Total No. of Printed Pages—5

4 & 6 SEM TDC FCH (CBCS)
SEC 4.1/6.1

2022

(June/July)

[Skill Enhancement Course]

FUEL CHEMISTRY

Paper : SEC–4.1/6.1

Full Marks : 40
Pass Marks : 16

Time : 2 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct answer : 1×5=5

(a) Which of the following is a non-renewable energy resource?

(i) Solar

(ii) Hydrogen

(iii) Hydroelectric

(iv) Coal

(b) The different types of coal in increasing order of their carbon content is

(i) lignite < peat < sub-bituminous < bituminous < anthracite

(ii) lignite < peat < sub-bituminous < anthracite < bituminous

(iii) peat < lignite < bituminous < sub-bituminous < anthracite

(iv) peat < lignite < sub-bituminous < bituminous < anthracite

(c) Which one is the main constituent of natural gas?

(i) C_4H_{10}

(ii) C_3H_8

(iii) C_2H_6

(iv) CH_4

(d) Liquefied Petroleum Gas (LPG) is mainly a mixture of

(i) methane and ethane

(ii) propane and butane

(iii) high boiling olefins

(iv) ethane and propane

(e) The lowest temperature at which the oil ceases to flow when cooled is known as

(i) cloud point

(ii) flash point

(iii) pour point

(iv) fire point

(Continued)

2. What is biomass? What are the different types of biomass? How can biomass be converted to energy? 3

Or

Define calorific value of a fuel. On which the calorific value of a fuel depends? How the net calorific value (LHV) related to gross calorific value (HHV)?

3. *(a)* What is coal gas? Write the composition of coal gas. 2

(b) Describe how coal is formed from dead vegetation. What is this process called? 2+1=3

Or

What is pitch? Mention about the uses of pitch. 2+1=3

4. *(a)* What is knocking? How can it be overcome? 2

(b) What is octane number? A given sample of gasoline has octane number 43, what does it mean? 1+1=2

(c) Answer any *two* from the following : 3×2=6

(i) What are the various fractions obtained by the fractional distillation of petroleum? Give one use of it. 2+1=3

(ii) What is cracking? Mention few catalysts used in refinery cracking. How is the catalytic cracking carried out? 1+1+1=3

(iii) What is biogas? Write the composition of biogas. Discuss the advantages of biogas. 1+1+1=3

5. (a) What are petrochemicals? Discuss different types of petrochemicals classified on the basis of chemical structure. 1+2=3

(b) Write short notes on the following petrochemicals (any *two*) : 2½×2=5

(i) Vinyl acetate

(ii) BTX

(iii) Isoprene

6. *(a)* What is a lubricant? What are the characteristics of a good lubricating oil? 1+2=3

Or

What are greases? Mention the advantages and disadvantages of greases. 1+2=3

(b) What is coke number? How does it signify a better lubricating oil? 2

(c) Discuss on what factors conductivity of lubricating oil depends. 2

(d) Write short notes on (any *one*) : 2

(i) Synthetic lubricants

(ii) Viscosity index of lubricants

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