

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2023**(2020 SCHEME)****Course Code : 20CHT382****Course Name: Hazard and Risk Assessment****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. Explain the Fire triangle using a sketch.
2. Elaborate the harmful effects of vibration.
3. Explain any one qualitative hazard evaluation technique.
4. What were the major reasons for the Bhopal Gas tragedy.
5. Explain the procedure for Bow-tie analysis.
6. How and when do we do a Preliminary Hazard Analysis.
7. Explain the need for fire and explosion modelling.
8. List out some release incidents encountered in the chemical industry.
9. Explain the F-N curve.
10. Differentiate between individual risk and societal risk.

PART B***(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. a) Draw and explain the flammability diagram in detail and its significance in the process industry. (10)
- b) Describe the features of the following: i) Deflagration and ii) Detonation. (4)

OR

12. a) Describe the features of the following: i) Pool fire and ii) Jet fire. (4)
- b) Elaborate various physical hazards in process industry. (10)

MODULE II

13. a) Elaborate the procedure for calculating Dow Fire and Explosion index. (10)

- b) What is MAH? (4)

OR

14. a) Describe in detail the major reasons for the Flixborough disaster of 1974. What are some preventive measures that could have been taken to prevent it. (8)
- b) Write notes on: i) Chemical Exposure Index, ii) Toxicity index and iii) ALARP triangle. (6)

MODULE III

15. a) Explain in detail the step-by-step HAZOP procedure, including the list of guide words with an example. (10)
- b) Explain the relevance of using Checklists in process plants. (4)

OR

16. a) Explain LOPA analysis in quantifying risk. (6)
- b) What are the symbols used in constructing a Fault tree. Construct a fault tree for LPG release from a storage tank located in an LPG storage terminal. (8)

MODULE IV

17. a) Write the causes and methods for preventing BLEVE in process plants. (8)
- b) Explain the concept of safe modelling. (6)

OR

18. a) Explain the procedure for Consequence analysis with a neat sketch. (10)
- b) Elaborate Dispersion modelling. (4)

MODULE V

19. a) Explain Source modelling. Describe the criteria for the selection of source models in the industry. (8)
- b) List different steps involved in risk assessment process. (6)

OR

20. a) Explain the role of On-site emergency plan in dealing with a disaster. Describe in detail the main elements of an on-site emergency plan. (10)
- b) Explain the importance of probit equation as a part of risk assessment. (4)
