Reg.No : | | | | | | | | | | | |

# D. K. M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1

## SEMESTER EXAMINATIONS

## JUNE - 2022 19CCH6A

## INORGANIC CHEMISTRY - II

**Time: 3 Hours** **Max. Marks: 75**

### SECTION – A (10 x 2 = 20)

**Answer ALL the questions.**

1. What are isotones? Give examples.
2. What are magic numbers?
3. What is K electron capture?
4. State and explain Geiger-Nuttall rule.
5. Define stellar energy.
6. What do you know about moderators? Give an example.
7. Draw the structure of $Mn_2(CO)_{10}$ and $Co_2(CO)_8$.
8. What is Zeigler Natta catalyst? Explain with an example.
9. Write any two uses of zeolites.
10. Write any two biological functions of sodium.

### SECTION – B (5 x 5 = 25)

**Answer ALL the questions.**

11. (a) Give a brief account on N/P ratio and nuclear isomerism.

(Or)

(b) (i) Explain in detail about various modes of radioactive decay.

(ii) The binding energy of $_2He^4$ is 28.8 MeV. Calculate the binding energy per nucleon.

12. (a) Discuss the properties of alpha, beta and gamma rays.

(Or)

(b) Derive the kinetic equation and explain the relationship between half life period and radioactive disintegration constant.

13. (a) Give a brief account on fast breeder reactors.

(Or)

(b) Discuss the applications of radioisotopes.

14. (a) Predict whether the following complexes obeys the 18 electron rule or not. Comment on it.

(i) $[Co(CO)_4]^-$ (ii) $[V(CO)_6]^{2-}$

(Or)

(b) Describe in detail about the catalytic cycle of Mansanto acetic acid process.

15. (a) Give a brief account on the nitrogen fixation process.

(Or)

(b) Explain the structural features and biological functions of haemoglobin.

### SECTION – C (3 x 10 = 30)

**Answer any THREE of the following questions.**

16. Describe in detail about Liquid drop model and Shell model of the nucleus.
17. How will you detect and measure the radioactivity using Geiger Muller Counter and Wilson Cloud Chamber method?
18. (a) Discuss in detail about the nuclear reactions involved in atom bomb.
    (b) Give a brief account on photonuclear reactions.
19. (a) Explain in detail about the mechanism involved in hydrogenation process using Wilkinson catalyst.
    (b) Discuss the structure of $[Ni(CO)_4]$.
20. (a) Describe in detail about the role of chlorophyll in photosynthesis.
    (b) Explain the catalytic cycle of conversion of carbon dioxide into bicarbonate ($HCO_3^-$) using carbonic anhydrase enzyme.

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