Chapter-1

Short Question

1. Define fuel.
2. What are different types of fuels?
3. Mention few solid, liquid and gaseous fuels.
4. Define primary and secondary fuels.
5. Name any two manufactures and two by-product fuel.
6. Define by-product fuels.
7. What is the source of liquid fuel in India?
8. What is chemical fuel? Give example.
9. Mention two advantages of liquid fuel over solid fuel.
10. Write two merits of gaseous fuel.
11. Define fuel and give classification of fuel.
12. What are fossils fuels?
13. Mention places of different fuels deposit in Odisha.
14. Give two examples of natural and man-made material.

Long Question

1. What are merits and limitation of the following fuels:
    a. Solid fuel
    b. Liquid fuel
    c. Gaseous fuel
2. Differentiate between manufactured fuel and by-product fuel.
3. Discuss the important fuel resources available different region in India.
4. Explain the importance of different type fuel.
5. Discuss the important characteristics of good fuel.
6. Discuss about secondary fuel with examples.

Chapter-2

1. What is coal?
2. Define coalification.
3. What are the different verities of coal?
4. What do we mean by rank of coal?
5. What is coal cleaning or washing?
6. Define calorific value of a fuel.
7. What is meant by the term “fixed carbon”?
8. Write the significance of volatile matter of coal.
9. Distinguish between proximate and ultimate analysis of coal.
10. What is the difference between caking and coking coals?
11. How is coke superior to coal?
12. Write the composition of metallurgical coal.

13. Mention place Coking coal or metallurgical coal available in India.
14. Define and differentiate between GCV and NCV.
15. Write the full form of NCV or GCV.
16. What do you mean by ultimate analysis?
17. What is swelling index?
18. Which coal composition is relation to rank of coal?
19. Why bituminous coal is little higher calorific value than the anthracite?
20. Mention the sequence stages of wood to anthracite.
21. Write two points of selection criteria of coal.
22. What are uses of coal?
23. What do you mean by prime, Medium and semi-coking coal?
24. What are the important coal mines of odisha?
25. What is the approximate ash content of Indian coking coal?
26. What is the colour of different types of coal?
27. What is gross calorific value of a fuel?
28. How coal gas is produce?

Long Question

1. Indicate the factors which affect coalification.
2. Explain briefly different theories of coal formation.
3. Make a classification of coal.
4. Explain coking and caking properties of coal.
5. Explain proximate analysis of coal in detail. What is it significance?
6. Explain ultimate analysis of coal? Explain how fixed carbon and total carbon of coal is different.
7. Define calorific value of coal. What is NCV and GCV?
8. Write short notes on: Shatter index, composition of coal, rank of coal.
9. Discuss the various criteria for selecting metallurgical coal.
10. Discuss in brief how coal is formed under the earth's crust?
11. Differentiate between in-situe and drift theory.
12. Differentiate between metallurgical coal and coking coal.
13. Differentiate between peat and coal.
14. What is proximate and ultimate analysis of coal ? Discuss their significance. How proximate analysis is carried out.
15. What are theories of coal formation?

Coke

Short Question

1. Define coke.
2. Differentiate between coal and coke.
3. What is carbonization?
4. What are basic requirements of a metallurgical coke?
5. What is a basic principle of coke making?
6. Do we use coke as fuel only, in blast furnace?
7. What are the processes for the manufacture of coke?
8. Which processes for coke making is adopted in an integrated steel plant?
9. What is metallurgical coke?
10. Write the two characteristics of metallurgical coke.
11. Define shatter index.
12. What is low temperature Carbonization?
13. Write down the composition of metallurgical coke.
14. What property of coke is measured by shatter and mecum test?
15. What are the important uses of coke?
16. How is coke obtained?
17. Which is a better fuel- coal and coke?
18. Write merits and demerits of HTC.
19. Which type of carbonisation is made metallurgical grade coke?
20. Coal is processed in industry to get some useful products? Name those products?

Long Question

1. Describe the method of manufacturing of metallurgical coke.
2. Write short notes on beehive's oven method for manufacture of metallurgical coke?
3. Discuss HTC of coal for production of coke in detail.
4. Draw a neat flow diagram of a coke oven plant.
5. Differentiate between coal and coke.
6. Differentiate between HTC and LTC.
7. Describe two basic tests performed on coke to assess its quality.
8. Write elaborate on micum test. What do M10 and M40 indicates?
9. Define Carbonisation. Discuss the scope and prime objective of carbonisation of coal in brief.
10. State five basic requirement of a metallurgical coke.
11. Discuss various tests carried out on solid fuel briefly.

