Q. Code:711590

Reg. No. | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Fourth Semester

MR22405 – MANUFACTURING TECHNOLOGY FOR MARINE ENGINEERS

(Marine Engineering)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	To know the different welding processes and select the appropriate process for different applications.	**3**
CO 2	To have the knowledge of different casting processes and select the appropriate process for different applications.	**3**
CO 3	To select the Grinding Wheel and process based on the surface finish required.	**3**
CO 4	To have a depth understanding of the various hot working and cold working processes.	**3**
CO 5	To selecting the appropriate machines or machine tools for different requirements.	**3**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define resistance welding and its subtypes, and provide an example of an industry where this technique is extensively used.	**1**	**3**
2.	Discuss the importance of welding symbols in the fabrication industry, and provide an example of a commonly used welding symbol.	**1**	**3**
3.	Outline the process of electroslag welding and its primary applications in heavy fabrication.	**1**	**3**
4.	Discuss the role of brazing and soldering in metal joining processes, highlighting one key difference between them.	**1**	**3**
5.	Describe the shell casting process and identify one industry where it is commonly employed.	**2**	**3**
6.	Differentiate between investment casting and die casting, focusing on the types of casting products each process produces.	**2**	**3**
7.	Explain the difference between pressure die casting and gravity die casting techniques, highlighting one specific application for each.	**2**	**3**
8.	Identify one common defect in castings and suggest a method for detecting and rectifying it.	**2**	**3**
9.	Why is grinding called the finishing process?	**3**	**3**

10.	What are the main types of grinding?	**3**	**2**
11.	What is the use of internal grinders?	**3**	**3**
12.	What is centre less grinding?	**3**	**2**
13.	How does bending differ from hot spinning in metal forming techniques?	**4**	**3**
14.	Define shearing and state its significance in metal fabrication.	**4**	**3**
15.	Differentiate between tube drawing and wire drawing processes.	**4**	**3**
16.	What is the purpose of shot peening in metal forming processes, and how does it enhance material properties?	**4**	**3**
17.	What is the working principle of a lathe machine?	**5**	**2**
18.	How are lathes classified based on their size and capacity?	**5**	**3**
19.	What are the specifications typically associated with drilling cutters?	**5**	**3**
20.	Briefly explain the principle behind milling operations.	**5**	**2**

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21. (a)	Discuss the different types of resistance welding used for industrial applications. Provide examples of industries where resistance welding is extensively used and explain its advantages in those contexts.	**(10)**	**1**	**3**
	(OR)			
(b)	How do fusion welding and solid-phase welding differ? Provide examples of where each method is used.	**(10)**	**1**	**3**
22. (a)	Compare and contrast pit furnaces and electric furnaces used in melting for casting. What are the advantages and disadvantages of each type of furnace?	**(10)**	**2**	**3**
	(OR)			

(b)	Investigate the different special casting processes such as shell, investment, die casting, and gravity casting. What are their unique characteristics and suitable applications?	**(10)**	**2**	**3**
23. (a)	How grinding machines are classified? Explain plain cylindrical grinding machine with a neat sketch.	**(10)**	**3**	**3**
	(OR)			
(b)	How is the grinding process carried out to achieve flat surfaces? Please explain the procedure along with a clear sketch.	**(10)**	**3**	**3**
24. (a)	Analyze the significance of rolling, forging, and drawing processes in metal forming, discussing their advantages, limitations, and key applications.	**(10)**	**4**	**3**
	(OR)			
(b)	Compare and contrast extrusion and bending processes in metal forming, considering their principles, equipment, applications, and limitations.	**(10)**	**4**	**3**
25. (a)	Describe the operations that can be performed on a lathe, such as turning, facing, threading, and grooving. Include the tools and techniques used for each operation.	**(10)**	**5**	**3**
	(OR)			
(b)	Compare different methods of taper turning on a lathe. What are the advantages and limitations of each method?	**(10)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	You have a cylindrical metal rod with a diameter of 150 mm and a length of 400 mm. Using a lathe machine, you need to turn down the diameter of the rod to 100 mm over a length of 250 mm, leaving the remaining 150 mm untouched. Additionally, you must achieve a surface finish of Ra 0.4 μm on the turned portion. Calculate the amount of material to be removed, determine the number of passes required, and recommend suitable cutting parameters to achieve the desired diameter reduction and surface finish.	**(10)**	**5**	**4**

****