TDC Even Semester Exam., 2019

CHEMISTRY

(Honours)

(2nd Semester)

Course No. : CHMH–201

(Inorganic Chemistry)

Full Marks : 35
Pass Marks : 12

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* Write three-dimensional Schrödinger's equation explaining the terms involved in the wave equation. What are the significances of and ^{2}? 2+2=4

(b) Arrange the following in the increasing order of size : 1

Mg^{2} , F , Na , O^{2} , Al^{3}

(c) Discuss briefly the diagonal relationship of element and write the factors responsible for it. 1+1=2

2. *(a)* Define screening effect and effective nuclear charge. Calculate the effective nuclear charges for Cu and Cu . 2+2=4

(b) Explain the stability of half-filled and completely-filled subshells. 3

UNIT—II

3. *(a)* Describe the use of $Na_2S_2O_3$ as a reductant in the iodometric estimation of copper (II) giving all the necessary reactions. 4

(b) Give a few examples of organic reagents that are used as precipitants in analytical chemistry. 3

4. *(a)* What are interfering acid radicals? Discuss the removal process of phosphate ion in analytical group separation. 3

(b) Write short notes on the following : 2+2=4

(i) Co-precipitation

(ii) Post-precipitation

UNIT—III

5. *(a)* Discuss the major points of shell model of nucleus. How does this model explain magic numbers? 3+1=4

(b) What are nuclear reactions? Give one example of each type of nuclear reactions. 1+2=3

6. *(a)* Discuss liquid-drop model to explain the stability of nucleus. 3

(b) Discuss one method for the detection of radioactivity. 2

(c) Write a short note on causes of radioactivity. 2

UNIT—IV

7. *(a)* Discuss the structures of diamond and graphite with special reference to their electrical conductivities. 2+2=4

(b) Write the chemical equations to represent the actions of water on methanides, allylides and acetylides. 3

8. *(a)* What is the effect of heat on boric acid? 2

(b) Draw and explain the structure of borax. 2

(c) Discuss the structure of fullerenes and carbon nanotubes. 3

UNIT—V

9. *(a)* Give the difference between the following : 2+2=4

(i) Malachite and Azurite

(ii) Chrome red and Red lead

(b) How is lithopone manufactured? Mention its uses. 2+1=3

10. *(a)* Describe the major characteristics of a good paint. 3

(b) Write a short note on Thenard's blue. 2

(c) Explain the following terms : 1+1=2

(i) Drier

(ii) Thinner

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