Liquid Fuel

1. What is petroleum?

2. What are main petroleum producing countries in the world?
3. What are main petroleum deposits in India?
4. How is petroleum extracted from oil wells?
5. What is coal tar?
6. Name the places where we find oil wells in India?
7. Name the fuels used to run light vehicles and heavy vehicles?
8. Name the petroleum product used for surfacing of road.
9. Is it possible to extract petroleum from under the sea bed?
10. Name the fuel which is used in jet aircraft engines.
11. Which substance is used for metalling the roads these days in place of coal tar?
12. Which material is called 'black gold'? Why?
13. Define cracking.
14. Difference between knocking in SI engine and CI engine.
15. Define octane number of petrol. How can it be improved?
16. Define cetane number of diesel. How can it be improved?
17. What is meant by refining of petroleum?
18. What is meant by auto ignation temperature of liquid fuel?
19. What is the viscosity of a liquid fuel?
20. What is cloud point?
21. What is pour point?

Long Question

1. Explain the process of formation of petroleum.
2. Write some important uses of the various constituents of petroleum.
3. What are the major products of petroleum refining? Give one use of each petroleum product.
4. Describe the process of the formation of petroleum
5. Write a short note on origin of petroleum
6. Discuss the distillation processes of crude petroleum in detail.
7. Explain the basic tests carried out on liquid fuels.
8. What do you mean by refining of petroleum? Describe in brief.
9. What is distillation process for treating crude oil? What are the various products obtained by oil distillation process?
10. Write the short notes on redwood viscometer.
11. Differentiate between flash and fire point.
12. Differentiate between cloud and pour point.
13. Differentiate between octane and cetane number.
14. What are merit and limitation of liquid fuel?
15. Discuss in detail tar distillation process.
16. Define flash point and discuss how flash point is determine.

Gaseous Fuel

Short Question

1. What is full form of LPG?
2. What is full form of CNG?
3. Name any two places in India where natural gas is found.
4. What is water gas?
5. How water gas is produce?
6. What is city/ town gas?
7. What is producer gas and how it is produce?
8. What is composition of producer gas?
9. Which has more calorific value producer gas or water gas?
10. Name the major component of natural gas.
11. Water gas is superior to producer gas. How?

Long Question

1. Differentiate between coke oven gas and blast furnace gas.
2. Explain the manufacturing of water gas. Mention its composition and uses.
3. Which factors affect coke oven gas composition and how it can be prevented.
4. How blast furnace gas is manufactured, write down its composition, characteristics and uses.
5. Short notes on producer gas verses water gas.
6. Where is natural gas found? Why is it called a clean fuel? Give the reason.
7. Differentiate between LPG and CNG.

Combustion

Short Question

1. Define oxidation
2. State Kirchhoff's law of constant heat summation
3. State Hess's law of constant heat summation.
4. What do you mean by coefficient of excess air?
5. What do you mean by air-fuel ratio?

Long Question

1. Differentiate between combustion and incomplete combustion
2. What is the principle of combustion and write down all the parameters suitable for complete combustion?

Refractory

1. Define refractories.
2. What are different types of refractories?
3. Define refractoriness.
4. What are acid, basic & neutral refractories?
5. What are the chemical formula of silica, fireclay, chromite and zircon?
6. What are approximate compositions of magnesite and chromite bricks?
7. Mention melting points of few refractory materials.
8. What is the refractory lining of blast furnace?
9. What are the lining materials of basic electric arc furnace?
10. Give two examples of basic refractories.
11. Define spalling resistance.
12. Why firing operation is carried out during manufacturing of refractory?
13. What is the main function of refractory?
14. What do you mean by gorg in refractory?
15. What is spalling resistance?
16. What is neutral refractory?
17. What is refractory used in the hearth of the blast furnace?
18. What refractory is used in the roof of the open hearth furnace?
19. What do you mean by SiC?
20. What is RUL?
21. Which refractory are uses in metallurgical furnace?

Long Question

1. Write a short note on special refractories.
2. Discuss the criteria for selection of refractories for various uses.
3. Write short notes on mullite refractory.
4. Explain the desirable properties of refractories.
5. Dicuss the method of manufacturing of fire clay brick in detail.
6. State the types of refractories to be used for different zones of blast furnace and why?
7. Explain briefly the desirable properties of a good refractory.
8. Classify different types of refractories with suitable examples.
9. Discuss the properties of fire clay and magnesia brick
10. Discuss the raw materials and manufacturing process of production of magnesite refractory.
11. What is refractory? Classify refractories.
12. Briefly explain the desirable properties of refractories.