

Enrollment No.....



Faculty of Engineering
End Sem (Odd) Examination Dec-2017
AU3CO01 / FT3CO01 / ME3CO01
Production Processes

Programme: B.Tech.

Branch/Specialisation: AU/FT/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

- Q.1
- i. The following allowance is a negative allowance 1
(a) Shake (b) Machining (c) Draft (d) Shrinkage
 - ii. The following sand has 50 percent of clay and dries hard 1
(a) Loam sand (b) Dry sand (c) Green sand (d) Natural sand
 - iii. Cupola is best method for melting metals 1
(a) Aluminium alloy (b) Ferrous metal
(c) Non-ferrous metal (d) Alloy of copper
 - iv. Following is vertical passage that connects the pouring basin and the runner 1
(a) Gate (b) Sprue (c) Cope (d) Riser
 - v. Dimensional accuracy in cold forging in comparison with hot forging is 1
(a) Same (b) Poor (c) Good (d) Cannot confirm
 - vi. In up-setting operation, the following is true 1
(a) Cross-section area is increased
(b) Length is increased
(c) Either (a) and (b)
(d) None of these
 - vii. Straight polarity is better for 1
(a) Thick material (b) Thin material
(c) Any material (d) Cannot say
 - viii. Maximum thickness possible in spot welding is 1
(a) 10mm (b) 30mm (c) 3mm (d) 0.3mm

P.T.O.

[2]

- ix. A part produced by Powder metallurgy is termed as **1**
(a) Welded part (b) Cast part
(c) Forging part (d) Sintered part
- x. The sintering temperature is **1**
I. Below the melting point of one of the component powder
II. Above the melting point of one of the component powder
III. A compromise between strength and dimensional stability
Which of the above is (are) true
(a) Only I (b) Only II (c) II & III (d) I, II & III
- Q.2 i. What is draft allowance? How it will be provided on a pattern. **2**
ii. Discuss types of pattern with diagram. [Any 3] **3**
iii. Sketch and explain the construction and operation of die casting machine. **5**
- OR iv. Explain the operation of shell moulding process with neat sketch. **5**
- Q.3 i. What is the function of sprue well? **2**
ii. What are the different zones in cupola? Discuss any two. **3**
iii. Two casting of the same metal have the same surface area. One casting is in the form of a sphere and the other is a cube. What is the ratio of the solidification time for the sphere to that of the cube? **5**
- OR iv. Write short note on: **5**
(a) Electric arc furnace (b) Induction furnace
- Q.4 i. Discuss the advantage of forging process. [any four] **2**
ii. Compare the hot and cold rolling process. [any three] **3**
iii. Discuss with sketch the following cutting operation related to sheet metal: **5**
(a) Shearing (b) Blanking
(c) Bending (d) Cutting-off
(e) Parting-off
- OR iv. Explain the principle of forward extrusion process with neat sketch. Write also advantage and limitation. [any two] **5**

[3]

- Q.5 i. State the desirable properties of a good flux. [any four] **2**
ii. Write short note on friction welding with neat sketch. **3**
iii. Explain the process of thermit welding. Give the reaction involved in thermit welding. State the common application, advantage and limitation. [any two] **5**
- OR iv. Explain the MIG welding process with neat sketch. Give the advantage, limitation and application. [any two] **5**
- Q.6 i. Define sintering. **2**
ii. Write the design consideration for making glass. **3**
iii. Describe, step by step, manufacturing of components by powder metallurgy process. Give the advantage, limitation and application. [any two] **5**
- OR iv. Explain the following: **5**
(a) Electroplating (b) Ceramics and their application

Marking Scheme

Q.1	i.	(a) Shake	1				
	ii.	(a) Loam sand	1				
	iii.	(b) Ferrous metal	1				
	iv.	(b) Sprue	1				
	v.	(c) Good	1				
	vi.	(a) Cross-section area is increased	1				
	vii.	(a) Thick material	1				
	viii.	(c) 3mm	1				
	ix.	(d) Sintered part	1				
	x.	(c) II & III	1				
Q.2	i.	What is draft allowance? How it will be provided on a pattern	2				
		[1+1]					
	ii.	Discuss types of pattern with diagram. [Any 3]	3				
	iii.	Sketch [1]	5				
		Construction [2]					
		Operations of hot chamber die casting machine [2]					
OR	iv.	Operation of shell moulding process [4]	5				
		Neat sketch? [1]					
Q.3	i.	What is the function of sprue well? [2]	2				
	ii.	What are the different zones in cupola [1]	3				
		Discuss any two. [2]					
		Combustion zone: The combustion zone of Cupola is also called as oxidizing zone. It is located between the upper of the tuyeres and a theoretical level above it. The total height of this zone is normally from 15 cm. to 30 cm.					
		Reducing zone Reducing zone of Cupola is also known as the protective zone which is located between the upper level of the combustion zone and the upper level of the coke bed.					
		Melting zone The lower layer of metal charge above the lower layer of coke bed is termed as melting zone of Cupola.					
		Preheating zone Preheating zone starts from the upper end of the melting zone and continues up to the bottom level of the charging door. This zone contains a number of alternate layers of coke bed, flux and metal charge					
		Stack zone The empty portion of cupola above the preheating zone is called as stack. It provides the passage to hot gases to go to atmosphere from the cupola furnace					
	iii.	Num.					5
		$T_s = (V/A)^2$	[1]				
		$T_s/T_c (V_s/V_c)^2$	[1]				
		Calculation	[2]				
		Ans $T_s/T_c = 6/\pi$	[1]				
OR	iv.	Write short note on					5
		(a) Electric arc furnace	[2.5]				
		(b) Induction furnace	[2.5]				
Q.4	i.	Discuss the advantage of forging process. [any four]	2				
	ii.	Compare the hot and cold rolling process. [any three]	3				
	iii.	Discuss with sketch the following cutting operation related to sheet metal:	5				
		A. Shearing	[1]				
		B. Blanking	[1]				
		C. Bending	[1]				
		D. Cutting-off	[1]				
		E. Parting-off	[1]				
OR	iv.	Explain the principle of forward extrusion process with neat sketch. Write also advantage and limitation. [any two]	5				
		Principle of forward extrusion process	[2]				
		Neat sketch	[1]				
		Advantage and limitation. [any two]	[1+1]				
Q.5	i.	State the desirable properties of a good flux? [any four]	2				
	ii.	Write short note on friction welding with neat sketch?	3				
		Short note on friction welding	[2]				
		Neat sketch	[1]				
	iii.	Explain the process of thermit welding. Give the reaction involved in thermit welding. State the common application, advantage and limitation? [any two]	5				
		Explain the process of thermit welding.	[1]				
		Give the reaction involved in thermit welding.	[1]				
		State the common application, [any two]	[1]				
		Advantage [any two]	[1]				
		Limitation? [any two]	[1]				

OR	iv	Explain the MIG welding process with neat sketch. Give the advantage, limitation and application? [any two]	5
		Explain the MIG welding process [1]	
		Neat sketch. [1]	
		Advantage, [any two] [1]	
		Limitation [any two] [1]	
		Application [any two] [1]	
Q.6	i.	Define sintering?	2
	ii.	Write the design consideration for making glass?	3
	iii.	Describe, step by step, manufacturing of components by powder metallurgy process. Give the advantage, limitation and application. [any two]	5
		Describe powder metallurgy process. [2]	
		Advantage, [any two] [1]	
		Limitation [any two] [1]	
		Application. [any two] [1]	
OR	iv.	Explain the following	5
		Electroplating [2.5]	
		Ceramics and their application [1.5+1]	
