CHECK YOUR PROGRESS **NAME:**
MASTER 24 STABILITY (answers)

PRINCIPLES OF STABILITY

Question 1 (1 Mark) Validates to TDMMA1107B element 1a

A stability book is prepared and a freeboard is assigned to a vessel at its:

a. periodic surveys.
b. loading dock.
c. initial survey.
d. launching.

Question 2 (1 Mark) Validates to TDMMA1107B element 1a

The stability book of smaller vessels is stored with the _____ book.

Question 3 (1 Mark) Validates to TDMMA1107B element 1a

The Plimsoll Mark on a vessel is used to determine its:

a. freeboard.
b. centre line.
c. trim.
d. heel.

Question 4 (1 Mark) Validates to TDMMA1107B element 1a

Loadline is checked after loading to ensure that a vessel has adequate:

a. list.
b. freight.
c. reserve buoyancy.
d. displacement.

Question 5 (1 Mark) Validates to TDMMA1107B element 1a

The Conditions of Assignment of a Freeboard require hatchways to have

_____ covers.

Question 6 (1 Mark) Validates to TDMMA1107B element 1a

The aft draft marks of a vessel with a raked keel are measured from:

a. under the keel at the forward tangent point.
b. the plan baseline.
c. under the keel amidships.
d. the keel at the LCB.

Question 7 (1 Mark) Validates to TDMMA1107B element 1b

A cubic metre of fresh water weighs _____ .

Question 8 (1 Mark) Validates to TDMMA1107B element 1b

Archimedes Principle states that when a body is wholly or partially immersed in a fluid it appears to suffer:

a. a loss in mass equal to the mass of the fluid it displaces.
b. an increase in mass equal to the mass of fluid it displaces.
c. a loss in fluid equal to the mass it displaces.
d. a increase in displacement equal to the mass it displaces.

Question 9 (1 Mark) Validates to TDMMA1107B element 1b

The distance from the base of a vessel's keel to its waterline is known as the

_____.

Question 10 (1 Mark) Validates to TDMMA1107B element 1b

To prepare a vessel for an inclining experiment it should be close to its

_____ condition.

Question 11 (1 Mark) Validates to TDMMA1107B element 1b

The intact buoyancy of a vessel describes:

a. the volume of spaces above the waterline.
b. a space that can flood without causing a ship to sink.
c. the buoyant volume on heel.
d. the volume of spaces below the waterline.

Question 12 (1 Mark) Validates to TDMMA1107B element 1b

A vessel with its cargo, crew and stores aboard is said to be in a condition of

_____ displacement.

Question 13 (1 Mark) Validates to TDMMA1107B element 1b

Metacentric height is a measure of a vessel's:

a. minimum stability.
b. maximum stability.
c. initial stability.
d. terminal stability.

Question 14 (1 Mark) Validates to TDMMA1107B element 1b

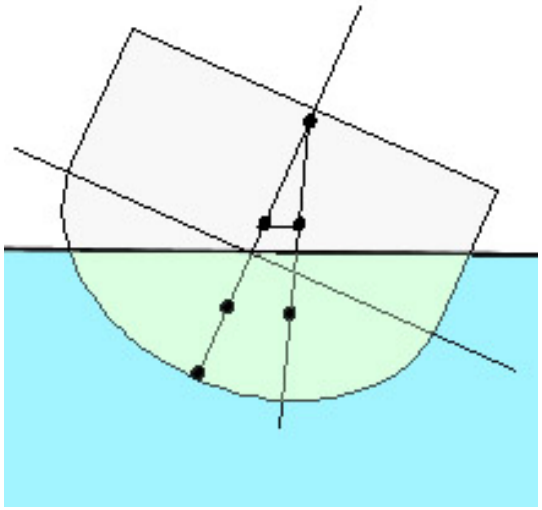
A "stiff" vessel will have a:

a. long rolling period.
b. low freeboard.
c. high center of gravity.
d. short rolling period .

Question 15 (4 Marks) Validates to TDMMA1107B element 1b

On the sketch below, mark the position of:

G	M	B	GZ
Centre of gravity	Metacentre	Initial centre of buoyancy	Righting lever



Question 16 (1 Mark) Validates to TDMMA1107B element 1b

The vessel shown above is in unstable equilibrium.

TRUE FALSE

Question 17 (1 Mark) Validates to TDMMA1107B element 1b

A vessel moved away from the upright by external forces it is said to be heeled.

