



Reg. No. :

Name :



K16U 2385

I Semester B.Sc. Degree (CCSS – Supple./Improv.)
 Examination, November 2016
COMPLEMENTARY COURSE IN CHEMISTRY
1C01 CHE : Chemistry for Physical and Biological Sciences
(2013 and Earlier Admn.)

Time : 3 Hours

Max. Weightage : 25

SECTION – A

(Answer **all** questions. Choose the correct answer. **Each** question carries a weightage of 1)

1. i) According to Aufbau principle after filling 4 d orbital the e^- goes to
 a) 4f b) 5p c) 4p d) 3p
- ii) The 3rd period of the periodic table contains
 a) 8 elements b) 32 elements c) 16 elements d) 18 elements
- iii) The element californium belongs to the family of
 a) actinide series b) alkali metals
 c) lanthanides d) alkaline earths
- iv) According to Bohr's theory the angular momentum of an e^- in the 4th orbit is
 a) $\frac{h}{2\pi}$ b) $\frac{2h}{\pi}$ c) $\frac{3h}{2\pi}$ d) $\frac{3h}{\pi}$
2. i) Which of the following compound has the least tendency to form H-bond ?
 a) HF b) NH_3 c) HCl d) H_2O
- ii) The nature of hybridisation in the NH_3 molecule is
 a) sp b) sp^2 c) sp^3 d) sp^3d^2
- iii) A hybrid orbital formed from s and p orbital can contribute to
 a) a σ bond only b) π bond only
 c) either σ or π bond d) none of the above
- iv) Which of the following bonds will have directional character ?
 a) Ionic bond b) Metallic bond
 c) Covalent bond d) Both covalent and metallic

P.T.O.

3. i) C-14 has a half life of 5760 years. 100 mg of the sample containing C-14 is reduced to 25 mg in
 a) 11520 Yr. b) 5760 Yr. c) 18270 Yr. d) 17280 Yr.
- ii) Hydrogen bombs are based on
 a) Natural radioactivity b) Nuclear fission
 c) Nuclear fusion d) Spontaneous chemical reaction
- iii) An isotope of ^{231}Th can be converted into ^{227}Th by the emission of
 a) one α particle b) one β particle
 c) two α and one β -particle d) one α and two β particle
- iv) Which one of the following pairs represent isobars ?
 a) $^2_1\text{H}, ^3_2\text{He}$ b) $^3_1\text{H}, ^3_2\text{He}$ c) $^{35}_{17}\text{Cl}, ^{37}_{17}\text{Cl}$ d) $^1_1\text{H}, ^2_1\text{H}$

4. i) The units of conductivity of solution are
 a) ohm^{-1} b) ohms
 c) $\text{ohm}^{-1} \text{cm}^{-1}$ d) $\text{ohm}^{-1} \text{eq}^{-1}$
- ii) At infinite dilution, the equivalent conductivity of the electrolyte is given by the expression $\lambda_{\text{eq}}^{\alpha} = \lambda^{\alpha}(+) + \lambda^{\alpha}(-)$. This expression is given by
 a) Kohlrausch b) Hittorf c) Ostwald d) Debye Huckel
- iii) When an aqueous solution of H_2SO_4 is electrolysed, the ion discharged at anode is
 a) H^- b) OH^- c) SO_4^{2-} d) O^{2-}
- iv) The laws of electrolysis were enunciated by
 a) Ostwald
 b) Avogadro
 c) Kohlrausch
 d) None of the above

(Weightage : 4×1=4)

SECTION – B

(Answer any 5 questions. Each question carries a weightage of 1)

5. Write down Schrodinger wave equation and explain the terms.
6. Write one difference between orbit and orbital.

7. Define intra-molecular H-bonding.
8. Explain sp^2 hybridisation.
9. Define isotones with examples.
10. Explain group displacement law.
11. What is ohm's law ?
12. Explain molar conductance.

(Weightage : 5×1=5)

SECTION – C

(Answer any 4 questions. Each question carries a weightage of 2)

13. Calculate the uncertainty product for a moving electron of mass $9.1091 \times 10^{-28} \text{g}$.
14. Explain all quantum numbers.
15. Explain the shape of SF_6 molecule.
16. Write short note on dsp^2 hybridisation.
17. What is carbon dating ?
18. How will you determine transport numbers by Hittorf's method ?

(Weightage : 4×2=8)

SECTION – D

(Answer any 2 questions. Each question carries a weightage of 4)

19. Explain the general characteristics of d-block elements.
20. a) What is Born-Haber cycle ?
 b) Explain the shape of :
 i) H_2O and
 ii) ClF_3 .
21. Explain the application of radioactivity in various fields.

(Weightage : 2×4=8)