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PKC/PG/IIIS/CEM-303/22

2022

M.Sc.

3<sup>rd</sup> Semester Examination

CHEMISTRY

PAPER – CEM-303 (Inorganic Special)

Full Marks :50

Time : 2 Hours

(CEM 303-Advanced Inorganic Chemistry-II)

1. Answer any **four** questions 2×4 = 8
- (a) Write an example of Metalloenzyme and the role of metal ion.
  - (b) What is replication? Mention the enzyme involved in the process?
  - (c) Define Cytochrome C oxidase.
  - (d) Draw the structure of 4Fe-4S.
  - (e) Define metal storage and transport proteins.
  - (f) What is Photosensitization? Give example.
2. Answer any **four** questions 4×4 = 16
- (a) Explain the importance of Porphyrin and Corrine as ligand.
  - (b) Draw the structure of Vitamin B<sub>12</sub> and its role in living process.
  - (c) What are the functions of mRNA, rRNA and tRNA? What are the enzymes involved in transcription and translation?
  - (d) Differences between PS-I and PS-II. Draw the z-Scheme.
  - (e) What is meant by "Quantum yield"? How does doping improve the photocatalytic activity of TiO<sub>2</sub>?
  - (f) What is photo-aquation reaction? Give example and plausible mechanism of the reaction.

3. Answer any *two* questions

2×8 = 16

- (a) Draw the structure of Chlorophyll and give its significance in photosynthesis.
- (b) Explain the outer-sphere redox reaction and Photo-elimination redox reaction process.
- (c) Explain the Franck-Condon principle and its related states? What is the significance of 'Transition moment integral'? What do you mean by 'THEXI' and 'DOSENCO' states?
- (d) Derive an expression of Stern-Volmer equation for determination of quenching rate constant. How you can determine  $K_S$  and  $K_D$  when both static and dynamic quenching takes place simultaneously?

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**Internal Assessment-10**