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BAS-002

00345

B.TECH. (AEROSPACE ENGINEERING) (BTAE)

Term-End Examination

June, 2014

BAS-002 : APPLIED CHEMISTRY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions in all. **All** the questions carry **equal** marks.*

1. (a) What do you understand by an atomic orbital ? Briefly describe the shapes of s, p and d orbitals. 5

   (b) What are the postulates of the Bohr's atomic model and problems associated with it ? 5

2. Answer **any two** of the following :

   (a) A mixture of 5.0 mol H_2 (g) and 10.0 mol I_2 (g) are placed in a 5 L container at 450°C and allowed to come to equilibrium. At equilibrium the concentration of HI (g) is 1.87 M. Calculate the value for K for this reaction. 5

   (b) What do you understand by standard electrode potential ? Describe in brief. 5

   (c) Explain the construction of a 'Dry Cell'. Write down the reactions taking place in such a cell. 5

3. (a) What is meant by diagonal relationship in the periodic table ? What is it due to ? Explain with the help of an example. 5

(b) Discuss the position of hydrogen in the periodic table. 5

4. (a) Describe the general characteristics of transition elements with special reference to *any two* of the following : 5

(i) Enthalpies of atomisation
(ii) Variable oxidation states
(iii) Interstitial compounds

(b) Discuss briefly the preparation and properties of allotropes of sulphur. 5

5. (a) Write the chemical reactions for the following : 5

(i) Sulphonation of benzene
(ii) Nitration of benzene

(b) Explain the following giving examples : 5

(i) Functional group in organic molecules
(ii) Homologous series and its characteristics

6. (a) Write short notes on properties of : 5

(i) ethylene
(ii) xylene

(b) Write ionic equations for the conversion of any two of the following : 3

(i) manganate to permanganate
(ii) permanganate to manganese (II)
(iii) chromate to dichromate

(c) Name the elements which are not really transition elements but are discussed with them. Why is it so ? 2

7. (a) What is meant by unidentate and bidentate ligands ? Illustrate with examples. 4

(b) Compare the chemistry of actinides with that of lanthanides with special reference to any two of the following : 6

(i) electronic configuration
(ii) oxidation state
(iii) atomic and ionic sizes
(iv) chemical reactivity

8. (a) Name the various oxides of nitrogen and give their oxidation states. 5

(b) What are polymers ? How are they classified on the basis of structure ? 5

9. (a) Write the mechanism of free radical vinyl polymerization. 5

(b) Give the preparation and two uses of two of the following : 5

(i) Bakelite
(ii) Terylene or Dacron
(iii) Teflon