**TDC (CBCS) Even Semester Exam., 2025**

# CHEMISTRY

**( 4th Semester )**

Course No. : CHMSEC–401

**( Fuel Chemistry )**

*Full Marks* : 50
*Pass Marks* : 20

*Time* : 3 hours

*The figures in the margin indicate full marks for the questions*

## UNIT—I

**1.** Answer any *three* of the following questions : 1×3=3

*(a)* What is a primary fuel?

*(b)* Mention two uses of solar energy.

*(c)* What is meant by nuclear energy?

*(d)* Mention one important use of hydro-energy.

**2.** Answer any *one* of the following questions : 2

*(a)* Write a brief note on wind energy.

*(b)* What is solar energy? Write advantages of using solar energy.

**3.** Answer any *one* of the following questions : 5

*(a)* Write a brief note on biofuel. Discuss the classification of fuel. What is meant by calorific value? 2+1+2=5

*(b)* Write a short note on renewable sources of energy.

## UNIT—II

**4.** Answer any *three* of the following questions : 1×3=3

*(a)* What is producer gas?

*(b)* What is coal gas?

*(c)* Mention one use of methane.

*(d)* What is carbonization of coal?

**5.** Answer any *one* of the following questions : 2

*(a)* Mention the composition and use of coal gas.

*(b)* Mention a few uses of coal.

**6.** Answer any *one* of the following questions : 5

*(a)* Discuss the role of coal in various industries.

*(b)* What is the composition of water gas? Mention its synthesis and utilities.

## UNIT—III

**7.** Answer any *three* of the following questions : 1×3=3

*(a)* What is catalytic cracking?

*(b)* What is meant by CNG?

*(c)* What do you mean by biodiesel?

*(d)* What are non-petroleum fuels?

**8.** Answer any *one* of the following questions : 2

*(a)* What do you mean by cracking of petroleum?

*(b)* Discuss the composition of crude petroleum.

**9.** Answer any *one* of the following questions : 5

*(a)* Explain in detail different types of petroleum product and their applications.

*(b)* Mention the advantages and dis-advantages of biofuels and CNG.

## UNIT—IV

**10.** Answer any *three* of the following questions : 1×3=3

*(a)* What is xylene?

*(b)* Mention one natural source of toluene.

*(c)* Mention two uses of vinyl acetate.

*(d)* Write the method of preparation of butadiene.

**11.** Answer any *one* of the following questions : 2

*(a)* Synthesize propylene oxide and mention its industrial uses.

*(b)* What do you mean by green feedstock?

**12.** Answer any *one* of the following questions : 5

*(a)* Discuss the manufacture of propylene oxide along with its industrial use.

*(b)* Discuss the synthesis of xylene derivatives. Mention their industrial uses along with greener alternatives.

## UNIT—V

**13.** Answer any *three* of the following questions : 1×3=3

*(a)* What is cloud point?

*(b)* What are synthetic lubricants?

*(c)* Give one example of solid lubricant.

*(d)* What are conducting oils?

**14.** Answer any *one* of the following questions : 2

*(a)* Give examples of semi-solid lubricants and mention its uses.

*(b)* What is meant by pour point?

**15.** Answer any *one* of the following questions : 5

*(a)* Discuss briefly how lubricants are classified. Give examples of each class.

*(b)* What do you mean by synthetic lubricants? Discuss viscosity index. How is it determined?

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