

# Jharkhand University of Technology, Ranchi

## Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Machine Tool Technology

Subject Code : MET-304

Time Allowed : 3 Hours

Full Marks : 70

Answer in your own words.

Answer five questions in which Question No. 1 is compulsory.

All questions carry equal marks.

1. Choose the correct alternative:

2×7=14

- (i) The point angle in High Speed Twist Drill is  
 (a) 60° (b) 118° (c) 128° (d) 80°
- (ii) A Grinding wheel is specified by  
 (a) Grain size (b) Grit size (c) Grade (d) All of these
- (iii) In cutting tools crater wear develops at  
 (a) the rake surface. (b) the principle flank (c) the auxiliary. (d) the tool nose.
- (iv) Which of the following part of Lathe moves in a direction normal to the axis of spindle?  
 (a) Cross slide (b) Saddle (c) Compound rest (d) Chuck
- (v) During thread cutting which of the following is used to give power feed?  
 (a) Rack and Pinion (b) Planer Mechanism (c) Quick Return Mechanism (d) Using Split Nut
- (vi) Which of the following can be effectively used for holding eccentric job?  
 (a) Four Jaw chuck (b) Three Jaw chuck (c) Both Three Jaw and Four Jaw (d) Two Jaw chuck
- (vii) Arbors in Milling Machines are generally used to  
 (a) hold cutters (b) hold workpiece on table (c) act as auxiliary spindle (d) None of these



304

( 2 )

2. (a) What is Tool Life? Explain factors affecting Tool Life.  
(b) What is chip? Explain different types of chip. 7+7
3. (a) Write down the Types and Qualities of a Good Cutting Fluids.  
(b) What do you understand by Bond and Abrasive? Explain principle Bond Material. 7+7
4. (a) According to Construction and Design, classify Lathe.  
(b) Describe Function and Position of main parts of Lathe. 7+7
5. (a) What are the various methods of Taper Turning? Explain any one of them.  
(b) Describe different parts of Twist Drill and their functions. 7+7 sep
6. (a) What do you understand by Traditional and Non-traditional Machining process? Distinguish between them.  
(b) With neat sketch explain principle and operation of Electrodischarge Machining Process *Spa. not* (EDM). 7+7
7. Write short notes on *any four*: 3.5×4=14
  - (a) Feed Mechanism
  - (b) Counter Sinking and Tapping
  - (c) Keyways and V-slot
  - (d) Knurling and Chamfering
  - (e) Feed, Speed and Depth of Cut

301  
METAL

## Jharkhand University of Technology, Ranchi

### Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Foundry Technology

Subject Code : MET 301

Time Allowed : 3 Hours

Full Marks : 70

Answer in your own words.

Answer five questions in which Question No. 1 is compulsory.

The figures in the margin indicate full marks.

All questions carry equal marks.

#### 1. Choose the correct alternative:

2×7=14

- (i) The addition of coal dust to the green moulding sand is to improve  
(a) permeability (b) surface finish  
(c) Mouldability (d) green strength
- (ii) A casting defect which results in general enlargement of a casting is known as  
(a) shift (b) sand wash  
(c) swell (d) scab
- (iii) Molten metal is transported down into the mould by the  
(a) gate (b) sprue  
(c) runner (d) riser
- (iv) Toys and ornaments of non-ferrous alloys are made by  
(a) die casting (b) centrifugal casting  
(c) permanent mold casting (d) slush casting
- (v) Surface finish of casting depends upon  
(a) mould dressing (b) pattern finish  
(c) sand compactness (d) All of these
- (vi) Match plate pattern is used in  
(a) green sand moulding (b) bench moulding  
(c) pit moulding (d) machine moulding
- (vii) Blow holes in sand casting are caused by  
(a) lower strength of the solidified metal (b) higher moisture in the moulding sand  
(c) faulty moulding flask (d) poor casting design

2. (a) What are main constituents of moulding sand ? How are binders classified?

(b) What do you mean by green strength and dry strength as applied to moulding sand?

