

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

Entrance Test for Admission to Ph.D / Integrated Ph.D / MS (By Research)

MODEL QUESTION PAPER

Subject Name: **MARINE ENGINEERING & TECHNOLOGY**

Maximum Marks: 50

There will be 50 questions and each question carry 1 mark.

Students are required to choose the answer nearest to the correct answer from the multiple choices given for each question.

1. Safe manning document is issued by
 - a. Port State Control
 - b. Flag State
 - c. ILO
 - d. IMO

2. Bill of lading serves following purposes.
 - a. It is document of title
 - b. It is an evidence of contract between shipper and carrier
 - c. It is receipt issued by shipper to consignee
 - d. Both A and B

3. The system with the open loop transfer function $1/(s+4)$ with unity feedback is:
 - a. Type 1 and order 1
 - b. Type 0 and order 1
 - c. Type 2 and order 1
 - d. Type 1 and order 2

4. What is the effect of phase lag compensation on the performance of a servo system?
 - a. For a given relative stability, the velocity constant is decreased
 - b. The bandwidth of the system is increased
 - c. For a given relative stability, the velocity constant is increased
 - d. The time response is made faster

5. In the describing function stability analysis, proceeding from the point of the intersection, if the $-1/N$ plot for increasing values of E is placed to the right side (inside) of the $G(j\omega)$ plot, then the system
 - a. will have unstable limit cycle
 - b. will have stable limit cycle
 - c. will be stable
 - d. will be unstable

6. Which of the following is an insurance & reinsurance market?
 - a. Lloyd's List
 - b. Lloyds Banking Group
 - c. Lloyds of London
 - d. Lloyd's Register

7. The exclusive economic zone (EEZ) is the zone immediately adjacent and beyond the territorial seas extending to a distance of
 - a. 200 nautical miles from the baselines
 - b. 24 nautical miles from the baselines.
 - c. 12 nautical miles from the baselines.
 - d. 350 nautical miles from the baselines

8. The periodicity of the boiler survey is normally
 - a. 5 years
 - b. 2 years
 - c. 2.5 years
 - d. 1 year

9. Ballast Water Management Convention came into force in:
 - a. 2012
 - b. 2020
 - c. 2017
 - d. 1978

10. How many Parts does the STCW code consist of?
 - a. 4
 - b. 3
 - c. 1
 - d. 2

11. SOLAS is made up of ____ chapters.

- a. 18
 - b. 16
 - c. 14
 - d. 12
12. What is "fourth pillar" of the international maritime regulatory regime?
- a. MLC 2006
 - b. ICS
 - c. EEDI
 - d. PSC MOU
13. Watertight doors below the Waterline should be
- a. Hinged type
 - b. Horizontal or Vertical sliding type
 - c. should be Made up of cast Iron
 - d. should be strong enough to prevent leakage
14. Slop tank decanting cannot be carried out within ____ miles from the coast or within special areas.
- a. 50
 - b. 25
 - c. 10
 - d. 12
15. CAP (Condition assessment program) is applicable to
- a. oil tankers and bulk carriers of 15 years of age and below
 - b. oil tankers of 15 years of age and above
 - c. oil tankers and bulk carriers of 15 years of age and above
 - d. bulk carriers of 15 years of age and above
16. RING MAIN SYSTEM fitted on tanker ships:
- a. Is cheaper to construct and requires less maintenance, line washing time is reduced
 - b. Has gate valves constructed in tank bulkheads, fast method of discharging.
 - c. Has shorter pipe lengths and fewer bends, provides better suction to pumps
 - d. Has versatility required for carrying various grades, offers good segregation of cargo.
17. Thermosyphon circulation of water heating system depends on –
- a. Thermal effect of solar energy

- b. density difference of hot and cold water
 - c. pump capacity of water circulation
 - d. environmental effect
18. Maximum flux density (*irradiance*) of solar energy is –
- a. 700 W/m²
 - b. 500 W/m²
 - c. 1 KW/m²
 - d. 1 W/m²
19. For correct operation of a Synchro-chain, all Synchros in the chain must be powered:
- a. From the same excitation voltage source
 - b. Through high quality slip-rings & brushes
 - c. Through highly accurate CTs (Current Transformers)
 - d. From a stabilized 3-phase AC supply with correct RYB sequence
20. In Rudder Position Indicator system, the Rudder Transmitter Synchro is designed to rotate 4-times the actual angle of the Rudder:
- a. For mechanical magnification since one Transmitter is required to drive many Receiver Synchros.
 - b. To compensate for electrical transmission losses to achieve accurate reading at the Bridge
 - c. To compensate for mechanical transmission losses to achieve accurate reading at the Bridge
 - d. For easy & accurate read-out at the Bridge
21. Which of the following statements characterizes steering operations using the "non-follow up controller"?
- a. The rudder responds to the Wheel if the switch is held left and responds to the gyro input if the switch is held right; in both cases, it remains in position when switch is "off".
 - b. The rudder responds to the gyro input if the switch is held left and responds to the Wheel if the switch is held right; in both cases, it returns to mid-ships with switch "off".
 - c. The rudder responds while the switch is held left or right and remains in position when the self-centering switch is released.
 - d. The rudder responds while the switch is held left or right and returns to mid-ships when the self-centering switch is released.
22. In a Ward Leonard System of Electrical Propulsion, the direction of Propeller Rotation is reversed:
- a. By reversing the excitation to the Exciter mounted on the same shaft

