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***B.Tech. Degree V Semester Regular Examination in  
Marine Engineering December 2021***

**19-208-0505 MARINE INTERNAL COMBUSTION ENGINES I  
(2019 Scheme)**

Time: 3 Hours

Maximum Marks: 60

(5 × 15 = 75)

- I. (a) Make a comparison between two stroke and four stroke engines. (7)  
(b) Explain the suitability of slow speed and medium speed marine diesel engines on board merchant ships. Where are they used on ships? (8)
- OR**
- II. Sketch and describe a Uniflow Scavenged 2-Stroke diesel engine cylinder head showing the combustion chamber, exhaust valve and cooling water arrangement. (15)
- III. What are the causes of starting air system explosion? What are the preventive measures to be taken to avoid the above explosions? What are the safety fittings fitted on the air starting system to avoid starting line explosions? (15)
- OR**
- IV. (a) Discuss the developments and merits of long stroke diesel engine. (7)  
(b) Sketch and describe a cylinder liner of a 2-stroke engine and explain what is bore cooling. (8)
- V. (a) Sketch and describe a fuel injector of a large marine diesel engine. (9)  
(b) Describe the overhauling procedure of a fuel valve. (6)
- OR**
- VI. What are the reasons for the variation of compression pressure and peak pressure in two stroke diesel engine? Describe the method of controlling the NOx emission in exhaust. (15)
- VII. Write short notes on:  
(i) Uptake fire (3)  
(ii) Stroke-bore ratio (4)  
(iii) Thermal stresses in IC engines components (4)  
(iv) Effect of viscosity on fuel combustion (4)
- OR**
- VIII. (a) What is SOx and NOx emissions in the exhaust of marine diesel engines and their effects in the atmospheric pollution. (8)  
(b) How NOx and SOx emissions are controlled in marine diesel engines. (7)
- IX. (a) Sketch and describe the working of two stage turbocharger and explain its advantages. (10)  
(b) Explain the advantage and disadvantage of constant pressure turbo charging. (5)
- OR**
- X. Describe with simple sketches, the construction of cross head guides and columns for any large two stroke main propulsion marine diesel engine. (15)