N. B. — Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

Issued at Panaji on the __________ day of __________ 19 __________

(Captain of Ports) Panaji

________________________________________
GOVERNMENT OF GOA
Certificate of Competency
as
Second Class Engine Driver
of an Inland Vessel under Act 1 of 1917

To ______________________

Whereas it has been reported to the Government of Goa that you been found after examination, duly qualified to fulfil the duties of SECOND CLASS ENGINE DRIVER of an Inland Steam Vessel having Engines of under 40 nominal horse-power. I do hereby, in pursuance of Act 1 of 1917 grant you this Certificate of Competency as ENGINE DRIVER.

This __________ day of __________ 19 __________

By order and in the name of the Governor of Goa.

Secretary/ Under Secretary to the Government of Goa.

Registered at the Office of the Captain of Ports, Panaji-Goa.

No. of Certificate: __________ Date of passing Examination __________
Bearer: __________ Date of Birth showing Village, Taluka and District __________ Residence, showing Village, Taluka and District __________

Height __________

Personal description, stating particularly any permanent marks or scars __________

Signature or L. H. T. I. __________

Any Engine Driver who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.

N. B. — Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

This __________ day of __________ 19 __________

(Captain of Ports) Panaji.

________________________________________
GOVERNMENT OF GOA
Certificate of Competency
as
Engineer
of an Inland Motor Vessel under Central Act 1 of 1917

To ______________________

Whereas it has been reported to the Government that you been found, duly qualified to fulfil the duties of Engineer of an Inland Motor Vessel, I do hereby, in pursuance of Central Act 1 of 1917 grant you this Certificate of Competency.

This __________ day of __________ 19 __________

By order and in the name of the Governor of Goa.

Secretary/ Under Secretary to the Government of Goa.

Registered at the Office of the Captain of Ports, Panaji-Goa.

No. of Certificate: __________ Date of passing Examination __________
Bearer: __________ Date of Birth showing Village, Taluka and District __________ Residence, showing Village, Taluka and District __________

Height __________

Personal description, stating particularly any permanent marks or scars __________

Signature or L. H. T. I. __________

Any Engine Driver who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.

N. B. — Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

This __________ day of __________ 19 __________

(Captain of Ports) Panaji.
Signature or L. H. T. I.

Any Engineer who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.  

N. B.—Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.  

This ________ day of ________ 19 ________  

(Captain of Ports)  

Panaji  

FORM No. 3  

Part of  Rotation No.  Date  19  

SIGHT TEST  

Issued by  
The Government of Goa  

Note for the Examiner:— A report to be sent to the Captain of Ports on this form in each case in which a Candidate does not pass the tests for Form or Colour Vision. The Examiner should pay strict attention to the instructions laid down for his guidance in App. A. Candidates must not be examined in the colour vision test until they have passed the Form Vision test.  

Name, etc. of Candidate  

1. Christian names at full length.  
2. Surname.  
3. Date of birth.  
4. Place of Birth.  
5. If Candidate has served at sea, state:—  
   (i) No. of years  
   (ii) Presenting Rating and No. and Grade of certificate (if any).  
6. If candidate has not served at sea, state:—  
   (i) If about to go to sea.  
   (ii) In what capacity.  

If Candidate has been previously examined the Sight Tests, here state when and where the last examination took place and insert “Passed”, “Failed” or “Not examined” as the case may be against each subject:—  

7. Date  
8. Port  
9. Form Vision test:—  

Present description of Candidate  

11. Height:—  
12. Complexion  
13. Colour of:—  
   (i) Hair  
   (ii) Eyes  
14. Personal Marks or peculiarities, if any.  

Signature of Candidate  

Present address  

I beg to state that I have reported the Candidate named above as having failed in the test on (a) Form Vision (b) Colour Vision.  

Signature of Examiner  

To,  
The Captain of Ports, Panaji-Goa.  

I.—Form Vision  

(1) Did the Candidate pass or fail in the test for Form Vision?  

(2) If the Candidate passes the required Standard the following Table must be filled up and submitted to the Captain of Ports for instructions as to whether the Candidate should be regarded as passed or failed (See Rule 9 and Appendix A).  

*Eye sheets used  Number of mistakes in each line of each sheet  

<table>
<thead>
<tr>
<th>1st line</th>
<th>2nd line</th>
<th>3rd line</th>
<th>4th line</th>
<th>5th line</th>
<th>6th line</th>
<th>7th line</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Second</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Third</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Fourth</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

* State whether Candidate used both eyes together or only his better eye.  

(3) What was the condition of the light when the Candidate was examined?  

II.—Colour Vision  

(1) Did the Candidate fail or is the case referred in the test for colour Vision?  

