Q. Code:602128

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

B.E./ B.TECH. DEGREE EXAMINATIONS, MAY 2024

Eighth Semester

MR18801 – MARINE VEHICLES PERFORMANCE

(Marine Engineering)

(Regulation 2018 / 2018 A)

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

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Students will have knowledge about types of resistance.	**4**
CO 2	Students will have knowledge about types of propeller and theory of propulsion.	**4**
CO 3	Students are enabled and understood the rudder theory and types of rudder.	**4**
CO 4	Students will have knowledge about wave theory and anti-rolling devices.	**3**
CO 5	Students will have knowledge about sources of ship vibration, noise and its effects.	**3**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	How does Bulbous bow help to overcome resistance?	**1**	**2**
2.	What is the significance of admiralty co-efficient?	**1**	**2**
3.	Draw a simple sketch of a propeller leaf showing Rake and Skew.	**2**	**1**
4.	What is a variable pitch propeller?	**2**	**1**
5.	What is a Spade rudder?	**3**	**1**
6.	How the rudder area is calculated for fast and slow ships?	**3**	**1**
7.	What is Smith effect?	**4**	**2**
8.	What are the six degrees of motion for a ship?	**4**	**2**
9.	What is “Couple” in vibration?	**5**	**2**

			Marks	CO	RBT LEVEL
10.	What is the prime adverse effect of noise on board a vessel?		**5**	**2**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)	A 6 m model of a ship has a wetted surface area of 7 m^2, and when towed in fresh water at 3 knots, has a total resistance of 35 N. Calculate the effective power of the ship, 120 m long, at its corresponding speed. n = 1.825: f - from formula: SCF = 1.15.		**(14)**	**1**	**3**
	(OR)				
(b)	The daily fuel consumption of a ship at 15 knots is 40 tonne. 1100 nautical miles from port it is found that the bunkers are reduced to 115 tonne. If the ship reaches port with 20 tonne of fuel on board, calculate the reduced speed and the time taken in hours to complete the voyage.		**(14)**	**1**	**3**
12. (a)	**(i)**	Derive a relation between mean effective pressure and speed of a vessel.	**(6)**	**2**	**3**
	(ii)	A propeller of 4m pitch has an efficiency of 67%. When turning at 120rpm, the real slip is 36% and the delivered power is 2800 kw. Calculate the thrust of the propeller.	**(8)**	**2**	**3**
	(OR)				
(b)	**(i)**	With a schematic diagram explain the relation between different speeds of a vessel.	**(5)**	**2**	**3**
	(ii)	When a propeller of 4.5 m pitch turns at 110 rpm the apparent slip is found to be 5% and the real slip is 1.55%. If the wake speed is 25% of the ship speed, calculate the ship speed, apparent slip and real slip.	**(9)**	**2**	**3**
13. (a)	Draw a neat sketch of an unbalanced rudder and explain the function of each part.		**(14)**	**3**	**3**
	(OR)				
(b)	A ship 150 m long and 8.5 m draught has a rudder whose area is one seventieth of the middle-line plane and diameter of stock 320 mm. Calculate the maximum speed at which the vessel may travel if the maximum allowable stress is 70 MN/m^2, the centre of stock 0.9 m from the centre of effort and the maximum rudder angle is 35°.		**(14)**	**3**	**3**
14. (a)	**(i)**	Explain Generation of Trochoid waves with sketch.	**(8)**	**4**	**2**
	(ii)	Explain Irregular wave systems.	**(6)**	**4**	**2**
	(OR)				
(b)	Explain in detail with sketches the function of Tank Stabilizer and Active Fin Stabilizers.		**(14)**	**4**	**2**

		Marks	CO	RBT LEVEL
15. (a)	Describe in detail the various forces causing Ship vibrations.	**(14)**	**5**	**2**
	(OR)			
(b)	Describe the methods used for calculation of vibration.	**(14)**	**5**	**2**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Analyze vibration characteristics of a two stroke diesel engine and the counter measures taken on a marine engine.	**(10)**	**5**	**3**

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