Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **Course: IDD (B.Tech and M.Tech)**
Sub_Code: MEPC2006

4th Semester Regular Examination: 2024-25
SUBJECT: BASIC MANUFACTURING PROCESSES
BRANCH(S): MECH, MMEAM
Time: 3 Hours
Max Marks: 100
Q.Code: S577

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Name various pattern allowances in sand casting method.
b) Explain the term gating system.
c) Name any two binders used for bonding of core sand.
d) What are the functions of flux used in welding?
e) Write the difference between brazing and soldering.
f) List four methods of solid-state welding.
g) Name any four rolling defects.
h) What is meant by the formability of metals?
i) Distinguish between embossing and coining operation.
j) Why hot working is not recommended for sheet metal operations?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) What is pattern? What considerations are necessary when designing a pattern? With neat sketch explain various types of patterns.
b) Why testing of foundry sand is necessary? What are the common tests performed on foundry sands? Elaborately explain any two testing processes.
c) Sketch the cross section of a sand mould casting which is ready for pouring and briefly explain the various important parts. Briefly describe the necessary steps in sand casting operation.
d) Define welding and weldability. Classify the various welding processes with neat diagram.
e) Write the principle of oxy-acetylene gas welding. Describe with neat diagram the various flames obtained in oxy-acetylene gas welding process.
f) State the differences between TIG (GTAW) welding and MIG (GMAW) welding process.
g) Explain with neat sketch basic working principle of rolling process. Compare the different rolling mill arrangements in brief.

h) What do you mean by metal forming process? State the difference between hot working and cold working process.

i) What are the basic two operations involved in forging? Explain in details different forging methods.

j) Draw the cross-section of a drawing die levelling various features in it. Also explain the different materials used for making wire drawing die. What is optimal die angle for wire drawing?

k) With neat sketch, discuss the basic principle of explosive forming.

l) Define surface engineering. Explain the importance of coating in modern manufacturing industries. Classify different coating methods.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 What is centrifugal casting? For what types of job would you recommend this casting process? With neat diagrams, explain the principle of working of true centrifugal casting process and semi-centrifugal casting process. **(16)**

Q4 What is resistance welding? With neat sketch, explain the working principle of resistance welding. Discuss various resistance welding processes. **(16)**

Q5 Explain the metal extrusion process. What are different types of extrusion processes? With neat sketch explain any three-extrusion process with their working principle, advantages, disadvantages, and application. **(16)**

Q6 Define sheet metal working. Explain in detail the shearing process in sheet metal working. Explain the classification of sheet metal operations with suitable diagrams. Discuss in detail the types of dies used in sheet metal forming – simple, compound, progressive, and combination dies. Provide sketches where appropriate. **(16)**