- b. By reversing the direction of the Diesel Engine driving the main DC Generator
 - c. By reversing the polarity of input DC Supply
 - d. By reversing the excitation to main DC Generator
23. Which of the statement is false for the ball bearing?
- a. Ball bearings support both radial & thrust load.
 - b. It is sliding contact bearing.
 - c. Ball bearing is also called anti friction bearing
 - d. Elastohydrodynamic lubrication exists in ball bearing assembly
24. At what temperature a gas is consider cryogenics:
- a. Above -180 degrees C
 - b. Below -180 degrees C
 - c. Below -150 degrees C
 - d. -195 degrees C
25. Detuners & Damper are fitted at
- a. Can be placed anywhere on the shafting system.
 - b. Nodal point of shafting system
 - c. Anti Nodal point of the shafting system
 - d. Delinked from shafting system
26. Following are the reasons for placing rudders at aft:
- I. As the pivoting point lies towards the aft end of the ship, hence the leverage of the stern rudder will be more than that of a bow rudder.
 - II. The stern rudders gain from the effect of the propeller race.
 - III. Bow rudders increases drag of the ship, as it disturbs the laminar flow to the ship.
- a. Reasons I and II are correct but III is incorrect
 - b. Reasons II and III are correct but I is incorrect
 - c. Reasons I and III are correct but II is incorrect
 - d. All reasons I, II, and III are correct
27. The area enclosed by the outline of the propeller blades outside the hub projected onto a plane normal to the shaft axis is called _____
- a. Disc area
 - b. Projected area
 - c. Expanded area
 - d. Developed area
28. In a reaction turbine, when the degree of reaction is zero, then there is.....

- a. Maximum heat drop in the fixed blades
 - b. Maximum heat drop in the moving blades
 - c. No heat drop in the fixed blades
 - d. No heat drop in the moving blades
29. An unusual vibration in the main propulsion turbine unit, accompanied by a rumbling sound in the reduction gear, could be caused by _____.
- a. overloading of the condenser
 - b. a reduction in condenser vacuum
 - c. a labyrinth seal failure
 - d. a carryover from the boiler
30. The steel component to be surface hardened by carburising should hold
- a. 0.01% carbon
 - b. 0.20% carbon
 - c. 0.8 % carbon
 - d. 1% carbon
31. During electrochemical corrosion in acidic environment
- a. Oxygen evolution occurs
 - b. Oxygen absorption occurs
 - c. hydrogen absorption takes place
 - d. hydrogen evolution takes place
32. Transverse frames are large more widely spaced on a ship that is designed with the _____.
- a. isometric system of framing
 - b. transverse system of framing
 - c. centerline system of framing
 - d. longitudinal system of framing
33. Which of the following method of launching allows the shipbuilding and dry-docking of a ship over flat piece of reinforced land in a shipyard?
- a. Stern Launching
 - b. Airbag launching
 - c. Side Launching
 - d. Shiplift Launching
34. IN CI engine compression ratio cannot be increased beyond a limit because:
- a. the components will do knocking
 - b. the components will become heated

- c. the components will have to withstand a very high stress making them very heavy
 - d. the components will become weak
35. At higher engine loads, the operating temperatures increase causing reduction in
- a. ignition delay
 - b. compression pressure/temp
 - c. combustion delay
 - d. peak pressure/temp
36. Ideal Indicator diagram for a reciprocating pump is
- a. Graph between pressure head and stroke length under ideal conditions
 - b. Graph between pressure head and suction stroke under ideal conditions
 - c. Graph between stroke length and delivery head under ideal condition
 - d. Graph between pressure head and delivery stroke under ideal condition
37. Centrifugal pump develops ideal head equal to
- a. Vw^2u^2/g
 - b. Vw^2/g
 - c. u^2/g
 - d. u^1Vw^2/g
38. To improve the isothermal efficiency, the ----- is used in reciprocating air compressor.
- a. Reheater
 - b. Open Air Filter
 - c. Intercooler
 - d. Closed Air heater
39. The ----- generally states that the velocity of rise and hence the separation rate is directly proportional to the difference in densities of the fluids and the size of the droplets of oil.
- a. Thompson law
 - b. Stoke's Law
 - c. Continuity law
 - d. Bernoulli law
40. Maximum power developed in synchronous motor occurs at a coupling angle of –
- a. 30 degree
 - b. 180 degree
 - c. 90 degree
 - d. 60 degree