TRUE FALSE

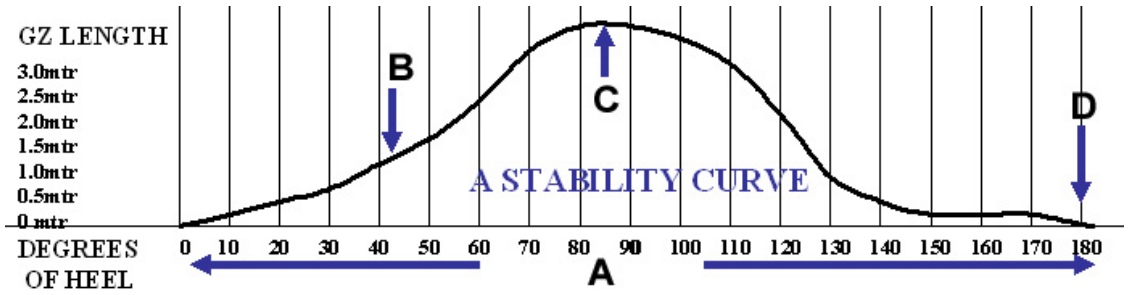
Question 18 (1 Mark) Validates to TDMMA1107B element 1b

Trim is the difference between the forward and after draughts.

TRUE FALSE

Question 19 (1 Mark) Validates to TDMMA1107B element 1b

On the stability curve shown below, what are the terms given to the points A, B, C and D.



A=_____

B=_____

C=_____

D=_____

Question 20 (1 Mark) Validates to TDMMA1107B element 1b

The difference between the draught of a vessel in salt water and fresh water is called the _____ Allowance.

Question 21 (1 Mark) Validates to TDMMA1107B element 1b

A thousand litres of diesel fuel weighs approximately _____ tonnes.

Question 22 (1 Mark) Validates to TDMMA1107B element 2a

A vessel without loaded water, stores, cargo and passengers is described as in a

_____condition.

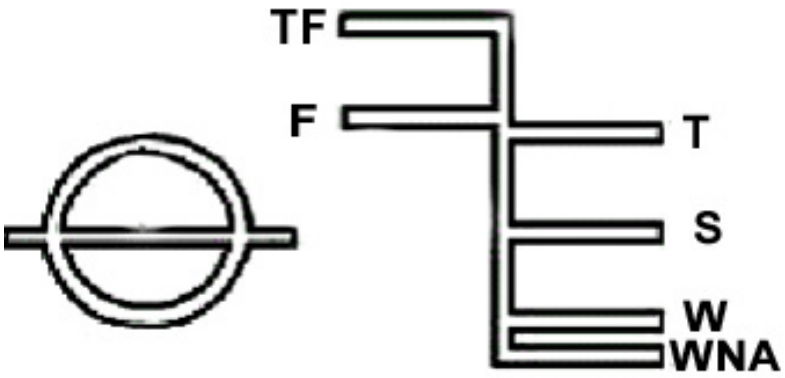
Question 23 (1 Mark) Validates to TDMMA1107B element 2a

If a vessel's load displacement is 100 tonnes when floating in salt water, and its lightship displacement is 65 tonnes in freshwater, then its deadweight is:

a. 165 tonnes
b. 32 tonnes
c. 35 tonnes
d. 47 tonnes

Question 24 (1 Mark) Validates to TDMMA1107B element 2a

On the loadline shown below, what do TF, F, S, and W signify?



