101309

GS-306

IV Semester B.Sc. Examination, May/June - 2019
CHEMISTRY
Chemistry - IV
(CBCS) (F+R) (2015-16 & Onwards)

Time : 3 Hours   Max. Marks : 70

Instructions : *The question paper has **two** parts. Answer **both** the parts write equations wherever necessary.*

PART - A

Answer **any eight** of the following questions. Each question carries **two** marks.

8x2=16

1. State phase rule. Mention the terms involved.

2. State the law of constancy of interfacial angles.

3. What are radio isotopes ? Mention the radioactive isotope of hydrogen.

4. What is induced radioactivity ? Give an example.

5. What is meant by annealing of steel ?

6. Give the reaction of acetone with $LiAlH_4$.

7. Explain Knoevenagel condensation with an example.

8. Write the reaction of citric acid with hydroiodic acid.

9. What is the effect of heat on glutaric acid ?

10. How does acetaldehyde reacts with Semicarbazide ?

11. Explain why formic acid is stronger than acetic acid ?

12. How is ethyl aceto acetate is converted into Succinic acid ?

P.T.O.

PART - B

Answer **any nine** of the following questions. Each question carries **six** marks.

9x6=54

13. (a) Construct the phase diagram of sulphur system and label the parts. **4+2**

    (b) What are freezing mixtures ? Give an example.

14. (a) Explain Pattinson's process for de-silverisation of lead. **4+2**

    (b) What are carbon steels ? How are they classified ?

15. (a) Derive Bragg's equation. **4+2**

    (b) The distance between the successive planes in Nacl crystal is 0.2316 nm, when $n=1$ and $\theta = 5.5°$. Calculate the wavelength of x-ray used.

16. (a) Briefly explain : **4+2**

    (i) Smectic liquid crystals

    (ii) Nematic liquid crystals

    (b) Mention any two applications of super conductors.

17. (a) Explain nuclear fission and nuclear fusion reactions giving one example **4+2** for each.

    (b) Calculate the half life period of a radioactive element with decay constant $4.8 \times 10^{-9} s^{-1}$.

18. (a) Complete the following nuclear reactions : **4+2**

    (i) $_{11}Na^{23} + \underline{\hspace{2cm}} \rightarrow {}_{12}Mg^{23} + {}_0 n^1$

    (ii) $_6 C^{12} + {}_1 H^2 \rightarrow {}_5 B^{10} + \underline{\hspace{2cm}}$

    (iii) $_{12}Mg^{24} + {}_1 H^2 \rightarrow \underline{\hspace{2cm}} + {}_2 He^4$

    (iv) $_4 Be^9 + {}_2 He^4 \rightarrow \underline{\hspace{2cm}} + {}_0 n^1$

    (b) State group displacement law.

19. (a) Describe the production of tungsten powder from Wolframite. **4+2**

    (b) Explain Hoffmann bromamide reaction.

20. (a) How is ferrosilicon manufactured ? Mention two uses of it. 4+2
(b) What is Austenite ? Mention its properties.

21. (a) Explain the mechanism of perkin condensation.
(b) How does acetone reacts with hydrazene. Give the reaction. 4+2

22. (a) Explain the following reactions with an example :
(i) Wolf-Kishner reduction 4+2
(ii) Mannich reaction
(b) Explain saponification with an example.

23. (a) How are the following compounds synthesised from diethyl malonate : 4+2
(i) Butanoic acid
(ii) Cinnamic acid
(b) How is acetic acid obtained from methyl cyanide ? Give the reaction.

24. (a) Explain deminerilisation process in the purification of water.
(b) Mention the number of phases in the following system : 4+2
(i) ice and water
(ii) ice, liquid water and water vapour

25. (a) What is acid rain ? Mention the harmful effects of acid rain.
(b) What is Greenhouse effect ? 4+2

- o O o -