4nd Engineer /EOOW level ORAL QUESTION BANK

Syllabus:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1112162/MIN_654_Engineering_and_Electro-technical_Officer_Oral_Exam_Syllabus_-_Amendment_1.pdf

2nd Engineer level ORAL QUESTION BANK

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Total Question collection : 250

Total Question collection : 394

Sample Question paper:

EOOW Oral Exam: 06/11/2023, 1315.
Location: Liverpool
Examiner: P. Lewis
Duration: Approx. 60 mins (50min questions, 5min chat at the beginning and end). Result: Pass.

The examiner sat me down and immediately took my TRB and Evidence folder off me and said that he would be looking through these throughout the exam. He then asked me for my passport and discharge book and confirmed with me that I was British and that I had worked for the RFA throughout my cadetship. He then asked me about my vessels, variances in propulsion etc.

He then started talking about the FD course at Fleetwood as it was still in its infancy, he also asked if whether myself and any of my classmates had planned to carry on studying to get a full B.ENG (Hons). This all took about 5 mins.

He then held up MIN 654 and explained that he would be following it but he will be asking question based on my taskbook.

These questions are not necessarily in the correct order and he liked to ask questions on top of questions to gauge the level of technical knowledge after the safety side had been covered.

1. He started off by asking me to write down every step I would take to obtain a Permit-to-Work for an enclosed space entry for a fuel tank whilst he started to look through my taskbook. He was obviously looking for a very detailed answer including why every step must be taken as he spent around 5 mins looking through my TRB thoroughly.
2. He then wanted to know about the atmosphere within a fuel tank, Gas contents, explosive limits etc.
3. What type of atmosphere would I expect within a STP?
4. Rounds – Started me off in the shaft tunnel, what would I be looking for
5. What is a stern tube?
6. How is it lubricated?
7. How would I know if there was bearing damage?
8. What keeps the sea water out?
9. What type of seals does a stern tube arrangement have?
10. Explain how the seals work?
11. What is a lip seal? How does it work? Draw it.
12. How is the stern tube system designed to assist in keeping sea water out if the aft seal is damaged?
13. Carry on with rounds after the shaft tunnel.
14. What would you check on an air compressor?
15. Why would an air compressor J.C.W be high?

16. What type of coolers are there?
17. What is a plate cooler made from?
18. What is a shell & tube cooler made from?
19. Bilge pumping.
20. How to pump water overboard from the bilge holding tank? (OWS)
21. Describe the procedure for operating the OWS.

22. Limitations?
23. ORB, what is it? What needs to be entered in it?
24. How to check that the OWS is working correctly?
25. Special areas?
26. Differences between 2 & 4 stroke engines?
27. Why does a 2 stroke have two different types of L.O?
28. Why is there different L.O's used on 2 & 4 stroke engines?
29. Where can a hotspot occur?
30. What to do if the OMD alarms?
31. Steering gear checks during STBY?
32. How are the two pump motors supplied?
33. Why are they fed from different sources?
34. What type of protection is there on the steering gear pump motors? (none)
35. Emergency steering control?
36. Safety Officer on board?
37. What should I do if I had an issue on board regarding safety?
38. Who else on board other than the safety officer could I speak to?
39. What if nothing gets done, is there a safety committee on board?
40. Who has access to the outcomes of the safety meetings? How is this info circulated to the crew members?
41. Is there anyone ashore that you could speak to regarding safety?
42. Who is your DPA?
43. Asked me about being on a H.V ship, differences?
44. Explain the switchboard arrangements you had on board?
45. Shown me my switchboard layout from my taskbook, what does this symbol mean? (transformer)
46. How does a transformer work?
47. Is there an equation to describe how a transformer works? (he was after turns ratio)
48. Why does the transformer need power to work?
49. Explain Reactive, apparent and true power?
50. Explain the relationship between them?
51. What do we mean by power factor?
52. What is the equation for power factor?

53. What can affect your stability?
54. What is free surface affect?
55. What does it do to the stability?
56. Explain what you mean about the "Actual loss of GZ and a virtual loss of GM"?
57. What is GZ?
58. What is GM?
59. Draw and explain a diagram showing this occurs? (Standard stability diagram with vessel listed over).

This is not all of the questions but is all I can remember at the moment. He didn't actually ask as many questions as I had expected him to and he seemed to be asking questions regarding the reports and diagrams from my taskbook rather than following MGN 69 as he said he would be. Therefore I would advise anyone who is currently at sea to put as much effort into your taskbook as you can and for anyone currently ashore who is revising for your oral exam you should try and learn your reports and diagrams as best you can. (However some examiners do not even look at your TRB etc.!!)

