

**Candidate's Name:**

**Ports and Shipping Organization**  
**Seafarer's Examination and Certification Directorate**  
Exams Cycle:

**Subject : ship construction & stability**

**Rank : Master GT<3000- NCV**

**Date:**

**Time allowed: 2.5 Hrs**

Q.1

- a) A Box shaped vessel,  $L= 60\text{m}$ ,  $B= 10\text{m}$  , draft= $5\text{m}$  on even keel, density= 1.025, find KB and BM.  
b) If the FWA= $50\text{mm}$ , find the TPC of the vessel.

(20 Marks)

Q.2 A Ship of 2000 tonnes displacement, has  $KB= 2.5\text{m}$ ,  $KG= 3.1\text{m}$ ,  $KM= 4.2\text{m}$  and is floating upright in salt water. Find the list if a weight of 12 tonnes is shifted 18m transversely across the deck.

(20 Marks)

Q.3 A Ship 100m long is floating at draft 4.50m FWD. and 5.05m AFT. The centre of flotation is 1.5m aft of amid ships.  $TPC= 10$  tonnes,  $MCTC= 120$  tones. Find the new drafts if a total weight of 430 tonnes is loaded in a position 14m forward of amidships.

(20 Marks)

Q.4 Define the followings: هر یک از اصطلاحات ذیل را به اختصار توضیح دهید:

- a) TPC (5 Marks)  
b) Stowage factor (5 Marks)  
c) Gross tonnage (5 Marks)  
d) Dead weight (5 Marks)

Q.5 Explain the procedures of gas cutting.

نحوه برش توسط گاز را توضیح دهید.

(20 Marks)

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**Q .1)** A Ship of 2100 tonnes displacement has  $KM = 5.6$  m and  $KG = 5.0$  m and is floating upright. A weight of 30 tonnes already on board on the port side is shifted 7 m transversely to starboard side. Find resultant list.  
(20 Marks)

**Q .2)** A vessel arrives in port with displacement 2999 tonnes and  $KG = 5.2$  m, She then loads and discharges the following quantities:  
Load : 500 tonnes of Cargo  $KG = 1.1$  m  
350 tonnes of Cargo  $KG = 4.3$  m  
50 tonnes of fresh water  $KG = 1.7$  m  
Discharge: 1300 tonnes of cargo  $KG = 3.8$  m  
During staying at port, 20 tonnes of oil ( $KG = 1.0$  m) are consumed, if the final  $KM$  is 5.7 m, find the  $GM$  on departure.  
(20 Marks)

**Q.3)** A box shaped vessel with  $L = 60$  m,  $B = 10$  m and draft = 4.0 m on even keel, density of water 1.025,  $FWA = 80$  mm. Find the  $KB$ ,  $BM$  and  $TPC$  of the vessel .  
(20 Marks)

**Q.4)** With regards to cathodic protection on ships, explain the followings:  
a) Impressed current system.  
با توجه به محافظت کاتدی کشتی، impressed current system را توضیح دهید.  
(10 Marks)  
b) Sacrificial anodes.  
با توجه به محافظت کاتدی کشتی، Sacrificial anodes را توضیح دهید.  
(10 Marks)

**Q.5)** Name the welding faults on ships and explain two of them.  
انواع خطاها در جوشکاری را نام برده دوتای آنرا توضیح دهید.  
(20 Marks)

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Q.1)- A ship 90 m long is floating at drafts 4.5 m FWD and 5.0 m AFT .The centre of floatation is 1.5 m aft of amid ships .TPC 120, MCTC 12 tonnes.metre.

Find the new drafts if a total weight of 450 tonnes is loaded in a position 14.0 metres forward of amid ships. (20 Marks)

Q.2)- With the aid of suitable sketches, show the effect of slack tanks on a ship's stability. (20 Marks)

Q.3)- Draw a cross section of a general cargo ship and name all parts. (20 Marks)

۳- عرض مقطعی یک کشتی کارگو را رسم نمائید و کلیه قسمت‌ها را نام گذاری نمائید.

Q.4)- a) Describe the Butt welding. (10 Marks)

جوشکاری نوع Butt را شرح دهید.

b) Name different types of welding tests.

(10 Marks)

انواع تست‌های جوشکاری را فقط نام ببرید.

Q.5)- Describe the followings:

عبارات زیر را توضیح دهید

a) Fresh water allowance

(5 marks)

b) Displacement

(5 marks)

c) Strain

(10 marks)

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**1-** A box shape barge of dimensions 100m x 10m x 6m. float in salt water on an even keel at 3m draft forward and aft. Find the new draft if a weight of 60 tonnes already on board is shifted a distance of 40 meter aft. (25 Mark)

**2- a)** A box shaped vessel Length= 40 meters and Breath= 8 meters.  
Draft = 4.0 mtrs on even keel density = 1.025  
Find KB and BM. (10 Mark)

**b)** If the FWA=60mm find the T.P.C of the vessel. (10 Mark)

**3-** Define the following terms:

- e) Stowage factor
- f) Gross tonnage
- g) Dead weight (5 marks each)

**4-** Draw a forward section of a cargo ship showing floors and panting arrangement name all parts. (25 Mark)

**5-** With the help of sketch, write short note on the following welded joints. (15 Mark)

- A) Butt welds
- B) Lap fillet Welds
- C) Full penetration welds