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***B.Tech. Degree V Semester Regular/Supplementary Examination in
Marine Engineering November 2024***

**19-208-0505 MARINE INTERNAL COMBUSTION ENGINES-1
(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 details.
 CO2: Explain regarding the scavenging and supercharging in marine diesel engines.
 CO3: Make a detailed study of combustion characteristics in IC engines and control of exhaust emissions.
 CO4: Understand the cooling methods employed in IC 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 Mean Piston speed. Enumerate the advantages and disadvantages of having a high mean piston speed.	7	L1	1	1.4.1
	(b) Explain timing diagram of four stroke and two stroke engines.	8	L2	1	1.3.1
OR					
II.	(a) Explain the accessories fitted on a four stroke cylinder head with neat sketch.	7	L1	1	1.3.1
	(b) Explain Bedplate with a neat diagram. Explain four different types of bedplates used on marine engines.	8	L2	1	1.3.1
III.	(a) Explain the different parts of Turbocharger with neat sketch.	10	L2	2	1.3.1
	(b) Enumerate the advantages and disadvantages of pulse and constant pressure turbo charging.	5	L1	2	1.3.1
OR					
IV.	(a) Explain surging in a Turbocharger with neat diagram.	10	L2	2	1.3.1
	(b) Explain different cleaning methods used in a turbocharger.	5	L1	2	1.3.1
V.	(a) Sketch and explain a fuel oil service system used onboard.	10	L1	3	1.4.1
	(b) Explain sac volume of a fuel injection valve and its significance.	5	L2	3	1.4.1
OR					
VI.	(a) Sketch and explain FO supply and circulation system for main engine.	10	L1	3	1.4.1
	(b) Name different grades of distillate and residual fuel used on board.	5	L2	3	1.4.1

(P.T.O.)

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		Marks	BL	CO	PI
VII.	(a) Explain Uptake fire with different stages of fire, control measures and indications.	10	L1	4	1.4.1
	(b) Explain bore cooling of cylinder liner.	5	L2	4	1.4.1
OR					
VIII.	Explain				
	(i) Explain a crank case relief door with neat sketch.	8	L1	4	1.3.1
	(ii) Explain two different types of OMD with neat sketch.	7	L1	4	1.3.1
IX.	(a) Explain Helix controlled Fuel pump with neat sketch.	10	L2	5	1.3.1
	(b) Explain FQS and its significance.	5	L2	5	1.3.1
OR					
X.	(a) Explain common rail fuel injection system used in large two stroke marine engines.	10	L2	5	1.3.1
	(b) Explain the need to adjust the FQS as per BDN.	5	L2	5	1.3.1

Bloom's Taxonomy Level
L1 – 44.67%, L2 – 55.33%.
