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B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023

Second Semester

ME22202 – MANUFACTURING PROCESSES

(Mechanical Engineering)

(Regulation 2022)

TIME: 3 HOURS

MAX. MARKS: 100

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Select a suitable casting process for a given engineering component.	3
CO 2	Given a material, the students will Apply a suitable joining process.	3
CO 3	Given a part diagram & its application, students will justify a suitable bulk deformation process.	3
CO 4	Students will identify the necessary operations to be performed on a sheet metal and will select a suitable process for a given application.	3
CO 5	Students will justify a suitable process for thermoplastics, thermosetting plastics and for cutting tools.	3

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

	CO	RBT LEVEL
1. Choose a suitable mould thousand numbers of Aluminium casting are to be manufactured.	1	3
2. Articulate the situation that leads to pin hole formation in casting.	1	3
3. List the advantages of casting.	1	2
4. A casting company requires a melting rate of the order of 3 tons/hr while melting cast iron. Recommend a suitable melting furnace.	1	3
5. Annotate the functions of flux materials in welding.	2	2
6. In a welding requirement, high quality weld with deep penetration is required. Choose a welding method that suits the above demand if the operator can complete the welding without safety equipment (or) the arc is under the flux granules.	2	3
7. List various solid state welding techniques.	2	2
8. A welding machine supplies 150 Ampere output current at 20 V and the overall efficiency of the machine is 0.90. Calculate the rated power of the welding machine.	2	3
9. Briefly differentiate hot working and cold working.	3	2
10. List various rolling defects.	3	2
11. Choose a suitable deformation process for manufacturing a lengthy wire of diameter 3 mm from a bar stock of diameter 15 mm.	3	3

12. Brief about side extrusion.	3	3
13. Distinguish punching and blanking.	4	2
14. Identify the reason for “spring back” effect in bending of sheet metals.	4	2
15. List the limitations of superplastic forming.	4	2
16. In a punching process, a punch of diameter 12 mm is used to shear a metal plate of thickness 3 mm. If the clearance between the punch and the die is 2% of sheet thickness, Calculate the die diameter.	4	4
17. Why curing in thermosets is termed as irreversible?	5	2
18. Large hollow shapes of simple design made of thermoplastics are to be manufactured at low production rates. Choose a suitable plastic processing technique.	5	3
19. Would you use thermosetting plastics in injection moulding? Brief about it.	5	3
20. List the purpose of blending process in making powder metallurgy parts.	5	2

PART- B (5 x 10 = 50 Marks)

	Marks	CO	RBT LEVEL
21. (a) In a casting process, the manufacturer accidentally used “ poor moulding material ” for the preparation of mould. With suitable diagrams, list and explain the possible casting defects the manufacturer is expected to come across in the casting.	(10)	1	3
(OR)			
(b) A Hollow cylindrical cast iron pipes are to be manufactured by ABC company. Choose and explain a suitable casting method with neat diagrams.	(10)	1	3
22. (a) Explain with a neat sketch the welding process that uses a non consumable electrode.	(10)	2	2
(OR)			
(b) How welding is done using electron beam welding? Discuss with a neat diagram.	(10)	2	2
23. (a) (i) Discuss the reasons by which flash assists in die filling during forging operations.	(5)	3	3
(ii) Name the important process variables in wire drawing, and explain how they affect the drawing process.	(5)	3	3

(OR)

- (b) In which extrusion process the billet is surrounded by hydraulic fluid? Explain with a neat sketch along with the process variable. (10) 3 3
24. (a) Name and explain the High Energy Rate Forming (HERF) process in which eddy current formation is utilized for the deformation. Explain its procedure with a neat sketch. (10) 4 3

(OR)

- (b) Conical shapes are to be formed on sheet metals. Choose suitable sheet metal forming process and explain its procedure with appropriate sketches. (10) 4 3
25. (a) Cutting tools made of tungsten carbide powders are suggested for a manufacturing operation. Explain suitable manufacturing methodology for the manufacture of these cutting tools. (10) 5 3

(OR)

- (b) A toy manufacturing company plans to manufacture thermoplastic toys with high production rate and with better dimensional control. Recommend a suitable plastic processing method and explain its procedure with suitable diagrams. (10) 5 3

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

- | | Marks | CO | RBT
LEVEL |
|--|-------|----|--------------|
| 26. Longitudinal seams in the gasoline tanks are to be welded. Recommend a suitable welding technique and explain the procedure involved with neat diagrams. | (10) | 2 | 3 |