TF=_____

F=_____

S=_____

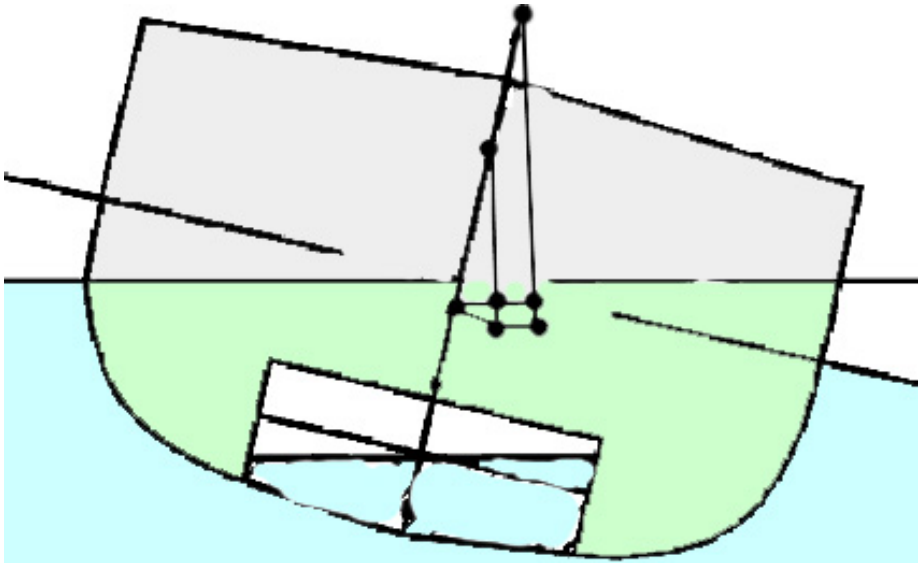
W=_____

Question 25 (1 Mark) Validates to TDMMA1107B element 2a

The distance between the summer loadline and the fresh water mark is called the _____.

Question 26 (4 Marks) Validates to TDMMA1107B element 2b

In the diagram below showing free surface effects label the following points:
A= the final centre of gravity of the vessel. B= the fluid centre of gravity
C=the initial centre of gravity of the vessel. D= the initial metacentre.



Question 27 (1 Mark) Validates to TDMMA1107B element 2c

To limit the free surface effect you should:

a. quarter fill all slack tanks.
b. increase the number of slack tanks.
c. limit the number of slack tanks.
d. half fill all slack tanks.

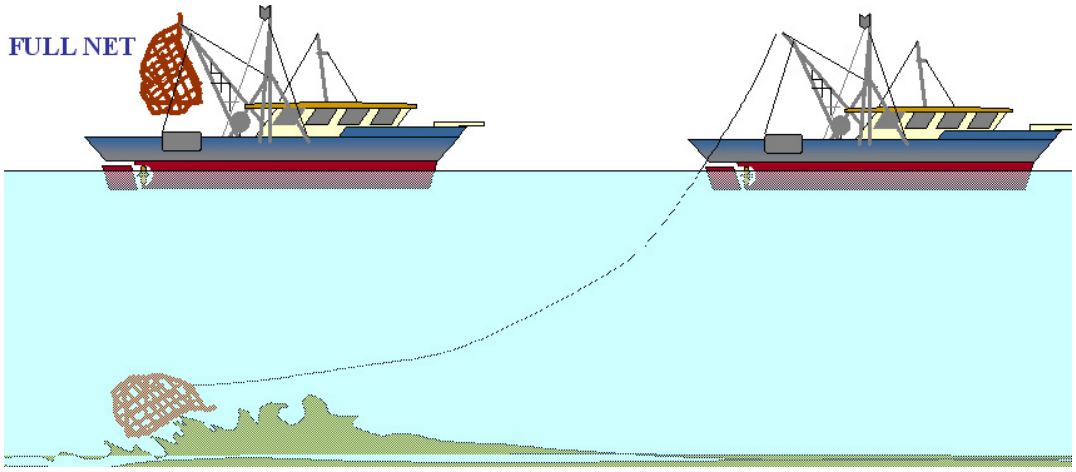
Question 28 (1 Mark) Validates to TDMMA1107B element 2c

Watertight doors must be closed when underway because of the possibility of bilging.

TRUE FALSE

Question 29 (1 Mark) Validates to TDMMA1107B element 2c

Describe briefly the dangers facing the two trawlers shown below:



_____

_____

_____

_____

_____

Question 30 (1 Mark) Validates to TDMMA1107B element 2d

Loading a weight to a position above the vessel's centre of gravity will cause a:

a. a decrease in KM.
b. shift in the CG away from weight added.
c. an increase in MG.
d. shift in the CG towards the weight added.

Question 31 (1 Mark) Validates to TDMMA1107B element 2d

Water on deck will:

a. cause a heel to develop.
b. increase reserve buoyancy.
c. cause FSE.
d. cause LCP.

Question 32 (1 Mark) Validates to TDMMA1107B element 2d

When unloading cargo from the port side lower hold the centre of gravity will move:

a. down and to port.
b. down and to starboard.
c. up and to port.
d. up and to starboard.

Question 33 (1 Mark) Validates to TDMMA1107B element 2e

The range of stability of a vessel in a seaway is most effected by:

a. the sum of the free surface.
b. the amount of freeboard.
c. the cargo carrying capacity.
d. the amount of waterline.

