



বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY
Question Paper

B.Sc. Honours Examinations 2022

(Under CBCS Pattern)

Semester - VI

Subject: CHEMISTRY

Paper : DSE 3-T

Full Marks : 40

Time : 2 Hours

Candidates are required to give their answer in their own words as far as practicable.

The figures in the margin indicate full marks.

(Green Chemistry)

Group - A

Answer any **four** questions from the following :

- | | | |
|----|--|-----|
| 1. | (a) “Green Chemistry is sustainable chemistry” — Explain the statement. | 2 |
| | (b) List any four limitations / obstacles in the pursuit of green chemistry. | 2 |
| | (c) Give an example of solvent free reaction. | 1 |
| 2. | (a) What is sonication ? Which effect is responsible for supplying energy in sonication? | 1+2 |
| | (b) Discuss two advantages of microwave assisted organic synthesis. | 2 |
| 3. | (a) What is super critical CO ₂ ? What are its advantages over conventional organic solvent ? | 2+2 |

(b)	Give an example of Ionic liquid.	1
4.	Carry out the following conversions considering the greener route.	
(i)	Glucose → Adipic acid	
(ii)	Corn → Poly lactic acid	2½ + 2½
5.	Write short notes on the following :	
(a)	Photo catalysis	
(b)	Atom economy	2½ + 2½
6.	Calculate the atom economy of the following reaction :	
(a)	$\text{CH}_3 - \text{CH}_2 - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{O} - \text{CH}_2 - \text{CH}_3 + \text{CH}_3 - \text{NH}_2 \rightarrow \text{CH}_3 - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{NHCH}_3 + \text{CH}_3 - \text{CH}_2 - \text{OH}$	2
(b)		3
Group - B		
Answer any two questions from the following :		10×2=20
7. (a)	What are Rightfit pigments ? List the toxicological problems associated with the conventional colourants.	2+2
(b)	What do you mean by combinatorial green chemistry ? Give example.	2
(c)	Discuss the principle of inherent safer design (ISD). How does it work for designing the green processes in Industry ?	2+2
8. (a)	Explain the working mechanism of Carbondioxide surfactant in garment industry.	2
(b)	What are antifoulants ? What were the adverse effects of the conventional antifoulant?	2+2
(c)	Catalytic reagents are superior to stoichiometric reagents. Explain.	2
(d)	Outline the green synthesis of Disodium iminodiacetate.	2

9. (a) What is biocatalyst ? Differentiate Homogenous and Heterogenous Catalysis. 2+3
- (b) Write a short note on production of healthier fats and oils. 3
- (c) What type of reaction vessels are used in microwave reactions ? 2
10. (a) Write twelve principles of green chemistry. Briefly explain any two with suitable example. 4+4
- (b) What do you mean by asymmetric catalysis ? 2

Or,

(Inorganic Materials of Industrial Importance)

Group - A

Answer any **four** from the following questions :

$5 \times 4 = 20$

1. (a) What is vitrification of glass ?
(b) How lead acid batteries are charged ? What happens when charging is done at higher voltage ? $2+(2+1)$
2. (a) What is phase transfer catalysis ? Give an example.
(b) Hydrogenation of ethene into ethane falls under which type of catalysis — explain. $(2+1)+2$
3. (a) What do you mean by “Fillers”? Give example.
(b) Give the composition of triple super phosphate. $(2+1)+2$
4. (a) What are propellants ? How they can be classified ?
(b) What is “Anodising process”? $(2+1)+2$
5. (a) What do you mean by blasting agent ? What is the difference between explosive and blasting agent ?
(b) Differentiate between ferrous and non-ferrous alloys. $(1+2)+2$
6. (a) What is decarburization reaction ?
(b) How the surface area of electrode plays a pivotal role in fuel cell ?
(c) What is armoured glass ? $2+2+1$

Group - B

Answer any **two** from the following questions :

$10 \times 2 = 20$

7. (a) What is catalyst poison ? Cite one example.
(b) Describe the steps involved in the manufacture of glass.
(c) Write the requisites of a good paint.
(d) Differentiate between primary and secondary batteries. $(2+1)+3+2+2$

8. (a) Synthesize PETN from formaldehyde
(b) What are fertilizers ? How they can be classified on the basis of their application?
(c) Write a short note on quick setting Cement.
(d) “A high detonation pressure is necessary when blasting hard, dense rock” — Explain. 2+(1+2)+3+2
9. (a) How fibre glass is different from safety glass ?
(b) Write a note on paint formulation.
(c) What are the advantages of Li-ion batteries ?
(d) Differentiate between different types of steel. 2+3+2+3
10. (a) Describe the applications of Zeolites as catalysts.
(b) What are the defects that occur during heat treatment of steel ?
(c) Write short note on metal spraying.
(d) What is the effect of adding Ba to glass ? 3+2+3+2