

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

- (A) American Bureau of Shipping
- (B) U.S. Coast Guard
- (C) Minerals Management Service
- (D) U.S. Corps of Engineers

If choice C is selected set score to 1.

2. In MODU operations, hoisting and lowering pipe in and out of the drilled hole is the main function of the _____.

- (A) stand pipe
- (B) drawworks
- (C) swivel
- (D) cathead spool

If choice B is selected set score to 1.

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

- (A) C1P
- (B) 10S
- (C) 1P
- (D) 2P

If choice C is selected set score to 1.

4. 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 transverse free surface effects if the entire contents of Salt Water Ballast Tanks 1P and 1S are discharged?

- (A) 65.95 feet
- (B) 66.85 feet
- (C) 67.66 feet
- (D) 68.59 feet

If choice D is selected set score to 1.

5. The righting moment created by a MODU that displaces 15,000 tons with a righting arm (GZ) of 0.02 foot is _____.
- (A) 3,000 foot-tons
 - (B) 750 foot-tons
 - (C) 600 foot-tons
 - (D) 300 foot-tons

If choice D is selected set score to 1.

6. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). Weather conditions require ballasting to survival draft. Assume that upon arrival at 45 feet, port and starboard ballast tanks 2 and 9 will be full and that port and starboard ballast tanks 1, 3, and 8 will be slack. What would be the new value of the total longitudinal free surface moments (FSML)?
- (A) 69,658 foot-tons
 - (B) 56,244 foot-tons
 - (C) 42,830 foot-tons
 - (D) 30,168 foot-tons

If choice B is selected set score to 1.

7. The DEEP DRILLER, at 60.0 feet draft in sea water, has VM = 974,441 foot-long tons, LM = 3 foot-long tons, FSML = 30,572 foot-long tons, and FSMT = 18,732 foot-long tons. What is the transverse free surface correction to KG?
- (A) 0.00 feet
 - (B) 1.03 feet
 - (C) 1.69 feet
 - (D) 2.22 feet

If choice B is selected set score to 1.

8. 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) indeterminable
 - (B) shorter
 - (C) identical
 - (D) longer

If choice B is selected set score to 1.

9. On a semisubmersible MODU, reserve buoyancy is increased by the presence of void spaces above the waterline in the _____.

- (A) quarters
- (B) submerged connecting structures
- (C) submerged hulls
- (D) columns and upper structure

If choice D is selected set score to 1.

10. The DEEP DRILLER, at 60.0 feet draft in sea water, has VM = 974,441 foot-long tons, LM = 40,301 foot-long tons, TM = 3 foot-long tons, FSML = 30,572 foot-long tons, and FSMT = 18,732 foot-long tons. What is the metacentric height corrected for longitudinal free surface effects?

- (A) 5.66 feet
- (B) 6.31 feet
- (C) 7.37 feet
- (D) 55.47 feet

If choice A is selected set score to 1.

11. In a semisubmersible MODU, the columns contain void spaces above the waterline that used principally for _____.

- (A) reserve buoyancy
- (B) machinery
- (C) equipment storage
- (D) elevators

If choice A is selected set score to 1.

12. The decks of a MODU are supported by transverse members called _____.

- (A) trusses
- (B) deck beams
- (C) deck longitudinals
- (D) web frames

If choice B is selected set score to 1.

13. The most important consideration in the event the Deep Driller suffers damage is _____.

- (A) pump from adjacent undamaged compartments
- (B) preserve reserve buoyancy
- (C) advise authorities
- (D) counterflood on the opposite corner

If choice B is selected set score to 1.

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

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

If choice C is selected set score to 1.

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

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

If choice A is selected set score to 1.

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

- (A) zero
- (B) vertical
- (C) negative
- (D) positive

If choice A is selected set score to 1.

17. A semisubmersible which flops between forward and aft angles of trim is likely to have _____.

- (A) KML less than KGL
- (B) an off-center LCG
- (C) KML greater than KMT
- (D) LCG greater than LCB

If choice A is selected set score to 1.

18. A semisubmersible displacing 700,000 cubic feet while floating in sea water (64 pounds per cubic foot) weighs _____.

- (A) 8,929 long tons
- (B) 19,509 long tons
- (C) 20,000 long tons
- (D) 24,500 long tons

If choice C is selected set score to 1.

19. A virtual rise in the center of gravity of a MODU may be caused by _____.

- (A) using fuel from a pressed fuel tank
- (B) emptying a partially filled tank
- (C) filling a partially filled tank
- (D) transferring pipe from the setback area to the pipe rack

If choice A is selected set score to 1.

20. The document that certifies the correctness of the load line marks on a MODU is called the _____.

- (A) Certificate of Documentation
- (B) SOLAS Certificate
- (C) Certificate of Inspection
- (D) Load line certificate

If choice D is selected set score to 1.

21. The DEEP DRILLER's lightweight is the condition prior to loading _____.

- (A) deck load
- (B) deck load and lower-hull liquids
- (C) deck load, lower-hull liquids, and external loads
- (D) deck load, lower-hull liquids, external loads, and deploying anchors

If choice D is selected set score to 1.

22. 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

If choice A is selected set score to 1.

23. The lightweight vertical moments for the DEEP DRILLER are _____.

- (A) 9,733 ft-long tons
- (B) -6,716 ft-long tons
- (C) 680,914 ft-long tons
- (D) -5,937 ft-long tons

If choice C is selected set score to 1.

24. 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 port ballast pumps
- (B) use starboard ballast pumps and crossover system
- (C) use port saltwater service pump
- (D) use port drill water pump

If choice D is selected set score to 1.