And final good luck to anyone sitting their orals!

A SECTION : DUTIES AND RESPOSIBILITIES

1. How will you perform watchkeeping duties?
2. Taking over as 4rth engineer on a vessel for which you are not familiar before ,what things would you check and ask from out going 4th engineer.
3. A new 4rth has come for first time on this ship. So now you take him through the ship.
4. What are the 4rt duties/Responsibilities. Where you can get it?
5. What are 4rt responsibilities of during bunkering?
6. What is critical spare and who maintains Critical Spares?

B SECTION : MOTOR

Structure:

1. what is the Function of ,A frame,bed plate,entablature,Tie rod ?
2. Why 4 stroke engine don't have tie bolts?
3. What is the Function of holding down bolts?
4. What is the function of Crosshead and how it is lubricated?
   https://www.marineinsight.com/tech/understanding-hot-cold-corrosion-marine-engines/#:~:text=Corrosion%20is%20a%20primary%20concern,exhaust%20passage%20of%20the%20engine
5. What are the Sign of liner/cylinder head Crack?
6. What are the Causes of liner/cylinder head Crack?
7. Antipolishing ring or flame ring?

Maintenance:

8. What are Consequences of crank shaft misalignment?

9. How Crank case explosion occur?
10. What is hot spot and how it occurs?

11. How to Prevent Crankcase explosion?
12. What action taken on detecting hot spot / OMD alarm?
13. What are the safety device in crank case?
14. Why crank case relief door fitted?
15. Describe 4 Stroke piston construction?
16. What are the Causes of Cracks in Piston Crown?
17. How to do Injector Overhaul?
18. What are the Injector Checks while overhauling?
19. How to detect leaky injector?
20. What are the Effects of leaking injector?
21. Draw a 4 stroke timing diagram.
22. Draw a 2 stroke timing diagram .
23. What are Types of indicator cards.
24. What is a Power card?
25. What is a Draw card?
26. Why is Compression card needed ?
27. Why is Light spring card needed?
28. What is the Purpose of indicator cards?
29. How to confirm engine performance is satisfactory?.
30. How to calculate Indicated Power?
31. How to take Indicator Card?(2&4 Stroke)
32. Early injection (reason & indications).
33. Late infection (reason & indications).
34. After burning (reason & indications).
35. Draw Card points (Injection start/stop, Ignition start/stop).
36. what is VIT?
37. How to notice incorrect timing?
38. Function of Spill port? https://www.youtube.com/watch?v=_VfnGg5EVdc
39. Function of delivery valve?
40. What is a proper Bunkering procedure?
41. What are the bunker Samples?
42. What are the BDN information?
43. Marpol annex VI Sample.
44. What are the on board Fuel oil treatment?

45. What are the Impurities in FO and effects?
46. What is the Sulphur limitation?
47. How to check fuel quality?
48. What are Fuel additives and their function?
https://www.corrosionpedia.com/definition/1625/fuel-additives-corrosion
49. Losses along a Two stroke propulsion system.
50. How is thrust transferred to the hull, lead onto workings of a thrust block
51. How do you know your injection timing is correct?
52. What are DFDE Gas safeties on your ship & what happens when gas leakage is detected?
53. What do you check for in the fuel oil lab test results? (Viscosity, density, flash point, water content etc.) https://www.marineinsight.com/tech/marine-heavy-fuel-oil-hfo-for-ships-properties-challenges-and-treatment-methods/#:~:text=HFO%20or%20heavy%20fuel%20oil,generate%20steam%20inside%20the%20boiler.
54. How does the Asphaltienes in fuel effects the engine?
55. What about in L.O Sample? (viscosity, Flash point, Microbial contamination, TBN, water content.
56. Function of the Thrust Pad and working.
https://www.marineengineersknowledge.com/2021/06/Thrust%20bearing.html
57. What is the purpose of thrust block?
58. How crosshead is lubricated?
https://www.meoexamnotes.in/2019/12/crosshead-lubrication-crosshead-on-slow.html
59. What actions are taken or what is done to have a proper lubrication of Crosshead Bearing?
60. How to reverse the Main Engine? https://www.brighthubengineering.com/marine-engines-machinery/60584-reversing-of-marine-engines/
61. What is the Nox limits ?
62. What are the Sulphur Control equipment (SOx)?
63. Describe the HFO to DO Change over procedure.
64. Describe the Do to HFO Changeover Procedure.
65. What indication is on the engine components for the NOx technical file?
Marked with special IMO number
66. what is Viscosity?
67. What is Pour Point?
68. What is Flash pont?
69. what is detergency?

