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**B.Tech. Degree VIII Semester Examination in Marine Engineering  
May 2019**

**MRE 1803 MARINE MACHINERY SYSTEM DESIGN  
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

(5 × 20 = 100)

- I. (a) List and explain the factors that need to be considered while selecting the material for making any machinery item. (10)
- (b) Describe the importance of surface finish of a cross-head pin. How is the required surface finish obtained and maintained? (10)
- OR**
- II. (a) Which are the main non-metals used in engineering industry and what are their qualities that make them suitable for their intended service? (10)
- (b) Make a brief comparative study of various processes available for manufacturing machinery components. (10)
- III. Analyse the various stresses that a two-stroke diesel engine crank shaft is subjected to. How are these stresses taken care of while designing and manufacturing a crank shaft? Use simple sketches where necessary. (20)
- OR**
- IV. (a) What are the performance requirements of an engine room crane on board an ocean going vessel? Explain with the aid of simple sketches the different arrangements usually used. (12)
- (b) What is the special feature of a pressure reducing valve used on board the ship? Explain with the aid of a sketch how this is achieved. (8)
- V. (a) What is the duty of a thrust block in a ship? Explain with the aid of a sketch how is this duty performed by the thrust block. (10)
- (b) What are the inputs required for designing the cooling water system of a modern vessel? Explain the arrangement of the system with the aid of a simple schematic diagram. (10)
- OR**
- VI. Describe the process of designing an intermediate shaft and a propeller shaft of a diesel engine driven vessel. What are the requirements the Classification Society in the selection of material, manufacturing and testing of the shafts? (20)
- VII. What is the working principle of an oil purifier? Describe with the aid of sketches the internal arrangement of a purifier and the different stages in its operation. (20)
- OR**
- VIII. Which are the two types of electro-hydraulic steering gear systems used on board modern vessels? Explain the main differences between them and the detailed arrangement of one of them using sketches. (20)
- IX. Explain the arrangements of a conventional fuel injection system of a diesel engine and the modern version of the same. What are the advantages of the modern system over the conventional system? (20)
- OR**
- X. Describe with the aid of sketches the arrangement of a life boat on a ship and its launching and recovery procedure. What are the statutory requirements for the life boat and its launching device? (20)