25. In the event the motion of the DEEP DRILLER is such that critical motion limits are exceeded, you should _____.

- (A) shift loads to increase KG
- (B) place the unit in standby
- (C) place the unit at 45 foot draft
- (D) place the unit at 65 foot draft

If choice C is selected set score to 1.

26. What are the transverse moments for the contents of P-tank #1 of the DEEP DRILLER if the ullage is 2.3 feet?

- (A) 3,049 ft-tons
- (B) 3,977 ft-tons
- (C) 6,412 ft-tons
- (D) 8,362 ft-tons

If choice A is selected set score to 1.

27. 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

If choice D is selected set score to 1.

28. Among the possible causes of unexpected rapidly increasing inclination of the DEEP DRILLER while on location is _____.

- (A) external environmental forces
- (B) miscalculation of loads
- (C) flooding due to column damage
- (D) consumption of on board variables

If choice C is selected set score to 1.

29. When a semisubmersible rig under tow experiences pounding on the forward transverse brace, the surest way to alleviate the condition would be to _____.

- (A) change course
- (B) adjust the length of the tow line
- (C) ballast down
- (D) have the tug slow down

If choice C is selected set score to 1.

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

If choice B is selected set score to 1.

31. In case of minor damage to lower-hull tank 1P while the DEEP DRILLER is in transit, you should pump from tank 1P using _____.

- (A) both port-side ballast pumps
- (B) saltwater service pump to supplement port-side ballast pumps
- (C) drill water pump to supplement port-side ballast pumps
- (D) all four ballast pumps

If choice A is selected set score to 1.

32. 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

If choice A is selected set score to 1.

33. An LWT anchor often has difficulty tripping in _____.

- (A) soft soil
- (B) heterogeneous soil
- (C) stiff clay
- (D) sand

If choice A is selected set score to 1.

34. The time required to ballast the DEEP DRILLER to survival draft, when threatened with heavy weather, while under tow, is about _____.

- (A) 2 hours
- (B) 3 hours
- (C) 4 hours
- (D) 5 hours

If choice A is selected set score to 1.

35. 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

If choice D is selected set score to 1.

36. Consideration should be given in planning for the mooring orientation in a new location so that in adverse weather a crane is available to off-load the supply vessel on what side of the unit?

- (A) Crosswind side
- (B) Weather side
- (C) Leeward side
- (D) Upwind side

If choice C is selected set score to 1.

37. While being towed at a 19.5 foot draft, the DEEP DRILLER experiences single amplitude pitching of 7.5 degrees with an 8 second period. You should _____.

- (A) alter course into the wind to improve motion characteristics
- (B) continue towing operations and carefully monitor vessel motions
- (C) ballast the rig to a 45 foot draft and check the vessel motion at the new draft
- (D) ballast the rig to a 60 foot draft and check vessel motion at the new draft

If choice B is selected set score to 1.

38. 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) wait until pitch and roll exceed the limits before ballasting down
- (B) ballast down to a 45 foot draft and check vessel motions
- (C) ballast up to a 15 foot draft and check vessel motions
- (D) shorten the tow wire for a smoother tow

If choice B is selected set score to 1.

39. What is the percentage of oxygen in a typical sample of uncontaminated air?

- (A) 12 percent
- (B) 15 percent
- (C) 18 percent
- (D) 21 percent

If choice D is selected set score to 1.

40. Who is responsible for lowering the survival craft?

- (A) Helmsman
- (B) Roustabout
- (C) First man aboard
- (D) Last man aboard

If choice A is selected set score to 1.

41. A survival craft being used to pick up a person who has fallen overboard from a MODU should approach the person _____.

- (A) at a high rate of speed
- (B) with the wind
- (C) under oars
- (D) against the wind

If choice D is selected set score to 1.

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

If choice A is selected set score to 1.

43. The DEEP DRILLER is loaded as shown in Sample Load Form #4. While the unit is deballasting, port valve 5 fails in the closed position. You may deballast from tank 2P by pumping from tank 9P by also opening valves 6 and _____.

- (A) 35
- (B) 21
- (C) 20
- (D) 8

If choice C is selected set score to 1.

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

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

If choice C is selected set score to 1.

45. Which type of respiratory protection is preferable for repair/investigation personnel on a MODU in a hydrogen sulfide (H₂S) environment?

- (A) U.S. Navy Oxygen Breathing Apparatus (OBA)
- (B) Demand Self-Contained Breathing Apparatus (SCBA)
- (C) Pressure-Demand Self-Contained Breathing Apparatus (SCBA)
- (D) Emergency Escape Breathing Apparatus (EEBA)

If choice C is selected set score to 1.

46. The end of the joint with the exterior threads is called the _____.

- (A) stem
- (B) stand
- (C) box
- (D) pin

If choice D is selected set score to 1.

47. A branch line valve of a fire extinguishing system on a MODU must be marked with the _____.

- (A) date of the last maintenance inspection
- (B) pressure needed to maintain an effective stream at that point
- (C) maximum pressure allowed at that branch
- (D) name of the space or spaces which it serves

If choice D is selected set score to 1.

48. Annual inspection of MODU cranes shall be conducted by _____.

- (A) U.S. Coast Guard
- (B) the person in charge
- (C) the crane operator
- (D) a qualified inspector

If choice D is selected set score to 1.

49. 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) barge superintendent
- (B) person in charge of the fuel transfer
- (C) crane operator
- (D) ballast control operator

If choice B is selected set score to 1.

50. Until a change to lightweight has been approved, the weights and center of gravity locations for the changes to lightweight shown in the permanent record for the Deep Driller are treated as _____.

- (A) variable load
- (B) gross tonnage
- (C) basic load
- (D) fixed load

If choice A is selected set score to 1.