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SARDAR PATEL UNIVERSITY

EXTERNAL EXAMINATION, APRIL 2016

M.Sc. INDUSTRIAL CHEMISTRY-SEMESTER 4

INDUSTRIAL HYGIENE AND SAFETY- PS04CICH07

Date: 6th 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 = 8 marks)

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. CO₂ 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/m³ 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 5S?
- 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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