

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019 - 20 Examination

Semester: 5th
Subject Code: 03112304
Subject Name: Safety Instrumented Systems

Date: 03/12/2019
Time: 10:30am – 01:00pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. What is SIS?
 (A) Safety Instrumented System (B) Safety Industrial System
 (C) System Instrumented Safety (D) System Industrial Safety
2. What is SIL?
 (A) Safety Instrumented level. (B) Safety Industrial level.
 (C) Safety Integrity level. (D) System Integrity level.
3. What is IEC?
 (A) International Electro technical Commission (B) Industry Electrical Commission
 (C) International Electronics Commission (D) Industry Electronics Commission
4. What is SMS?
 (A) Safety Management system (B) Safety Message system
 (C) Safety Mobile System (D) System Management safety
5. What is PHA?
 (A) Product Hazard Analysis (B) Process Hazard Analysis
 (C) Process Huddle Analysis (D) Product Huddle Analysis
6. Demand mode is widely applies when the safety trip is expected less than _____ per year.
7. IEC 61511 is used for _____ Industry Sector.
8. IEC 61508 part 1 was released in the _____ year.
9. PLC stands for _____.
10. OHS stands for _____.
11. SRS stands for _____.
12. PSMP stands for _____.
13. MAAP stands for _____.
14. HAZARD in SIS means _____.
15. RRF stands for _____.

Q.2 Answer the following questions. (Attempt any three) (15)

- A) Draw and explain structure of an SIS.
- B) Explain road map of safety systems.
- C) Draw layers of protection model.
- D) Explain Basic Process Control System (BPCS).

Q.3 A) Explain MAAP activity for Safety Management System (SMS). (07)

- B) Explain IEC 61511 functional safety instrumented systems for the process industry sector. (08)

OR

- B) Explain cost breakdown structure for SIS. (08)

Q.4 A) Explain key elements of IEC 61508. (07)**OR**

- A) What do you mean by IEC? Discuss all IEC standards. (07)

- B) Explain potential failure of SIS and Discuss measure to avoid failure in SIS. (08)