

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: **NAUTICAL SCIENCE**

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. Which would be the correct statement among the following?
 - a. In the case of a loaded ship stationary in water, on even keel the Pivot Point is very close to the longitudinal centre of gravity.
 - b. A ship underway under the effect of the propeller has its pivot point pushed in the direction of travel-forward or aft and this new position is temporarily $1/10 L$ from bow or stern as the case may be depending on the direction of ships movement.
 - c. At constant speed, pivot point settles about $\frac{3}{8} L$ from the bow when ship is making headway or $\frac{3}{8} L$ from the stern when ship is making sternway.
 - d. The centre of the rotational motion of turning ship depends upon draught to beam ratio of the vessel

2. Select the wrong statement?
 - a. Permeability (μ) is the percentage ratio of the space available for the entry of water into a compartment.
 - b. A smaller permeability will mean a smaller loss of buoyancy.
 - c. For an empty compartment permeability $\mu = 0\%$
 - d. If the reduced permeability applies at the final waterline, there will be less loss of water plane area and hence less loss of BM

3. Which of the following is FLAME POINT?
 - a. is that temperature, to which a flammable mixture(vapor-air) is heated up so that the combustion starts spontaneously without any source of ignition
 - b. is a chemical reaction, initiated by a source of ignition, in which a flammable vapour combines with oxygen to produce carbon dioxide, water vapour and heat
 - c. of a liquid is the lowest temperature at which a liquid generates enough vapor to create a flammable mixture with air. At this point if a source of ignition is

introduced, there will be a flame but the moment ignition source is removed the flame will not continue to burn

- d. Is the lowest temperature at which a liquid generates enough vapor to create a flammable mixture with air, when a source of ignition is introduced will continued to burn even after the ignition source is removed
4. Which of the following is not correct as required by the minimum intact stability criteria to be satisfied by all cargo ships when at sea?
 - a. The area under the righting lever curve (GZ curve) should not be less than 0.05 metre--radian up to 30° angle of heel
 - b. not less than 0.09 metre-radian up to 40° or the angle of down flooding Θ_f , if this angle is less than 40°
 - c. The initial metacentric height (GM) should not be less than 0.15 m
 - d. The righting lever GZ should be at least 0.20 m at an angle of heel equal to or greater than 30°
 5. Which factors will affect the rate of turn and size of the actual circle?
 - a. Whether the ship is on even keel or carrying a list
 - b. Draught and trim of the vessel at the time of trials
 - c. The amount of rudder angle applied to complete the turn
 - d. All the above
 6. Discard Criteria for a single layer 6x7 fibre core wire rope used for a cargo wire, when?
 - a. 2 or more wires are visibly broken in a length equivalent to 6 diameters
 - b. 4 or more wires are visibly broken in a length equivalent to 6 diameters
 - c. 6 or more wires are visibly broken in a length equivalent to 6 diameters
 - d. 8 or more wires are visibly broken in a length equivalent to 6 diameters
 7. Voyage data recorder records:
 - a. Status of visibility
 - b. Date & time from GPS
 - c. Movements of vessels in the vicinity
 - d. Efficiency of all Bridge equipment
 8. Which statement regarding Features of a cargo plan is False?
 - a. The location of each main item of cargo, with a brief description
 - b. The load port and discharge port of each stow
 - c. Extend of any pre-slinging

