**(CO-V) CHEMICAL FUELS (Unit-IV) PART–A**

1. Define the term Fuel. What are the requirements of a good fuel? 2. What are chemical fuels? Give their classification with example. 3. Define calorific value of fuel.What are the units of calorific value for gaseous fuels? 4. What are the advantages of gaseous fuels over solid and liquid fuels? 5. Write Dulongs formula for calculation of calorific value of fuel, write its usefulness 6. Define calorific value of a fuel. What is HCV & LCV? 7.Gross calorific value of a fuel is 3500cal/gm. If it contains 6.5%H2.Calculate its NCV. 10.Calculate the weight of air(23% oxygen by wt) required for combustion of 16Kg of methane. 11.Calculate the minimum weight of air required for complete combustion of 1kg of fuel containing c=90%, H=3.5%, O=3% and rest is ash.

14. Sulfur is a poison for a fuel. Justify the statement.

16.What is meant by knocking? How to improve anti knocking of fuel.

17.Explain octane and cetane numbers of a fuel. What is their significance.

18.What is unleaded Petrol? How is its Octane number improved? Discuss its advantages.

19.What is the approximate composition & calorific value of LPG?

20.What is the composition of CNG?

22. Give the uses and composition of diesel and petrol.

**PART –B**

23(a) A sample of coal contains 80% of carbon,15%hydrogen,and rest oxygen. Calculate the weight and volume of air needed for complete combustion of 5 Kg of coal. Air contains 21% of oxygen by volume, 23%by weight.

(b) Calculate its HCV and LCV.

24.The composition of a Producer Gas is CO2=8%;CO=27.6%;CH4=1.2%;N2=52.6%; H2=10%; O2= 0.6%.Calculate the GCV of the Gas.(CV of H2=3100Kcal/m3,CO=2970Kcal/m3,CH4=9260Kcal/m3)

25.A sample on analysis by weight, is as follows,-C=90%, H=8%, S=0.5%,O=1%, ash=0.5%. Calculate

a) the minimum quantity of air required for Complete combustion of 1Kg of fuel.

b)Calculate the air fuel ratio and volumetric analysis of dry products of combustion if 20% excess air is used. ( Given the% of Oxygen in air = 23 by weight & 21% by volume)

26.Write the principle of fractional distillation of crude oil. What are composition and uses of important fractions obtained ie. Gasoline,diesel and kerosene.

27.What is cracking? What is its significance

28.Explain moving bed catalytic cracking of heavy oil.

**Biodiesel (Unit-V)**

1.What is Biodiesel? What are its advantages over petro diesel?

2.Explain the transesterification reaction for the preparation of Biodiesel.What are its advantages and applications.