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

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2019

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. Which of the following is not a characteristic property of any moulding sand? **1**

(a) Flowability (b) Hardenability

(c) Green strength (d) Dry strength

ii. Why are core prints added to the patterns when cores are used? **1**

(a) They provide different cooling rates to the core

(b) They provide support to the cores and strength to the mould and core itself

(c) They are used to ease the removal of core

(d) They are used to manufacture cores

iii. The liquid metal that runs through the channels without friction in the mould obeys which of the following theorem? **1**

(a) Bernoulli's theorem (b) Clausius theorem

(c) Helmholtz's theorem (d) Carnot's theorem

iv. Which of the following chemical compound, is the most common flux added to the charge in a cupola furnace? **1**

(a) Coke (b) Methane

(c) Carbon dioxide (d) Limestone

v. The working temperature of cold working is below a certain temperature. That temperature is known as? **1**

(a) Critical temperature (b) Re crystallization temperature

(c) Transition temperature (d) None of these

vi. In which process the cross section of the metal is reduced by forcing it to flow through a die under high pressure? **1**

(a) Forging (b) Forming (c) Extrusion (d) Welding

vii. Thermit welding is a form of **1**
(a) Resistance welding (b) Gas welding
(c) Fusion welding (d) Arc welding

viii. The electro-slay welding. **1**
(a) A process which uses a mixture of iron oxide and granular aluminium
(b) Accomplished by maintaining a hot molten metal pool between plates.
(c) A process in which arc is maintained under a blanket of flux
(d) There is nothing called electro-slay

ix. Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as **1**
(a) Atomization (b) Reduction
(c) Crushing (d) Electrolysis

x. Powder of various ferrous and non-ferrous material which become brittle on heating, can be formed using **1**
(a) Atomization (b) Reduction
(c) Crushing (d) Electrolysis

Q.2 i. Give the design consideration of pattern. **3**
ii. Explain various types of pattern with diagram. **7**
OR iii. Explain various types of test for molding sand. **7**

Q.3 i. In the casting of steel under certain mold conditions, the mold constant in Chvorinov's Rule is known to be 4.0 min/cm^2. The casting is a flat plate whose length l= 30 cm, width w= 10 cm, and thickness h= 20 mm. Determine how long it will take for the casting to solidify. **3**
ii. Explain various types of defects in casting. **7**
OR iii. Explain construction and working of cupola furnace with neat sketch. **7**

Q.4 i. What is pickling? **2**
ii. Give the working principle and application of rolling process? **3**
iii. Give the basic classification of forging. **5**

OR iv. Explain various sheet metal operation. **5**

Q.5 Attempt ant two:
i. Explain TIG welding with neat sketch. **5**
ii. Explain thermit welding and give its application. **5**
iii. Explain various defects in welding, its causes and remedies. **5**

Q.6 i. What is compacting and sintering. **3**
ii. Explain various steps of preparing any product from powder metallurgical process. **7**
OR iii. What is powder metallurgy? Give its advantages, limitation and application. **7**

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Marking Scheme

AU3CO01/FT3CO01/ME3CO01 Production Processes

Q.1	i.	Which of the following is not a characteristic property of any moulding sand? (b) Hardenability	**1**
	ii.	Why are core prints added to the patterns when cores are used? (b) They provide support to the cores and strength to the mould and core itself	**1**
	iii.	The liquid metal that runs through the channels without friction in the mould obeys which of the following theorem? (a) Bernoulli's theorem	**1**
	iv.	Which of the following chemical compound, is the most common flux added to the charge in a cupola furnace? (d) Limestone	**1**
	v.	The working temperature of cold working is below a certain temperature. That temperature is known as? (b) Re crystallization temperature	**1**
	vi.	In which process the cross section of the metal is reduced by forcing it to flow through a die under high pressure? (c) Extrusion	**1**
	vii.	Thermit welding is a form of (c) Fusion welding	**1**
	viii.	The electro-slay welding. (d) There is nothing called electro-slay	**1**
	ix.	Process of forming metal powder by directing molten metal through an orifice after which it is break into small particle using high pressure fluid is known as (a) Atomization	**1**
	x.	Powder of various ferrous and non-ferrous material which become brittle on heating, can be formed using (c) Crushing	**1**
Q.2	i.	Design consideration of pattern. 0.5 mark for each (0.5 mark * 6)	**3**
	ii.	Any seven types of pattern with diagram. 1 mark for each (1 mark * 7)	**7**
OR	iii.	Types of test for molding sand. 2 marks for each test (2 marks * 3) 6 marks Proper explanation 1 mark	**7**
Q.3	i.	Determine how long it will take for the casting to solidify. Area 1 mark Volume 1 mark Time 1 mark	**3**
	ii.	Types of defects in casting 1 mark for each defect (1 mark * 7)	**7**
OR	iii.	Cupola furnace Diagram 2 marks Construction 2 marks Working 3 marks	**7**
Q.4	i.	Definition of pickling	**2**
	ii.	Working principle 1.5 marks Application of rolling process 1.5 marks	**3**
	iii.	Basic classification of forging.	**5**
OR	iv.	Sheet metal operation 1 mark for each operation (1 mark * 5)	**5**
Q.5		Attempt ant two:	
	i.	TIG welding 3 marks Diagram 2 marks	**5**
	ii.	Thermit welding 3 marks Its application 2 marks	**5**
	iii.	Defects in welding, its causes and remedies 1 mark for each (1 mark *5)	**5**
Q.6	i.	Compacting 1.5 marks Sintering 1.5 marks	**3**
	ii.	Steps of preparing any product from powder metallurgical process 1 mark for each step (1 mark * 7)	**7**
OR	iii.	Powder metallurgy 3 marks Its advantages 2 marks Limitation 1 mark Application 1 mark	**7**

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