7+7

36493

Please Turn Over

mechanical  
11 spare

301

(2)

3. (a) What do you understand from 'gating system'? Explain with help of suitable sketch.  
(b) What are chaplets? Why they are used?
4. (a) Explain the cupola furnace and its construction with neat sketch.  
(b) What are the main advantage and disadvantage of die-casting?
5. (a) What is the difference between gravity die casting and pressure die casting?  
(b) Explain different types of pattern.
6. (a) With the help of neat diagram describe the process of true centrifugal casting.  
(b) What is investment casting? What are the main materials used for making the investment pattern?
7. Write short notes on any four:
- (a) Defects due to faulty heat treatment
  - (b) Dry reclamation
  - (c) Pattern allowances
  - (d) Loam sand
  - (e) Core prints
  - (f) Chills and Chaplet

7+7  
requires

requires

7+7  
Cupola

7+7

7+7

3.5×4=14





302  
METAL

## Jharkhand University of Technology, Ranchi

### Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Iron Making

Subject Code : MET 302

Time Allowed : 3 Hours

Full Marks : 70

Pass Marks : 00

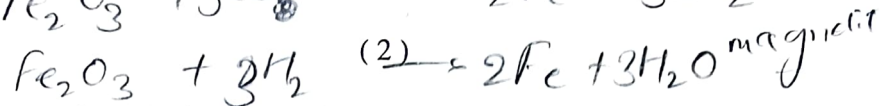
*Answer in your own words.**Answer any five questions in which Question No. 1 is compulsory and answer any four from rest questions.**All questions carry equal marks.*

1. Select correct answer:

2×7=14

- (i) What is the primary raw material used in the blast furnace for iron making?  
 (a) Iron ore (b) Coal  
 (c) Limestone (d) Coke
- (ii) Which temperature range is typically maintained in the blast furnace for iron making?  
 (a) 500-800°C (b) 1000-1200°C  
 (c) 1500-1700°C (d) 2000-2200°C
- (iii) What is purpose of adding binders to green pellets?  
 (a) Withstand downstream shock (b) Chemical support  
 (c) Increase porosity (d) Increase in size
- (iv) What is the major perk of using low ash coke in blast furnace?  
 (a) Increase slag rate (b) Decreases slag rate  
 (c) Decreases productivity (d) Increases consumption of fuel
- (v) Which of the following is the purest iron?  
 (a) Steel (b) Pig iron  
 (c) Cast iron (d) Wrought iron
- (vi) What is the carbon percentage present in Pig iron produced in blast furnace?  
 (a) 0.05-0.25% (b) 0.25-0.59%  
 (c) 4-5% (d) 1-2%
- (vii) What is the effect of 1% increase in methane of RAFT temperature?  
 (a) Decreases the RAFT by 6°C (b) Decreases the RAFT by 5°C  
 (c) Decreases the RAFT by 56°C (d) Increases the RAFT by 56°C

i — a  
 ii — c  
 iii — a  
 iv — b  
 v — d  
 vi — c  
 vii — d



302

2. (a) Describe operation of mineral dressing for iron making raw materials?  
(b) What is the principle of sintering?
3. (a) Schematic diagram of blast furnace with different zone wise and temperature.  
(b) Explain the reaction of different zone of blast furnace.
4. (a) Explain the Ellingham diagram of oxide.  
(b) Discuss the various component of blast furnace.
5. (a) What is irregularities and remedies of blast furnace?  
(b) What is blowing in process of blast furnace?
6. (a) What is Direct reduction and Smelting reduction process?  
(b) What is the operation of Corex process?
7. Describe the *any four* short notes on the following:

- (a) Gas based direct reduction process
- (b) Sponge iron processes-Physical chemistry of direct reduction.
- (c) Scaffolding and channeling
- (d) Pillaring and chilled hearth
- (e) Banking and blowing out

0.107

Agglomeration 7+7

7+7

7+7

7+7

3-5x4=14

1  
3  
1  
2  
2  
3  
4  
throat  
Stack  
Belly  
Bosh  
Tg-Tuyers  
Hearth

## Jharkhand University of Technology, Ranchi

### Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Non Ferrous Extractive Metallurgy

Subject Code : MET 303

Time Allowed : 3 Hours

Full Marks : 70

*Answer in your own words.*

*Answer Five questions in which Question No. 1 is Compulsory.*

*The figures in the margin indicate full marks.*

*All questions carry equal marks.*

1. Choose the correct answer:

2×7=14

- (i) The mineral from which a metal is extracted economically is called \_\_\_\_\_.  
(a) gangue material (b) ore  
(c) fuel (d) flux
- (ii) Refining of Aluminium is done by \_\_\_\_\_.  
(a) Zone refining (b) Hoop's process  
(c) Fire refining (d) Harris process
- (iii) Copper matte is a mixture of mainly \_\_\_\_\_.  
(a) copper sulphide and iron sulphide (b) copper sulphate and iron sulphate  
(c) copper oxide and iron oxide (d) copper sulphide and iron oxide
- (iv) The sulphide ore of Zinc is called \_\_\_\_\_.  
(a) zinc blende (b) calamine  
(c) zincite (d) willemite
- (v) In mond's process \_\_\_\_\_ is obtained.  
(a) liquid nickel (b) nickel vapour  
(c) nickel shots (d) a solution of nickel carbonyl
- (vi) Lead ore may be smelted in a suitable \_\_\_\_\_.  
(a) reverberatory furnace (b) rotary kiln  
(c) blast furnace (d) Dwight Lloyd machine

303

( 2 )

(vii) The calcining operation is associated with \_\_\_\_\_.

