Q. Code:621790

Reg. No. | | | | | | | | | | | | | | |

B. E / B. TECH.DEGREE EXAMINATIONS, MAY 2023

Fourth Semester

MR18402 – MARINE DIESEL ENGINES I

(Marine Engineering)

***(Regulation2018A*)**

TIME: 3 HOURS **MAX.MARKS: 100**

CO1 Fuel technology and combustion in I. C. Engines.
CO2 Types and characteristics of Marine Diesel Engines.
CO3 Construction of Large Marine Propulsion Engines.
CO4 Cooling, Scavenging and Supercharging arrangements in Marine Diesel Engines.
CO5 Camshaft, Crankshaft and their drive arrangements.

PART- A (10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1	What are all the various treatment methods for residual fuel oil practiced onboard?	**1**	**2**
2	What is stoichiometric combustion of fuel and its significance?	**1**	**2**
3	Draw with simple sketch a 4-stroke valve timing diagram.	**2**	**2**
4	How the indicated power of a marine diesel engine is calculated?	**2**	**2**
5	Name the different types of piston rings in 4-stroke diesel engine.	**3**	**2**
6	What is the purpose of a stuffing box in a 2 stroke marine diesel engine?	**3**	**2**
7	What is scavenging and various types of scavenging?	**4**	**2**
8	How the piston and liner in a 2 stroke marine diesel engine is cooled?	**4**	**2**
9	What are the various types of drive used between crank shaft and camshaft in marine diesel engine?	**5**	**2**
10	What is camshaft speed relative to the engine speed in a 4-stroke and 2-stroke engine?	**5**	**2**

PART- B (5x 14=70Marks)

(Restrict to a maximum of TWO subdivisions)

			Marks	CO	RBT LEVEL
11(a)		What are the various properties of residual fuel oil used onboard and briefly explain each property?	**(14)**	**1**	**2**
		(OR)			
11(b)	**(i)**	What is microbial degradation of fuel oil and how it can be prevented in distillate fuel oil?	**(7)**	**1**	**2**
	(ii)	Name the various types of crude oil and briefly describe the refining processes by which petroleum fuels are produced?	**(7)**	**1**	**2**

12(a)	**(i)**	Describe the event which takes place in the cylinders of 4-stroke and 2-stroke diesel engine?	**(7)**	**2**	**2**
	(ii)	Explain the difference between crosshead and trunk piston type engine and their relative advantages?	**(7)**	**2**	**2**
		(OR)			
12(b)		What is heat balance sheet and how to calculate heat balance sheet for an I.C Engine? Also explain what is thermal efficiency of an I.C Engine?	**(14)**	**2**	**2**
13(a)		With the help of neat sketch, explain the working of Jerk type fuel pump and how the fuel oil quantity delivered is controlled?	**(14)**	**3**	**3**
		(OR)			
13(b)	**(i)**	Briefly describe the manufacturing technique and materials used for liner, piston, piston rings and cylinder cover?	**(7)**	**3**	**3**
	(ii)	What are the various types of liner wear and how it can be minimized?	**(7)**	**3**	**3**
14(a)		Explain pulse type and constant pressure type turbo charging of marine diesel engine. Also list out their merits and demerits?	**(14)**	**4**	**3**
		(OR)			
14(b)		With respect to cooling of an I.C Engine:			
		1. With the aid of a simple sketch explain the path followed by a coolant medium from inlet to outlet of an engine for liner and piston cooling.	**(7)**	**4**	**3**
		2. What is the need to maintain the cooling water quality and various treatments carried out onboard for cooling water?	**(7)**		
15(a)		Describe how crankshaft deflections are taken and how they are recorded? What precaution must be taken when taking the deflection readings on the cranks nearest to the turning gear?	**(14)**	**5**	**3**
		(OR)			
15(b)	**(i)**	With respect to construction of crankshaft, Explain the terms fully built and semi built crankshaft?	**(7)**	**5**	**3**
	(ii)	How are crankshafts manufactured by welding processes? What are the advantages of welded crankshaft?	**(7)**	**5**	**3**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16		With respect to combustion of fuel in I.C Engine			
	1.	What do you understand by atomization of fuel?	**(3)**		
	2.	How the NOx and SOx emissions from the engine are controlled to meet regulatory requirements?	**(7)**	**1**	**3**

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