

GANPAT UNIVERSITY  
 B.TECH. SEMESTER V MECHATRONICS ENGINEERING  
 REGULAR EXAMINATION NOVEMBER / DECEMBER 2011  
 MC 501 CASTING AND MACHINING PROCESSES

Time: 3 Hours

Total Marks: 70

**Instructions:-**

1. Attempt **all** Questions.
2. Figure to the **right** indicate full marks.
3. Answers to the two section must be written in **separate** drawing papers
4. Assume suitable data if **necessary**.
5. Draw neat sketch wherever essential.

SECTION – I

- Q.1** (a) Define sand casting process and list out advantages and area of applications of casting process in industries and also list out the raw material requirement for sand casting process. (4)
- (b) What is gating ratio? Enumerate general practical rules for making gating systems to obtain sound castings. (4)
- (c) List out different properties of molding sand and briefly explain the method to find out different strength of sand mold with the help of neat sketch. (4)

OR

- Q.1** (a) To make the casting of any component brief out different steps required to perform sand casting process with the help of block diagram. (4)
- (b) Elaborate factors affecting on the selection of pattern materials. Also list out merits and demerits of any three-pattern materials. (4)
- (c) List out the properties of molding sand and their effects on casting product. (4)
- Q.2** (a) Explain functions of pattern and with suitable example explain the importance of different pattern allowances in detail. (5)
- (b) Explain all characteristics of gates used in gating system and with the help of neat sketch explain different types of bottom gates. (6)

OR

- Q.2** (a) What is casting defects? Make classification of casting defects and briefly explain surface defects with neat sketch. (4)
- (b) Schematically illustrate the sand mold, with various features and explain the functions of each part. (4)
- (c) What is the importance of chill? Explain functions and Types of Chills used in sand casting process. (3)

**Q.3** Write short notes on : (Any Three) (12)

- (a) Continuous casting process with neat sketch.
- (b) With neat sketch explain the working of cupola furnace.
- (c) Centrifugal casting process with neat sketch.
- (d) Lost wax casting process with neat sketch.

**SECTION-II**

- Q.4 (a) Explain the different operation performed on lathe. (4)  
 (b) What is machinability of metal? What factors affect the machinability? (4)  
 (c) What is the use of back gear? Explain the use of back gear? (4)

**OR**

- Q.4 (a) What is the use of a chip breaker? Discuss the various types of chips produced during metal machining process. (4)  
 (b) Distinguish between climb and conventional milling. Explain their characteristics (4)  
 (c) Describe different methods of holding work in a lathe. (4)

- Q.5 (a) Differentiate between shaping, planing and slotting, as regards relative tool and work motions. (6)  
 (b) Explain compound indexing with example. (5)

**OR**

- Q.5 (a) Explain with neat sketch planer type horizontal boring machine. (6)  
 (b) Explain the various shaper operations? (5)

Q.6 **Answer the following: (Any Three)** (12)

- (a) How does the area of contact affect grinding wheel selection? Explain  
 (b) Explain the principle and give the classification of milling machine.  
 (c) Write short notes on :  
 1. Steady Rest,  
 2. Follower Rest,  
 3. Apron mechanism  
 (d) Describe the various types of cutters commonly used on milling machine.

===== **END OF PAPER** =====