

2023

4th Semester Examination

CHEMISTRY (Honours)

Paper : SEC 2-T

[CBCS]

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

(Basic Analytical Chemistry)

Full Marks : 25

Time : Two Hours

Group - A

Answer any *three* questions : $2 \times 3 = 6$

1. What is Q-test?
2. "Good precision does not assure good accuracy."
Explain the fact.
3. Define separation factor.
4. In what way TLC is superior to paper chromatography?
5. What is meant by COD of an water sample?

P.T.O.

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P.T.O.

(2)

Group - B

Answer any *two* questions : $5 \times 2 = 10$

6. (a) How does standard deviation related to accuracy?
(b) Calculate the mean and the standard deviation of the following set of analytical results : 25, 32, 25, 39, 25, 42 and 25.97g. $2+3$
7. (a) What is meant by the term R_f value?
(b) On what factors does the R_f value of a compound depends? What is the physical significance of $R_f = 0$ and $R_f = 1$? $2+2+1$
8. (a) What are the functions of food preservatives? Name the type of foods preserved by sugar and salt.
(b) What are the importance of soil pH in agriculture? $2+1+2$

Group - C

Answer any *one* question : $9 \times 1 = 9$

9. (a) What is henna? How is it made? What type of colour is produced by henna? What is its advantage over synthetic hair dyes?
(b) What is meant by hardness of water? $(1+2+2+2)+2$

(3)

10. (a) How metal indicators develop colour in EDTA titration?
- (b) Write the principle of chromatographic analysis.
- (c) Name the steps for the treatment of water for domestic use.
- (d) What is absolute error and relative error.

2+2+3+2

P.T.O.

(4)

OR

(Chemistry of Cosmetics & Perfumes)

Full Marks : 25

Time : Two Hours

Group - A

Answer any *three* questions : $2 \times 3 = 6$

1. Write the formulation of lipsticks.
2. What is SPF?
3. What are the toxic effects of Hair spray?
4. What are the properties of a good hair remover?
5. What are Neoyl and Aerosil and why these are added to face powder?

Group - B

Answer any *two* questions : $5 \times 2 = 10$

6. (a) How Geraniol can be prepared from Citral?
(b) Write the formulation of baby shampoos. $2 + 3 = 5$
7. (a) Write the name and structural formula of any four ingredients used in suntan lotion.
(b) Why TiO_2 or ZnO is mixed with face powder?

$4 + 1 = 5$

8. Write short notes on (any two) :

$2\frac{1}{2} \times 2 = 5$

- (a) Rose oil
- (b) Preservatives used in cosmetics.
- (c) Semi-permanent Hair colorants.

Group - C

Answer any *one* question :

$9 \times 1 = 9$

9. (a) Discuss the types of surfactants used to prepare shampoos.

(b) Write the method of preparation of lipsticks.

$5 + 4 = 9$

10. (a) Write the various methods involved in the preparation of compact power.

(b) Briefly discuss what types of solvents are used in the preparation of nail enamel.

$5 + 4 = 9$

P.T.O.

(6)

OR

(Pesticides Chemistry)

Full Marks : 25

Time : Two Hours

Group - A

Answer any *three* questions :

$2 \times 3 = 6$

1. What is Natural Pesticide? Give examples.
2. Write two examples of synthetic pesticides.
3. Write two uses of DDT.
4. What is organochlorine pesticides? Give examples.
5. Are organophosphate pesticides banned?

Group - B

Answer any *two* questions :

$5 \times 2 = 10$

6. Write down the synthetic methods of any two organochlorine pesticides. $2\frac{1}{2} + 2\frac{1}{2}$
7. What are carbamate pesticides? Where are carbamate pesticides used? $2 + 3$
8. How do organophosphate pesticides affect the environment? Write two examples of anilide pesticides.

(7)

Group - C

Answer any *one* question :

9×1=9

9. What is difference between natural pesticides and synthetic pesticides? What are the benefits of natural pesticides? Write the synthetic process of malathion.

3+3+3

10. What are the adverse effects of pesticides on the environment? Discuss the structure activity relationship of pesticides.

4+5

P.T.O.

(8)

OR

(Fuel Chemistry)

Full Marks : 40

Time : Two Hours

Group - A

Answer any *five* questions : $2 \times 5 = 10$

1. What are the various gasification processes of solid fuels?
2. What are secondary fuels? Give examples.
3. Define HCV.
4. What are non-renewable and renewable sources of energy?
5. What is diesel?
6. Write two advantages of CNG.
7. What do you mean by coking of coal?
8. What is biodiesel?

Group - B

Answer any *four* questions : $5 \times 4 = 20$

9. (a) How fuels are classified? Give example of each. 3
(b) Briefly describe how moisture content of a coal sample is determined? 2

10. (a) Write down the types of lubricants and briefly discuss the same. 2
- (b) What are fossil fuels? Discuss two major options to avoid their depletion from the earth crust. 1+2
11. (a) What is meant by calorific value of a fuel? How is it related with efficiency of a fuel? 2+1
- (b) Discuss the structure of graphite as solid lubricant. 2
12. (a) What are the main constituents of LPG? 2
- (b) Describe the procedure of producer-gas production mentioning the chemical reactions involved in the method. 3
13. (a) Explain the following properties of lubricants and discuss their significance : $1\frac{1}{2}+1\frac{1}{2}$
- (i) Viscosity index
- (ii) Flash point
- (b) What are benefits of gasification of coal? 2
14. (a) State the safety measures to be taken during the storage of coal. 2
- (b) How Metallurgical coke is manufactured by Otto-Hoffman's method. 3

P.T.O.

(10)

Group - C

Answer any *one* question :

10×1=10

15. Write notes on :

2½×4

- (a) Thermal cracking
- (b) Cetane number
- (c) Ultimate analysis
- (d) Rocket fuels

16. (a) What do you mean by hydrogenation of coal?
How solid fuel is converted into liquid fuel? Discuss
in detail.

2+3

- (a) Briefly discuss the fractional distillation of coal tar
with a proper schematic representation.

5
