

UNIT 1

MCQ:

1. Metals having tendency to lose electron so they are good\_\_\_\_\_.  
 (a) Oxidizing agent (b) Reagent  
**(c) Reducing agent** (d) None of these
2. Hardness of metal is increasing by making its\_\_\_\_\_?  
 (a) Compounds **(b) Alloys** (c) Size increased (d) None of these
3. Stainless steel is an alloy of:  
 (a) Carbon steel **(b) Alloy steel**  
 (c) Mixture (d) None of these
4. Roasting is essentially on which process?  
 (a) Reduction **(b) Oxidation**  
 (c) Volatization (d) All of these
5. Which of the following is used in smelting to remove impurity in metals?  
 (a) Refining (b) Leaching  
 (c) Volatization **(d) Both (a) & (c)**
6. Metals occur in nature in\_\_\_\_\_ state.  
 (a) Free (b) Chemical combined  
**(c) Both (a) & (b)** (d) None of these
7. Which of following are very good conductor of heat and electricity?  
 (a) Metalloids **(b) Metals** (c) Non-metal (d) All of these
8. Sources of elements are:  
 (a) Atmosphere (b) Oceans  
 (c) Earth crust only **(d) All of these**
9. Alloys have melting point:  
 (a) Higher than their constituent elements  
 (b) Same as their constituent elements  
**(c) Lower than their constituent elements**  
 (d) None of these
10. Scrap metals are:  
**(a) Sources of metals**  
 (b) Sources of non-metals  
 (c) Waste and have no use  
 (d) None of these
11. Ore dressing includes:  
 (a) Comminution only (b) Concentration only  
**(c) Both (a) & (b)** (d) All of these
12. Brass is:  
**(a) Alloy** (b) Metal (c) Mineral (d) None of these
13. Which of following is furnace need no fuel supply and use only electricity?  
**(a) Electric furnace** (b) Blast furnace (c) Hearth furnace (d) None of these
14. Matt is the mixture of:  
**(a) Two metallic sulfide only**  
 (b) Two metallic oxide only  
 (c) Two metallic sulfide and oxide only  
 (d) None of these
15. Smoke is the:  
**(a) Gas stream from furnace**  
 (b) Solid stream from furnace  
 (c) Liquid stream from furnace  
 (d) None of these
16. Waste liquid obtained in the extraction of metal is:  
**(a) Slag** (b) Matt (c) Electrolyte (d) None of these

**SHORT QUESTIONS:**

1. Write physical properties of metals.
2. Define ores and ore minerals.
3. Define non-metals and metalloids.
4. What is mean by metallurgical slag?
5. What is mean by metallurgical smoke
6. Define flux, smelting and refining.
7. Define smelting and give its characteristics.
8. Enlist the qualifications of slag.
9. Define sintering and enlist the purposes of roasting.
10. Enlist the four most common methods of roasting.
11. Enlist the two advantages of ore dressing.
12. Enlist the various types of furnaces.

**LONG QUESTIONS:**

1. Discuss classification of ores.
2. Explain criteria for the mineral to be an ore.
3. Write a short notes on:
  1. Alloys
  2. Secondary metals
  3. Furnaces
  4. Ore dressing
  5. Ore sampling
4. What are alloys? Discuss the types of alloys.
5. Discuss the purposes of making of alloys.
6. Discuss the characteristics of metals.
7. Make comparison between following:
  1. Drying and calcining
  2. Roasting and sintering
  3. Palletizing and bricking

**UNIT 2**

**MCQ:**

- Which of following is important mineral ore of Nickel?  
(a) Calcite ore (b) Bauxite ore  
**(c) Sudbury ore** (d) Niccolite
- Aluminium is manufacture from:  
(a) Alunite (b) Kaolinite **(c) Bauxite** (d) Dolomite
- Alumina content in Bauxite is?  
(a) 40-45% (b) 10-15% **(c) 55-60%** (d) 85-95%
- By which method Nickel metal is extracted from its sulphide?  
**(a) Pyro metallurgy** (b) Electro metallurgy  
(c) Hydro metallurgy (d) None of these
- By which method Silver metal is extracted from its sulphide ore?  
(a) Pyro metallurgy (b) Electro metallurgy  
**(c) Hydro metallurgy** (d) None of these
- In cynidation process of extraction of silver the solution employed is of:  
(a) Sodium chloride (b) Sodium nitrate  
**(c) Sodium cynide** (d) Silver nitrate
- Refining of crude gold is done by:  
(a) Parting with Zn dust (b) Parting with  $H_2SO_4$  dust  
**(c) Both (a) & (b)** (d) None of these
- Bronzes are mainly alloy of:  
(a) Copper and Zinc (b) Copper and Iron  
**(c) Copper and Tin** (d) Copper and Nickel
- Amalgatio process of silver extraction is known as  
**(a) Maxican process** (b) Texas process  
(c) Chinese process (d) All of these
- Mond's process is used to extract:  
(a) Zinc **(b) Nickel** (c) Cobalt (d) Aluminum

**SHORT QUESTIONS:**

- State important mineral ores aluminium.
- State important mineral ores silver.
- State important mineral ores magnesium.
- State important mineral ores nickel.
- Write commercial uses of silver and aluminium.
- Explain steps of purification of Bauxite ore by serpeck's process.
- Explain the function of cryolit in extraction of alumina other then as solvent for bauxite.
- Why aluminium cannot be extracted by reduction of its ore by carbon?
- Explain preparation of  $MgCl_2$  from sea water.
- Explain preparation of  $MgO$  from dolomite.
- Enlist the steps of extraction for Zinc.

