

**B.Tech. AEROSPACE ENGINEERING
(BTAE)**

Term-End Examination

00305 December, 2014

BAS-002 : APPLIED CHEMISTRY

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **seven** questions. All questions carry equal marks.*

1. (a) Write the postulates of Bohr's atomic model. What are its limitations? 7
(b) List the points of difference between an orbit and an orbital. 3

2. (a) Explain the metallic bonding with the help of band theory. 6
(b) Explain Le Chatelier's Principle. 4

3. (a) Write the Nernst equation and calculate the e.m.f. of the following cell at 298 K :
$$\text{Mg(s)} | \text{Mg}^{2+}(0.001\text{M}) || \text{Cu}^{2+}(0.0001\text{M}) | \text{Cu(s)}. \quad 5$$

(b) What are fuel cells ? Describe in brief the $\text{H}_2 - \text{O}_2$ fuel cell. 5

4. (a) What are isotopes ? Discuss briefly the properties and uses of isotopes of hydrogen. 5
- (b) What is corrosion ? Explain any two methods for prevention of corrosion. 5
5. (a) Discuss the anomalous behaviour of lithium. Mention the similarities shown by lithium towards magnesium. 5
- (b) Name the chief ore of aluminium and describe the extraction of aluminium metal from this ore. 5
6. (a) Briefly describe the atomic and physical properties of inert gases. 5
- (b) What are actinides ? Discuss briefly the physical and chemical properties of actinides. 5
7. Explain the following about transition elements : 10
- (a) Have high melting and boiling points
- (b) Exhibit the tendency of complex formation
- (c) Form coloured compounds
- (d) Show catalytic behaviour
- (e) Exhibit paramagnetism
8. (a) Write the electrophilic substitution mechanism for any **one** of the following : 5
- (i) Nitration of benzene
- (ii) Sulphonation of benzene

- (b) Write short notes on the preparation of the following : 5
- (i) Ethylene
 - (ii) Propylene
9. (a) Differentiate between the following : 5
- (i) Homopolymer and Copolymer
 - (ii) Random and Alternating copolymer
- (b) Discuss the mechanism of free radical polymerization of alkene derivatives. 5
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