

501
Fire and Safety

P. P. SAVANI UNIVERSITY
First Semester of B.Sc. Fire and Safety Examination
December -2022

13.12.2022, Tuesday

Time: 09:00 a.m. to 11:30 a.m.

Maximum Marks: 60

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions

[10]

1.1 Objectives

[05]

1.1a Which of the following is an example of Very slow reaction-

- A Reaction of sodium hydroxide with hydrochloric acid
- B Rusting of iron
- C Inversion of cansugar
- D None of above

1.1b The feasibility of a chemical reaction which can be predicted by thermodynamics (as you know that a reaction with _____,

- A $\Delta G < 0$
- B $\Delta G > 0$
- C $\Delta G = 0$
- D None of Them

1.1c The change in concentration of a reactant or product in unit time

- A Chemical kinetics
- B Rate of the reaction
- C Corrosion
- D None of above

1.1d Which of the following is an example of fast reaction-

- A Reaction of sodium hydroxide with hydrochloric acid
- B Rusting of iron
- C Inversion of cansugar
- D None of above

1.1e Fire is a

- A Blast Reaction
- B Chemical kinetics
- C Corrosive Reaction
- D Chemical Reaction

1.1f Which of the following is not a part of safety t.

- A Heat
- B Chain reaction
- C Fuel
- D Oxygen

1.1g Amount of oxygen in atmosphere is ____.

- A 78
- B 21
- C 22
- D 23

1.1h Which of the following is correct.

- A $= -\frac{\Delta P}{\Delta t}$
- B $= -\frac{\Delta R}{\Delta t}$
- C $= +\frac{\Delta P}{\Delta t}$
- D $= +\frac{\Delta R}{\Delta t}$

1.1i Combustion of solid material affected by

- A Shape
- B Size
- C Both
- D None

1.1j Which of the following is not a part of safety triangle.

- A Heat
- B Chain reaction
- C Fuel
- D Oxygen

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks)

[05]

1.2a Chain reaction is a basic element of fire. (True/False)

1.2b Define: chemical kinetics

1.2c Define: Flash Point

1.2d List basic element of fire.

1.2e What is "Heat Shield"?

Q.2 Short Notes (Attempt any two)

[06]

A For any chemical reaction, chemists try to find out which three point?

B Explain Rate of a Chemical Reaction.

C Explain Combustion.

Q.3 Explain in detail (Attempt any two)

[14]

A Derive equation for Rate of Chemical Reaction.

B Explain in detail: Fire responses.

C Give detail classification of liquids.

Section-II (Total Marks - 30)

Q.1 Short Questions

[10]

1.1 Objectives

[05]

- 1.1a Arrange in priority order: (1) Incident Stabilization (2) Life Safety and Personal Protection (3) Property conservation
- A 1, 2, 3
 - B 1, 3, 2
 - C 2, 1, 3
 - D 2, 3, 1
- 1.1b Which is not a key factors in the outcome of any fire incident?
- A Esembly
 - B Fire plan
 - C Alarm notification,
 - D Evacuation
- 1.1c Which one is ODD among the following?
- A Fire extinguishers
 - B Training
 - C Fire suppression systems
 - D Hose lines
- 1.1d _____ fire elements are there?
- A 1
 - B 2
 - C 3
 - D 4
- 1.1e Which one is not used to displace oxygen?
- A CO₂
 - B Nitrogen
 - C Steam
 - D Dust
- 1.1f In CLASS "A" FIRES, A is stands for _____.
- A Any material that has a burning ember or leaves an ash
 - B Flammable liquid or gas
 - C Live electrical equipment
 - D Exotic metals
- 1.1g Ratio of the weight of a substance to an equal volume of dry air is known as _____.
- A Flash Point
 - B Vapor Density
 - C Specific Gravity
 - D None of above
- 1.1h 3% solution would be a mixture
- A 3 parts concentrate to 97 parts water
 - B 6 parts concentrate to 94 parts water
 - C 3 parts concentrate to 7 parts water
 - D 3 parts concentrate to 50 parts water
- 1.1i Which of the following is not Halon Alternatives?

- A FE-36
- B Halotron I
- C NFPA
- D NOVEC 1230

1.1j "smothering" action occurs when _____ is decomposed in a flame.

- A Water Mist
- B Wet Chemical
- C Dry Chemical
- D Halon Alternatives

1.2 **Answer the Following: (MCQ/Short Question/Fill in the Blanks)** [05]

- 1.2a What is Auto-Ignition Temperature?
- 1.2b Give one property of Hydrocarbon.
- 1.2c What is AFFF?
- 1.2d Give an example of halogenated extinguisher.
- 1.2e Give full form of FFFP.

Q.2 **Short Notes (Attempt any two)** [06]

- A Give types of Heat transfer.
- B Explain any two elements of fire.
- C How will you explain "Life Safety and Personal Protection."?

Q.3 **Explain in detail (Attempt any two)** [14]

- A Give detail classification of fire.
- B Write a short note on Safety Triangle Concept.
- C Explain Chemical foam.