

U.S.C.G. Merchant Marine Exam
Mobile Offshore Drilling Units
Q441 BCO – MODU Operations
(Sample Examination)

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

1. For the DEEP DRILLER, what are the vertical moments for a sounding of 10 feet in tank C3P?
- A. 1,055 foot-tons
 - B. 4,754 foot-tons
 - C. 14,621 foot-tons
 - D. 17,113 foot-tons

Correct answer: B

2. When removing the cap from a sounding tube on a MODU, the sound of air escaping indicates the tank _____.
- A. is full
 - B. may be partially flooded
 - C. level has dropped
 - D. is completely flooded

Correct answer: B

3. The COASTAL DRILLER is loaded as shown in the Sample Load Form #1 (Rig Move). If the contents of #6 and #7 Drill Water Tanks are discharged, what is the new transverse free surface correction?
- A. 1.77 feet
 - B. 1.67 feet
 - C. 1.56 feet
 - D. 1.45 feet

Correct answer: B

4. An uncontrolled flow of gas, oil, or other well fluids into the atmosphere is called a _____.
- A. blowout
 - B. kick
 - C. flow
 - D. breakout

Correct answer: A

5. What type of test determines the pressure at which the formation immediately below the last set casing will take fluid?
- A. Leak-off
 - B. Drill stem
 - C. Production
 - D. Conductor

Correct answer: A

6. The COASTAL DRILLER, with no trim, is at a true mean draft of 10 feet and 10 inches. TM is -6,800 ft-kips. Using only tanks 1, 25, and 26, how many kips of drill water must be transferred to level the jack-up?
- A. Transfer 53.1 kips each from 25 and 26 forward to 1
 - B. Transfer 100 kips from 26 to 25
 - C. Transfer 200 kips from 25 to 26
 - D. Transfer 100 kips from 25 to 26

Correct answer: D

7. Reinforcing frames attached to a bulkhead on a MODU are called _____.
- A. side longitudinals
 - B. stiffeners
 - C. brackets
 - D. intercostals

Correct answer: B

8. While the COASTAL DRILLER is in transit, stability is acceptable provided that neither the KGL nor the KGT exceed _____.
- A. KML or KMT
 - B. the height of the righting arm
 - C. maximum allowable KG
 - D. GML or GMT

Correct answer: C

9. In MODU construction, a greater number of watertight bulkheads results in _____.
- A. increased capacity to set flooding boundaries
 - B. decreased capacity to set flooding boundaries
 - C. reduced compartmentation
 - D. greater deck load capacity

Correct answer: A

10. Repair of structures on a MODU in the vicinity of liquid mud handling areas presents what possible hazard?
- A. Toxic gasses may be present.
 - B. An oxygen-deficient atmosphere may be present.
 - C. Flammable gasses may be present.
 - D. Liquid muds may flood adjoining spaces.

Correct answer: C

11. The maximum transverse extension of the cantilever for the COASTAL DRILLER places the rotary _____.
- A. at the leg centroid
 - B. at the vessel TCG
 - C. 40 feet aft of the transom
 - D. within 10 feet of the centerline

Correct answer: D

12. Drilling loads on the COASTAL DRILLER are the combined loads arising from conductor tension, rotary, hook, and _____.
- A. fixed loads
 - B. basic loads
 - C. variable loads
 - D. setback loads

Correct answer: D

13. 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

14. An integral part of a blowout preventer that serves as the closing element on an open hole, and whose ends do not fit around the drill pipe but seal against each other and shut off the space below completely is the _____.
- A. shear ram
 - B. blind ram
 - C. pipe ram
 - D. annular ram

Correct answer: B

15. While the COASTAL DRILLER is elevated, the out-of-level alarm indicates that hull inclination exceeds 0.3°. What should you do?
- A. Confirm operation of out-of-level alarm.
 - B. Raise the low corner.
 - C. Raise the high corner.
 - D. Raise unit to proper air gap and inspect for damage.

Correct answer: A

16. What is the FIRST action to take if you detect oil around your tank vessel while discharging petroleum products?

- A. Try to find out where the oil is coming from
- B. Have the pumpman check the discharge piping
- C. Shut down operations
- D. Call the Master

Correct answer: C

17. The draft of the DEEP DRILLER in the lightweight condition is _____.

- A. 16.19 feet
- B. 17.71 feet
- C. 17.96 feet
- D. 18.35 feet

Correct answer: A

18. You have been granted authorization to use chemical agents on an oil spill. What is the main purpose for using the chemicals?

