Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2019

FT3EL11 Safety in Petroleum & Petrochemical Industries

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. What is the primary component of crude oil? **1**

(a) Sulfur (b) Carbon (c) Hydrogen (d) Nitrogen

ii. How is crude oil separated? **1**

(a) Crystallization (b) Fractional distillation

(c) Decantation (d) Sublimation

iii. Oil gas is obtaining by the cracking of _____ **1**

(a) Kerosene oil (b) Diesel oil

(c) Heavy oil (d) Gasoline

iv. What is the function of petroleum coke? **1**

(a) Lubrication (b) In candles

(c) As fuel (d) As solvent

v. Which type of fire extinguish do you use to fight an electrical fire if a carbon dioxide extinguisher is unavailable? **1**

(a) Water (b) Wet Chemical

(c) Foam (d) Dry Powder

vi. While you are using a fire extinguisher containing to carbon dioxide; what happens to the nozzle? **1**

(a) It becomes extremely hot (b) It becomes warm

(c) It becomes slightly cold (d) It becomes extremely cold

vii. Which of the following is desirable in petrol (gasoline) but undesirable in kerosene? **1**

(a) Paraffins (b) Aromatics

(c) Mercaptans (d) Naphthenic acid

P.T.O.

viii. Which of the following has maximum hydrogen/carbon ratio (by weight)? **1**
(a) Naphtha (b) Gasoline (c) Diesel (d) Fuel oil

ix. Which of the following is the most important property for a jet fuel? **1**
(a) Cloud point (b) Pour point
(c) Colour (d) Freezing point

x. Which of the following has the lowest flash point of all? **1**
(a) Diesel (b) Kerosene (c) Petrol (d) Furnace oil

Q.2 Attempt any two:

i. Explain the composition of crude oil? What are the different properties of crude oil? **5**

ii. Describe the material safety data sheet of LPG based on their flammability and reactivity data? **5**

iii. Give the threshold limit values of Ammonia? Suggest first Aid/steps during leakage of Ammonia? **5**

Q.3 i. What do you understand by primary distillation? **2**

ii. Develop a flow diagram of a typical refinery process. Also describe products of refinery. **8**

OR iii. Describe various types of storage tanks used in bulk storage of Petroleum products? **8**

Q.4 i. Define fire hydrant system. What are the types of hydrants are used in fire services? **4**

ii. What are the different criteria for selection of fire water network? **6**

OR iii. What is specific use of foam in fire fighting? Explain different type of foam generators with neat diagram? **6**

Q.5 i. What are the major causes of BLEVE inside a storage tank? **3**

ii. Describe in detail about the firefighting facilities required in terminals? What do you understand by terminal? **7**

OR iii. Enlist and explain the potential fire hazards in the event of liquefied petroleum gas leak from bullet at LPG. **7**

Q.6 Attempt any two:

i. Describe important safety provisions of petroleum Act 1934. **5**

ii. Discuss safety precaution to be taken while storing filling, transportation and use of gas cylinder as per gas cylinder rules 2002. **5**

iii. Write short note on PNGRB (Petroleum and Natural Gas Regulatory Board). **5**

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Marking Scheme

FT3EL11 Safety in Petroleum & Petrochemical Industries

Q.1	i.	What is the primary component of crude oil? (b) Carbo	**1**
	ii.	How is crude oil separated? (b) Fractional distillation	**1**
	iii.	Oil gas is obtaining by the cracking of _____ (a) Kerosene oil	**1**
	iv.	What is the function of petroleum coke? (c) As fuel	**1**
	v.	Which type of fire extinguish do you use to fight an electrical fire if a carbon dioxide extinguisher is unavailable? (d) Dry Powder	**1**
	vi.	While you are using a fire extinguisher containing to carbon dioxide; what happens to the nozzle? (d) It becomes extremely cold	**1**
	vii.	Which of the following is desirable in petrol (gasoline) but undesirable in kerosene? (b) Aromatics	**1**
	viii.	Which of the following has maximum hydrogen/carbon ratio (by weight)? (b) Gasoline	**1**
	ix.	Which of the following is the most important property for a jet fuel? (d) Freezing point	**1**
	x.	Which of the following has the lowest flash point of all? (c) Petrol	**1**

Q.2		Attempt any two:		
	i.	Composition of crude oil	2.5 marks	**5**
		Properties of crude oil	2.5 marks	
	ii.	Material safety data sheet of LPG based on their flammability and reactivity data Stepwise marking		**5**
	iii.	Threshold limit values of Ammonia	2.5 marks	**5**
		First Aid/steps during leakage of Ammonia	2.5 marks	

Q.3	i.	Primary distillation		**2**
	ii.	Flow diagram of a typical refinery process	4 marks	**8**
		Products of refinery	4 marks	
OR	iii.	Types of storage tanks	6 marks	**8**
		Diagram of storage tanks	2 marks	

Q.4	i.	Definition of fire hydrant system	2 marks	**4**
		Types of hydrants are used in fire services	2 marks	
	ii.	Criteria for selection of fire water network	4 marks	**6**
		Diagram	2 marks	
OR	iii.	Specific use of foam in fire fighting	2 marks	**6**
		Type of foam generators with diagram	4 marks	

Q.5	i.	Causes of BLEVE inside a storage tank		**3**
	ii.	Firefighting facilities required in terminals	4 marks	**7**
		Terminal	3 marks	
OR	iii.	Potential fire hazards in the event of liquefied petroleum gas leak from bullet at LPG.		**7**
		Listing	3 marks	
		Explanation	4 marks	

Q.6		Attempt any two:		
	i.	Important safety provisions of petroleum Act 1934		**5**
		At least 10 points 0.5 mark for each	(0.5 mark * 10)	
	ii.	Safety precaution for storing filling, transportation and use of gas cylinder as per gas cylinder rules 2002		**5**
		1 mark for each precaution	(1 mark * 5)	
	iii.	PNGRB (Petroleum and Natural Gas Regulatory Board).		**5**
		1 mark for each point	(1 mark * 5)	

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