

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

December 2017 End Semester Examinations
M.Tech. (Marine Engineering & Management)
First Semester

Sub: Materials in Marine Env.

Date: 06.12.2017

Time: 3 Hrs

Sub Code: PG13T1103

Maximum Marks : 100

Pass Marks: 50

Note: Answer any five questions. All questions carry equal marks.
(5 x 20 Marks = 100 Marks)

1. (a) What type of steels are normally used for shipbuilding and what are their desirable properties.

(b) What are the Classification Society requirements before they accept/approve any steel for shipbuilding.

[10+10 =20]

2. (a) What is meant by "Polymorphism" and "Allotropy".

(b) Give at least two examples of materials/metals/nonmetals that exhibit this property of Polymorphism.

[10+10 =20]

3. (a) Explain "Critical Temperature" in the context of the phenomenon of "Superconductivity".

(b) Give some examples of Superconducting Materials along with their respective Critical temperatures.

[10+10 =20]

4. Draw neat sketches with labels of the following Steel Sections used for shipbuilding; **Flat Bar, Bulb Plate, Equal Angle, Unequal Angle, Channel, Tee , Round Bar, Square Bar.**

[=20]

5. (a) What is "Galvanic Corrosion" . List out the "Galvanic Series" of Metals and Alloys in Sea Water.

(b) What are the steps that can be taken to minimize the effects of Galvanic Corrosion.

[10+10 =20]

6. Write short notes on the following:

- a) Gas Welding.
- b) Electric Arc Welding.
- c) Fillet Weld.
- d) Butt Weld.

[5X4=20]

7. (a) What are the sources of Nano particles in the natural environment. Name some areas of the world which are known to generate most of these nano particles.

(b) What are the sources of Anthropogenic (originating from human activity) nano particles? Elaborate on them. [10+10 =20]

8. (a) What is the role of Classification Societies in ensuring safety in the Marine/Shipping Business.

(b) When was IACS (International Association of Classification Societies) formed. Name all the members of the IACS.

[10+10 =20]