- A. To facilitate the removal of the pollutant from the water
- B. To absorb the oil for easy removal
- C. To dissolve the oil in the water
- D. To sink the oil to the bottom of the sea bed

Correct answer: A

19. The probability of sulfide stress cracking in the presence of hydrogen sulfide is greatest for which of the following materials?

- A. rubber sealing elements
- B. aluminum
- C. low strength steel
- D. high strength steel

Correct answer: D

20. What is a pinion in a jacking system?

- A. Flexible shaft
- B. Gearwheel
- C. Flexible joint
- D. Flexible coupling

Correct answer: B

21. On board a mobile offshore drilling unit, the key to the most rapid and effective response to a man overboard situation is _____.

- A. good communication
- B. a dedicated crew
- C. well-conducted drills
- D. good equipment

Correct answer: C

22. Keeping the draft of a MODU at or below the load line mark will ensure that the unit has adequate _____.

- A. reserve buoyancy
- B. lightweight displacement
- C. critical motions
- D. reserve ballast

Correct answer: A

23. The height of the transverse metacenter for a MODU is 62.44 feet. The height of the center of gravity is 56.10 feet, and the transverse free surface correction is 1.21 feet. What is the value of the metacentric height corrected for transverse free surface effects?

- A. 5.13 feet
- B. 6.34 feet
- C. 8.76 feet
- D. 12.10 feet

Correct answer: A

24. With a rig in tow, there is immediate danger to the tug in the event of the _____.

- A. tug losing power
- B. tow line parting
- C. bridle twisting
- D. rig broaching

Correct answer: A

25. To maintain a high state of readiness against the possibility of damage and subsequent flooding while aboard the DEEP DRILLER, you should _____.

- A. post a watch in the pump room
- B. cap sounding tubes except when in use
- C. keep bilge pumps operating continuously
- D. keep tanks no more than half filled

Correct answer: B

26. When a vessel violates the oil pollution laws, who may be held responsible?

- A. Any individual connected with the vessel involved in the operation
- B. Owners only
- C. Credentialed officers only
- D. Master only

Correct answer: A

27. A weight of 1,000 kips is equivalent to _____.

- A. 1,000 pounds
- B. 2,000 short tons
- C. 2,240 pounds
- D. 500 short tons

Correct answer: D

28. While drilling loaded as shown in Sample Load Form #4 (Drilling), the DEEP DRILLER suffers a sudden unexpected inclination to port and aft. Strong winds and high waves are from the starboard bow. Among the possible causes, you should consider _____.

- A. leak in ballast tank 9P
- B. failure of mooring lines 3 or 4
- C. failure of mooring lines 1 or 2
- D. ballast tanks equalizing into tank 10P

Correct answer: B

29. A special device that, when fitted into the rotary table, transmits torque to the kelly and simultaneously permits vertical movement of the kelly to make the hole is called a _____.

- A. kelly slips
- B. kelly bushing
- C. master bushing
- D. rotary bushing

Correct answer: B

30. For the DEEP DRILLER, it is recommended that the number of lower-hull ballast tanks with free surfaces be less than _____.

- A. 2
- B. 4
- C. 6
- D. 8

Correct answer: C

31. In a severe storm while elevated, the drilling loads on the COASTAL DRILLER must be considered as _____.

- A. rotary loads
- B. hook loads
- C. setback loads
- D. variable loads

Correct answer: D

32. The storage device for nitrogen-pressurized hydraulic fluid, which is used in closing the blowout preventers is called the _____.

- A. actuator
- B. annular preventer
- C. annulus
- D. accumulator

Correct answer: D

33. When taking soundings on a MODU, coating the tape with chalk helps to _____.

- A. show the depth of any water in an oil tank
- B. reduce possibility of sparks
- C. make the tape roll easier
- D. better identify the correct reading

Correct answer: D

34. If you must abandon a rig in VERY HEAVY SEAS, in a survival craft, when should you remove the safety pin and pull the hook release?

