UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Program: B. Tech- FSE   **Semester – V**
Subject (Course): Fire Engineering-II   **Max. Marks : 100**
Course Code : HSFS 3003   **Duration : 3 Hrs**
No. of page/s: 3

SECTION A

S.No	Answer all the following:	20 Marks	CO

Q 1	Answer the following:
	Choose the correct answer(s):
	  i. The safe angle for ladder usage is
	    a. Π rad
	    b. 0.5Π rad
	    c. 75°
	    d. None of the above
	  ii. The standard for Fire Apparatus is _____
	    a. NFPA 1991
	    b. NFPA 2005
	    c. OISD GDN 115
	    d. All the above
	    e. None of the above
	  iii. Hose that is used for drafting water from ponds, lakes and/or any water body containing coagulant solids is _____
	  iv. The nozzle used for warehouse firefighting is_____
		4	CO 2 & CO 4

Q 2	Postulate various parts of an extension ladder	4	CO 4
Q 3	Enlist the size-ups to be done before ventilation.	4	CO 5
Q 4	Brief different types of supply hose lays.	4	CO 4
Q 5	Write a short note on various types of hoses used in fire service. (NFPA)	4	CO 2

SECTION B

S.No	Answer all the following:	40 Marks	CO
Q 5	Explain the classification of 'Ropes' along with their applications and limitations of each type.	[5+3]	CO 4
Q 6	**Proper safety gadgets are to be maintained and used safely & efficiently by fire service personnel. Poor maintenance may cause serious problems. In case if you're a member of any fire service department. Assume you're a fire service professional:**	[6+2]	CO4 & CO 5

	If a room is filled with dense black smoke up to almost half volume of the room from roof and you're required to enter such atmosphere for firefighting, then brief the breathing aids that you use to avoid fatality/illness and how will you determine duration of usage		
Q 7	Discuss various kinds of hoses used in fire service with specifications, applications and limitations. Also, brief the maintenance procedure.	**[6+2]**	**CO 4**

Q 8	Answer the following:
	  a. Elaborate the conceptual meaning of the statement: "Try before Pry". [2]
	  b. Also, brief the situations that demand such "Prying", [2]
	  c. Brief the pre-checks/size-ups to be done before 'Prying". [4]
	
	(OR)
			CO 5 & CO 2

	Describe the operational specifications of Pumper apparatus and quote relevant code/standard(s).	**[8]**	**CO 3**
Q9	**Due to versatility, high outlet pressures 'Centrifugal Pumps' are widely used in fire service. Centrifugal pumps replaced almost all the positive displacement pumps from fire service history. Variety designs/layouts and configurations are used as per application.** For an oil & gas terminal depot 4 fire pumps each of 300LPM, 80 psi capacity are proposed to be installed for fetching water from nearby natural water body to reservoir from which it needs to supply all the fixed fire protection facilities. The total firewater demand decided is 100 m3. The capacity of reservoir said to be 120% of firewater demand. Give proper combination/interconnection of pumps in such a way that they could be able to fill reservoir and supply the firewater network @ 10 bar(g). (OR)	**[4+4]**	**CO 1 & CO 2**
	State the mathematical equation to calculate PDP. Calculate PDP in psi(g) for the following case: A fire apparatus is supplying a portable monitor (whose nozzle is 0.5m vertically off from ground level) delivering solid stream of 500GPM through a 10m long 3" hose. The angle of inclination of monitor is 45º and reach (horizontal) of stream is 20 meters, aiming to put off a structural fire. Consider the total losses in couplings, fittings and appliances as 2 bar(g).	**[1+7]**	**CO 3**
	SECTION-C		
	Answer the following:	**40 Marks**	**CO**
Q 10	List and elaborate various strategic aspects to be considered to decide correct course of action in fire emergency cases.	**[4+16]**	**CO 5 & CO 6**
Q 11	List and discuss various techniques of 'Ventilation' with applications and limitations of each, along with it's significance. (OR)	**[15+5]** **(OR)** **[20]**	**CO 5 & CO 6** **CO 1**

	Discuss the design and operational specifications of ACFT and relevant Indian Standard for the same.		