Reg. No.																

Question Paper Code	13212

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Third Semester

Mechanical and Automation Engineering

20MUPC301 - BASIC MANUFACTURING PROCESSES

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following is a common type of pattern used in sand casting? (a) Solid pattern (b) Split pattern (c) Match plate pattern (d) All of the above	1	K1	CO1
2.	Which melting furnace is primarily used for melting iron and steel? (a) Electric arc furnace (b) Cupola furnace (c) Induction furnace (d) Blast furnace	1	K1	CO1
3.	The main advantage of laser welding is: (a) Lower cost (b) High precision and speed (c) Ease of operation (d) No need for filler materials	1	K1	CO1
4.	In manual metal arc welding, the arc is formed between: (a) A non-consumable electrode and the workpiece (b) A consumable electrode and the workpiece (c) Two work pieces (d) A gas flame and the workpiece	1	K1	CO1
5.	What is the main difference between hot working and cold working of metals? (a) Temperature of the workpiece (b) Type of tooling used (c) Speed of operation (d) Material properties	1	K1	CO2
6.	The process of reducing the diameter of a rod or wire is known as: (a) Extrusion (b) Forging (c) Drawing (d) Rolling	1	K1	CO2
7.	What is the primary purpose of bending operations in sheet metal processing? (a) To cut the material (b) To join materials (c) To create specific angles and shapes (d) To increase the thickness	1	K1	CO2
8.	Which of the following is a typical characteristic of sheet metal? (a) High tensile strength (b) Ductility and malleability (c) Low yield strength (d) All of the above	1	K1	CO2
9.	What is the primary mechanism of metal cutting? (a) Abrasion (b) Fracture (c) Shear (d) Compression	1	K1	CO3
10.	Taylor's Equation is used to determine: (a) Cutting speed (b) Tool life (c) Material removal rate (d) Feed rate	1	K1	CO3
11.	What is the primary purpose of cutting fluids in machining? (a) To lubricate the tool (b) To cool the workpiece (c) To remove chips (d) All of the above	1	K1	CO3
12.	Machinability is a measure of: (a) How easily a material can be machined (b) The surface finish of the machined part (c) The strength of the cutting tool (d) The speed of the machine	1	K1	CO3
13.	What is the primary purpose of a drill bit? (a) To shape materials (b) To create holes (c) To cut gears (d) To mill surfaces	1	K1	CO4
14.	What is the function of tapping in machining? (a) To create a hole (b) To cut threads inside a hole (c) To enlarge a hole (d) To remove excess material	1	K1	CO4
15.	In gear shaping, the tool's motion is primarily: (a) Rotational (b) Linear (c) Oscillatory (d) Spiral	1	K1	CO4

16.	What is the primary consideration when selecting a milling cutter? (a) The color of the cutter (b) The type of material being cut (c) The weight of the cutter (d) The speed of the machine	*1*	*K1*	*CO4*
17.	Which type of grinding process is best suited for producing complex shapes? (a) Internal grinding (b) Cylindrical grinding (c) Surface grinding (d) Centreless grinding	*1*	*K1*	*CO5*
18.	What is a key advantage of centreless grinding? (a) Ability to grind large workpieces (b) No need for centers or fixtures (c) High precision (d) Low energy consumption	*1*	*K1*	*CO5*
19.	In which grinding process is a magnetic chuck commonly used? (a) Centreless grinding (b) Internal grinding (c) Surface grinding (d) Cylindrical grinding	*1*	*K1*	*CO5*
20.	Which type of grinding wheel is best suited for high-speed applications? (a) Ceramic bonded wheel (b) Resin bonded wheel (c) Vitrified bonded wheel (d) Metal bonded wheel	*1*	*K1*	*CO5*

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21.	Describe the properties of moulding sand and how they affect casting quality.	*2*	*K2*	*CO1*
22.	List the common weld defects and their causes.	*2*	*K1*	*CO1*
23.	Identify the types of rolling operations.	*2*	*K2*	*CO2*
24.	What is shearing in sheet metal operations?	*2*	*K1*	*CO2*
25.	What is Merchant's Circle, and how does it relate to the cutting process?	*2*	*K1*	*CO3*
26.	Describe the different types of chips produced during the cutting process.	*2*	*K2*	*CO3*
27.	What is the difference between reaming and boring?	*2*	*K1*	*CO4*
28.	What are the common methods used for Gear finishing?	*2*	*K1*	*CO4*
29.	Define internal grinding.	*2*	*K1*	*CO5*
30.	Describe the factors influencing the selection of grinding wheels.	*2*	*K2*	*CO5*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31.	a)	Explain the working principles of Cupola Furnace, including their applications and advantages.	*10*	*K2*	*CO1*
		OR			
	b)	Compare and contrast the various fusion welding processes, such as Gas Welding, Manual Metal Arc Welding, and Gas Tungsten Arc Welding.	*10*	*K2*	*CO1*
32.	a)	Discuss the various forging processes. Explain the advantages and disadvantages.	*10*	*K2*	*CO2*
		OR			
	b)	Describe the principles of extrusion processes. Discuss the advantages, and applications.	*10*	*K2*	*CO2*
33.	a)	Detail the operations performed on a centre lathe, including taper turning methods.	*10*	*K2*	*CO3*
		OR			
	b)	Compare and contrast capstan lathes and turret lathes in terms of tool layout, operational capabilities and applications in manufacturing.	*10*	*K2*	*CO3*
34.	a)	Explain the constructional features and working principles of a milling machine. Including the types of milling cutters.	*10*	*K2*	*CO4*

OR

	b)	Describe the gear cutting processes in detail explain gear milling.	*10*	*K2*	*CO4*
35.	a)	Explain the Centreless grinding in detail. Include its operational principles, advantages, and typical applications.	*10*	*K2*	*CO5*
		OR			
	b)	Compare cylindrical grinding and surface grinding. Discuss the advantages and limitations.	*10*	*K2*	*CO5*
36.	a)	Discuss the applications, advantages, and limitations of metal casting processes. Include specific examples of components manufactured through casting.	*10*	*K3*	*CO6*
		OR			
	b)	Explore recent emerging areas in manufacturing processes, such as additive manufacturing and advanced machining technologies.	*10*	*K3*	*CO6*