

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program:	M.Tech (PLE)	Semester –	III
Subject (Course):	Equipment & Machinery Maintenance	Max. Marks	:
100			
Course Code :	MPEG-702	Duration	: 3
Hrs			
No. of page/s:			

Section A

Question No: 1 to 5 are compulsory and to be answered. Question No: 1 to 3 is objective types with multiple choice Questions, fill in the blanks and correct the statement. Question No: 4 & 5 are short answered questions. All questions are compulsory and carry equal marks.

Maximum Marks: 20

Q: 1: Multiple choice questions have 3 to 4 choices. Mark the most appropriate answer as a correct answer. All questions carry one mark each.

- Scanning of tank bottom in storage tanks is carried out to ascertain:
 - Pitting/ corrosion from product /underside of bottom plate.
 - Tank leakage inspection
 - For periodic inspection of pipeline
 - None of above
- For effective operation of AFFF Fire Fighting system on storage tank, following checks are carried out :
 - Testing and calibration of pressure gauges,
 - Leakage from connectors
 - inspection of fuse bulb
 - All of above.
- Anchor chains are used for securing :
 - Crude or product tankers.
 - SBM
 - PLEM
 - None of above.

4. Honing operation in liners of engine is carried out to :
 - a) To generate criss- cross pattern on liner surface for retention of lubricating oil.
 - b) To generate a smooth inside surface in the liner for lube oil retention.
 - c) To remove the hardness in the material structure observed due to overheating.
 - d) All of above,

Q: 2: Fill in the blanks. Write most appropriate answer. All questions carry one mark each.

1. Differential Pressure Indicators (Gauge) are used for indicating the _____ and mostly used across Strainer & separator filter.
2. Alarms are simulated for _____ of proper alarm display on the control system and actuation of the desired control logics.
3. Reciprocating pumps are _____ pump. These pumps deliver _____ flow & are used for application developing _____ pressure.
4. _____ is the minimum temperature at which liquid will give sufficient vapour to combine with air to give a momentary flash on application of a source of ignition.

Q: 3: Mark the statements right or wrong. All questions carry one mark each.

1. The reason for inadequate fuel combustion & Whitish Smoke is Choked Fuel Filter, Improper working of engine driven fuel pump.
2. Moist air is of primary importance to ensure the proper functioning of the pneumatic instrumentation systems
3. An area will be deemed to be hazardous where petroleum having flash point below 80 degree C or any flammable gas or vapor in a concentration capable of ignition is likely to be present.
4. In Single Point Mooring (SPM) system, the tanker is moored at its bow to the floating buoy with mooring Equipments to facilitate tanker to swing around freely and take up the most advantageous position with respect to the external forces. One end of the mooring equipment is permanently connected to the buoy and other end floats in water when not connected to the tanker.

Q:4: Illustrate active & passive fire protection in industry?

Q:5: What are the yearly maintenance activities of SPM system?

Section B

This section contains Four (4) Questions. (ie Q No: 6 to Q No: 9). Q. No:9 has internal choice & one part is to be answered. Each question carry 10 marks each. All questions are compulsory.

Maximum Marks: 40

Q:6: What are the Equipments to be provided for protection against fire for pressure boosting installations in pipelines as per OISD-117. It is desired that number of each equipment as per OISD-117 may also be specified.

Q:7: Write short note on following topics:

- a) Various clearance values of liners and piston assemblies of turbocharged marine diesel engines.
- b) Maintenance philosophy & approach.

Q:8:

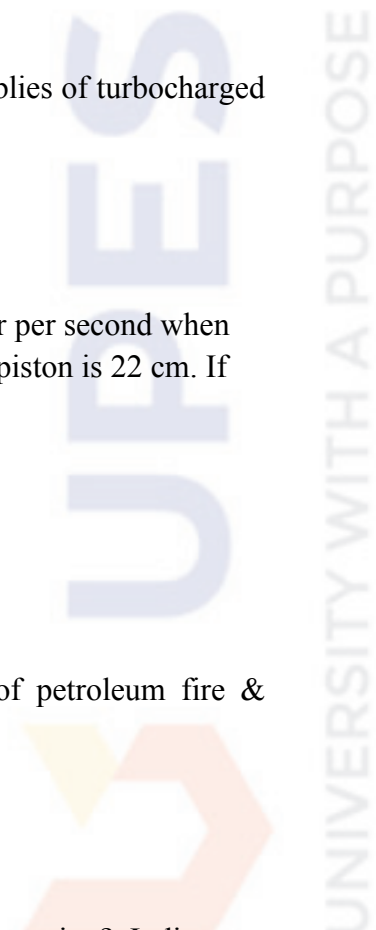
A single-acting reciprocating pump discharge 0.018 m³ /s of water per second when running at 60 rpm. Stroke length is 50 cm and the diameter of the piston is 22 cm. If the total lift is 15 meters. Calculate:

- a) Theoretical discharge of the pump
- b) Slip and percentage slip of the pump
- c) Co-efficient of discharge
- d) Power required for running the pump

Q:9: Write down the chemistry of fire, theory for extinguishing of petroleum fire & Equipments used for same.

OR

How do you ensure the safety of Equipments installed in boosting station? Indicate 10 instruments setting of prime mover in pump station.



Section C

This section contains two questions (Q No: 10 & 11). Both questions are compulsory and to be answered. Q NO: 11 have internal choice & one part is to be answered. Each question carries 20 marks each.

Maximum marks: 40

Q:10: Write short notes on any two of the following:

- a) Write down various types of electrical earthlings. Explain any one.
- b) Write down the yearly maintenance activities of MCC/PCC panels.
- c) Various modes of communication used in cross country pipelines.
- d) Various maintenance activities for large storage tank.

Q:11: Describe various types of work permit system in practice in industry and essential contents for the same. Design the hot permit for taking up maintenance in LPG pump station.

OR

Indicate corrective actions against below each problem. Corrective action should be made in tabular form, specifying correction action against each problem.

- a) Centrifugal pump is not able to generate the sufficient head and losses head just after starting the pump. Analyze the reason & indicate corrective steps required.
- b) Write down the reason for bearing overheating & wear for the NDE side journal bearing.