2024
M.Sc.
3rd Semester Examination
CHEMISTRY
PAPER – CEM-303
Full Marks:50
Time: 2 Hours
(CEM 303-Advanced Inorganic Chemistry-II)

Group-A

Answer any ***four*** questions 2×4 = 8

1. What is the difference between excimer and exciplex?
2. Phosphorescence is favoured in solid matrix and at low temperature. Why?
3. What are the basic requirements of photochemical energy storage devices?
4. Draw the structure of 4Fe-4S.
5. write the differences between transcription and translation process,
6. What is replication? Mention the enzyme involve in the process?

Group-B

Answer any ***four*** questions 4×4 = 16

7. i)What is photosensitizer? ii)The photosensitizer properties of fullerene (C_{60}) can enhance the anticancer activity of cis-platin. Explain the role of fullerene in this context. (1+3)
8. i)What are the functions of the enzymes involved in DNA replication?ii)Write down the structure of Cyt. P-450. (2+2)
9. i)Which site in 'SOD' is redox active for its bio-activity and why? Write down its mechanistic cycle. (4)
10. i)Why cytochrome P-450 is known as oxidative enzyme? Why is it named so? ii)What is blue oxidase? (3+1)
11. i) Write the differences between photochromism and thermochromism? Explain with suitable example. (4)

12. i) Write down the structure of vitamin B_{12}**.** ii)What is the name of disease occurred in human for the deficiency of vitamin B_{12}. (3+1).

Group-C

Answer any ***two*** questions 2×8 = 16

13. i) Write the differences between PS-I and PS-II. Draw the related z-Scheme. ii) What are the functions of mRNA, rRNA and tRNA? What are the enzymes involved in transcription and translation process? (4+4)
14. i)Explain the outer-sphere redox reaction and Photo-elimination redox reaction process. (ii) Explain the Franck-Condon principle and its related states.Write the significance of 'Transition moment integral'? What do you mean by 'THEXI' and 'DOSENCO'states? (4+4)
15. i)Draw the structure of Chlorophyll and give its significance in photosynthesis. (ii)Explain the importance of Porphyrin and Corrine as ligand. (5+3)
16. i) Discuss the differences between Light Emitting Sensitizer (LES) and Light Absorbing Sensitizer (LAS)?ii)What are the differences between chemosensor and chemodosimeter? iii) How PET-blocking mechanism can improve fluorescence enhancement instead of quenching? (3+3+2)

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Internal Assessment-10