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; PDF notes code of safe working practices page 124 chapter 5.0 (10)
   b) explain the process by which diesel oil, escaping under pressure from a damaged pipe, can self-ignite; fuel leaks from a small hole, it causes friction as the fuel passes thought the hole causing it to heat up and self ignite. (5)
   c) state the immediate actions that should be taken on discovering a fire. Rise the alarm, access fire, restrict the fire if possible, inform fire team of fire type and relay information. (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; refrigerant gases released into the air such as CFC HCFC, sulfur dioxide cause ozone depletion by attacking and displacing the ozone particles (6)
   b) state the precautions that should be taken when overhauling a refrigeration plant, with regard to ozone depletion;when eventing the system, it must be contained and stored into a tank and not released into the air. (8)
   c) detail the limitations that are presently coming into force regarding the burning of hydrocarbon fuels in internal combustion engines.MGN142 MCA .1% low sulfar fuel. Keep on board bunker notes for up to a year. (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. By slowing down fuel consumption will reduce and increase range. Proceed to nearest port safely. (12)

4. With reference to machinery maintenance:-
a) state FOUR reasons why reliance on unplanned, or breakdown maintenance is unacceptable; Not cost affective, reduce down time, and freight costs shipping parts (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;cylinder heads, power pack, oil changes, oil filters (4)
ii) calendar intervals water tank flushing, bleach shower heads, cleaning A/C system, change engine oil,
(4)
iii) condition monitoring. Oil anyish, vibration monitoring once a month. Insolation testing monthly (4)
c) describe how a record of planned maintenance may be kept on board. On board in a written log book and stored on a backup data base. Print a paper copy and store in log folder and kept in the engineroom.
Unsafe. (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)