The Examiner is reminded that, if the candidate fails in this test when case is referred for consideration all mistakes (if any) made in the Lantern test should be recorded on, and pieces (about an inch) of the skeins of wool, if any, incorrectly selected by him, or incorrectly left in the heap a report should be submitted and forwarded together with this form (See rule 9 Appendix. A containing the directions for the conduct of this test). Any remarks on this test which the Examiner has to offer should be made in the Report.  

General remarks and record of mistakes in Lantern Test.
OFFICIAL GAZETTE — GOVT. OF GOA
(EXTRAORDINARY)

2ND MAY, 1997

FORM No. 1

Rotation No.

GOVERNMENT OF GOA

Application for an Inland Certificate of Competency as Master,
Serang or Driver

Note: — Divisions (A), (B), (C), (D) and (E) of the Form are to
be filled up by the Applicant and handed to the Captain of Ports,
with his Testimonials and former Certificates.

(A) Name etc. of Applicant

<table>
<thead>
<tr>
<th>Name in full</th>
<th>Permanent Address</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Date of birth

Day 4
Month 5
Year 6

Place of birth

Town/ Village 7
Country 8

(B) Particulars of Previous Certificate (if any)

Previous attempts, if any 9

Whether any application for
Certificate of Competency
is pending 10

No. 11
Grade 12
Where issued 13
Date of issue 14
C. D. C. No. 15

(C) Certificates of Competency required

16

FORM No. 2

Name of Applicant

Examiner's authority for de-

Delivery of a Certificate of Com-

petency to an Applicant who has

passed his examination.

(N. B. This authority is sub-

ject to the approval of Govern-

ment of Goa).

Name of Applicant ...

Grade for which passed ...

Height ... Metre ...

Centi-

metre, Colour of eyes ...

Hair ...

Complexion ...

Tattoo or other marks...

Examiner

Signature of Applicant

Please deliver to the above

named person on his com-

plying with the Office Regu-

lations the Certificate of Com-

petency forwarded to you by

the Government of Goa.

Dated at _______

day of _______

Signature of Examiner

To

The Captain of Ports,

Panaji-Goa

To

The Captain of Ports,

Panaji-Goa

(D) Declaration to be made by Applicant

Take Notice: — Any person who makes, procures to be made or assists
in making any false representation for the purpose of obtaining for
himself or any other person a Certificate of Competency is for each
offence liable to be punished as for a misdemeanour.

I do hereby declare that the particulars contained in Divisions
(A), (B), (C) and (F) of this Form are correct and true to the
best of my knowledge and belief; and that the PAPERS
enumerated in division (F) and sent with this Form are true and
genuine documents, given and signed by the persons whose
names appear on them.

And I make this declaration conscientiously believing it to be
true.

Dated this ______ day of _______ 19 ______

Signature of Applicant

(E) Receipt for fee

<table>
<thead>
<tr>
<th>Amount received</th>
<th>Date of Receipt</th>
<th>Office at which received</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>18 19 20</td>
<td>21</td>
</tr>
</tbody>
</table>

Rs. .......

The declaration marked (D) above was signed in my presence
and the Fee named in Division (E) has been received by me.

Captain of Ports.
(F) List Testimonials and Statement of Service

(The testimonials to be numbered consecutively according to the number given in column 21 below)

<table>
<thead>
<tr>
<th>No.</th>
<th>Testimonials if any</th>
<th>Ship's Name</th>
<th>Horse Power</th>
<th>Port of Registry &amp; Official Number</th>
<th>Rank</th>
<th>Date of Commencement</th>
<th>Date of Termination</th>
<th>Years</th>
<th>Months</th>
<th>Days</th>
<th>Remarks</th>
<th>Lay up</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td></td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
</tr>
</tbody>
</table>

Total Service: Time served for which Certificates are now produced. Time served for which no Certificates are produced

(G) Certificates of Examiners

Note:—Examiners should fill up Division (G) and in all cases as soon as possible forward this Paper along with testimonials and previous Certificates to the Captain of Ports, Panaji.

<table>
<thead>
<tr>
<th>Date and Place of Verification</th>
<th>Certificate of Competency to be issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Place</td>
</tr>
<tr>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>38</td>
<td>39</td>
</tr>
</tbody>
</table>

(II) Personal Description of Applicant

<table>
<thead>
<tr>
<th>Height</th>
<th>Complexion</th>
<th>Personal Marks of peculiarities if any</th>
<th>Colour of Hair</th>
<th>Colour of Eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>Inches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>41</td>
<td>42</td>
<td>43</td>
<td>44</td>
</tr>
<tr>
<td>45</td>
<td>44</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I hereby certify that the particulars contained in Division (G) are correct.

