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Reg. No. :

Code No. : 5885

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M.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Fourth Semester

Chemistry — Core

INORGANIC CHEMISTRY — IV

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. Negative isomer shift is obtained for _____ complexes.
(a) σ bonded (b) π bonded
(c) non bonded (d) none of these
2. In SnX_4 compounds, as the electro negativity of halogens increased δ _____.
(a) decreases (b) remains constant
(c) increases (d) none of these

3. In NQR spectroscopy, a nucleus with $I = 0$ in an axially symmetric field _____ is expected in the spectrum.
- (a) two lines (b) three lines
(c) one line (d) zero line
4. The K-shell spectrum of carbon in ethyl trifluoroacetate ($C_2H_5COOCF_3$) consist of _____ lines.
- (a) one (b) two
(c) four (d) three
5. Transferrin is a _____
- (a) enzyme
(b) non protein
(c) transport and storage protein
(d) hormones
6. Cytochromes are _____ proteins.
- (a) O_2 carrier (b) electron transfer
(c) methyl transfer (d) metal transfer
7. Which one of the following enzyme converts CO_2 to carbonates?
- (a) Carboxy peptidase
(b) Super oxide dismutase
(c) Carbonic anhydrase
(d) Ascorbic oxidase

8. Cis platin is _____
(a) $\text{Pt}(\text{NH}_3)_2\text{Cl}_2$ (b) $\text{Pt}(\text{NH}_3)_4\text{Cl}_4$
(c) $\text{Pt}(\text{NH}_3)_2\text{Br}_2$ (d) $\text{Pt}(\text{NH}_3)_2\text{I}_2$
9. The temperature of the high temperature reactions can be moderated by the addition of _____
(a) zeolite (b) inert salt
(c) metal oxides (d) graphite
10. Buckminster fullerene with sixty carbon atoms is arranged in a _____ shape.
(a) rod (b) cubical
(c) spherical (d) none of these

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Account on spin state cross over determination.

Or

- (b) Write notes on isomer shift.

12. (a) State and explain Koopman's theorem.

Or

- (b) Explain the theory of photoelectron spectroscopy.

13. (a) Describe the structure of cytochromes.

Or

- (b) Write notes on rubredoxin.

14. (a) Explain the mechanism of action of ascorbic oxidase.

Or

- (b) Give an account on metal complexes as probes of nucleic acids.

15. (a) Write the synthesis of inorganic materials by low temperature method.

Or

- (b) Write notes on intercalation compounds of transition metal disulphides.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss in detail the application of Mossbauer spectra in the structural determination of oxy and deoxy hemeerthrin and catalase.

Or

- (b) Elucidate the absolute configuration of chelate complexes with the help of ORD and CD.

17. (a) Explain the theory and applications of Auger electron spectroscopy.

Or

- (b) Explain how the ionic character and hybridization of bonds and structure of charge transfer complexes are determined by NQR spectroscopy.

18. (a) Explain the structure of vitamin B₁₂ and its biological functions.

Or

- (b) List and explain the functions of metals in the biological system.

19. (a) Explain the structure, function and mechanism of action of carboxy peptidase.

Or

- (b) Describe the inhibition and poisoning mechanism of xanthine oxidase and aldehyde oxidase.

20. (a) Describe the structure and properties of fullerenes and fullerides.

Or

- (b) Discuss in detail the about insertion compounds of metal oxides.
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