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# SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FOURTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), JULY 2022**
**MECHANICAL ENGINEERING**
**(2020 SCHEME)**

**Course Code :** **20MET204**

**Course Name:** **Manufacturing Process**

**Max. Marks :** **100** **Duration: 3 Hours**

## PART A

***(Answer all questions. Each question carries 3 marks)***

1. Briefly explain the characteristics of molding sand.
2. Explain gating ratio in casting process.
3. Differentiate between forehand and backhand welding techniques
4. Are there any techniques used to relieve stress in weld? If so, List the techniques?
5. Distinguish between the cold rolling and hot rolling process
6. Justify the need for camber in rolling mills
7. How is the grain flow in forging operation different from that of the casting and machining process?
8. With a neat sketch explain the wire drawing process
9. How are Jigs different from Fixtures?
10. What are the methods used to compensate for spring back in bending?

## PART B

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

### MODULE I

11. Discuss the different types of centrifugal casting processes? (14)

**OR**

12. What are the different pattern allowances used in the foundry? Briefly explain them with a schematic diagrams (14)

### MODULE II

13. With a schematic diagram, explain the working principle and chemistry behind the process of oxy-acetylene gas welding. (14)

**OR**

14. Write short notes on the differences between TIG and MIG welding process. Compare the process in terms of merits, demerits, and application. (14)

### MODULE III

15. An annealed copper strip 228 mm wide and 25 mm thick is rolled to a thickness of 20 mm in one pass. The rolling radius is 300 mm, and the rolls rotate at 100 rpm. The work material has a strain hardening exponent of 0.2 and a strength coefficient of 250 MPa. Determine the minimum coefficient of friction to make this operation possible. Calculate the roll force and the power required in this operation. (14)

**OR**

16. a) With a neat sketch, explain the process of ring rolling. Discuss the merits, demerits, and applications of this process (8)
b) Explain Tresca and Von Mises's yield criteria for metallic materials. (6)

**MODULE IV**

17. Briefly explain the following forging operations (with a neat sketch)
(i) Upsetting
(ii) Fullering
(iii) Bending
(iv) Piercing (14)

**OR**

18. Discuss the principle and classification of extrusion process with neat diagrams (14)

**MODULE V**

19. Discuss the basic principles of location and different locating methods in manufacturing with diagrams (14)

**OR**

20. What are the different types of shearing dies? Explain them with a neat sketch. Discuss the merits and demerits of each die. (14)

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