

**Demo PDF file. This file includes questions: 10 from 115. Full version of file looks the same as demo, but full version includes all questions. You may download file with all questions by link on bottom of this page**

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## Q331 - Great Lakes Topics

**1. When the height of the metacenter is greater than the height of the center of gravity, the upright equilibrium position is stable and stability is \_\_\_\_\_.**

- unstable
- **positive**
- neutral
- negative

Note:

*A positive metacentric height (GM) indicates that the metacenter is above the center of gravity, resulting in positive stability and a restoring force that returns the vessel to an upright position.*

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**2. Which term defines the difference between the forward and aft drafts?**

- **Trim**
- Flotation
- List
- Heel

Note:

*Trim defines the difference between forward and aft drafts. Draft is the vertical distance from the waterline to the keel. Trim is the difference between forward and aft drafts, indicating fore-and-aft inclination. List and heel describe transverse inclination due to unequal loading or external forces, respectively. Therefore, trim is the correct answer.*

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**3. When the height of the metacenter has the same value as the height of the center of gravity, the metacentric height is equal to \_\_\_\_\_.**

- **zero**
- the height of the metacenter
- the same as half the height of the metacenter
- the height of the center of gravity

Note:

*Metacentric height is the difference between the metacenter and center of gravity heights; therefore, when these heights are equal, the metacentric height is zero.*

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**4. When a wind force causes a floating MODU to heel to a static angle, the \_\_\_\_\_.**

- **righting moment equals the wind-heeling moment**
- downflooding point is below water
- centers of buoyancy and gravity are in the same vertical line
- deck-edge immersion occurs

Note:

*At a static heel angle caused by wind, the righting moment and the wind-heeling moment are equal.*

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**5. The maximum draft to which a drilling unit may be safely loaded is called \_\_\_\_\_.**

- deep draft
- calculated draft
- mean draft
- **load line draft**

Note:

*The load line draft is the legally mandated maximum draft to which a drilling unit can be safely loaded, as defined by load line regulations.*

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**6. Which action reduces the yawing of a vessel in a following sea?**

- **Shifting weights to the stern**
- Pumping out tanks aft
- Increasing GM
- Shifting weights to the bow

Note:

*Shifting weights to the stern reduces yawing in a following sea by improving directional stability and rudder effectiveness; trimming by the stern keeps the rudder immersed and increases lateral area aft, while trimming by the bow increases yawing risk. Increasing GM affects rolling stiffness, not yawing, and shifting weights to the bow exacerbates yawing.*

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**7. How are aids to navigation on the Great Lakes arranged geographically?**

- In a westerly and northerly direction, except on Lake St. Clair
- In an easterly and southerly direction, except on the New York State Barge Canal
- **In a westerly and northerly direction, except on Lake Michigan**
- In an easterly and southerly direction, except on Lake Erie

Note:

*Aids to navigation on the Great Lakes are generally arranged westerly and northerly, with Lake Michigan being the exception.*

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**8. Assume that your vessel has just entered Lake Erie by way of the Welland Canal and is proceeding in a southwesterly direction. Which statement about the aids to navigation you can expect to encounter along the route is TRUE?**

- All red even-numbered buoys should be kept on your port side when proceeding in this direction.
- Lighted aids, fog signals, and radio beacons maintained by Canada are not included in the Great Lakes Light List.
- **The characteristics of buoys and other aids are as if "returning from seaward" when proceeding in this direction.**
- All aids are maintained by the U.S. Coast Guard, 9th Coast Guard District, Cleveland, Ohio.

Note:

*When proceeding southwest on Lake Erie from the Welland Canal, aids to navigation are oriented as if approaching from seaward, following the upbound direction.*

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**9. Assuming that the recommended hatch loading sequence is followed, how many long tons of iron ore may be loaded through hatch No. 3 while using a single belt loader to arrive at a desired mean keel draft of 27'-07"? (Use the Guidance Manual for Loading M.V. GRAND HAVEN.)**

- **2500 tons**
- 2550 tons
- 2600 tons
- 2650 tons

Note:

*The correct answer is 2500 long tons, as indicated in the M.V. GRAND HAVEN loading guidance table for a single belt loader and a target mean draft of 27'-07".*

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**10. Which basic category of water level fluctuations on the Great Lakes is the most regular?**

- Outflow fluctuations
- Long-term fluctuations
- **Seasonal fluctuations**
- Short-term fluctuations

Note:

*Seasonal fluctuations are the most regular due to their consistent annual cycle driven by predictable weather and hydrologic patterns.*

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