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| Name: |  |
| Enrolment No: | |

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Course: Risk Assessment & Planning (Fire Engineering IV)

Semester: VII

Programme: B Tech- Fire & Safety Engineering

Time: 03 hrs.

Max. Marks: 100

Course Code: FSEG 401

Instructions:

SECTION A


| S. No. | Question | Marks | CO |
|--------|---|-------|-----|
| Q 1 | Extend your views on “Arson” and its control measures. | 4 | CO1 |
| Q 2 | Briefly describe length of stride and its objective in consideration during evacuation process. | 4 | CO2 |
| Q 3 | Define fire safety audit and highlight its objective. | 4 | CO1 |
| Q 4 | Justify the need for building classification and its general requirements. | 4 | CO3 |
| Q 5 | Elaborate speed of “motion” and its consideration in building evacuation process. | 4 | CO2 |

SECTION B

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| Q 6 | Fire safety audit is an integral part of any fire safety management system. Briefly discuss fire safety audit its types and general procedures applicable to any organizations/ work place or any building. | 10 | CO2 |
| Q 7 | Discuss various stages of evacuation applicable to a work place. Highlight major planning & design consideration with respect to fire & life safety. OR Justify the need of various parameters of building evacuation. Also, discuss the role of concern authority for deciding these parameters. | 10 | CO2 CO3 |
| Q 8 | Fire risk assessment is an important tool used to evaluate fire safety condition of any workplace. Prepare a checklist evaluating fire safety condition at work place with respect to NBC requirements. | 10 | CO1 CO4 |
| Q 9 | Elaborate fire investigation. Extend your views on fire investigation process, its effectiveness and factor involved in its effectiveness. | 10 | CO2 CO5 |

SECTION-C

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| Q 10 | Based on design criteria of fire & life safety, explain in detail about salient features of national building code 2016. OR Building evacuation time is one of major concern while designing building emergency evacuation routes. Explain in detail about building evacuation time based on maximum travel distance. | 20 | CO4 |
| Q 11 | An auditorium of capacity 2000 has four columns. Each columns of seat is having a width of 16m with total evacuation time two minutes during a fire emergency. Calculate - (i) Distance travelled if aisles are closed either side. (8 marks) (ii) Distance travelled if aisles are open either side. (6 marks) (iii) Width and number of exits required. (6 marks) | 20 | CO5 |

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| | Assume, the speed of motion of people in unary stream as 40m/min. and that in primary stream as 16m/min., width of aisle is 2.0m, specific traffic capacity of exit, $q = 50$ persons/m-min, Width of each opening is 2m. | | |
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| SECTION A | | | |
| S. No. | | Marks | CO |
| Q 1 | Brief of institutional building and its types. | 4 | CO1 |
| Q 2 | What is an emergency and its types? | 4 | CO1 |
| Q 3 | How a fire safety audit essential in maintaining safety of workplace? Justify. | 4 | CO2 |
| Q 4 | Extend your view on fire investigation methodology and its purpose. | 4 | CO3 |
| Q 5 | Discuss relative density of movement of people in a building and its application. | 4 | CO2 |
| SECTION B | | | |
| Q 6 | Fire safety audit helps in assessing fire safety arrangement in an occupancy or building. List out objectives and steps involved in fire safety audits. | 10 | CO2 |
| Q 7 | Arson is one of the major cause of fire observed during fire investigation. Extend your views on Arson and highlight its motives with control measures. OR Movement of people during evacuation plays important role for smooth conduction of emergency evacuation. Highlight major challenges encountered due to movement of people during emergency and link with framed general requirements listed in NBC part IV. | 10 | CO2 CO3 |
| Q 8 | Fire risk assessment is an important tool used to evaluate fire safety condition of any workplace. Prepare a checklist evaluating fire safety condition at work place with respect to NBC requirements. | 10 | CO1 CO4 |
| Q 9 | Exits are important means of access during emergency evacuation. Illustrate the requirements for planning & designing of an exit. Extend your views on cost prospective in design and implementation of an exist and its benefits. | 10 | CO2 CO5 |
| SECTION-C | | | |
| Q 10 | An organization having poor fire safety has met a numbers of fire incidents along with reportable injuries in last few years. However, higher management of organization is still not willing to deploy any auditing agencies assessing or identifying fire safety culture at work place for improvements. Being a fire safety officer of this organization do the technical and economical evaluation of fire safety of workplace. Also, highlight the need of assessing agencies to be deployed at work place for its improvements. OR | 20 | CO4 |

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| | List various fire protection facilities available in modern building. Highlight their need and applications during fire emergency. | | |
| Q 11 | <p>An auditorium of capacity 2000 has four columns. Each columns of seat is having a width of 16m with total evacuation time two minutes during a fire emergency. Calculate -</p> <p>(i) Distance travelled if aisles are closed either side. (8 marks)</p> <p>(ii) Distance travelled if aisles are open either side. (6 marks)</p> <p>(iii) Width and number of exits required. (6 marks)</p> <p>Assume, the speed of motion of people in unary stream as 40m/min. and that in primary stream as 16m/min., width of aisle is 2.0m, specific traffic capacity of exit, $q = 50$ persons/m-min, Width of each opening is 2m.</p> | 20 | CO5 |