This Form and the Testimonials are forwarded to the Captain of Ports.

Dated this __________________ day of ______ 19

(Signature of Examiner)

To

The Captain of Ports,

Panaji.

By order and in the name of the Governor of Goa.

APPENDIX 'E'

By the Government of Goa

GOVERNMENT OF GOA

Certificate of Competency as First Class Master of an Inland Vessel under Central Act 1 of 1917

To,

Whereas it has been reported to the Government that you have been found after examination, duly qualified to fulfil the duties of First Class Master of an Inland Vessel, I do hereby in pursuance of Central Act 1 of 1917 grant you this Certificate of Competency as such First Class Master.

By order and in the name of the Governor of Goa.

This __________________ day of ______ 19

Secretary/Under Secretary to the Government of Goa.

Registered at the Office of the Captain of Ports, Panaji-Goa

(On the reverse)

(page-2)

No. of Certificate: __________________ Date of passing Examination: __________ Bearer: __________

Date * and place of Birth showing Village, Taluka and District: __________ Residence, showing Village, Taluka and District: __________ Height: __________

Personal description, stating particularly any permanent marks or scars: __________ Signature or L. H. T. I.

Any master who fails to deliver up a certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/.-

N. B.—Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

Issued at Panaji on the __________________ day of ______ 19

Captain of Ports, Panaji.

If not known exactly shall be stated on the best information or evidence. Page 3 Photograph of the holder renewal every ten years.

Pages 4 and 5 Endorsements:'
APPLICATION
for an
INLAND CERTIFICATE OF COMPETENCY
as
MASTER, SERANG OR DRIVER

Govt. of Goa, Daman and Diu

Note:— Divisions (A), (B), (C), (D) and (F) of this Paper are to be filled up by the Applicant and handed to the Captain of Ports, with his Testimonials and former Certificates

(A)

Name etc. of Applicant

<table>
<thead>
<tr>
<th>Name in full</th>
<th>Permanent Address</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>Place of birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 4</td>
<td>Month 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous attempts, if any</th>
<th>(B)</th>
<th>Whether any application for Certificate of Competency is pending</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Particulars of previous Certificates (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Certificate of competency required</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

(D)

Declaration to be made by Applicant

Take Notice:— Any person who makes, procures to be made or assists in making any false representation for the purpose of obtaining for himself or any other person a Certificate of Competency is for each offence liable to be punished as for a misdemeanour.

I do hereby declare that the particulars contained in divisions (A), (B), (C) and (F) of this Form are correct and true to the best of my knowledge and belief; and that the PAPERS enumerated in division (F) and sent with this Form are true and genuine documents, given and signed by the persons whose names appear on them.

And I make this declaration conscientiously believing it to be true.

Dated this __________ day of __________ 19__

(Signature of Applicant)

(E)

Receipt for fee

<table>
<thead>
<tr>
<th>Amount received</th>
<th>Date of receipt</th>
<th>Office at which received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs. ... ...</td>
<td>Day 18</td>
<td>Month 19</td>
</tr>
</tbody>
</table>

The declaration marked (D) above was signed in my presence and the Fee named in Division (E) has been received by me.

Captain of Ports,
List of Testimonials and Statement of service

(The Testimonials to be numbered consecutively according to the number given in column 21 below)

<table>
<thead>
<tr>
<th>No. Testimonials of any</th>
<th>Ship's Name</th>
<th>Horse Power</th>
<th>Port of Registry &amp; Official Numbers</th>
<th>Rank</th>
<th>Date of Commencement</th>
<th>Date of Termination</th>
<th>Days</th>
<th>Time in each ship</th>
<th>Repairs Lay up</th>
<th>Remarks</th>
<th>In Captain of Ports Office</th>
<th>Initials of verifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
</tr>
</tbody>
</table>

Total Service

Time served for which Certificates are now produced

Time served for which no Certificates are produced

(G)

Certificate of Examiners

Note: Examiners should fill up Division (G) and in all cases as soon as possible forward this Paper alongwith testimonials and previous Certificates to the Captain of Ports, Panaji.

