Type: DES

Q1. Explain the methods used to analyse Carbon, Nitrogen, Hydrogen and sulfur content in Coal. (4)

Q2. How is natural gas produced and obtained? Explain. (3)

Q3. Explain about various types of producers? What are they used for? (3)

Q4. Why is wood called as a fuel of low calorific value? Explain the process of wood carbonization. (4)

Q5. Define Proximate analysis, Flash Point, Cracking, Gasification, Coalification and Net calorific value. (3)

Q6. Explain the application and the working of Jig washer and oil agglomeration processes with the help of a neat diagram. (3)

Q7. With the help of a neat diagrams explain the working of a four stroke IC engine. (4)

Q8. Why is it important to purify petroleum? Explain any 2 purification processes in detail. (3)

Q9. Why is the Dean and Stark method used? What is the importance of octane number in petroleum industry? Explain (3)

Q10. With the help of neat diagrams explain the working of reheating, blast and cupola furnaces. (5)

Q11. Briefly explain about the premixed flame. Which kind of flame is economical and why? (3)

Q12. Explain about Electrolysis of water in hydrogen production. (2)

Q13. From the data given below, calculate the cold gas efficiency using a dry blast. Clinker analysis - %dry: carbon 15.0 and ash 85.0. Heat of combustion- (–ΔHc cal/mol): CO -67,636; H_2 -68,317; C_2H_4 -337,234 and CH_4 -212,798.

Coal analysis				Gas analysis, orsat, per cent	
Per cent as charged		Per cent, dmmf			
Moisture	3.0	C	85.2	CO2	7.0
Ash	14.7	H	5.6	O2	0.7
Volatiles	35.7	N	2.8	CO	20.3
Fixed carbon	46.6	S	0.4	H2	12.5
Total	100.0	O	6.0	C2H4	0.5
		Total	100.0	CH4	3.0

Coal analysis	Gas analysis, orsat, per cent	
	N2	56.0
	Total	100.0

Dulong Formula- C_G=80.8C+344 (H-O/8)+22.2S (4)

Q14. Explain in detail about swirl-oil and rotary cup burners with the help of a neat diagrams. (4)

Q15. Why is it important to know the flame properties of a fuel during combustion process? (2)