INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATIONS –DECEMBER 2018

B. Tech (Marine Engineering)
Semester- V
Material Science (UG11T2501)

Date:26-12-2018 Maximum Marks: 100
Time: 3Hrs Pass Marks: 50

Part – A

(All Questions are compulsory) (3×10=30Marks)

1.(a) State the different types of bonds & their characteristics.

(b)What is Gibb's phase rule? Explain its importance.

(c) Explain in brief the uses of Eutectic alloys.

(d) What are the different objectives of heat treatment?

(e) What is "Babbit Metal". What are its applications.

(f) Explain the difference between ductile fracture and brittle fracture.

(g) What do you mean by the Phenomenon of Creep?

(h) Draw explanatory sketch of the galvanic corrosion.

(i) Briefly explain the principle of Cathodic Protection.

(j) What are the applications of PTFE in Shipboard systems?

Part –B

(Answer any five) (5×14=70 Marks)

2. (a) Dirrerentiate between "Screw" defect and "Edge" defect with the help of a neat diagram. (7)

(b) Show the approximate Phase diagram of an alloy consisting "A" and "B" having,

(i)100% liquid solubility and 100% solid solubility.
(ii)100% liquid solubility and 0% solid solubility (7)

3. (a) Explain with the help of a neat sketch the procedure of carrying out Impact Test. (7)
(b)Explain in brief various Non-Destructive methods adopted in testing of materials. (7)

4. With a neat sketch describe the Iron-Iron carbide equilibrium phase diagram and label the different compositions and temperatures. Also show the Eutectic and Eutectoid points. (14)

5. (a) Explain the process of failure of a material due to fatigue & show what appearances the fractured surface may have. (7)
(b)Describe normalizing process. (7)

6. (a) Explain in detail the phenomenon of Electrochemical Corrosion (7)
(b) Explain the process of Anodizing and Phosphating. (7)

7. (a) Explain briefly the material used for various components of steam turbine. (7)
(b) Discuss the effects of alloying elements like Carbon, Sulphur, Phosphorous on steel. (7)

8. (a) Write short notes on following alloys,
(i)White metal
(ii)Muntz metal (7)

(b) Write short notes on,
(i)Ceramic
(ii)Titanium (7)

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