70. What is dispersant?
71. What is LO sampling procedure?
72. What are the Contaminant in Lube Oil?
73. Causes of contamination and effects and remedy action.
74. What is batch Purification?
    https://club.mobilindustrial.com/glossary-of-lubrication-terms/w/glossary-of-terms/1151/batch-purification#:~:text=batch%20purification%20%2D%20a%20filtration%20process,returned%20or%20placed%20into%20service.
75. How to maintain LO Onboard?
76. What are the On board LO tests and how often you do that?
77. What are the information in LO analysis report?
    https://www.machinerylubrication.com/Read/29598/oil-analysis-report
78. What are the Properties of LO?
    https://en.wikipedia.org/wiki/Lubricant
79. Draw a FO,JCW ,BILGE,SW,LO System.
80. Draw 2 stroke Cross head engine section?
81. What are the ME slowdowns?
82. What are the ME shut downs?
83. Draw a Starting air valve?
84. What is slow turning?
85. How to identify leaking air starting Valve?
86. What are the Safety device on Air compressor?
87. How to test Safety device on Air bottle and inspection procedure?

Turbochargers

https://marineengineeringonline.com/tag/measure-turbocharger-axial-and-radial-clearance/#:~:text=K%20value%2C%20it%20is%20a,from%20bottom%2C%20record%20the%20clearance.

https://meoexampreparation.wordpress.com/2017/07/01/how-to-put-turbocharger-out-of-operation/

88. what are the methods of Scavenging?
89. What is the method of Turbo charging, advantages and disadvantages?
90. What are the Turbocharges lubrication methods?
91. What are various Turbocharger Problems? what can affect Turbo charger Performance?
92. Why Turbo charger vibrate?
93. What is Surging? Causes of Surging?

C SECTION: REGULATIONS

1. What is ISM?
2. what is SMS?
3. What manual include SMS?
4. what is SMC?
5. what is DOC?
6. Who is DPA?
7. What is SOLAS?
8. What is MARPOL?
9. What is COSWP?
10. what is PSC?
11. What is your duties in ISM?
12. Who issue IOPP certificate?How to test OWS?

13. MARPOL Annex I, IV and VI.
14. What can you tell me about annex I? OWS operation conditions?
15. Certificates under annex 1?
16. What about annex IV? Applies to which ships? Ships with Holding tank can discharge where?
17. Conditions for operation of STP?
18. MARPOL Annex 6. IEE cert, IAPP cert, EIAPP cert, SEEMP,EEXI Cert,EEDI
19. Annex VI pollution prevention against what? Fuel sulphur content how much in ECA and non-ECA?
20. How would a PSC Officer check compliance with NOx emissions?
21. What is EIAPP?
22. What documents under NOx?
23. If pollution takes place which manual to be followed?(SOPEP)
24. Types of maintenance Procedure?
25. what is PMS?
26. what is Condition monitoring system?

27. What are the Condition monitoring for ME ?.
28. What is MSN,MIN and MGN?
29. ISPS Code? Where is security manual kept?
30. Asked for where I had found information regarding exams and syllabus? MIN 654 notice
31. What is Enclosed Space entry procedure?
32. Which gases are detected by gas meter?
33. What is BA Compressor?
34. What is SCBA
35. What are the checks on SCBA ?
36. What is permit to work?
37. What is the convention that regulates your conditions onboard? (MLC)
38. What conditions are these? dmlc 1 and dmlc 2
39. What are the MCA notices? (M Notice)
40. Which M'Notice has to be followed? (MSN)
41. What is SMS system.

D SECTION: GENERAL

Boiler:

1. What are the Boiler mountings?
2. What are the Boiler safety devices?
3. Why air Vent valve is given?
4. Why boiler water test is done?
5. Boiler water treatment / Remedy ?
   https://meoexampreparation.wordpress.com/2017/06/09/boiler-water-test/
6. What is Caustic Cracking/Caustic embrittlement?
7. How to pressure test boiler?
8. How to test safety valve?
9. How to fire boiler from cold condition?
10. What are the Boiler alarms?
11. What are the Boiler shut downs?
12. Draw Boiler feed water system?

