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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 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 $\theta=5.5^\circ$. 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 $4.8 \times 10^{-9} \text{s}^{-1}$.
18. (a) Complete the following nuclear reactions : **4+2**
(i) ${}_{11}\text{Na}^{23} + \dots \rightarrow {}_{12}\text{Mg}^{23} + {}_0\text{n}^1$
(ii) ${}_6\text{C}^{12} + {}_1\text{H}^2 \rightarrow {}_5\text{B}^{10} + \dots$
(iii) ${}_{12}\text{Mg}^{24} + {}_1\text{H}^2 \rightarrow \dots + {}_2\text{He}^4$
(iv) ${}_4\text{Be}^9 + {}_2\text{He}^4 \rightarrow \dots + {}_0\text{n}^1$
(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. **4+2**
(b) How does acetone reacts with hydrazene. Give the reaction.
22. (a) Explain the following reactions with an example : **4+2**
(i) Wolf-Kishner reduction
(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 demineralisation process in the purification of water. **4+2**
(b) Mention the number of phases in the following system :
(i) ice and water
(ii) ice, liquid water and water vapour
25. (a) What is acid rain ? Mention the harmful effects of acid rain. **4+2**
(b) What is Greenhouse effect ?