- d. None of the above
9. Cleanliness of cargo hold bilges for grain cargo – which of the following statement is correct?
- a. Hold bilges must be cleaned thoroughly to remove all residue, rust particles and cargo stains etc.
 - b. The filter (Rose Box) must be cleaned thoroughly
 - c. The bilge well must be sponged dry to remove all trace of water and dried
 - d. All the above
10. Which of the International Maritime Solid Bulk Cargoes (IMSBC) Code's three cargo groups is correct?
- a. Group A cargoes - cargoes which may liquefy
 - b. Group B cargoes - cargoes which are loaded in bulk
 - c. Group C cargoes - cargoes which are neither liable to liquefy nor loaded in bulk
 - d. None of the above
11. Which of the following is recommended methods for securing grain as per international grain code?
- a. Shifting boards (Filled/partly filled)
 - b. Saucers (Filled)
 - c. Bundling of bulk grain (Filled)
 - d. All of the above
12. Which is the cleanest burning fossil fuel among the following?
- a. LPG
 - b. LNG
 - c. LEG
 - d. None of the above
13. Which of the following statements gases is true?
- a. The atmospheric boiling point of a liquid is the special case in which the vapor pressure of the liquid equals the defined atmospheric pressure at sea level, 2 atmospheres
 - b. The standard boiling point is defined by as the temperature at which boiling occurs under a pressure of 0.5 bar

- c. The boiling point of an element or a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid
 - d. None of the above
14. Which of the following SOLAS and LSA code Requirements for lifeboat is true?
- a. The requirement for lifeboat of a cargo ship with 20,000 GT is that the boat must be capable of launching when the ship is heading with a speed of 7 knots
 - b. The speed of the lifeboat descent should not be more than 36m/min which is controlled by means of centrifugal brakes
 - c. The hoisting time for the boat launching appliance should not be less than 0.5 m/sec with the boat loaded to its full capacity
 - d. None of the above
15. Which of the properties of a good paint is correct:
- a. It should give a thick and uniform coating
 - b. It should be hard and durable on drying
 - c. The painted surface should not fade on drying.
 - d. It should not react with water
16. Which of the following items should be taken into account in voyage and passage planning:
- a. the condition and state of the vessel, its stability, and its equipment; any operational limitations
 - b. any special characteristics of the cargo (especially if hazardous), and its distribution, stowage and securing on board the vessel
 - c. its permissible draught at sea in fairways and in ports; its manoeuvring data, including any restrictions
 - d. All the above
17. Every Company should develop, implement and maintain a safety management system which includes the following functional requirements. Which of the following statement is true?
- a. a safety and garbage-protection policy
 - b. procedures to prepare for and respond to emergency situations
 - c. procedures for external audits
 - d. None of the above

18. Which Principles of Guidelines for ships operating in polar waters is false?
- a. aim to promote the safety of navigation and to prevent pollution from ship operations in polar waters
 - b. recognize that this is best achieved by an integrated approach, based on requirements in existing Conventions which cover the design, outfitting, crewing and operation of ships for the conditions which they will encounter
 - c. take into account that Arctic and Antarctic conditions may include sea and glacial ice that can represent a serious structural hazard to all ships
 - d. None of the above
19. Which requirement according to Principles of Guidelines for ships operating in polar waters is false?
- a. All means of escape from accommodation or interior working spaces should not be rendered inoperable by ice accretion or by malfunction due to low external ambient air temperatures
 - b. All escape routes should be dimensioned so as not to hinder passage for persons wearing suitable polar clothing
 - c. Escape routes should be designed to minimize the distance between their exit to an open deck and the survival equipment to which they lead
 - d. None of the above
20. Select the false statement. As per ISM "RESOURCES & PERSONNEL" clause requires, the Company must employ the "right" people onboard and in the office and make sure that all of them
- a. Know what their duties are
 - b. Receive instructions on how to carry out their duties
 - c. Get trained when and if necessary
 - d. None of the above
21. What Statutory documents will you take over from outgoing Master?
- a. Safety Equipment Certificate
 - b. List of charts onboard
 - c. De-rat Certificate
 - d. All the above
22. What is the item not covered by 'Safety Construction certificate'?

