

01515

**B.TECH. (AEROSPACE ENGINEERING)
(BTAE)****Term-End Examination****June, 2011****BAS-002 : APPLIED CHEMISTRY***Time : 3 hours**Maximum Marks : 70*

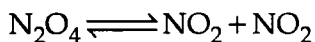
Note : *Answer seven questions in all. Question number 1 is compulsory. Use of calculator is allowed.*

1. Define *any five* of the following : 5x2=10
- (a) Collision radius
 - (b) Screening constant
 - (c) Electron affinity
 - (d) Bond energy
 - (e) Lanthanide series
 - (f) Ionization potential
 - (g) Hydro halogenation
2. (a) Write reaction for the formation of a deuteron and a positron. 5
- (b) Calculate the energy released (Q) from the fusion of ${}_3\text{Li}^6$ and ${}_1\text{D}^2$ by the reaction in terms of amu and Mev (the isotopic masses are - ${}_1\text{D}^2 = 2.01474$ amu, ${}_3\text{Li}^6 = 6.01702$ amu and ${}_2\text{He}^4 = 4.00387$ amu) 5

3. Answer *any two* of the following : 2x5=10

- (a) Binding energy and importance of binding energy curve in the release of nuclear energy.
- (b) Angular probability distribution of orbital
- (c) sp^3 hybridisation and shape of NH_3 molecule

4. (a) At $90^\circ C$, the vapour density of nitrogen tetrachloride is 24.8 for the reaction 5



- (i) State if the dissociation reaction is balanced.
- (ii) Calculate the percentage dissociation using the following expression.

$$x = \frac{P_1 - P_2}{P_2}$$

- (b) (i) Define electrode potential. Name the scientist and the theory that explains electrode potential generation. 5
- (ii) Write the factors which affect magnitude of electrode potential.

5. Give reasons for *any five* of the following : 5x2=10

- (a) The articles made of iron are coated with Ag, Au metals.
- (b) The saturated solution of KNO_3 is used to make salt bridge.

- (c) Finely divided Fe mixed with Mo is used for combination of N_2 and H_2 in Haber's Process.
- (d) The electron density on O-atom is higher than on S - atom.
- (e) Conc. H_2SO_4 shows dehydration property.
- (f) $AgNO_3$ solution is stored in covered dark bottles.
6. (a) Differentiate between addition polymerisation and condensation polymerisation. Give industrial uses of isoprene and ethene. 5
- (b) Define polymer. Give the chemical formula of monomer of teflon. 5
7. (a) Give the variation in the size of cations compared to their respective parent atoms citing the example of Na, K and F. 5
- (b) Differentiate between Van der Waals radii and Covalent radii. Give one method for the determination of ionic radii. 5
8. (a) Write the structural formulae and IUPAC names of acetylene and acetaldehyde. 5
- (b) What are the special names used for naming 1, 2 ; 1, 3 ; and 1, 4 disubstituted derivatives of benzene ? 5

9. (a) Give Haber's process for the manufacture of ammonia. 5
- (b) How benzene is obtained from coal gas ? 5
Also give the reaction (s) involved.
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