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Question Paper Code: R9971

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

Open Elective

R21UCH971 – FIRE SAFETY ENGINEERING

(Regulations R2021)

(Common to All Engineering Branches)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. For fighting fires in cable tunnels and other confined areas__ foams are used. CO1 - U
(a) Low Expansion (b) Medium Expansion
(c) High Expansion (d) All of the above
2. If the 'flash point' of flammable liquid is higher, then the substance would be CO1- U
(a) More hazardous (b) Less hazardous
(c) More innocuous (d) Steady
3. The _____ gases are flammable gases that spontaneously ignite in air. CO1- U
(a) Cryogenic (b) Oxidizing (c) Pyrophoric (d) Unstable reactive
4. Firefighting Foam is not effective on the fires involving CO1- U
(a) Class D fires (b) Pressurized gas fires
(c) Three - dimensional fires (d) All of the above
5. The Mono-ammonium Phosphate Dry Chemical (ABC) fire extinguishing media extinguishes the fire by _____principle. CO1- U
(a) Smothering (b) Cooling (c) Breaking of chain reaction (d) Starvation
6. In water stored pressure fire extinguisher, the working pressure and stored pressure would remain CO1- U
(a) Same (b) Lower (c) Higher (d) None of the above

7. If combustion is to be initiated and sustained, all of the following elements must be present except the CO1- U
- (a) Application of heat (b) Elimination of carbon monoxide
(c) Presence of a fuel (d) Availability of oxygen
8. In the case of hydrocarbons fire, the formation of carbon monoxide and soot _____ with the oxygen deficiency. CO1- U
- (a) Decreases (b) Remains Same (c) Increases (d) None of the Above
9. Hot gaseous fire releases radiant energy in the form of ____ CO1- U
- (a) Infra-Red Radiation (b) Visible Light
(c) Ultraviolet Radiation (d) All of the Above
10. Any liquid with a flash point at or above 37.8°C (100°F) and below 93.3°C (200°F) is CO1- U
- (a) Flammable Liquid (b) Flammable Solid
(c) Flammable Gases (d) Combustible Liquid

PART – B (5 x 2= 10 Marks)

11. What are 5 properties of glass reinforced plastic? CO1 U
12. How do you stop a flashover? CO3- Ana
13. Are fire doors active or passive? CO3- Ana
14. How do you assess fire damaged concrete structures? CO4- App
15. What precautions must be taken when working on a fragile roof? CO5- Ana

PART – C (5 x 16= 80 Marks)

16. (a) Describe the effect of fire on fibers, textile and other household materials. CO1 U (16)
- Or
- (b) Describe briefly the ways of fire spreading? CO1 U (16)
17. (a) Explain the factors which affect the development and spread of a compartment fire? CO2- App (16)
- Or
- (b) Elaborate about ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials, also known as the (Steiner Tunnel Test). CO2- App (16)

18. (a) How many different types of fire doors can you explain? CO3- Ana (16)
Or
(b) Discuss in detail about ANSI UL 263 test standards CO3- Ana (16)
19. (a) Discuss in detail about fire protection of structural elements CO4 - App (16)
- Steel and Reinforced cement concrete.
Or
(b) Elaborate repair techniques for the following: CO4 - App (8)
(i) repair to steel structural members (8)
(ii) repair to masonry structures
20. (a) Examine in detail the fall preventive fundamental CO5 - Ana (16)
importance, methods and protocols used by employees at
higher levels.
Or
(b) Examine the requirements for a safe work environment of CO5 -Ana (8)
(i) safety belts (8)
(ii) gangways

