

May 2024

B. Tech. (ME/ME(Hindi)) (Fourth Semester)**Manufacturing Processes (PCC-ME-405-21)***Time : 3 Hours]**[Maximum Marks : 75*

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) List the various types of allowances which are usually provided in a pattern. 1.5
- (b) What are the main properties of a molding sand ? 1.5
- (c) State the principle of extrusion process. 1.5
- (d) What is the principle of working of a shaper machine ? 1.5
- (e) What are the applications of milling machine ? 1.5
- (f) Define the term machinability index. 1.5
- (g) Enumerate the essential requirements of a cutting tool material. 1.5

- (h) Define lapping process. 1.5
- (i) Differentiate between soldering and brazing. 1.5
- (j) How is Polarity defined in the case of a DC welding source ? 1.5

Part B

2. (a) With the help of diagrams discuss the various types of patterns in casting. 8
- (b) Briefly enumerate the steps in sequence for producing castings from shell moulding. Also write advantages, disadvantages and product application of shell moulding method. 7
3. (a) Define the rolling process. Explain the different types of rolling mill based on number of rolls in the stand. 8
- (b) Differentiate between hot working and cold working of metals. Also write the advantages and disadvantages of each of these techniques. 7
4. (a) Explain the main parts of a lathe with a block diagram. 8
- (b) What are the requirements of a cutting fluid ? Explain the various methods of applying the cutting fluid at the cutting zone. 7

5. (a) Explain the various types of chips produced during metal machining. 8
- (b) Discuss the factors which affect tool life. Calculate the cutting speed for a tool to have a tool life of 160 min. The same tool had a life of 9 min when cutting at 250 m/min. Take $n = 0.22$ in the Taylor's tool life equation. 7
6. (a) Explain gas tungsten arc welding. Also write the advantages and drawbacks of inert gas shielded arc processes. 8
- (b) Explain the working principle of following welding processes : 7
 - (i) Gas welding
 - (ii) Resistance welding
7. Write short notes on the following :
 - (a) Gear hobbing 5
 - (b) Gear forming 5
 - (c) Honning. 5