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Date: 14/05/2015

Student Exam No. _____

GANPAT UNIVERSITY

B. Tech. Semester: IV (Marine) Engineering

Regular Examination April - June 2015

2MR402 Engineering Materials

Time: 3 Hours

Total Marks: 70

- Instruction:**
- 1 Attempt all Questions.
 - 2 Assume suitable data if necessary.
 - 3 Figure to the right indicates full Marks.
 - 4 Start new Question on New Page.

Section - I

- Que. - 1 (a) Property and application of plastic and rubber? 6
(b) What is the purpose of heat treatment? 6
OR
Que. - 1 (a) Give the advantages and disadvantages and property alloy steel. 6
(b) What is the Stainless Steel.? Explain different types of Stainless steel. 6
Que. - 2 (a) Explain Cooling Curve with suitable diagram 6
(b) Explain S- curve with suitable diagram. 5
OR
Que. - 2 (a) Explain the different types of cast iron. 6
(b) What is the meaning of creep? Explain the different types of creep curve 5
Que. - 3 Explain the Iron-Carbon Equilibrium diagram. 12

Section - II

- Que. - 4 (a) What are the different factors which determine the rate of corrosion? Draw the steel to aluminum connection diagram of plates to prevent corrosion. 4
(b) Mention the methods of preparing surface for applying protective coatings. Write the paint system for superstructure, waterline and below waterline of a ship. 4
(c) What is corrosion? Explain electro chemical corrosion. What are the essential requirements for electro chemical corrosion to occur? 4
OR
Que. - 4 (a) State the properties of PTFE (Teflon) and its different uses in various products. 4
(b) What are different methods of controlling the corrosion of a ship? Explain the sacrificial anode system of controlling corrosion. Mention the two names of sacrificial anodes used for steel protection 4
(c) Explain impressed current system of corrosion protection. What are its advantages? Why reference cell is provided? 4
Que. - 5 (a) State the two most useful properties of Titanium element for its uses in marine application. Which metals are mixed to produce strong light weight alloy metal? Write its marine uses. 6

(b) Which materials are most commonly used for manufacture of Pistons, Piston rings, Liners, Cylinder Covers, Exhaust Valves, and Bed Plate of large slow speed marine engines? 5

OR

Que. - 5 (a) State the two most useful properties of Chromium element. Mention its various uses /Applications. 5

(b) What are the properties required for selecting materials for propellers. Which materials are used for the manufacture of propellers of ships? 6

Que. - 6 (a) Describe the Hardening process. 6

(b) Explain Tensile testing of material 6

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END OF PAPER