

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec 2022

Course Name: Fire Risk & Control

Programme: M Tech- HSE

Course Code: HSFS 7007

No pages: 01

Semester: I

Time: 03 Hours

Max. Marks: 100

SECTION A

Attempt all questions. Each question carries 4 Marks.

Sr. No.	Question	CO
Q 1	Explain the various stages of fire.	CO1
Q 2	List out the various components of fire hydrants.	CO1
Q 3	Do the comparison of the Dry & Wet types of the sprinkler system with their limitations.	CO3
Q 4	Comment on the effectiveness of portable fire-fighting systems along with their limitations.	CO3
Q 5	Discuss the role of autoignition temperature or burning temperature in the fire phenomenon.	CO1

SECTION B

Attempt all questions. Each question carries 10 Marks.

Q 6	Enumerate classes of standpipes and their application. OR List out the various factors affecting fire severity.	CO1
Q 7	Create a fire safety inspection checklist for the tank farm facility	CO5
Q 8	Justify the need for standard operating procedures with an example of controlling industrial fire accidents.	CO4
Q 9	Explain mass loss rate and its applicability in the fire. Discuss the role of essential variables while predicting or calculating mass loss rate of a fuel.	CO2

SECTION C

Attempt all questions. Each question carries 20 Marks.

Q 10	Develop a fire safety plan for an occupancy (Commercial building) of low hazardous categories. OR (a) Explain various explosion protection principle and their effectiveness. (b) A manufacturing process industry uses the following material. Calculate the fire load by using the following data: -	CO5																																
	<table border="1"> <thead> <tr> <th rowspan="2">Material</th> <th rowspan="2">Quantity in Kg.</th> <th rowspan="2">Area in Sq. mtr.</th> <th colspan="2">Calorific value</th> </tr> <tr> <th>(KJ/Kg)</th> <th>(Kcal/kg)</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>100</td> <td>100</td> <td>15650</td> <td>3725.38</td> </tr> <tr> <td>Wood</td> <td>2000</td> <td>300</td> <td>17500</td> <td>4179</td> </tr> <tr> <td>Coal</td> <td>10000</td> <td>500</td> <td>20000</td> <td>4776</td> </tr> <tr> <td>Rubber</td> <td>500</td> <td>200</td> <td>40000</td> <td>9552</td> </tr> <tr> <td>Petroleum products</td> <td>5000</td> <td>400</td> <td>43000</td> <td>10268.4</td> </tr> </tbody> </table>		Material	Quantity in Kg.	Area in Sq. mtr.	Calorific value		(KJ/Kg)	(Kcal/kg)	Paper	100	100	15650	3725.38	Wood	2000	300	17500	4179	Coal	10000	500	20000	4776	Rubber	500	200	40000	9552	Petroleum products	5000	400	43000	10268.4
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Q 11	(a) Calculate the heat release rate from a ventilation control fire burning inside an enclosure of having a window 2.4 m wide and 1.2 m high. (b) A building compartment of dimensions 20m wide, 20 m deep and 4 m high and contains 15000 kg of combustible material, if the area of the open window is 72 m ² and height of the opening is 1.2 m, calculate the maximum temperature and time equivalent for the severity.	CO4																																