Question 34 (1 Mark) Validates to TDMMA1107B element 2e

In rough weather, the Free Surface Effect resulting from slack tanks in a vessel will cause a virtual:

a. rise of G
b. rise of K
c. reduction of FSE
d. increase in GM

Question 35 (1 Mark) Validates to TDMMA1107B element 2e

FSE is dependant on the:

a. surface area of a slack tank.
b. length of a slack tank.
c. breadth of a slack tank.
d. depth of a slack tank.

Question 36 (1 Mark) Validates to TDMMA1107B element 2e

To increase the inflooding your vessel could suffer without sinking, you could:

a. raise the centre of gravity
b. increase reserve buoyancy.
c. lower the centre of gravity.
d. press up all double bottom tanks.

Question 37 (1 Mark) Validates to TDMMA1107B element 2e

By raising weights twice the height above K a vessel's rolling period is:

a. reduced.
b. doubled.
c. increased.
d. halved.

Question 38 (1 Mark) Validates to TDMMA1107B element 2f

Loll can develop in a vessel which is in:

a. neutral equilibrium.
b. stable equilibrium.
c. unstable equilibrium.
d. load equilibrium.

Question 39 (1 Mark) Validates to TDMMA1107B element 2f

To press up all double bottom tanks and lower the centre of gravity of a vessel suspected of being in a state of loll, you should first fill:

a. the low side of each of the double bottom tanks.
b. both sides of all double bottom tank simultaneously.
c. the high side of each of the double bottom tanks.
d. the high side of all double bottom tanks simultaneously.

Question 40 (1 Mark) Validates to TDMMA1107B element 2f

When using empty double bottom tanks to lower the centre of gravity in a vessel in a condition of loll, then the tanks to be filled first should be the:

a. longest.
b. narrowest.
c. shortest.
d. widest.

Question 41 (1 Mark) Validates to TDMMA1107B element 2f

During the actual lift, when a vessel's own derrick is used to swing a cargo clear of the starboard deck for discharge on the port side wharf, the vessel's centre of gravity:

a. moves downward and to port.
b. moves upward and to starboard.
c. moves upward and to port.
d. moves downward and to starboard

Question 42 (1 Mark) Validates to TDMMA1107B element 2f

A vessel that has poor steering and whose bow is ploughing into a seaway probably requires more:

a. trim by the bow.

b. trim by the stern.

c. more ballast.

d. less ballast.

Question 43 (1 Mark) Validates to TDMMA1107B element 2f

Open freeing ports clear the water shipped on a vessel's decks. They prevent it sinking lower in the water, thereby maintaining_____ and the range of

_____ .

Question 44 (1 Mark) Validates to TDMMA1107B element 2f

To reduce the effects of synchronous rolling, a vessel should alter her course or speed.

TRUE FALSE

Question 45 (1 Mark) Validates to TDMMA1107B element 2f

The FSE of liquids in tanks can be minimised by:

a. subdividing tanks longitudinally.

b. cutting larger lightening holes in floors.

c. making them wider and longer.

d. subdividing tanks transversely.

Question 46 (1 Mark) Validates to TDMMA1107B element 2g

If a loaded vessel passes from salt water to fresh water the bouyancy due to water density on the vessel is:

a. less.
b. greater.
c. unchanged.
d. less, determined by the FWA.

Question 47 (1 Mark) Validates to TDMMA1107B element 2g

Permeability is the percentage of the volume of a compartment which:

a. is occupied by water if the compartment is bilged.
b. cannot be occupied by water if the compartment is bilged.
c. is occupied by water when the compartment is intact
d. cannot be occupied by water when the compartment is intact

Question 48 (1 Mark) Validates to TDMMA1107B element 2g

If a loaded vessel moves from fresh water to salt water then its draught will:

a. decrease because salt water is more dense.
b. increase because salt water is more dense.
c. decrease because salt water is less dense.
d. increase because salt water is less dense.

Question 49 (1 Mark) Validates to TDMMA1107B element 2g

The build up of ice ion the rigging can cause a well found vessel to_____.

Question 50 (1 Mark) Validates to TDMMA1107B element 2g

If a trawler's nets become fast on an obstruction it will experience_____ and static effects.

Question 51 (1 Mark) Validates to TDMMA1107B element 2h

When a trawler's nets become fast on an obstruction, the drag on them will need to be _____ immediately in order to prevent capsize.