13. What are the reasons for Boiler burner failures?
14. What are Types of boiler burners?
15. What is refractory. / materials?
16. What is accumulation pressure?
17. What is boiler safety valve bench test?
18. what is boiler foaming.
19. what is boiler priming.
20. What is ppm.
21. What make boiler start and stop on auto, describe how it is regulated?
22. What is the difference bw working pr. & Operating Press., why safety vv is adjusted 3% above working pr? why not 2% or 5%
23. Boiler Survey?
24. Boiler gauge glass blow down?
25. Cooling water treatment? Importance
26. How do you know your boilers are operation well?
27. Various boiler water test on board and how do you know the amount of chemical to dose?
28. Full details of enclosed space entry?
29. How to start the COPT plant.
30. Inert Gas System.
31. When can he be ready to put on UMS watch.
32. Procedure and permits for entering a tank
33. Safeties on cargo tank from over pressurisation.
34. How much pH level of water to be maintained.
35. What happens if high or low pH.
36. Gauge glass blowdown.

37. Draw ME JW system draw?
38. How PT 100 temperature sensor work?
39. pid

Steering gear:

40. What are the Types of steering gear?
41. What are the Steering gear LO Properties?

42. What are the Safety device on Steering?
43. What are the Emergency Steering gear regulations?
44. Draw 4-ram steering gear system.

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Refrigeration and AC System:

45. Draw refrigeration system.
46. What are Safety devices refrigeration system?
47. What are the Associated problems in refrigeration system?
48. How to detect leak?
49. Refer compressor continuously running, what could be the reason.
50. AC system: What will happen if water is not removed.
    Name of the bacteria that grows. How to prevent its reoccurrence.
51. What to do or How to clean a Shower Head, if not used for a long time

Evaporator chemical.
Comfort zone .
Legionella bacteria.

Fire:

https://marineengineeringonline.com/co2-flooding-system-on-ships/

52. What fixed FF on your ship? (watermist and CO2 – he then mentioned m notice containing
53. details of other methods of fixed FF)
54. Explain watermist system? What pump pressure? What type of pump? If tank empty? (fire main cross over)
55. Explain sequence of events for CO2 release? How to check discharged?
56. What is capiliary tube for in bottle valves? (I didn't know – he lead me onto answer – to prevent icing up and blockage)
57. what is ship fire plan?
58. How hi-fog system Fights with fire?
59. Maintenance of hi-fog.
60. How to release CO2.

61. Why time delay provided.
62. Why CO2 room ventilate.
63. Flame detector test.
64. Smoke detector test.
65. Heat detector test.
66. Maintenance / inspection / testing in detector system
67. Special arrangement of paint locker. How to Fight with Fire.
68. Purifier room fire, action from starting to end
69. Explain working principle of Fixed Foam system including its PM?
70. Explain working principle of Hifog system? (Do not forget to mention the SW connection too)
71. Explain working principle Dry Powder system?
72. Draw and explain fixed CO2 system including its PMs?

E SECTION : ELECTRICAL

1. What is the regulation for Emergency generator ?
2. What are the essential Emergency power supply?
3. How to do Emergency generator checks (manual/ Auto)?
4. How to do Emergency generator load testing?
5. How to do Generator Paralleling?
6. What are Switch board safety devices?
7. What is fuse?
8. What is the Difference between fuse and trip?
9. How do MCB work?
10. How to achieve OCR action?
11. What is AVR?
12. How reverse power trip work?
13. How induction to motor work.
14. Over Current Protection of motor.
15. How motor Single phasing.
16. Methods of reduce motor starting current.

17. Insulated neutral system (advantages/disadvantages) Earthed neutral system (advantages / disadvantages).
18. What is NER.
19. Causes of Single Phasing.
20. Effect of Single phasing.
21. How to detect Single phasing.
22. How to Check AC motor.
23. How to Carried out IR test.
24. How to identify intrinsically safe equipment.
25. Special arrangement of battery room?
26. How to check an Earth Fault.
27. How to reduce Motor Starting Current.
28. Manual paralleling of Generator(full procedure).

Why overspeed trip.

F SECTION: SHIP CONSTRUCTION

1. Class A bulk head.
2. Class B buik head.
3. Emergency fire pump regulations.
4. How to prepare ship to load line Survey.
5. Load line mark.
6. Types of water tight doors.
7. Which conditions /Situation water tight doors closed.
8. Who force to Survey.
9. What is free surface effect, How to reduce it?

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