two High Rolling Mill	90
3.32. Three High Rolling Mill	91
3.33. Four High Rolling Mill	91
3.34. Multiple Roll Mills	92
3.35. Universal Rolling Mill	92
3.36. Shape Rolling Operations	93
3.37. Ring Rolling	93
3.38. Thread Rolling	94
3.39. Defects In Rolled Parts	95
3.40. Hot Extrusion	96
3.41. Forward Extrusion	96
3.42. Backward Extrusion	97
3.43. Cold Extrusion(Impact Extrusion)	97
3.44. Principles of Drawings	98
3.45. Classification of Drawing	98
3.46. Wire Drawing	99

	3.47. Rod Drawing	99
	3.48. Deep Drawing	99
	3.49. Equipments Used in Drawing	100
	Questions	101
4	Shaping & Forming	103
	4.1. Sheet Metal Characteristics	103
	4.2. Fly Press	104
	4.3. Mechanically Operated Power Press	105
	4.4. Inclined Press	106
	4.5. Gap Press	107
	4.6. Arch Press	107
	4.7. Straight Side Press	108
	4.8. Horn Press	108
	4.9. Crank Driven Press	109
	4.10. Eccentric Driven Press	109
	4.11. Rack and Gear Driven Press	110
	4.12. Hydraulically Driven Press	110
	4.13. Presses with Screw Drive	111
	4.14. Types of Cutting Dies	112
	4.15. Blanking	115
	4.16. Piercing	115
	4.17. Punching	116
	4.18. Notching	117
	4.19. Forming Operation	118
	4.20. Squeezing	118
	4.21. Embossing	118
	4.22. Nipping	118
	4.23. Roll Forming	119
	4.24. Seaming	120
	4.25. Stretch Forming Operation	120
	4.26. Formability of Sheet Metal	122
	4.27. Special Forming Process	123

4.28. Hydro Mechanical Forming	123	
4.29. Electro Hydraulic Forming	124	
4.30. Explosive Forming	125	
4.31. Rubber Pad Forming	126	
4.32. Magnetic Pulse Forming	128	
4.33. Peen Forming	129	
4.34. Super Plastic Forming	130	
4.35. Metal Spinning	132	
Questions	133	
5	Plastics & Polymerization	135
5.1. Introduction	135	
5.2. Properties of Plastics	136	
5.3. Types of Plastics	137	
5.4. Forming and Shaping of Plastic	142	
5.5. Screw Type Injection Moulding	143	
5.6. Blow Moulding	144	
5.7. Rotational Moulding	146	
5.8. Film Blowing	147	
5.9. Sheet Making	148	
5.10. Vacuum Forming Process	149	
5.11. Ultrasonic Welding	150	
5.12. Induction Welding	151	
Questions	154	
Anna University Model Question Paper	156	