<table>
<thead>
<tr>
<th>Date and Place of Verification</th>
<th>Certificate of Competency to be issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date 36</td>
<td>39</td>
</tr>
<tr>
<td>Place 37</td>
<td></td>
</tr>
<tr>
<td>Form and Colour Vision 38</td>
<td></td>
</tr>
</tbody>
</table>

(H)

Personal Description of Applicant

<table>
<thead>
<tr>
<th>Height</th>
<th>Complexion</th>
<th>Personal Marks of Peculiarities, if any</th>
<th>Colour of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>Inches</td>
<td></td>
<td>Hair</td>
</tr>
<tr>
<td>40</td>
<td>41</td>
<td></td>
<td>44</td>
</tr>
</tbody>
</table>

I hereby certify that the particulars contained in Division (G) are correct.
This Form and the Testimonials are forwarded to the Captain of Ports.
Dated this day of 19
To
APPENDIX — ‘E’

By the Government of Goa

GOVERNMENT OF GOA

Certificate of Competency as Second Class Master of an Inland Vessel under Central Act 1 of 1917

To:

Whereas it has been reported to the Government that you have been found after examination, duly qualified to fulfil the duties of Second Class Master of an Inland Vessel. I do hereby in pursuance of Central Act 1 of 1917 grant you this Certificate of Competency as Second Class Master.

By order in the name of the Governor of Goa.
This _______ day of __________ 19 ______
Secretary/ Under Secretary to the Government of Goa.
Registered at the Office of the Captain of Ports Panaji-Goa.

(On the reverse)

No. of Certificate: _______ Date of passing Examination _______
Bearer: _______

Date* and place of Birth showing Village, Taluka and District: _______
Residence, showing Village, Taluka and District: _______
Height: _______

Personal description, stating particularly any permanent marks or scars ______ Signature or L. H. T. I.

Any master who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.

N. B.— Any person other than the owner thereof becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

Issued at Panaji on the _______ day of _______ 19 _______

Captain of Ports, Panaji

* If not known exactly must be stated on the best information or evidence. Page 3 Photograph of the holder, renewal every ten years.

Pages 4 and 5 Endorsements.

By the Government of Goa

GOVERNMENT OF GOA

Certificate of Competency as Serang of an Inland Vessel under Central Act 1 of 1917

To:

Whereas it has been reported to the Government that you have been found after examination, duly qualified to fulfil the duties of Serang of an Inland Vessel, I do hereby in pursuance of Central Act 1 of 1917 grant you this Certificate of Competency as Serang.

By order in the name of the Governor of Goa.
This _______ day of _______ 19 ______
Secretary/ Under Secretary to the Government of Goa.
Registered at the Office of the Captain of Ports Panaji-Goa.

(On the reverse)

No. of certificate: _______ Date of passing Examination _______
Bearer: _______

Date* and place of Birth showing Village, Taluka and District: _______
Residence, showing village, Taluka and District: _______
Height: _______

Personal description, stating particularly any permanent marks or scars ______ Signature or L. H. T. I.

Any Serang who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.

N. B.— Any person other than the owner thereof becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

Issued at Panaji on the _______ day of _______ 19 _______

Captain of Ports, Panaji

* If not known exactly must be stated on the best information or evidence. Page 3 Photograph of the holder, renewal every ten years.

Pages 4 and 5 Endorsements.

By the Government of Goa

GOVERNMENT OF GOA

Certificate of Competency as First Class Engine Driver of an Inland Motor Vessel under Central Act 1 of 1917

To:

Whereas it has been reported to the Government that you have found duly qualified to fulfil the duties of First Class Engine Driver of an Inland Motor Vessel having Engines of under 100 nominal horse power, I do hereby, in pursuance of Central Act 1 of 1917, grant you this Certificate of Competency as Engine Driver.

By order in the name of the Governor of Goa.
This _______ day of _______ 19 ______
Secretary/ Under Secretary to the Government of Goa.
Registered at the Office of the Captain of Ports, Panaji-Goa.
OFFICIAL GAZETTE -- GOVT. OF GOA
(Extraordinary)

2ND MAY, 1997

No. of certificate: Date of passing Examination: Bearer:

Date* and place of Birth showing Village, Taluka and District: Residence, showing Village, Taluka and District: Height:

Personal description, stating particularly any permanent marks or scars: Signature or L. H. T. I.

Any Engineer who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/.

N. B.-- Any person other than the owner thereof becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

This day of 19

Captain of Ports, Panaji

* If not known exactly must be stated on the best information or evidence. Page 3 Photograph of the holder, renewal every ten years.

Pages 4 and 5 Endorsements.

By the Government of Goa

GOVERNMENT OF GOA

Certificate of Competency as Engineer of an Inland Motor Vessel under Central Act 1 of 1917

To:

Whereas it has been reported to the Government that you have been found duly qualified to fulfil the duties of Engineer of an Inland Motor Vessel, I do hereby, in pursuance of Central Act 1 of 1917, grant you this Certificate of Competency.

By order and in the name of the Governor of Goa.

This day of 19

Secretary/Under Secretary to the Government of Goa.

