

**SARDAR PATEL UNIVERSITY****EXTERNAL EXAMINATION, APRIL 2016****M.Sc. INDUSTRIAL CHEMISTRY-SEMESTER 4****INDUSTRIAL HYGIENE AND SAFETY- PS04CICH07****Date: 6<sup>th</sup> April, 2016****Total marks: 70****Time: 2.30 p.m to 5.30 p.m****Answer all the questions. Figures to the right indicate marks.****Q1. Write the number of the correct statement. All questions carry 1 mark each. (8 \* 1 = 8marks)****a.. Threshold limit value of phosgene is ---- ppm**

- i. 100      ii. 0.1      iii. 1      iv. 10

**b. Identify the Chemical asphyxiant among the following**

- i. Nitrogen      ii. CO      iii. CO<sub>2</sub>      iv. Water

**c. Using of hazardous materials under less hazardous condition is called----**

- i. simplification      ii. attenuation      iii. gasketing      iv. knocking

**d. Penalty for exothermic reactions in DOW F & EI index vary from**

- i. 0.3- 1.25      ii. 0.1- 7      iii. 4-10      iv. 10-20

**e Material factor for DOW Index is adjusted using the process conditions---- & -----**

- i. flash & boiling point      ii. flash & fire point      iii. melting & boiling point      iv. None of these

**f. The guide word OTHER THAN in Hazop indicates-----**

- |                           |                           |
|---------------------------|---------------------------|
| i. Qualitative increase   | iii. Qualitative decrease |
| ii. Complete Substitution | iv. None of the above     |

**g. TLV is expressed in -----**

- i. kg/m<sup>3</sup>      ii. litres      iii. Ppm      iv. molarity

**h. Lowest temperature at which material will ignite to form a momentary flame is called-----.**

- i. flash point      ii. Fire point      iii. autoignition temp      iv. Adiabatic temp

**Q2. Answer any SEVEN ( 7 x 2 = 14 marks)**

- Enlist all the 12 SPECIAL PROCESS HAZARDS which contribute to the probability of a loss incident as used in DOW F & EI index
- What is the concept of SS?
- Define auto ignition temperature and flammability limit
- Distinguish between type I and Type II hard hats used for personal protection

- e. Mention the important parts of local exhaust ventilation system
- f. Distinguish between Simple and Chemical asphyxiants
- g. Mention major problems associated with Heat exchanger design & operation
- h. Define Flare Stack
- i. What is the importance of hot work permit in PSM ?

**Q3.**

a. Briefly discuss the principle of Hazard and Operability study, its requirements. team composition , important guide words used (06)

b. Write note on any one (06)

- Dow F & EI Index
- Fault Tree Analysis

**Q4.**

a. Describe the various hazards involved in Distillation & pumping operations (06)

b. Describe the various hazards associated with and the precautions to be taken during (06)

**Sulphonation & Halogenation**

**OR**

**Chlorination & Nitration**

**Q5.**

- a. What are the major causes of Electrical Hazards? Discuss the various preventive measures to be taken. (06)
- b. Discuss the term Mechanical Integrity (06)

**OR**

b. Discuss the term Management of Change (06)

**Q6.**

- a. Write a note on Use of FOAMS for fire extinguishing (06)
- b. Explain the various types of Gloves used in Chemical Industries (06)

**OR**

b. Explain the various respiratory protection methods used in Chemical Industries. (06)

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