

Total No. of Questions: 6

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Enrollment No.....



Faculty of Engineering  
End Sem (Even) Examination May-2022  
FT3CO17 Fire Engineering -II

Programme: B.Tech.

Branch/Specialisation: FT

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1
- i. The IS-Code for crash fire tender is: 1  
(a) IS-951 (b) IS-950 (c) IS-952 (d) IS-953
  - ii. Which of the following method does not indicates fire extinguishment? 1  
(a) Starvation (b) Chain reaction  
(c) Cooling (d) Smothering.
  - iii. Choose the correct category of firefighting pipe among following: 1  
(a) Hose box (b) Hose pipe  
(c) Hose reel (d) Hose fittings
  - iv. The occurrence of flash fire will take place when: 1  
(a) Liquid store at its boiling point  
(b) Liquid store at below its boiling point  
(c) Liquid store at above its boiling point  
(d) None of these
  - v. The full form of BLEVE is: 1  
(a) Boiling liquid explosion vapor expansion  
(b) Boiling liquid expanding vapor explosion  
(c) Boiling liquid escaping vapor expansion  
(d) Boiling liquid expansion vapor escaping
  - vi. Formula to calculate risk considering risk perception is: 1  
(a)  $R = P \times C^y$  (b)  $R = P^y \times C$   
(c)  $R = P^y \times C^y$  (d) None of these

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[2]

- vii. Liquefied petroleum gas composition is: **1**  
 (a) Propane and Butane (b) Methane and Propane  
 (c) Butane and Methane (d) None of these
- viii. The full form of JSA is: **1**  
 (a) Job Safety Analysis (b) Job Safety Assessment  
 (c) Job Safety Advantage (d) None of these
- ix. .... Section indicates the appointment of safety officer inside a factory: **1**  
 (a) 40A (b) 40B (c) 41A (d) 41B
- x. In PSC concept primary failure of components are due to: **1**  
 (a) Excessive stress  
 (b) Human error  
 (c) Inadvertent control signals  
 (d) Wear and tear
- Q.2 i. Give any four specific characteristics of rescue tender as per IS: 949-1985? **2**  
 ii. Differentiate active and passive fire protection system with suitable examples. (Any three) **3**  
 iii. Give the empirical equations in different fire growth stages? Explain method of fire extinguishment in detail? **5**
- OR iv. Write the different components for an ideal fire pump house? Differentiate the functions of main fire pump and standby fire pump? **5**
- Q.3 i. Specify the IS code number for coupling, branch pipe, nozzle use in hose reel tubing for firefighting? **2**  
 ii. Draw a simple design fire curve in between heat release rate and time for a burning pool of gasoline? **8**
- OR iii. Give the expression for estimating the burning characteristics of liquid pool fire on the following points: **8**  
 (a) Heat release rate (b) Burning duration  
 (c) Flame height
- Q.4 i. Write a short note on features available within extension ladder and hook ladder? **3**

[3]

- ii. Write an expression on BLEVE effects in terms of fire ball mainly relate to human injury on the basis of followings: **7**  
 (a)  $E_r$ - Emissive radiative heat flux  
 (b)  $v_a$  – Transmissivity  
 (c) H- height of the fire ball from the ground  
 (d) D and L are diameter of fire ball and distance of receptor at ground level respectively
- OR iii. What are the different types of small gears used in rescue operation? Give a brief note on ropes and lines concern with rescue techniques? **7**
- Q.5 i. Explain the working principle of breathing apparatus with the help of neat and clean diagram? **4**  
 ii. A group of 03 workers assigned the task for cleaning a silo inside the factory. Demonstrate the JSA technique from safety officer point of view? **6**
- OR iii. Enlist the salient feature of IOCL Jaipur fire case study on the following points: **6**  
 (a) Logic diagram on initiating drives  
 (b) Possible causes of fire  
 (c) Findings and improvement in fire safety legislations
- Q.6 Attempt any two: **5**  
 i. Differentiate between accident and incident data? Explain qualitative and quantitative differences in both types of data? **5**  
 ii. Explain the organization structure of safety committee? What are the various function must be performed by the safety committee as per norms? **5**  
 iii. What are the duties and responsibility shall be performed by a safety officer in an organization? **5**

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**Marking Scheme**  
**FT3CO17 Fire Engineering -II**

Q.1	i.	The IS-Code for crash fire tender is: (a) IS-951	1
	ii.	Which of the following method does not indicates fire extinguishment? (b) Chain reaction	1
	iii.	Choose the correct category of firefighting pipe among following: (b) Hose pipe	1
	iv.	The occurrence of flash fire will take place when: (c) Liquid store at above its boiling point	1
	v.	The full form of BLEVE is: (b) Boiling liquid expanding vapor explosion	1
	vi.	Formula to calculate risk considering risk perception is: (b) $R = P^y \times C$	1
	vii.	Liquefied petroleum gas composition is: (a) Propane and Butane	1
	viii.	The full form of JSA is: (a) Job Safety Analysis	1
	ix.	..... Section indicates the appointment of safety officer inside a factory: (b) 40B	1
	x.	In PSC concept primary failure of components are due to: (d) Wear and tear	1
Q.2	i.	Any four characteristics of rescue tender as per IS: 949-1985	2
	ii.	Active fire 2 marks	3
		Passive fire 1 mark	
	iii.	Fire growth stages 3 marks	5
OR	iv.	Fire extinguishment 2 marks	
		Components for an ideal fire pump house 3 marks	5
Q.3		Functions of main fire pump and standby fire pump 2 marks	
	i.	IS code number for coupling, branch pipe, nozzle use in hose reel tubing for firefighting	2
	ii.	Heat release rate 3 marks	8
		Time for a burning pool of gasoline 3 marks	
		Gun Design 2 marks	

OR	iii.	Characteristics of liquid pool fire on the following points:	8
		(a) Heat release rate 4 marks	
		(b) Burning duration 2 marks	
		(c) Flame height 2 marks	
Q.4	i.	Features available within extension ladder and hook ladder	3
		3 points 1 mark for each (1 mark * 3)	
	ii.	Definition of BLEVE effects 1 mark	7
		(a) $E_r$ - Emissive radiative heat flux 2 marks	
OR		(b) $v_a$ – Transmissivity 2 marks	
		(c) H- height of the fire ball from the ground 1 mark	
		(d) D and L 1 mark	
	iii.	Types of small gears used in rescue operation 4 marks	7
Q.5		Ropes and lines concern with rescue techniques 3 marks	
	i.	Working principle of breathing apparatus 1 mark	4
		Diagram 4 marks	
	ii.	JSA technique from safety officer point of view	6
OR		1 mark for each point (1 mark * 6)	
	iii.	Enlist the salient feature of IOCL Jaipur fire case study on the following points:	6
		(a) Logic diagram on initiating drives 2 marks	
		(b) Possible causes of fire 2 marks	
Q.6		(c) Findings and improvement in fire safety legislations 2 marks	
		Attempt any two:	
	i.	Difference b/w accident and incident data	5
		3 points 1 mark for each (1 mark * 3)	
OR		Qualitative and quantitative differences 2 marks	
	ii.	Organization structure of safety committee 2 marks	5
		Norms 2 marks	
		About organization 1 mark	
Q.3	iii.	Duties and responsibility shall be performed by a safety officer in an organization	5
		At least five points (1 mark * 5)	

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