

Faculty of Engineering / Science

End Semester Examination May 2025

EN3BS14 / BC3BS04 Engineering Chemistry

Programme	:	B.Tech. / B.Sc.	Branch/Specialisation	:	ALL
Duration	:	3 hours	Maximum Marks	:	60

Note: All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary.
 Notations and symbols have their usual meaning.

Section 1 (Answer all question(s))

Q1. A suitable lubricant for watches-	Marks CO BL
	1 1 1

Rubric	Marks
Hazel nut oil	1

- Soap water Palm oil
 Grease Hazel nut oil

Q2. Viscosity index (VI) is a measure for the change of viscosity with change in-	1 1 1
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Rubric	Marks
Temperature	1

- Temperature Pressure
 Volume Concentration

Q3. Which of the following is used to make nonstick cookware?	1 1 1
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Rubric	Marks
Teflon	1

- PVC Polythene
 Buna -S Teflon

Q4. Natural rubber is heated with sulfur, this process is known as-	1 1 1
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Rubric	Marks
Vulcanization	1

- Galvanization Vulcanization
 Bessemerization None of the above

Q5. The phenomena of super conductors was first discovered by-	1 1 1
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Rubric	Marks
Heike Kamerlingh Onnes	1

- Heike Kamerlingh Onnes Neils bohr
 Richard Smalley Otto lehman

Q6. Carbon nano tubes are also called as-

1 1 1

Rubric	Marks
Bucky tubes	1

- Bucky tubes Bulky tubes
 Bulk tubes Buck balls

Q7. The time required by the sample component to travel through the column and reach to the detector, from the time of injection is known as- 1 1 1

Rubric	Marks
Retention time	1

- Retention factor Retention time
 Deflection time Rotation time

Q8. Deuterium lamps are used as light source in- 1 1 1

Rubric	Marks
UV spectroscopy	1

- UV spectroscopy IR spectroscopy
 Raman spectroscopy NMR spectroscopy

Q9. What is the name of method used for protection of iron by coating it with zinc? 1 1 1

Rubric	Marks
Galvanization	1

- Tinning Cathodic protection
 Galvanization Anti-rust solutions

Q10. Why the solution of AgNO_3 can not be stored in copper container? 1 1 1

Rubric	Marks
Copper is more reactive than silver so replaces silver from solution	1

- Silver is more reactive than copper Copper is more reactive than silver so replaces silver from solution
 Reactivity of copper and silver is same None from the all given options

Section 2 (Answer all question(s))

Q11. Define steam emulsification number and list any two significances of it. 2 2 2

Rubric	Marks
Definition -01 Mark Two Significances - 01 Mark	2

Q12. Classify greases with suitable examples. 3 3 2

Rubric	Marks
At least three types of Classifications-1 Marks for each classification i.e. 1 Marks X 3 = 3 Marks	3

Q13. (a) Compare and outline the differences between thick film and thin film mechanism of lubrication with suitable diagrams.

5 4 3

Rubric	Marks
At least 4 differences -04 Marks, Diagram of both mechanism --01 Mark,	5

(OR)

(b) Distinguish between Redwood viscometer no. 1 and Redwood viscometer no. 2. Compare absolute viscosity with kinematic viscosity.

Rubric	Marks
Distinguish between Redwood viscometer no. 1 and Redwood viscometer no. 2 - 03 Marks. Comparison (at least two) between the absolute viscosity and kinematic viscosity . -02 Marks	5

Section 3 (Answer all question(s))

Marks CO BL

2 2 2

Q14. Explain the degree of polymerization by giving one example.

Rubric	Marks
Explanation including definition of degree of polymerization -1.5 Marks, One example:- 0.5 Marks.	2

Q15. Discuss the classification of biopolymers with suitable examples. Write any three advantages of biopolymers. 3 3 2

Rubric	Marks
Classification of biopolymers with examples - 1.5 Marks, Three advantages of biopolymers .- - 1.5 Marks.	3

Q16. (a) Execute the preparation (with chemical reaction) and applications (five applications) of Nylon 6,6. 5 5 3

Rubric	Marks
Preparation of Nylon 6,6 - 2.5 Marks, Applications (five applications) of Nylon 6,6. - 2.5 Marks.	5

(OR)

(b) Articulate the preparation and applications (at least three) of low density polythene (LDPE) and high density polythene (HDPE).

Rubric	Marks
Preparation and applications (at least three) of low density polythene (LDPE).- 2.5 Marks, Preparation and applications (at least three) of high density polythene (HDPE).- 2.5 Marks,	5

Section 4 (Answer all question(s))

Marks CO BL

2 2 2

Q17. Write a short note on Meissner effect .

Rubric	Marks
Definition of Meissner effect and small description	2

Q18. Discuss the different types of superconductors with suitable examples.

3 3 2

Rubric	Marks
Two types of superconductors - 2 Marks, Examples of both types of superconductors - 1 Mark,	3

Q19. (a) Elucidate the properties (at least five) and applications (at least five) of optical fibers .

5 5 3

Rubric	Marks
Properties (at least five) of optical fiber - 2.5 Marks, Applications (at least five) of optical fibers 2.5 Marks,	5

(OR)

(b) Elucidate the properties (at least five) and applications (at least five) of fullerene .

Rubric	Marks
Properties (at least five) of fullerene - 2.5 Marks, Applications (at least five) of fullerene . - 2.5 Marks.	5

Section 5 (Answer all question(s))

Marks CO BL

Q20. Explain the different types of electronic transitions.

2 3 2

Rubric	Marks
Four types of electronic transitions - 2.0 Marks,	2

Q21. Demonstrate the important applications (at least four) of UV-Visible spectroscopy. Also give the statement of beer-lambert's law.

3 5 3

Rubric	Marks
Four Applications of UV-Visible spectroscopy - 2.0 Marks, One line statement of beer-lambert's law - 1.0 Mark,	3

Q22. (a) Illustrate the diagram and description of instrumentation of IR spectroscopy and also give the applications of IR spectroscopy (at least five applications).

5 5 3

Rubric	Marks
Diagram instrumentation of IR spectroscopy - 1.0 Mark, Description of instrumentation of IR spectroscopy - 1.5 Marks, Applications of IR spectroscopy (at least five)-- 2.5 Marks	5

(OR)

(b) Illustrate the instrumentation of gas chromatography by suitable diagram and describe working of it. Write at least five applications of Gas Chromatography.

Rubric	Marks
Diagram of instrumentation of gas chromatography - 1 Mark, Working of gas chromatography - 1.5 Marks, Applications of Gas Chromatography (at least five applications).- 2.5 Marks,	5

Section 6 (Answer any 2 question(s))

Marks CO BL

Q23. Discuss Gibbs free energy and describe it's applications.

5 4 3

Rubric	Marks
Discuss Gibbs free energy -.2 Marks, describe it's applications/ importance -.3 Marks.	5

Q24. "Illustrate the comparison between electrochemical and chemical corrosion. Demonstrate the important factors for corrosion of metals.

5 4 3

Rubric	Marks
comparison between electrochemical and chemical corrosion (at least three)-.3 Marks, Important factors for corrosion of metals - 2 Marks,	5

Q25. Contrast and compare the properties (at least three) of enthalpy and entropy. Illustrate the important significance of entropy.

5 4 3

Rubric	Marks
Comparison (at least three) properties of enthalpy and entropy - 3 Marks Significance of entropy (at least four) - 2 Marks	5
