

MCA Yacht 3/2 - Chief Engineer Statutory and Operational Requirements - Examination March 2006.

1. With reference to engine room fires:-
 - a) describe how a new member of staff should be instructed on the necessary precautions that should be taken to avoid machinery space fires; (10)
 - b) explain the process by which diesel oil, escaping under pressure from a damaged pipe, can self-ignite; (5)
 - c) state the immediate actions that should be taken on discovering a fire. (5)

2. With reference to the International MARPOL Convention 73/78, Annex VI:-
 - a) explain what is meant by the term **ozone depletion**, stating THREE examples of gases that are thought to affect the ozone layer; (6)
 - b) state the precautions that should be taken when overhauling a refrigeration plant, with regard to ozone depletion; (8)
 - c) detail the limitations that are presently coming into force regarding the burning of hydrocarbon fuels in internal combustion engines. (6)

3. a) A motor yacht has a cruising speed of 21 knots.
The combined engine power output to achieve this speed is 3000kW.
The quoted specific fuel consumption at this power is 0.31kg/kWh.

Calculate, to TWO decimal places, EACH of the following:-
 - i) the fuel consumption per 24 hours of continuous steaming; (3)
 - ii) the safe amount of fuel required for a voyage of 2500 nautical miles at the stated speed. (5)

- b) Describe the actions that should be taken if it is found that, during the voyage, a proportion of the fuel cannot be transferred out of the storage tanks. (12)

4. With reference to machinery maintenance:-
- a) state FOUR reasons why reliance on unplanned, or breakdown maintenance is unacceptable; (4)
 - b) describe the parameters on which EACH of the following planned maintenance systems are based, stating an example where EACH may be applied:-
 - i) running hours; (4)
 - ii) calendar intervals; (4)
 - iii) condition monitoring. (4)
 - c) describe how a record of planned maintenance may be kept on board. (4)
5. With reference to dry-docking procedures:-
- a) list SIX arrangements that are necessary to maintain essential services on board the vessel during the docking period; (6)
 - b) describe the inspection of the underwater hull that would be conducted by a class surveyor; (6)
 - c) list the essential checks that should be made in EACH of the following situations:-
 - i) before re-flooding the dock; (5)
 - ii) when the vessel has been re-floated. (3)