- a. Structural Strength
- b. Machinery and electrical installations
- c. Pilot Ladders & Hoist
- d. Windlass and Mooring equipment

23. What is the item not covered by 'Load Line Certificate'?

- a. Assignment of freeboard and marking of Load Line
- b. Fire plan
- c. Crew Protection (i.e., Crew access and guard-rails, life line)
- d. Loadicator, Stability book

24. Validity of Certificates?

- a. Damage Control appliance -5 year
- b. Certificate of registry -5 year
- c. Safety equipment -2 year
- d. Safety Radio -1 year

25. What preparation you will make whilst proceeding for distress? Select the false answer

- a. Establish a traffic co-ordination system among vessel's proceeding to same area of distress
- b. Radar plots on vessels in the vicinity
- c. ETA's of own and other vessel assisting
- d. None of the above

26. Who will be On-Scene Co-ordinator (OSC)? Select the false answer.

- a. When two or more SAR facilities conduct operations together, the SMC should designate an OSC
- b. Until an OSC has been designated, the first facility arriving at the scene should assume the duties of an OSC
- c. If this is not practicable, facilities involved should designate, by mutual agreement, an OSC
- d. None of the above

27. The Safe manning certificate would be issued on the basis of minimum person required to operate. Select the false answer

- a. Vessel to alongside
- b. Vessel to cast off
- c. Vessel to Dry dock
- d. Port operation including cargo watch, gangway watch

28. When to Note of Protest?

- a. After every case of General average
- b. On arrival after a long voyage
- c. Delay in Pilot boarding
- d. None of the above

29. In deciding whether to accept salvage assistance, what circumstances would you take into account?

- a. Weather and sea conditions
- b. Proximity to the shore or shoal water
- c. Threat of pollution
- d. All the above

30. What is the difference between the old OLF and LOF 95?

- a. On new LOF, the claiming percentage for salvage have changed from 30% to 50%.
- b. On new LOF, the claiming percentage for salvage have changed from 30% to 75%.
- c. On new LOF, the claiming percentage for salvage have changed from 30% to 100%
- d. None of the above

31. Objective of International Safety Management Code?

- a. To ensure safety at sea, prevention of human injury or loss of life and avoidance of damage to the environment
- b. Provide for safe practices in ship operation and safe working environment
- c. Establish safeguards against all identified risks
- d. All the above

32. What is the Master's Responsibility and Authority under Safety Management Code?

- a. Maintaining harmony among crew
- b. Implementing the safety and environmental protection policy of the company

- c. Ensuring safety of Navigation at sea
- d. None of the above

33. Lifesaving appliances for all ship? Select the true statement

- a. Life jacket for adult- 100% + 10% extra.
- b. Survival craft: Totally enclose life boat both side 100%
- c. Horizontal distance if more than 80m from nearest survival craft then another life raft to be place fwd or aft.
- d. Rescue boat: Two.

34. Factors increasing squat include?

- a. Shallow depth of water
- b. Traffic density
- c. Even keel condition
- d. None of the above

35. Name the types Of Research? Select false statement

- a. Descriptive Versus Analytical
- b. Applied Versus Fundamental
- c. Quantitative Versus Qualitative
- d. Searching for solutions to the problem

36. A PhD prepares you for...?

- a. An academic career where you engage in teaching and research
- b. A research career where you engage in research
- c. A clinical research career where you engage in research alongside clinical practice
- d. All the above

37. Criteria of Good Research?

- a. The purpose of the research should be clearly defined and common concepts be used
- b. The procedural design of the research should be carefully planned to yield results that are as objective as possible
- c. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis
- d. All the above

38. What are the responsibilities of the Safety officer? Select the false statement

- a. To improve safety consciousness among the crew
- b. The safety officer's role is to seek to initiate or develop safety measures before an incident occurs rather afterwards
- c. To keep a record of all accidents and dangerous occurrences
- d. None of the above

39. Purposes of Safety committee is

- a. Make the ship a better working place
- b. Prepare risk assessment and send it to Owners
- c. To record the rest hours of all crew members
- d. All the above

40. International Oil pollution prevention Certificate (IOPP)

- a. Required by non-tankers of 500 GRT or more and tankers of 150 GRT or more
- b. Validity 3 years. Can be extended by 5 months
- c. Surveys required: Initial, Annual, Intermediate, Periodic/Renewal
- d. All the above