

U.S.C.G. Merchant Marine Exam
Mobile Offshore Drilling Units
Q432 OIM Surface Units Underway
(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions.

1. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). What is the new height of the center of gravity corrected for longitudinal free surface effects if the entire contents of Salt Water Ballast Tanks 1P and 1S are discharged?
- A. 67.04 feet
 - B. 68.02 feet
 - C. 68.72 feet
 - D. 69.21 feet

Correct answer: D

2. Keeping the draft of a MODU at or below the load line mark will ensure that the unit has adequate _____.
- A. reserve ballast
 - B. critical motions
 - C. lightweight displacement
 - D. reserve buoyancy

Correct answer: D

3. A semisubmersible, while floating level, displaces 20,000 long tons. LCB is 3.0 feet forward of amidships. Bulk, weighing 300 long tons, is placed in P-tanks located 40 feet aft of amidships. What is the new LCG?
- A. 3.64 feet forward of amidships
 - B. 2.45 feet forward of amidships
 - C. 2.36 feet forward of amidships
 - D. 0.55 foot forward of amidships

Correct answer: C

4. What are the additional vertical moments created when P-tank #4 in the DEEP DRILLER sample load form #1 (Transit) is completely filled?
- A. 2,252 foot-tons
 - B. 9,413 foot-tons
 - C. 11,665 foot-tons
 - D. 13,917 foot-tons

Correct answer: B

5. Who is responsible for lowering the survival craft?
- A. Last man aboard
 - B. Helmsman
 - C. First man aboard
 - D. Roustabout

Correct answer: B

6. A semisubmersible with a negative GM flops to an angle of _____.

- A. trim
- B. heel
- C. list
- D. loll

Correct answer: D

7. If you see someone fall overboard from a MODU, you should _____.

- A. immediately jump in the water to help the individual
- B. run to the radio room to send an emergency message
- C. call for help and keep the individual in sight
- D. go to the control room for the distress flares

Correct answer: C

8. The wooden plug inserted in the vent of a damaged tank of a MODU should be removed in case it is decided to _____.

- A. abandon the rig
- B. fight a fire
- C. use the crossover system
- D. pump from the damaged tank

Correct answer: D

9. During severe storms when survival becomes a major concern, it may become necessary to relieve high anchor tensions on the windward side of the unit by _____.

- A. paying out cable on the windward side
- B. ballasting the rig
- C. deballasting the rig
- D. paying out cable on the leeward side

Correct answer: D

10. A MODU is inclined at an angle of loll. In the absence of external forces, the righting arm (GZ) is _____.

- A. zero
- B. positive
- C. vertical
- D. negative

Correct answer: A

11. Movement of liquid in a tank when a drilling barge inclines causes an increase in _____.

- A. height of the uncorrected KG
- B. natural rolling period
- C. metacentric height
- D. righting arm

Correct answer: B

12. The lightweight longitudinal free surface moments for the DEEP DRILLER are _____.

- A. 680,914 ft-long tons
- B. 000 ft-long tons
- C. -5,937 ft-long tons
- D. -6,716 ft-long tons

Correct answer: B

13. In the DEEP DRILLER, the longitudinal free surface correction (FSCL) is obtained from the total of the longitudinal free surface moments (FSML) by _____.

- A. multiplying by displacement
- B. dividing by displacement
- C. subtracting the LCG
- D. adding the LCG

Correct answer: B

14. The DEEP DRILLER is loaded as shown in Sample Load Form #3 (Preparing to Drill). What is the margin on the maximum allowable KG while drilling?

- A. 4.58 feet
- B. 5.24 feet
- C. 6.27 feet
- D. 6.94 feet

Correct answer: A

15. A set of clamps that are latched onto the drill pipe to allow the driller to raise or lower the drill string out of or into the hole are the _____.

- A. elevators
- B. clamps
- C. lifts
- D. collars

Correct answer: A

16. It is proposed to moor the DEEP DRILLER in 600 feet of water in a region in which the effective wind velocity could reach 80 knots, significant wave height could reach 30 feet, and the current could be 1.5 knots. If these conditions occurred at the same time from the bow, the total environmental force would be _____.

