Roll No: ----------

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: M.Tech. PE **Semester : III**
Subject (Course): HSE Challenges in Petroleum Exploration, **Max. Marks : 100**
Course Code : MEEG 844 **Duration: 3 Hrs**
No. of page/s:3

Section A : (5 x 4 = 20 Marks)

Note : Attempt all questions from section "A". Each question carry equal marks.

Q.1 .Choose the correct answers **(1 x 4 = 4 Marks)**

i) EIA means
a) Environment impact assessment b) Energy impact assessment
c) Environment management System d) None of these

ii) The world worst industrial disaster Bhopal Gas Tragedy occurred in the year
a) 1986 b) 1985 c) 1984 d) 1986

iii) OHSA stands for
a) Occupational health safety assignment series , b) Occupational health safety assessment series c) Occupational health safety association standards , d) Occupational Health Safety Administration

iv) Full form of SCBA
a) Self control breathing apparatus b) Self cause breathing apparatus
c) Self content breathing apparatus d) Self costing base apparatus

Q.2. Fill in the blanks. **(1 x 4 = 4 Marks)**

a) The provisions of Factories Act 1948 contained in different chapters on health, safety and welfare are administered by----------

b) In India EIA was introduced as an administrative measures in 1978-79, initially for ---------- and extending later to industrial projects.

c) A first class boiler attendant can take charge of a battery of boilers, the total surface area of which does not exceed ---------- square meters.

d) ---------- It is an effective weathering process in which water is incorporated into the floating oil forming in oil emulsion.

Q.3. Define the followings : (4 Marks)

a) BOD & COD (2 Marks) b) IMO (2 Marks)

Q.4. What are the different types of waste generated during drilling and production activities. (4 Marks)

Q.5. What are the point sources and non point sources of water pollution? (4 Marks)

Section "B" (5 x 12 = 60 Marks)

Note : This section is divided into two parts B1 and B2. All questions carry equal marks Student are required to attempt all questions from Part B1 and however choice is given in part B2, student may attempt any one question from part B2 is that either Q.10 or Q.11

Part BI

Q.6. Oil and gas well drilling and servicing activities involve many different types of equipment and materials which may cause various safety hazards. Explain the Safety Hazards associated with associated with Oil and Gas Extraction Activities. (12 Marks)

Q.7. The provision of this Act contained in different chapter of Health Safety & Welfare administered by Chief Inspector of the Factories. Describe the general responsibilities of occupier under Factories Act 1948. (12 Marks)

Q.8. What are the sources and impact of oil spill ? Explain various methods which are used for controlling oil spill. (2+2+8 = 12 Marks)

Q.9. What is EIA ? What are the various methodologies of EIA which are required to conduct for taking environmental clearance for petroleum installation from Ministry of Environmental and Forest? (2+10 = 12 Marks)

Part B2

Q.10. Every installation should design work permit formats as per its requirement and nature of activities. OISD and NSC give guidelines for designing work permit formats. What is permit to work system? Identify various element and types and procedure of work.

(2 +3+4 + 3 = 12 Marks)

Or

Q.11. Explain various methods which are used for removal of dissolved solids from the effluent which are generated during drilling and production activities. (12 Marks)

Part C (20 Marks)

(Attempt any one question from this section either Q.12 or Q.13)

Q.12. In the early stage of industrialization safety was managed through training and following safe procedures, compliance with rules and regulations, etc**, n**ext stage witnessed enhanced safety feature through technological up gradation, safe processes, safety features in built in design and prescriptive statutory rules and presently the safety is managed through systems approach. The 'Cullen Report', 1990 on Piper Alpha Disaster stressed the need for formal safety management system. Describe the various component of Process Safety Management system for Oil and Gas sectors. (20 Marks)

Or

Q.13. When drilling effluents / waste water is discharged into a water bodies i.e. river, lake and sea, a number of process occur like physical, chemical and biological characteristics of water change which causes loss of organism and deterioration of water quality. Describe the various units of Primary, Secondary and Tertiary treatment of Effluent Treatment Plant with the help of well labeled diagram. (20 Marks)

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Section A : (5 x 4 = 20 Marks)

Note : Attempt all questions from section "A". Each question carry equal marks.