- A. Immediately upon launching
- B. One to three feet before first wave contact
- C. Upon first wave contact
- D. Only when waterborne

Correct answer: A

35. While drilling loaded as shown in Sample Load Form #4 (Drilling), the DEEP DRILLER suffers a sudden unexpected inclination to starboard and forward. Strong winds and high waves are from the port quarter. Among the possible causes, you should consider _____.

- A. leak in ballast tank 2S
- B. failure of mooring lines 3 or 4
- C. failure of mooring lines 7 or 8
- D. ballast tanks equalizing into tank 1S

Correct answer: C

36. The space around a pipe in a wellbore, the outer wall of which may be the wall of either the borehole or the casing, is the _____.

- A. down hole
- B. open hole
- C. bore
- D. annulus

Correct answer: D

37. A jack-up 180 feet in length with the LCF at 120 feet AFO has a draft of 8 feet at the bow and 11 feet at the stern. What is the trim by the stern?

- A. 2.0 feet
- B. 2.4 feet
- C. 3.0 feet
- D. 6.0 feet

Correct answer: C

38. The COASTAL DRILLER, loaded as shown in the Sample Load Form #3 (Drilling), discharges the bulk in Bulk Tanks 1 and 2. What is the new TCG?

- A. -1.61 feet
- B. -1.58 feet
- C. 0.43 feet
- D. 0.99 feet

Correct answer: D

39. The sounding for Drill Water Tank #18 for the Coastal Driller is 1.25 feet. It is decided to fill the tank. What is the vertical center of gravity for the added liquid?

- A. 3.13 feet
- B. 2.50 feet
- C. 1.87 feet
- D. 0.63 foot

Correct answer: A

40. Lowering the hull of the COASTAL DRILLER and refloating should be done in favorable weather conditions with wave heights not more than _____.

- A. five feet
- B. four feet
- C. three feet
- D. six feet

Correct answer: A

41. The jettisoning of topside weight from a MODU serves what purpose?

- A. It lowers the center of gravity.
- B. It raises the center of gravity.
- C. It reduces free surface effect.
- D. It returns the MODU to an even keel.

Correct answer: A

42. The maximum angle at which the intact stability curves are valid for MODU's is the angle for _____.

- A. the limit of positive stability
- B. downflooding
- C. maximum offset
- D. the limit of small-angle stability

Correct answer: B

43. Among the valves on the DEEP DRILLER which may be opened when using the Salt-Water Service Pump to pump water into Tank 1P is _____.

- A. 33
- B. 36
- C. 46
- D. 48

Correct answer: C

44. When the height of the metacenter has the same value as the height of the center of gravity, the metacentric height is equal to _____.

- A. the height of the center of gravity
- B. zero
- C. the same as half the height of the metacenter
- D. the height of the metacenter

Correct answer: B

45. On the COASTAL DRILLER, the bilge discharge is normally through the _____.

- A. dump valves
- B. overboard discharge
- C. sump valves
- D. skimmer tank

Correct answer: B

46. The DEEP DRILLER is loaded as shown in the Sample Load Form #3 (Preparing to Drill). If the liquid mud in mud pit #1 (see table 8) is dumped, what would be the new draft?

- A. 60 feet 9.6 inches
- B. 59 feet 9.3 inches
- C. 59 feet 2.7 inches
- D. 56 feet 10.9 inches

Correct answer: C

47. What pump may be used to supplement the bilge pump on the DEEP DRILLER?

- A. Salt-Water Service
- B. No.2 Ballast
- C. No.1 Ballast
- D. Drill water

Correct answer: D

48. While the DEEP DRILLER is operating as shown in Sample Form #4 (Drilling), casing is accidentally dropped over the port side. If the port aft inclination is slowly increasing, which tank is probably damaged?

- A. 1P
- B. 10S
- C. 9P
- D. 10P

Correct answer: D

49. Leg penetration to depths which require pullout forces greater than that which can be supplied by the buoyancy of the hull may exist in _____.

- A. soft mud
- B. sand
- C. soft to firm clays
- D. silt

Correct answer: C

50. The center of flotation for the COASTAL DRILLER is located at the geometric center of the _____.

- A. above water volume
- B. waterplane area
- C. amidships section
- D. underwater volume

Correct answer: B