- A. 620 kips
- B. 595 kips
- C. 475 kips
- D. 425 kips

Correct answer: B

17. Compared to internal structural plating, the exterior hull plating on a MODU is usually _____.
- A. stronger
 - B. thinner
 - C. more corrosion resistant
 - D. a lower grade steel

Correct answer: A

18. For a MODU with longitudinal inclination, an increase in GML causes _____.
- A. list to stabilize at an angle of loll
 - B. trim to stabilize at an angle of loll
 - C. trim to increase
 - D. trim to decrease

Correct answer: D

19. During counterflooding to correct a severe list or trim aggravated by an off-center load, a MODU suddenly takes a list or trim to the opposite side. You should _____.
- A. immediately stop counterflooding
 - B. deballast from the low side
 - C. continue counterflooding in the same direction
 - D. continue counterflooding, but in the opposite direction

Correct answer: A

20. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). Weather conditions make it necessary to ballast down to survival draft. It is decided to check the stability at the intermediate draft of 32 feet. If the added ballast has an average VCG of 9.03 feet, and the sum of free surface moments is 56,244 foot-tons, what is the new KGL?
- A. 54.76 feet
 - B. 55.76 feet
 - C. 57.22 feet
 - D. 61.16 feet

Correct answer: D

21. When a semisubmersible rig under tow experiences pounding on the forward transverse brace, the surest way to alleviate the condition would be to _____.
- A. ballast down
 - B. adjust the length of the tow line
 - C. have the tug slow down
 - D. change course

Correct answer: A

22. An effective braking system for windlasses on rigs in deep water is a(n) _____.

- A. electrical regenerative braking system
- B. disc backstopping brake
- C. larger chain stopper
- D. hydraulic clutch

Correct answer: A

23. A MODU crane which has been idle for a period of over six months shall be inspected to the same standards as a _____.

- A. yearly inspection
- B. quarterly inspection
- C. monthly inspection
- D. weekly inspection

Correct answer: A

24. The DEEP DRILLER, loaded as shown in Sample Load Form #1 (Transit), suffers minor damage which results in flooding in tank 1S. You may pump from _____.

- A. 1S
- B. 2S
- C. C1S
- D. 10P

Correct answer: A

25. Each person on the rig has a designated area to proceed to in the event of a fire. This assignment is shown clearly on which of the following documents?

- A. Certificate of Inspection
- B. shipping articles
- C. firefighting plan
- D. Muster List ("Station Bill")

Correct answer: D

26. The factor of safety, based on the elastic limit of the material, for the forks used on power operated industrial trucks aboard a MODU must be at least _____.

- A. 2 to 1
- B. 3 to 1
- C. 4 to 1
- D. 5 to 1

Correct answer: B

27. The sounding in fuel oil tank 4P on the DEEP DRILLER is 8.75 feet. What are the longitudinal moments for this amount of fuel?

- A. -17,416 ft-long tons
- B. -874 ft-long tons
- C. 3,992 ft-long tons
- D. 17,416 ft-long tons

Correct answer: C

28. What is the change in transverse moments for the DEEP DRILLER if 103.48 long-tons of ballast is transferred from a full ballast tank 1P to an empty ballast tank 10S?

- A. 15,522 foot-tons increase
- B. 15,181 foot-tons increase
- C. 3,594 foot-tons increase
- D. 1,797 foot-tons increase

Correct answer: B

29. In order to withstand fluid head pressure on a MODU, stiffeners are often attached to the bulkhead _____.

- A. penetrations
- B. plating
- C. brackets
- D. framing

Correct answer: B

30. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). Weather conditions require ballasting to survival draft. Assume that 4087 long tons of ballast are added at an average VCG of 8.32 feet, and upon arrival at 45 feet, port and starboard ballast tanks 1, 3, and 8 are slack. What is the new KGL?

- A. 51.65 feet
- B. 52.67 feet
- C. 55.16 feet
- D. 62.24 feet

Correct answer: C

31. The two main types of load cells used in mooring tension gauges are _____.

- A. magnetic and applied torque
- B. hydraulic and mechanical
- C. distortion and compression
- D. frictionless and hydraulic

Correct answer: C

32. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). Excessive motion makes it necessary to ballast down to survival draft. It is decided to check the stability at the intermediate draft of 32 feet. If the added ballast has an average VCG of 9.03 feet, and the sum of free surface moments is 56,244 foot-tons, what is the new margin on the maximum allowable KG?
- A. 6.23 feet
 - B. 5.11 feet
 - C. 4.86 feet
 - D. 4.06 feet

Correct answer: D

33. The document that certifies the correctness of the load line marks on a MODU is called the _____.
- A. SOLAS Certificate
 - B. Certificate of Documentation
 - C. Certificate of Inspection
 - D. Load line certificate

Correct answer: D

34. The DEEP DRILLER suffers minor flooding of the port pump room while in transit. If both port bilge pumps fail to dewater the pump room, you may _____.
- A. use starboard ballast pumps and crossover system
 - B. use port drill water pump
 - C. use port ballast pumps
 - D. use port saltwater service pump

