Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering
End Sem Examination Dec-2023
AU3CO18 / ME3CO18 Manufacturing Processes -I

Programme: B.Tech. Branch/Specialisation: AU/ME

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Core prints are used to- **1**
(a) Strengthen core
(b) Form seat to support and hold the core in place
(c) Fabricate core
(d) All of these

ii. Which of the following materials requires the largest shrinkage allowance, while making a pattern for casting? **1**
(a) Cast iron (b) Brass
(c) Aluminium (d) Plain carbon steel

iii. The purpose of gate is used to- **1**
(a) Deliver molten metal into the mould cavity
(b) Act as a reservoir for the molten metal
(c) Feed the molten metal to the casting in order to compensate for the shrinkage
(d) Deliver molten metal from the pouring basin to gate

iv. A casting defect which occurs due to improper venting of sand is known as- **1**
(a) Cold shuts (b) Blow holes (c) Shift (d) Swell

v. In rolling process, roll separation force can be reduced by- **1**
(a) Increasing the roll diameter
(b) Increasing the friction between the rolls and workpiece
(c) Providing backup roll
(d) Reducing the roll diameter

vi. Spinning operation is carried out on a- **1**
(a) Hydraulic press (b) Milling machine
(c) Lathe machine (d) Mechanical press

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vii. In thermit welding, the thermit is the mixture of- **1**
(a) Aluminium and Iron oxide
(b) Oxygen and Acetylene
(c) Aluminium oxide and Cobalt powder
(d) Aluminium and Bauxite

viii. For ultrasonic welding the thickness of metal is usually restricted to- **1**
(a) 3 mm (b) 6 mm (c) 10 mm (d) 15 mm

ix. What is the correct sequence of operations in powder metallurgy? **1**
(a) Compacting, Sintering, Blending, Production of metal powder
(b) Production of metal powder, Compacting, Sintering, Blending
(c) Production of metal powder, Blending, Compacting, Sintering
(d) Production of metal powder, Blending, Sintering, Compacting

x. Powder metallurgy techniques are used in the production of- **1**
(a) High carbon steel tool (b) HSS tools
(c) Tungsten carbide tools (d) Twist drills

Q.2 i. What is the use of chaplets? **2**

ii. Explain different types of pattern allowances any three with the help of neat sketch. **3**

iii. Explain shell moulding with the help of neat sketch. **5**

OR iv. Describe various types of sands and write down their properties. **5**

Q.3 i. Define casting. What do you mean by directional solidification? **4**

ii. Discuss any six casting defects with the help of sketch. Explain reasons for casting defects and its remedies. **6**

OR iii. Derive the expression for filling time in bottom and top gating system. **6**

Q.4 i. Define rolling processes with the help neat diagram. **2**

ii. A punch is used for making holes in steel plates with thickness of 8 mm. If the punch diameter is 20 mm and force required for creating a hole is 110 kN. Determine the average shear stress in the plate. **3**

iii. Define extrusion. Explain wire and tube drawing with the help of diagram. **5**

OR iv. Write Short on following terms with the help of neat diagram. **5**
(a) Blanking
(b) Punching
(c) Notching
(d) Spinning
(e) Stretch forming

Q.5 i. Define welding. Write two advantages and limitations of welding process. **3**

ii. Differentiate between tungsten inert gas welding and metal inert gas welding. **3**

iii. Explain working principle of thermit welding with the help of sketch. **4**

OR iv. What is explosive welding? List out the applications and advantages of friction welding. **4**

Q.6 Attempt any two:

i. Define powder metallurgy. List out its advantages, limitations and applications. **5**

ii. Explain the basic steps involved in powder metallurgy. **5**

iii. What do you understand by forming and shaping of glass in powder metallurgy? **5**

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Marking Scheme

AU3CO18 / ME3CO18 Manufacturing Processes -I

Q.1	i.	(b) Form seat to support and hold the core in place		**1**
	ii.	(d) Plain carbon steel		**1**
	iii.	(a) Deliver molten metal into the mould cavity		**1**
	iv.	(b) Blow holes		**1**
	v.	(d) Reducing the roll diameter		**1**
	vi.	(c) Lathe machine		**1**
	vii.	(a) Aluminium and Iron oxide		**1**
	viii.	(a) 3 mm		**1**
	ix.	(c) Production of metal powder, Blending, Compacting, Sintering		**1**
	x.	(c) Tungsten carbide tools		**1**
Q.2	i.	Use of chaplets	(As per explanation)	**2**
	ii.	Different types …. …… sketch.	(1 Mark*3)	**3**
	iii.	Shell moulding …… sketch.	3 Marks	**5**
		Diagram	2 Marks	
OR	iv.	Their properties.	(1 Mark*5)	**5**
Q.3	i.	Define casting.	2 Marks	**4**
		Directional solidification	2 Marks	
	ii.	Six casting defects …… its remedies.	(1 Mark*6)	**6**
OR	iii.	The expression ……..	(As per explanation)	**6**
Q.4	i.	Define rolling processes	1 Mark	**2**
		The help neat diagram.	1 Mark	
	ii.	Given		**3**
		Thickness (t)= 8mm Diameter (d)=20 mm Force (F)= 110 kN f=Tdt		
		T=218.83 Mpa		
	iii.	Define extrusion.	1 Mark	**5**
		Explain wire	2 Marks	
		Tube drawing with the help of diagram.	2 Marks	
OR	iv.	Write Short on following terms with the help of neat diagram.		**5**
		(a) Blanking	1 Mark	
		(b) Punching	1 Mark	
		(c) Notching	1 Mark	
		(d) Spinning	1 Mark	
		(e) Stretch forming	1 Mark	
Q.5	i.	Define welding.	1 Mark	**3**
		Two advantages	1 Mark	
		Limitations of welding process.	1 Mark	
	ii.	Tungsten …… welding.	(As per explanation)	**3**
	iii.	Working principle of thermit welding	2 Marks	**4**
		The help of sketch.	2 Marks	
OR	iv.	Explosive welding	2 Marks	**4**
		Applications and advantages.	2 Marks	
Q.6		Attempt any two:		
	i.	Define powder metallurgy.	2 Mark	**5**
		Advantages	1 Mark	
		Limitations	1 Mark	
		Applications.	1 Mark	
	ii.	Basic steps involved in powder metallurgy.	(As per explanation)	**5**
	iii.	Forming and shaping …. Metallurgy	(As per explanation)	**5**

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