Registered at the Office of the Captain of Ports, Panaji-Goa.

No. of certificate: Date of passing Examination: Bearer:

Date* and place of Birth showing Village, Taluka and District: Residence, showing Village, Taluka and District: Height:

Personal description, stating particularly any permanent marks or scars: Signature or L. H. T. I.

Any Engineer who fails to deliver up a Certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/.

N. B.-- Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

This day of 19

Captain of Ports, Panaji

* If not known exactly must be stated on the best information or evidence. Page 3 Photograph of the holder, renewal every ten years.

Pages 4 and 5 Endorsements.

APPENDIX 'B'

... hereby certify that ... has served with me in the engine room of ... as ... for a period of ... during which time he has discharged his duties to my entire satisfaction.

I consider that he fully understands the working of an engine, and has sufficient tact, presence of mind, and energy to look after and manage the working of the engines of an inland vessel having engine of 30 nominal horse-power or upwards, but of less than 80 nominal horse-power.

Dated: ...

Signed: ...

No. and description of certificate

Any engineer giving a testimonial in this form should be very careful in doing so, as the document may materially influence the applicant's eligibility as a candidate.

APPENDIX 'C'

Examination in rough working drawing for an Engineer's Certificate of Competency

1. The regulations in regard to the qualifications of a candidate for an engineer's certificate of competency are:—

He must be able to make rough working drawing of the different parts of the engines and boilers.

He must be able to state the general proportions borne by the principal parts of the machinery to each other.

2. In accordance with these clauses, a candidate for an engineer's certificate is required to make a rough working drawing of the parts specified. A mechanic, who has been some years in charge of marine engines and boilers ought by this time to have familiarity in his mind, the general construction of at least one set of engines and boilers, say that set he was last with. Fine drawing is
not expected, and in the proportions of the parts a wide margin will be allowed; absurd dimensions will entail failure in practical knowledge.

3. The drawing must, however, be practically a working/drawing, giving, a sufficient number of views to show the parts fully-sections, plants, or elevations just as the candidate would require to be supplied to him if he had to make the parts to the design of another person.

4. A clear hand sketch showing the construction completely and fully dimensioned, will be accepted if the candidate prefers this alternative.

5. A portion only of the parts specified may be accepted in place of the whole, if the portion is sufficient to show that the candidate has a good practical idea of the construction of the parts, and a fair motion of their general proportions or dimensions.

6. Candidates are hereby cautioned not to put on paper what they have not fully considered, and deliberately intend to be understood as their statement of what they know about the construction of any part required.

7. The statements given in by a candidate may be in themselves, apparently, of little importance, but, as sample material from which the state of the candidate’s knowledge of engines and boilers is to be inferred, every detail which is glaringly inconsistent with a sound knowledge of the use of the part, or in which as essential consideration as evidently been overlooked is an important element in the description which the candidate is giving of his own qualifications.

8. The candidate is advised not to begin more than he can clearly finish in the time allowed. An important object in this part of the examination is to ascertain whether the candidate can be trusted to mark all necessary dimensions upon a sketch or a drawing. The test of this is, practically, the making of the part from the sketch without having to supply additional dimensions and without measuring the drawing. To provide this ability the candidate must fully dimension the parts shown in his sketch or drawing notwithstanding that the parts may be correctly drawn to scale. A drawing is fully dimensioned when no part of it is left to the option of the person or the person who is to work to the drawing.

9. To prevent misunderstanding, however, when the candidate has been led into showing more of the details than he has time fully to finish, he should name in the statement on the other side, the particular parts which he has fully dimensioned.

10. All dimensions should have lines and arrow heads to indicate distinctly the points between which the dimensions are given.

11. The candidates should not write cross dimensions upon centre lines, or upon longitudinal dimension lines. This is not an order but a recommendation.

12. The candidate is not expected to design anything but to sketch or draw something with which he is expected to be already familiar.

13. Make sure that there will be sufficient room on the drawing sheet to show all the necessary views. There can be another sheet of drawing paper, if necessary. All the papers used must be forwarded with the drawing.

14. Fill in and sign the following statements:

(SPECIMEN)

Subject for examination in rough working drawing

(Read the foregoing general instructions)

A common slide valve with its spindle. Show also an outline section of the parts at the cylinder face. Show the provision for connecting the slide valve to the spindle.

The candidate is required to fill up the following and to attach this paper to his drawing—

Statement by the Candidate

The accompanying drawing, made by me this day, without reference to any document, and without the assistance of any person is intended by me to be sufficient for the new construction of the parts above described to fit the places of similar parts which are to be removed. The construction is similar to what I have been with in the ... steamer ... but the dimensions may be different.