Correct answer: B

35. Compliance with the terms of the load line certificate on a MODU is the responsibility of the _____.
- A. Barge Supervisor
 - B. Operators representative
 - C. Master or Offshore Installation Manager
 - D. Ballast Control Operator

Correct answer: C

36. The DEEP DRILLER is under tow at a 20 foot draft. The rig motions are close to exceeding the limits for critical pitch and roll. The rig is also experiencing occasional pounding on the horizontal braces. In this situation you should _____.
- A. shorten the tow wire for a smoother tow
 - B. ballast up to a 15 foot draft and check vessel motions
 - C. ballast down to a 45 foot draft and check vessel motions
 - D. wait until pitch and roll exceed the limits before ballasting down

Correct answer: C

37. Port ballast pump #1 on the DEEP DRILLER has failed. If you want to deballast the forward-port column using port ballast pump #2, it is necessary to open valves _____.

- A. 3, 34, 36, 46, and 48
- B. 4, 34, 36, 46, and 48
- C. 4, 34, 35, 36, 46, and 48
- D. 3, 34, 35, 36, 46, and 48

Correct answer: D

38. When a semisubmersible rig under tow veers from side to side on its tow line, the best way of controlling the action is to _____.

- A. adjust the length of the towing bridle
- B. trim by the stern
- C. trim by the bow
- D. play out stern anchor chain

Correct answer: B

39. What is the effect of high concentrations of H₂S gas on personnel?

- A. cause eye inflammation
- B. cause dizziness
- C. cause involuntary muscle contractions
- D. paralyze your breathing system

Correct answer: D

40. Requirements for H₂S preparation and equipment usage aboard MODU's in U.S. offshore waters are administered by which of the following organizations?

- A. American National Standards Institute
- B. U.S. Corps of Engineers
- C. Minerals Management Service
- D. U.S. Coast Guard

Correct answer: C

41. Beyond the area of state ownership in the U.S. outer continental shelf, the right to drill is controlled by the _____.

- A. Bureau of Ocean Energy Management
- B. American Bureau of Shipping
- C. U.S. Corps of Engineers
- D. U.S. Coast Guard

Correct answer: A

42. When pumping fuel between an offshore supply vessel (OSV) and a MODU, there must be direct VHF radio contact between the offshore supply vessel engineer and the _____.
- A. person in charge of the fuel transfer
 - B. crane operator
 - C. barge superintendent
 - D. ballast control operator

Correct answer: A

43. In the event the motion of the DEEP DRILLER is such that critical motion limits are exceeded, you should _____.
- A. place the unit at 45 foot draft
 - B. place the unit in standby
 - C. place the unit at 65 foot draft
 - D. shift loads to increase KG

Correct answer: A

44. On a semisubmersible MODU, reserve buoyancy is increased by the presence of void spaces above the waterline in the _____.
- A. columns and upper structure
 - B. submerged hulls
 - C. quarters
 - D. submerged connecting structures

Correct answer: A

45. The transverse distance between draft marks for the DEEP DRILLER is _____.
- A. 122'-09"
 - B. 164'-00"
 - C. 217'-01"
 - D. 260'-05"

Correct answer: A

46. On the DEEP DRILLER, among the valves to open when transferring ballast from Tank 10S to Tank 1P using the #2 ballast pump is valve _____.
- A. 33 Starboard
 - B. 33 Port
 - C. 34 Port
 - D. 44 Starboard

Correct answer: C

47. Given the same water depth and line tension, the catenary length of a 90 pound/foot mooring chain in comparison to the catenary length of a 19 pound/foot wire rope mooring line will be _____.
- A. longer
 - B. shorter
 - C. indeterminable
 - D. identical

Correct answer: B

48. In the piping systems of a MODU, what type of valve gives the least resistance to fluid flow when fully open?
- A. Gate valve
 - B. Globe valve
 - C. Packless valve
 - D. Butterfly valve

Correct answer: A

49. What is the transverse shift in the center of gravity if 200 short tons are placed 10 feet to port of the centerline on a MODU with TCG 0.7 foot starboard of the centerline, and the displacement is 9,000 short tons?
- A. 0.03 foot
 - B. 0.20 foot
 - C. 0.23 foot
 - D. 0.62 foot

Correct answer: C

50. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). What are the new LM (longitudinal moments) if the entire contents of Salt Water Ballast Tanks 1P and 1S are discharged?
- A. 5,191 ft-tons
 - B. 13,414 ft-tons
 - C. 31,992 ft-tons
 - D. 69,175 ft-tons

Correct answer: A