

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. A hurricane has recurved to the northeast and its forward speed is 20 knots. Your MODU is located 600 miles northeast of the hurricane's center. How long will it take for the hurricane center to reach your position if it holds its present course and speed?
- A. 10 hours
  - B. 30 hours
  - C. 50 hours
  - D. 80 hours

Correct answer: B

2. Aboard the DEEP DRILLER, the bilge pumps take suction from the pump rooms, cofferdam, void area, access trunk, and which other area?
- A. The primary salt-water service tank
  - B. The backup drill water tank
  - C. The forward and after column chain lockers
  - D. The center column chain lockers

Correct answer: C

3. The DEEP DRILLER is moored in 600 feet of water. The tension on anchor line #8 is 190 kips. What is the vertical component of chain tension for that line?
- A. 53.6 long tons
  - B. 55.3 long tons
  - C. 84.8 long tons
  - D. 442.4 long tons

Correct answer: B

4. The DEEP DRILLER is loaded as shown in the Sample Load Form #1 (Transit). If weather conditions make it necessary to ballast down to survival, how much ballast would be required?
- A. 3,998.3 long tons
  - B. 4,086.5 long tons
  - C. 4,188.0 long tons
  - D. 5,087.0 long tons

Correct answer: B

5. 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 Saltwater 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

6. 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. 44 Starboard
  - B. 33 Starboard
  - C. 34 Port
  - D. 33 Port

Correct answer: C

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

Correct answer: C

8. When should the emergency position-indicating radio beacon be activated after abandoning a MODU?
- A. After one hour
  - B. Only when another vessel is in sight
  - C. Immediately
  - D. Only after sunset

Correct answer: C

9. Why are symmetric mooring patterns frequently used to keep MODU's on station?
- A. Environmental forces will probably vary in direction during the time the MODU is on station.
  - B. Governmental regulations require this mooring pattern unless an exemption is issued.
  - C. All lines contribute to the holding power of the mooring system.
  - D. Environmental forces will probably come from the same direction during the time the MODU is on station.

Correct answer: A

10. 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

**11.** 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. What would be the value of uncorrected KG?

- A. 51.65 feet
- B. 52.67 feet
- C. 55.15 feet
- D. 62.24 feet

Correct answer: A

**12.** If a MODU takes a sudden severe list or trim from an unknown cause, you should FIRST \_\_\_\_\_.

- A. assume the shift is due to off-center loading
- B. determine the cause before taking countermeasures
- C. assume the cause is environmental forces
- D. counterflood on the side opposite the list or trim

Correct answer: B

**13.** A semisubmersible at a draft of 19 feet 9 inches arrives on location planning to deploy eight mooring lines. Each anchor weighs 15 long tons and each mooring line consists of 3,000 feet of 3-inch chain (89.6 lbs/ft). If no ballast corrections are made, what is the expected draft if the average TPI is 60?

- A. 17 feet 9 inches
- B. 18 feet 3 inches
- C. 18 feet 9 inches
- D. 21 feet 3 inches

Correct answer: B

**14.** Annual inspection of MODU cranes shall be conducted by \_\_\_\_\_.

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

Correct answer: B

**15.** 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

**16.** 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

Correct answer: B

**17.** A semisubmersible rig under tow should be ballasted down if \_\_\_\_\_.

- A. water begins to break over the pontoons
- B. motion begins to be excessive
- C. forward progress is halted by head wind
- D. period of roll exceeds 12 seconds

Correct answer: B

**18.** Why can a person's sense of smell not be depended upon to detect H<sub>2</sub>S?

- A. hydrogen sulfide gas is odorless
- B. the sense of smell is deadened by the gas
- C. it is better to rely on eye irritation as a detector
- D. it has a smell similar to petroleum products

Correct answer: B

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

Correct answer: D

**20.** If a man falls overboard from a rig under tow, you should FIRST \_\_\_\_\_.

- A. deploy life buoys
- B. launch a boat
- C. notify the tug
- D. sound the general alarm

Correct answer: A

**21.** 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

**22.** The element used to keep weight on the bit at a constant value in spite of up-and-down movement of a MODU during floating drilling operations is the heave or drill string \_\_\_\_\_.