The diameter of the cylinder is

The stroke of the piston is

The travel of the valve is

The cover at top end of steam side is

The cover at bottom end on steam side is

The load at top is intended to be

The load at bottom is intended to be

The inside cover is

The thickness of the face of valve is

The thickness of the body of valve is

The greatest opening for steam will be

That gives an area equal to one

The opening for exhaust when the crank is on the top centre is

That gives an area equal to ... of the piston

The valve will cut off steam on the top stroke at

The valve will cut off steam on the down stroke

The parts fully dimensioned in ink are

The Candidate may omit this part if the choises

Dated ... this ... day of ... 19 ...

Applicant
APPENDIX ‘D’

Specimen Elementary Questions for the Examination of Engineers for Certificates of Competency

1. What parts of an engine are generally made of wrought-iron?
2. What parts of an engine are generally made of cast-iron?
3. For what parts of an engine is steel sometimes used?
4. What parts of an engine are generally made of brass or gun-metal?
5. Where is white metal sometimes used? On account of what property possessed by it is it adopted? What objection is there to its more general use?
6. For what parts is Muntz metal sometimes used? Is it malleable?
7. What difference is there in the composition of cast-iron, of wrought-iron and of steel?
8. How can cast-iron, wrought-iron, and steel be distinguished from each other?
9. What are the different properties of cast-iron, of wrought-iron and of steel?
10. What is meant by the terms breaking stress, proof stress, safe working stress?
11. What is the cohesive strength or breaking stress of good ordinary wrought-iron?
12. Tampering steel how is it done, and in what order do the colours come?
13. What is case hardening?
14. Which of the common metals or alloys can be forged, and which of them are brittle or short?
15. What is meant by welding? Which of the common metals can be welded?
16. The expansion of metals by heat; give examples of this in the engine and in the boiler?
17. In the construction of cylindrical marine boilers for what parts have the plates to be worked hot? When the material is steel what precautionary treatment of these plates is afterwards necessary?
18. What is double reveting? In what parts of cylindrical marine boilers is double reveting employed? In which of the shell seams is it most necessary?
19. What is “caulking” and how are seams prepared for caulking?
20. Describe the different ways of fastening the ends of the main stays of a boiler. What are the merits, or objections to the different methods?
21. What strain per square inch is allowed on boiler stays?
22. Describe a reveted stay, and state where such stays are commonly used?
23. Where are thin plates to be looked for in a boiler as it wears and how is the thinness to be detected?
24. How are boiler tubes fixed? What are “stay tubes” and how are they secured?
25. Where is it generally that boiler-tubes leak? How is this defect repaired? What are causes of this leaking?
26. What are the causes of cracked tube plates? Where are the cracks situated? How are they repaired?
27. What is the difference between a dry “uptake” and a “wet uptake” which required most repair? Why? Where have you seen a wet uptake?
28. What is a superheater? What is its construction? What valves are on it? There is sometimes a gauge glass on it; What is that for?
29. What parts of a marine tubular boiler are first injured by shortness of water?
30. Where are angle irons sometimes used in the construction of a boiler, and where are flanged plates used?
31. Priming: To what causes as it attributed? What means are applied to prevent it? What evils may be produced by it?
32. Funnel draught: What makes it? What checks it?
33. Flame is sometimes seen at the top of a funnel: What causes this appearance: Is it beneficial or it is detrimental? Why so?
34. A blast pipe: What is its construction? Where is it placed? For what is it used?
35. How many bottom blow off cocks are generally fitted to each boiler and why are they so fitted?
36. Blow-off cocks are sometimes fitted with a spanner guard for what purpose is this? Describe how the guard is formed.
37. Test cocks or watergauge: cocks: Where are they placed? At what heights? Must the cocks themselves be at these heights? What provision is made for cleaning these cocks? Should they ever become choked? When there are no test cocks, how is the height of the water ascertained?
38. What is a dead-weight safety valve? Of what are the rubbing surfaces formed? How is a lockup valve arranged to admit of lifting it or of turning it round, and to prevent addition to the weight?
39. About what area of safety valve is no required by the Board of Trade? What area was formerly required and on what ground has that been altered? What is the effect of suddenly opening a safety valve when steam is up? To about what extent to safety valves rise when blowing of without being cased by hand?

40. Spring-loaded safety valves: What advantages have they that are not processed by dead-weight valves? What are the disadvantages as compared with dead-weight valves?

41. Of what pieces does a glass water-gauge mounting consist? How does it act? Where is it placed? At what height? Is it liable to derangement? How is its working tested?