- |                |               |
|----------------|---------------|
| (a) oxides     | (b) sulphates |
| (c) carbonates | (d) silicates |

2. (a) Differentiate between Roasting and Calcination.

(b) Compare merits and demerits of Pyro-metallurgy and Hydro metallurgy. 7+7

3. (a) Explain the simplified flow sheet of Bayer process for Alumina production from Bauxite.

(b) Explain in detail the production of Aluminium by Hall-Heroult process from the pure Alumina. 7+7

4. (a) How Nickel is extracted from sulphide ore by pressure leaching?

(b) Explain the Carbonyl process for refining of Nickel. 7+7

5. (a) Explain the cyanidation process for Gold extraction.

(b) Discuss the steps involved in the extraction of Copper from sulphide ores by pyro-metallurgical process. 7+7

6. (a) Draw the flow sheet with important steps involved in the process for production of base bullion from lead ore (Galena) in the blast furnace.

(b) Explain Environmental pollution and its address related to various metal extraction processes. 7+7

7. Write short notes on *any four* of the following: 3.5×4=14

- (a) Entropy
- (b) Aluminium Alloys
- (c) Vertical Retort Process
- (d) Mond Process
- (e) Stainless Steel



301  
ALL

**Jharkhand University of Technology, Ranchi**  
**Diploma 3rd Semester Examination, 2024 (NEP)**

**Subject : Professional Skills**

**Subject Code : AUC-301**

**Time Allowed : 3 Hours**

**Full Marks : 70**

*Answer in your own words.*

*Answer any five questions in which Question No. 1 is compulsory.*

*All questions carry equal marks.*

1. Choose the correct option / answer of the following:

2×7= 14

- (i) Your resume is a tool with one specific purpose  
(a) to get a job ✓ (b) to discuss salary  
(c) to win an interview (d) to know about the work ✗
- (ii) The word interview refers to a conversation between  
(a) Interviewer (b) Interviewee  
(c) Both (a) and (b) ✓ (d) Interview
- (iii) In a group discussion, one must communicate with \_\_\_\_\_.  
(a) Hostility (b) Ignorance  
(c) knowledge ✓ (d) long sentence
- (iv) Which of these is not important in an oral presentation?  
(a) Words (b) Body language  
(c) Gestures (d) The number of people as audience ✓
- (v) How much listening effect on our communication?  
(a) 20-35% (b) 5-15%  
(c) 25-40% (d) 40-70% ✗
- (vi) A group technique used to develop many ideas in a relatively short line—  
(a) Brainstroming ✓ (b) Compromise  
(c) conflict (d) Consenses
- (vii) When a fixed list of questions is administered to all the participants in the same order, it is known as  
(a) Summative interview (b) Formative interview  
(c) Structured interview (d) Fixed question interview ✓

36497

Please Turn Over

3014



301

( 2 )

2. (a) Why do we need to prepare a good resume or CV? A resume is a mirror reflection of a person's pursuits. Explain. 7  
(b) What is Group Discussion? Explain the process of Group Discussion. 7
3. (a) How far is body language important to succeed in the interview? Discuss in detail. 7  
(b) What do you mean by Career Exploration? Explain basic components of career planning. 7
4. (a) What do you mean by presentation skills? What are strategies would you adopt to make presentation. 7  
(b) What is listening skills? What are the different types of listening skills? 7
5. (a) What are different types of non-cognitive skills and strategies? 7  
(b) What are the roles of social Etiquette in promotibg team work? 7
6. (a) What is brainstorming? What are types of brainstorming? 7  
(b) Define Trust? Explain the impotance of trust in creating a collaborative team. 7
7. Write short notes on *any four* of the following:
  - (a) Technical interview
  - (b) Cultural Etiquette
  - (c) Group Meeting
  - (d) Group Brainstorming
  - (e) Non-Cognitive skills
  - (f) Verbal communication

3.5x4=14  
Knowledge po  
person pos person

① Self Assessment (knowing your interested and strengths)  
② setting career goals  
③ exploring job option  
④ creating an action  
Website: [Diplomawallah.in](http://Diplomawallah.in)