BT MRE-V(S.S)-06-23-2482 Reg. No. | | | | | | | | |

B

B.Tech. Degree V Semester Special Supplementary Examination in Marine Engineering June 2023

19-208-0505 MARINE INTERNAL COMBUSTION ENGINES -I

(2019 *Scheme*)

Time: 3 Hours Maximum Marks: 60

Course Outcome

On successful completion of the course, the students will be able to:

CO1: Understand the basics of IC engines and on the IC engine components in detail.
CO2: Explain regarding scavenging and supercharging in Marine Diesel Engines.
CO3: Make a detailed study of combustion characteristics in I.C. Engines and control of exhaust emission.
CO4: Understand the cooling methods employed in I.C. Engines and to analyze the safety and prevention of incidents like crankcase explosion, scavenge fires, uptake fires and starting air line explosion.
CO5: Gain knowledge on balancing of engine and on the effects of vibration. To have a good understanding about the fuel injection system of a marine diesel engine.

Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create

PI – Programme Indicators

(Answer *ALL* questions) (5 × 15 = 75)

			Marks	BL	CO	PI
I.	(a)	Explain the timing diagram of 2-stroke and 4-stroke engines.	6	L2	1	1
	(b)	Enumerate the differences in design, operation and application of crosshead type and trunk type diesel engines used on board ships.	9	L3	1	1
		OR				
II.	(a)	Explain the term 'rating' of marine diesel engines and define MCR, CSR and OR.	5	L1	1	1
	(b)	Sketch and explain a cylinder liner and jacket used in a large two-stroke crosshead type engine with uniflow scavenging.	10	L2	1	1
III.	(a)	Describe the different types of scavenging used in marine 2-stroke diesel engines along with their merits and demerits.	9	L2	2	2
	(b)	Explain pulse type and constant pressure type turbocharging along with its application on different engines on board a ship.	6	L3	2	2
		OR				
IV.		With the help of a neat sketch explain the constructional details of a turbocharger used in marine diesel engines.	15	L2	2	1
V.	(a)	Write short notes on: (i) Atomization (ii) Penetration (iii) Turbulence (iv) Sac volume.	8	L1	3	1
	(b)	Explain, how the fuel oil bunkered onboard a ship is prepared for use in a diesel engine?	7	L2	3	1
		OR				

(P.T.O.)

		Marks	BL	CO	PI
VI.	Sketch and describe a fuel injector used in a marine medium speed engine.	15	L2	3	1
VII.	Write short notes on: (i) Scavenge fire (ii) Uptake fire (iii) Starting air line explosion.	15	L1	4	1
	OR				
VIII.	Discuss the merits and demerits of various cooling media used for piston cooling in marine diesel engines. What are the coolant conveying mechanisms used for piston cooling in large two stroke marine diesel engines?	15	L1	4	1
IX.	Sketch and describe a spill valve type fuel pump with provision for varying the injection timing and the quantity of fuel injected.	15	L2	5	3
	OR				
X.	Explain in detail a camshaftless marine diesel engine with common rail system for fuel supply and exhaust valve actuation.	15	L2	5	1

Bloom's Taxonomy Levels
L1 – 29%, L2 – 61%, L3 – 10%.

***