Q.1 .Choose the correct answers **(1 x 4 = 4 Marks)**

i) Under the Petroleum Act, the petroleum products are classified into
Class-A having flash point
a) below 23°C b) below 23°C c) 23°C to 65°C d) 66°C to 93°C

ii) The concentration that is lethal to half of the exposed population during the test is LC50
a) LD 50 b) LC50 c) EC 50 d) ED 50

iii) What is the importance of MSDS?
a) Useful for safe handling, storage & usage of unknown material
b) For only material physical property checking
c) For only type of PPE's used while handling of unknown material
d) For identity purpose only

iv) OHSA stands for
a) Occupational health safety assignment series , b) Occupational health safety assessment series
c) Occupational health safety association standards , d) Occupational Health Safety Administration

Q.2. Fill in the blanks. **(4 Marks)**

i) ---------- was the first country to assign mandatory status to EIA through its National Environmental Protection Act (NEPA) of 1969.

ii) ---------- is the process in which small droplet of oil which are bigger then dissolve molecules get incorporated into water in the form of dilute- oil water suspension.

iii) For the purpose of the act, a boiler means any closed vessel exceeding ---------- liters in capacity which is used exclusively for generating steam under pressure.

iv) The owner has to forward the layout drawings showing the elevation details, dimensions and other details of the structures/ buildings in the prescribed format and submit to the nearest -------.

Q.3. What are the impact of drilling and production operation on marine ecosystem. (4 Marks)

Q.4. Define the followings term. **(2 x 2 = 4 Mark)**

a) BOD & COD (2 Marks) b) MSDs (2 Marks)

Q.5. Before setting up of Oil and gas installation , what statutory approvals / Permissions are required to be taken by the organization. (4 Marks)

Section "B" (5 x 12 = 60 Marks)

Note : This section is divided into two parts B1 and B2. All questions carry equal marks Student are required to attempt all questions from Part B1 and however choice is given in part B2, student may attempt any one question from part B2 is that either Q.10 or Q.11

Part BI

Q.6. Describe Prior Environmental Clearance Process for activities falling under Category A and Category B Projects, as per the revised Notification issued on 14th September , 2006 for petroleum exploration and drilling project with schematic diagram. (12 Marks)

Q.7.. a) What are the objectives of HSE management framework? Name the regulatory agencies which are responsible for regulation enforcement. (6 Marks)

a) Explain various hazard control methods which are used in petroleum industries. (6 Marks)

Q.8. Write short notes on the followings : (12 = 12 Marks)

a) Activated sludge process (4 Marks) b)Reverse Osmosis & neutralization (4 Marks)
b) The Indian Boiler Act, 1923 (4 Marks)

Q.9. Explain various Health Hazards associated with associated with Oil and Gas Extraction Activities. (12 Marks)

Part B2

Q.10. Describe Prior Environmental Clearance Process for activities falling under Category A and Category B Projects, as per the revised Notification issued on 14th September , 2006 for petroleum exploration and drilling project with schematic diagram. (12 Marks)

Or

Q.11. Explain any six methods used for removal of hydrocarbon impurities from solids such as drill cutting, contaminated solid and produced sand generated during drilling and production activities with schematic diagram. (12 Marks)

Part C (20 Marks)

(Attempt any one question from this section either Q.12 or Q.13)

Q.12. Safety is denoted as the condition or state of being safe, freedom from the danger or hazard, exemption from injury and loss. Describe the various component of Process Safety Management System. (20 Marks)

or

Q.13. Describe various methods for removal of suspended hydrocarbon and dissolved hydrocarbon impurities from the effluent generated during drilling and production activities with schematic diagram.
(20 Marks)