


<b>Name:</b> <b>Enrolment No:</b>			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, December 2022</b>			
<b>Programme Name:</b> B Tech- Fire and Safety Engineering <b>Course Name</b> : Fire Engineering I (Basics) <b>Course Code</b> : HSFS 2015 <b>Nos. of page(s)</b> : 2		<b>Semester</b> : III <b>Time</b> : 03 hrs <b>Max. Marks:</b> 100	
<b>Instructions: Read the question properly and give the most relevant answer.</b>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.		Marks	CO
Q 1	Explain the term “ Fire” and classify Fire as per Indian Standard.	4	CO1
Q 2	Discuss the term “ Smoke” elloborately	4	CO1
Q 3	Distinguish Active and Passive Fire protection system.	4	CO4
Q 4	Differentiate Fire resistance and Fire retardant	4	CO4
Q 5	Outline the concepts of Flash fire and Vapour Cloud Explosion	4	CO2
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	Explain the following theories a) Fire causation b) Fire Suppression	10	CO2
Q 7	Consider a mixture of the following gases butane- 4 %, methane-3 %, and heptane 3.5 % in a chamber. The LEL and HEL of a) butane is 5%-20%, b) Methane is 5%- 17% and c) heptane is 3 % to 10 %. Calculate the LEL and HEL of a mixture and conclude whether the gas mixture is flammable/ nonflammable	10	CO3
Q 8	Paper of mass 100 kg and calorific value of 35000 kcal/kg kept in in 1000 cm <sup>2</sup> of area, Wood of mass 300 kg and calorific value of 55000 kJ/kg kept 600 m <sup>2</sup> of area , Plastics of 250.25 kg ,calorific value of 25000 kJ/kg kept in 200 m <sup>2</sup> of area. Calculate the overall fire load and classify the level of fire load as per Indian standard.	10	CO3
Q 9	a) List 5 fire retardant and Fire-resistant materials b) Explain the phenomena of failure of concrete under the exposure of fire.  (OR) Explain concept of purging in detail	10	CO1

**SECTION-C**  
**(2Qx20M=40 Marks)**

Q 10	Explosions are very crucial and difficult to understand, as a fire safety engineer analyze the types of explosions elaborately with supporting sketch	<b>20</b>	<b>CO2</b>
Q11	As a Fire protection Engineer develop a plan to safe guard a building from Fire using the various concepts and prepare a elaborate report. (OR) Explain any four combustion by products (gas) and its health effects in detail and present your view on reasons that causes air pollution in Delhi.	<b>20</b>	<b>CO4</b>