Question 52 (1 Mark) Validates to TDMMA1107B element 2h

An angle of loll is caused by:

a. a condition of unequal loading.
b. a condition of under loading.
c. a condition of overloading.
d. a condition of bottom loading.

Question 53 (1 Mark) Validates to TDMMA1107B element 2h

Damage control procedures after collision may include:

a. lashing the collided vessel's together.
b. closing all watertight hatches and doors.
c. rigging fire hoses.
d. all of the choices.

Question 54 (1 Mark) Validates to TDMMA1107B element 2i

Draught marks must always remain_____.

Question 55 (1 Mark) Validates to TDMMA1107B element 2i

A new stability book should be prepared after a vessel undergoes any_____ changes.

USE OF STABILITY DATA

View the stability book

(Information supplied courtesy Marine Safety, WA Department for Planning and Infrastructure).

Question 56 (1 Mark) Validates to TDMMA1107B element 2b

Using the Curve of Limiting KG for M.V. TWOSUCH, what is the maximum KG_{fluid} for the vessel with a displacement of 150 tonnes?

a. 3.43 metres.

b. 3.54 metres.

c. 3.42 metres.

d. 3.60 metres.

Question 57 (1 Mark) Validates to TDMMA1107B element 2f

If your Loading Condition was UNSAFE on the Curve of Limiting KG, you should:

a. shift cargo lower.

b. shift cargo onto the deck.

c. empty half your tanks.

d. shift cargo to the stern.

Question 58 (1 Mark) Validates to TDMMA1107B element 2a

If M.V. TWOSUCH floats at a hydrostatic draft of 2.80 metres, how much cargo will sink her by 20 millimetres?

a. 1.68 tonnes.

b. 2.38 tonnes.

c. 2.56 tonnes.

d. 2.34 tonnes.

Question 59(1 Mark) Validates to TDMMA1107B element 2a

If M.V. TWOSUCH floats at a hydrostatic draft of 3 metres, and 1 tonne of cargo is loaded, then she would sink:

a. 1.020 centimetres.

b. 1.020 millimetres

c. 1.212 centimetres.

d. 1.000 millimetres.

Question 60 (1 Mark) Validates to TDMMA1107B element 2a

From the forward and aft drafts of M.V. TWOSUCH, you determine the hydrostatic draft to be 2.20 metres. The displacement in salt water will be:

a. 111.2 tonnes.

b. 210.0 tonnes.

c. 132.5 tonnes.

d. 112.1 tonnes.

Question 61 (1 Mark) Validates to TDMMA1107B element 2a

The displacement of M.V. TWOSUCH the vessel at its design load draft of 3.00 metres is:

a. 178.23 tonnes.

b. 224.7 tonnes.

c. 204.0 tonnes.

d. 178.0 tonnes.

Question 62 (20 Marks) Validates to TDMMA1107B element 2a

The loading table overleaf is incomplete. Use the Simplified Stability Information for M.V. TWOSUCH to enter the missing data to complete the loading table. Use the Curves of Limiting KG and LCG to determine whether the vessel is safe to operate in this condition.

CONDITIONS OF LOADING M.V.TWOSUCH

CONDITION 6 Arrival in port 100% Catch. 10% Fuel, 38% Water in equalised P&S tanks. FSE in part filled tanks.

Item	Tonnes	V.C.G.	Vert. Moment	L.C.G. +/-	Long. Moment	F.S.N.
Fresh water	3.40					
Fwd FO P&S	-					
Fwd D/B FO P&S	-					
Aft D/B FO P&S	-					
ER Wing FO P&S	4.40					
Lub Oil	0.10					
Crew & Effects	1.00	4.0		+6.0		
Stores	1.00	3.0		-		
Provisions	0.40	2.0		+7.0		
Catch	24.00	2.6		+0.5		
Deadweight						
Lightship	**148.46**	**3.48**	**516.61**	**-0.65**	**-96**	**-**
Displacement						
K.G 3.48m(light)	**(Loaded)**		**L.C.G.**	**(Loaded)**		
F.S.N. 0m			**Safe K.G.f. ?**			
Kgf 3.48m			**Safe L.C.G. ?**			

Has the vessel SAFE or UNSAFE K.G.fluid AND L.C.G in this loading condition?
Show me the Curves of limiting KG & LCG. Answers