42. Glass water-gauges have sometimes pipe connections top and bottom? What is the object of the arrangement? Should there be cocks at the extremities of these pipes?

43. Describe a Bourdon's steam-gauge. Some gauges have an inverted syphon pipe below them: What is its use?

44. Why is a small cock sometimes put on the pipe leading to a steam-gauge? Where should it be placed, and what error might be made by omitting to use it?

45. Do steam-gauge indicate the total pressure of the steam, or only a portion of that pressure? What is the pressure measured from?

46. What is meant by the salting of the boiler? How is this prevented? What is the density of ordinary sea water? How is the density ascertained? What is the difference between the formation of scale and the salting of the boiler? What is the maximum density at which boilers should be worked at sea?

47. Scum cocks and pipes? How are they arranged? Where are they placed? At what height in the boiler? When are they used? When must they be shut? Neglect of these cocks lead to what dangers?

48. Scale: Of what does it consist? Where is it most objectionable? How is it removed? How is its formation prevented? What evil effects are produced by it?

49. What is a salinometer? Of what does it consist? How does it act? How is it graduated? Can it be used at any temperature indiscriminately?

50. What harm may be done through the check valve of one of a set of boilers being defective while underway? How would you work to avoid this harm?

51. How is the leak from a split tube stopped in a boiler at sea?

52. What is the use of dampers? Where are they fitted? When they should be used?

53. When there are no dampers fitted, what is used instead? What evil to the boiler is sometimes attributed to this? When the heating surface is clean, does it occur?

54. Describe the piston of a steam cylinder with its different rings and their uses. There are generally round pieces let in flush on one side of a piston. What are they? How are these pieces fixed?

55. Cylinder drain cocks? What is their use? There is sometimes a valve upon each cock? What purpose does it serve?

56. Cylinder escape valves: Of what does they consist? How protected? How regulated? When are they most needed? To what danger do they expose these engines? What precaution is sometimes used to obviate this danger?

57. What is compound engine? What different kinds are there for screw steamers in respect to the number and arrangement of their cranks and cylinders? What is a triple expansion engine?

58. What is link motion? What are some of its advantages? In modern engines for the screw propeller, when there is no link motion, what takes its place?

59. What is a separate expansion valve? Why is it not fitted to all engines? What effect has an expansion valve upon the starting and upon the reverting of the engines?

60. What arrangement is applied to reduce the friction of a slide valve? To what is the friction due?

61. Describe a loose eccentric. How does it sui? In what engines is the loose eccentric still employed?

62. What is the travel of the eccentric rod? How is it measured on the eccentric? What is the travel of the slide valve when the link motion is in mid gear and the engine still moving?

63. What are "double-boat" "Valve"? Why are not generally used for safety valves? Are they ever used instead of the valve? What objections are there to their use.

64. What is a circulating pump? Is it always worked by the main engine? Give an example from your last steamer of the three water temperatures generally noted by careful engineers.

65. An air valve is sometimes fitted to a circulating reciprocating pump: What purpose does it serve?

66. What is the difference between a bucket air-pump, a piston a pump and a plunger air-pump?

67. Whether double acting air pumps are made with plungers, with pistons or with buckets?

68. What is an air-pump trunk? When is it necessary? How is it attached to the bucket?

69. What class of air-pump requires both feet and delivery valves and in what other class can either of these valves be in some cases dispensed with?

70. When underway, when the air-pump bucket is at the top of its stroke, at what height is the water in the condenser?
71. With a surface condenser and a single acting air-pump, what is the effect of a leaky foot valve and what is the effect of a leaky bucket when there is also a foot valve?

72. Air-pump pet cock or valve where is it placed? How does it act? What is its object? Does it in every case reduce the effective capacity of the pump? Is it equally applicable to double acting pumps?

73. At what temperature is the boiler worked? What is the effect of higher temperatures? What is the effect of lower temperature? What limits the lowness of temperature? Has very low temperature any disadvantages?

74. Bilge injection with common condensers? What are the fittings required? When is it used? What precautions are necessary in using it?

75. When surface condensers are used, what takes place of the bilge injection? To what is the connection made? How is its valve formed? Why is this necessary?

76. What are the practical guides to the proper amount of opening of the inlet valve for the circulating pump?

77. Food-pump pet cock or valve: Where is it placed? What is its use? How does it act? Is it always a necessary fitting?

78. What are some of the ways of fastening the ends of surface condenser tubes? About what size and about what thickness are condenser tubes? What parts of a surface condenser are made brass?

79. What is a blow-through valve or cock? To what is it attached? There is sometimes a valve that when opened admits steam from slide valve causing to the exhaust part? What is its use? To which cylinder is it fitted?

