ACADEMIC YEAR 2023 – 2024

Program	Year	Semester	Paper
DO's	3	1	Mid-term exam

MODULE NAME:	DYNAMIC TRANSVERSE AND LONGITUDINAL STABILITY-III		
MODULE CODE:	DSTAB-III	EXAM DATE:	9/11/2023
TEACHER'S NAME:	Capt. Sherif Hussein	DURATION:	90 Min

STUDENT NAME:	
STUDENT ID:	

	20
	FINAL MARKS

ANSWER ALL QUESTIONS

Q1: **(TWO MARKS)**
A box-shaped vessel is 24m X 5m X 5m and floats on an even keel at 2 m draft. KG = 1.5 m. Calculate the initial metacentric height.

Q2: **(FOUR MARKS)**
Compare the initial metacentric heights of two barges, each 60 m long, 10m beam at the waterline, 6m deep, floating upright on an even keel at 3m draft, and having KG = 3m. One barge is in the form of a rectangular prism and the other is in the form of a triangular prism, floating apex downwards.

Q3: **(ONE MARKS)**
A ship of 5600 tons displacement is floating upright. A weight of 30 tons is lifted from the port side of No. 2 tween deck to the starboard side of No. 2 shelter deck (10 m horizontally). Find the weight of water to be transferred in No. 3 double-bottom tank from starboard to port to keep the ship upright. The distance between the centers of gravity of the tanks is 6 m.

Q4: **(FOUR MARKS)**

A ship of 6500 tons displacement is floating upright and has GM 0.15 m. A weight of 50 tons, already on board, is moved 1.5m vertically downwards and 5 m transversely to starboard. Find the list.

Q5: **(THREE MARKS)**

A ship of 12500 tons displacement, KM 7 m and KG 6.4 m, has a 3 degree list to starboard and has yet to load 500 tons of cargo. There is space available in the tween decks, centers of gravity 6 m each side of the centerline. Find how much cargo to load on each side if the ship is to complete loading upright.

Q6: **(SIX MARKS)**

A ship of 5000 tons displacement has KG 4.2 m and KM 4.5 m, and is listed 5 degrees to port. Assuming that the KM remains constant, find the final list if 80 tons of bunkers are loaded in No. 2 starboard tank whose center of gravity is 1 meter above the keel and 4 meters out from the centerline.

Good Luck