

Code No: A109211803

R09**Set No. 2**

II B.Tech I Semester Examinations, MAY 2011
METALLURGICAL ANALYSIS
Metallurgy And Material Technology

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. Define the following:
 - (a) Cupellation
 - (b) Cupel
 - (c) Parting
 - (d) Scorification
 - (e) Inquartation
 - (f) Reducing power
 - (g) Oxidizing power
 - (h) Fire assaying. [15]
2. Explain the steps involved in conventional solution methods for qualitative analysis of Iron ore. [15]
3. Draw neatly the schematic diagram of a simple spectroscopy and explain the spectrograph. [15]
4. (a) What is the principle of conductometric titrations in metallurgical Analysis. [15]
(b) Draw curves for a strong base with a weak acid. [15]
5. What are the elements which forms rich carbides in alloy steels & what properties are improved based upon carbides and how they are estimated by titration method. [15]
6. Differentiate between the following:
 - (a) Persulphate - Arsenite method and chlorate or Ford and Williams method.
 - (b) Strohlein method and Eggertz method. [15]
7. Discuss the physico - chemical principles involved and equipment required in Duplication method of colorimetry and what are its applications. [15]
8. Write short notes on the following:
 - (a) Dissolution of ores.
 - (b) Classification of chemical reactions.
 - (c) List out the analytical factors used in chemical analysis. [15]

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R09**Set No. 4**

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Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. Define the following

- (a) Ore
- (b) Mineral
- (c) Alloy
- (d) Qualitative analysis
- (e) Quantitative Analysis
- (f) Flux
- (g) Slag
- (h) Dissolution

[15]

2. Explain the steps involved in conventional solution methods for qualitative analysis of Manganese ore. [15]

3. What are the optical and electronic systems used for Isolation of flame emission lines or bands and explain briefly. [15]

4. Discuss in detail about the estimation of lime from limestone by titration method. [15]

5. Explain the determination of iron in Aluminium and Its Alloys by spectrophotometry and list out the advantages and disadvantages of this process. [15]

6. Write short notes on any two:

- (a) Cyanide method used for nickel estimation
- (b) Chromium estimation by electrolysis process
- (c) Tungsten estimated by gravimetric method.

[15]

7. Write notes on

- (a) Electro chemical Analysis
- (b) Advantages and limitations of spectrographic Analysis.
- (c) Semi quantitative methods.

[15]

8. Discuss in detail about the qualitative analysis of tin by titration method and gravimetric method from solders. [15]

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R09**Set No. 1**

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METALLURGICAL ANALYSIS
Metallurgy And Material Technology

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. What is the importance of electrolysis process and explain the analysis of nickel in alloy steel by this method and also list out the advantages and disadvantages of this process. [15]
2. What are the important ores of manganese. Give their formulae, composition, occurrence and other details. [15]
3. Define the following:
 - (a) Chemical method
 - (b) Instrumental analysis
 - (c) Colorimetry
 - (d) Adsorptiometry
 - (e) Photometry
 - (f) Titration
 - (g) Standard solution
 - (h) Spectrophotometry. [15]
4. Explain the estimation of carbon and silicon in cast irons. [15]
5.
 - (a) Discuss the importance of metallurgical Analysis in metallurgical Industries.
 - (b) Discuss the importance of Instrumental Analysis in metallurgical Industries. [15]
6. Explain the steps involved in conventional solution methods for qualitative analysis of Metals and Alloys. [15]
7. Write short notes on the following:
 - (a) Indicators used in Potentiometric titrations
 - (b) Oxidizing agents used in Amperometric titrations
 - (c) Catalysts used in general titration methods
 - (d) Reducing agents used in Calorimetric methods [15]
8. Discuss in detail about the estimation of Tungsten from Alloy steels by Calorimetric titration methods. [15]

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Set No. 3

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Metallurgy And Material Technology

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. What is the importance of absorptiometric method and explain the estimation of chromium in alloy steel by absorptiometric method. [15]
2. What are the different types of furnaces which are used for fire assaying and explain in detail about the furnaces? [15]
3. Explain the fundamental physico chemical principles involved in instrumental Analysis. [15]
4. Explain about the following:
 - (a) Determination of sulphur in cast Iron by Gravimetric method.
 - (b) Determination of sulphur in cast Iron by Titration method.
 - (c) Determination of sulphur in cast Iron by Combustion method. [5+5+5]
5. Explain the determination of Iron in Aluminium and Aluminium Alloys by pulfrich photometer. [15]
6. Explain the steps involved in conventional solution method for qualitative analysis of Refractories. [15]
7. (a) How is Spectroscopy used in the analysis of various elements in an alloy?
(b) Outline the principles involved in Potentiometric titrations.
(c) List out the different types of indicators and electrodes used in Potentiometric titrations. [15]
8. Explain the fundamental physico - chemical principle involved in colorimetry and list out the advantages and disadvantages of this process. [15]