- A. equalizer
- B. compensator
- C. tensioner
- D. stabilizer

Correct answer: B

**23.** 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

**24.** 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. righting arm
- D. metacentric height

Correct answer: B

**25.** 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

**26.** The lightweight vertical moments for the DEEP DRILLER are \_\_\_\_\_.

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

Correct answer: D

**27.** 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

Correct answer: B

**28.** Which type of hull damage on a floating MODU should be repaired first?

- A. Damage at or just above the waterline
- B. Damage to/in machinery rooms
- C. Damage below the waterline
- D. Damage to interior watertight boundaries

Correct answer: A

**29.** 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

**30.** Compliance with the terms of the load line certificate on a MODU is the responsibility of the \_\_\_\_\_.

- A. Ballast Control Operator
- B. Operators representative
- C. Master or Offshore Installation Manager
- D. Barge Supervisor

Correct answer: C

**31.** 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, 35, 36, 46, and 48
- B. 4, 34, 36, 46, and 48
- C. 3, 34, 36, 46, and 48
- D. 4, 34, 35, 36, 46, and 48

Correct answer: A

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

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

Correct answer: B

**33.** Which of the following would be the most probable location to encounter explosive and flammable gasses on a MODU?

- A. on the drill floor and liquid mud handling areas
- B. at any location
- C. in bulk storage tanks
- D. in machinery spaces

Correct answer: A

**34.** On a semisubmersible MODU, reserve buoyancy is increased by the presence of void spaces above the waterline in the \_\_\_\_\_.

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

Correct answer: D

**35.** Requirements for H<sub>2</sub>S preparation and equipment usage aboard MODU's in U.S. offshore waters are administered by which of the following organizations?

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

Correct answer: A

**36.** How must each storage tank for helicopter fuel on a MODU be marked?

- A. DANGER - FLAMMABLE LIQUID
- B. DANGER - NO SMOKING
- C. DANGER - KEEP AWAY
- D. DANGER - EXPLOSIVE VAPORS

Correct answer: A

37. On a semisubmersible drilling unit, increasing riser tension increases \_\_\_\_\_.

- A. KG
- B. free surface moments
- C. KM
- D. GM

Correct answer: A

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

Correct answer: D

39. 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

Correct answer: C

40. 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

Correct answer: C

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

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

Correct answer: B

**42.** Periodic surveys to renew the load line assignment for a MODU must be made at intervals not exceeding \_\_\_\_\_.

- A. 18 months
- B. 2 years
- C. 3 years
- D. 5 years

Correct answer: D

**43.** 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

Correct answer: B

**44.** What is the shift in the longitudinal center of gravity if 200 short tons are discharged from 30 feet forward of amidships on a MODU with LCG 1.5 feet forward of amidships, and displacement 9,000 short tons?

- A. 0.62 foot aft
- B. 0.65 foot aft
- C. 0.68 foot aft
- D. 0.71 foot aft

Correct answer: B

**45.** A hydraulic accumulator aboard a MODU is designed to \_\_\_\_\_.

- A. replenish fluid to a system
- B. provide overpressure relief
- C. store fluid under pressure
- D. act as a fluid reservoir

Correct answer: C

**46.** Under the regulations implementing MARPOL, a mobile offshore drilling unit is required to have an International Oil Pollution Prevention (IOPP) Certificate when the unit \_\_\_\_\_.

- A. moves to a new drilling location in U.S. waters
- B. is drilling on the Outer Continental Shelf
- C. engages in a voyage to a port of another country which is a party of MARPOL
- D. All of the above

Correct answer: C

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

Correct answer: D

**48.** 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

**49.** The central longitudinal structural hull strength member of the lower hulls of semisubmersible MODU's is called the \_\_\_\_\_.

- A. main beam
- B. keel
- C. stress plate
- D. rider plate

Correct answer: B

**50.** 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