**LONG QUESTIONS:**

- Discuss Hall electrolytic cell process for manufacture of Aluminium.
- Discuss Baeyer's process and Serpeck's process for manufacture of Aluminium.
- Explain the steps involved in extraction of Nickel metal.
- Discuss the manufacture of Mg from  $MgCl$  using electrolytic process.
- Discuss the manufacture of Ag (silver) by Amalgamation process.
- Discuss in brief the extraction of Ag from its sulfide ore by cyanidation process.
- Explain the purification of Bauxite ore for preparation of Alumina.
- Discuss in brief the steps involved in the manufacture of nickel from its sulphide.

**UNIT 3**

**MCQ:**

1. The main engineering requirement of materials falls under \_\_\_\_\_ category?  
(a) Fabrication (b) Service  
(c) Economical **(d) All of these**
2. Purest form of iron is:  
(a) Pig iron **(b) Wrought iron**  
(c) Cast iron (d) Steel
3. Duralumin is an alloy of:  
**(a) Aluminum** (b) Copper  
(c) Iron (d) All of these
4. Stainless steel is an alloy of:  
**(a) Fe, Cr** (b) Fe, Ni  
(c) Fe, Cr, Ni (d) All of these
5. Grey cast iron possesses greyish colour due to presence of:  
**(a) Graphite** (b) Iron carbide  
(c) Both (a) & (b) (d) Iron
6. Antimony is a:  
**(a) Metal** (b) Ceramic  
(c) Non-metal (d) None of these
7. Ceramics materials are :  
(a) Organic (b) Inorganic  
(c) Both (a) & (b) (d) Ferrous
8. Which of following is not organic material?  
(a) Rubber (b) Plastic  
(c) Wood **(d) Brick**
9. Which of following is ceramic material?  
(a) Paint (b) Plastic  
(c) Wood **(d) Insulator**
10. Which of following is organic material?  
(a) Brick (b) Plaster  
**(c) Wood** (d) Insulator

**SHORT QUESTIONS:**

1. List the properties of material for selection of engineering applications.
2. List factors to be considered for engineering material of selection.
3. Define materials and engineering materials.
4. Enlist the main engineering requirement of materials.
5. Enlist the various forms in which steels are marketed.
6. Enlist the various forms in which cast iron are marketed.
7. Distinguish between pig iron and cast iron.
8. Write properties and uses of aluminium.
9. Name types of cast iron.

**LONG QUESTIONS:**

1. Discuss the classification of engineering materials.
2. What is cast iron? Discuss about varieties of cast iron.
3. Give classification of carbon steels.
4. What are alloy steel? Explain the need for making alloy steels.
5. Write composition, properties and uses of following:
  1. Stainless steel
  2. Duralumin
  3. Monel metal
  4. Gun metal

5. Nicrom
6. Discuss about following:
  1. Brasses
  2. Bronzes
  3. Aluminium alloys

**UNIT 4**

**MCQ:**

- Which is the most important ferroelectric ceramic?  
(a)  $\text{SiO}_2$  (b)  $\text{CaSiO}_3$  (c)  **$\text{BaTiO}_3$**  (d)  $\text{Al}_2\text{O}_3$
- Which plastic is used in safety glass to reinforce it?  
(a) **Vinyl** (b) Polythene (c) Teflon (d) None of these
- Most glasses produced being belong the category of :  
(a) Borosilicate glass (b) Potash glass (c) **Soda glass** (d) Flint glass
- Lime stone mainly consist of:  
(a)  $\text{SiO}_2$  (b)  **$\text{CaCO}_3$**  (c)  $\text{BaTiO}_3$  (d)  $\text{Al}_2\text{O}_3$
- Which type of following refractory silica bricks belongs:  
(a) **Acidic** (b) Basic (c) Neutral (d) None of these
- Ceramics means:  
(a) Clay products (b) Refractory (c) Whiteware (d) **All of these**
- The function of gypsum in cement is:  
(a) Start the settling (b) **Retard the initial settling**  
(c) Increase settling time (d) None of these
- Which of the following is neutral refractory:  
(a) **Graphite** (b) Dolomite (c) Silica (d) Magnesite
- The main constituent of glass is:  
(a)  **$\text{SiO}_2$**  (b)  $\text{CaO}$  (c)  $\text{Na}$  (d)  $\text{Al}_2\text{O}_3$
- Clay contains mainly:  
(a) Silica (b) Alumina (c) Lime (d) **Both (a) & (b)**
- Drainage pipe usually made of:  
(a) Whiteware (b) Porcelain (c) **Stoneware** (d) None of these
- Example of acidic refractory is  
(a) **Silica** (b) Dolomite (c) Magnesite (d) Graphite

**SHORT QUESTIONS:**

- Define glass and enlist its properties.
- Give the composition of Ordinary cement.
- State raw materials of Ordinary cement.
- Enlist the uses of cement.
- Enlist the various types of cement.
- Give the difference between wet process and dry process of cement manufacturing.
- Enlist the various types of ceramics.
- Enlist the raw material required for ceramics.
- Enlist the classification of Refractories with suitable example.
- State raw materials of Glass.
- Enlist the steps for the manufacturing of glass.
- Write short note on:
  - Annealing of glass
  - Fabrication of glass
  - Tank furnace
  - Pot furnace
  - Glass wool
  - Laminated glass
  - Safety glass
  - Fibre glass
  - Coloured glass

**LONG QUESTIONS:**

- Enlist the various raw materials of whitewares and discuss its manufacture. Enlist the purposes to applied glazing.
- Discuss the manufacturing of Refractories. Enlist its properties.
- Discuss the manufacture of whitewares.

4. Discuss the manufacture of Ordinary Cement.
5. Explain the manufacturing of glass with neat block diagram.
6. Enlist the properties of glass and discuss it's types and application.
7. Explain the pot furnace and tank furnace with neat diagram.