80. What is a sniffing valve? What is its use? Where is it placed? Can it be placed too high? Can it be placed too low? At what height should it be placed? Was there one in your last steamer, if so, where was it? Why are sniffing valves generally omitted now?

81. What connections are generally fitted to the donkey-pump? And to what services can be applied?

82. When the engines are stopped with steam up, what are to be shut and what are to be opened?

83. How is an engine heated up before starting? What precautionary examinations as made before starting?

84. What is an interceptor or catch-water? Where is it fixed? What is its construction? How does it act and what attention does it require?

85. Describe an air-pump bucket, with its valve or valves and its packing of what are the valves generally made?

86. Of what materials are air-pumps rods made? Why so?

87. What is the racing of the engine? When does it occur? What danger attaches to it? What is done to prevent it?

88. What are marine Governors? What is their general construction? How does they act?

89. What is meant by the pitch of a screw propeller? How is it measured?

90. Explain the difference between a right hand and left hand propeller and state how each of them revolves?

91. What is the slip of a screw propeller? How is its amount expressed in figures?

92. Which of the valves about engines and boilers have to be worked by hand, which of them work self-actingly, and which are worked by the motion of the engines?

93. Why is soda sometimes put into a boiler, and how is it put in while under weight? What is the kind of soda used?

94. Tallow cups for cylinders were sometimes made with two small cocks or with only one small cock or with one large hollow plug cock, or with one small cock and a valve which of those is suitable for a high pressure cylinder and which for the cylinder of a condensing engine? Describe how the cup with only one small cock is used. What is now generally used instead of these? How has this change come about.

95. Does a cylinder escape valve, self-acting, allow all the water to escape, if not how much is left in the cylinder?

96. What is a steam lubricator (sometimes called an impregnator) Explain its action; To what part of the engine is it connected; Whether will throwing cold water over it make it work faster or slower? Describe the one used in your last steamer?

97. A common paddle wheel; Of what is the centre made? Of what are the arms formed? What is the form of the bolts which attach the floats to the arms? How are the arms attached to the centres?

98. Why have some paddle wheels one or more cast-iron-flats in each wheel? With what engines are these most required? At what part of the circumferences are they placed?

99. Why are paddle wheel floats sometimes made of different breadth in the same wheel? With what description engine is this most needed? Where are the board floats placed and where are the narrow floats placed in the circumference of the wheel?

100. What difference is there between a radia paddle wheel and one with feathering floats? What is the object of feathering floats? Are all the eccentric rods attached in the same way, and are they all of the same form?

101. Whereabout is the centre of the eccentric of a paddle wheel with feathering floats placed? In that case are the feathering lovers on the striking face or on the back of the float? When the paddle shaft has an outer bearing, how is the eccentric made?
102. Of what materials are the working surfaces of a paddle wheel with feathering floats? Are they all lubricated? With what?

103. What is a disconnecting paddle engine? At what place is the disconnecting affected? How is it accomplished? In which of the cranks of a disconnecting engine are the crank pins fixed?

104. Whether is the link motion valve gear or the loose eccentric generally used for disconnecting paddle engine? For what steamers are disconnection paddle engines frequently employed?

105. What are expansion joints? Where are they necessary? What attention do they require? Of what should the working surface be made?

106. What omission in the construction of expansion joints may lead to a serious accident when steam is first applied? How is this prevented in the construction of a steam trunnion pipe for an oscillating engine?

107. Describe an oil cup with a syphon worsted. How is the worsted arranged? How is it cleaned? How far down the tube does it extend?

108. Describe a thrust bearing; which of the surface wears? Why are there sometimes a number of oil tubes for one thrust bearing?

109. What parts of a screw shaft are generally covered with brass? Why is this necessary? About what thickness is the brass?

110. What is the stern tube or screw shaft pipe? Why is a pipe of such length required? Of what is it made? How is it fixed at each end?

111. What is a lignum vitae bearing? How is the wood fitted? Where is such a bearing generally used?

112. How is a screw propeller fixed on the shaft? What means are used to prevent its getting loose at sea?

113. Where are sluice valve placed? What large sluice valve is there in almost all screw steamers? From what position should this valve be worked? Why so? What attention should it receive?

114. With a condensing engine what valves or cocks are on the skin of the ship in the engine-room and in the stokehole?

115. What are the necessary fitting of a marine boiler?

116. With a surface condensing engine what cocks or valves are open some time before the engine is started so as to be ready for starting whenever the order is given?

117. What is a steam jacket? What cocks are one it? In what engine or jackets most generally used? Do they required to be felted?

118. What parts of an engine or its fittings should be felted or otherwise protected from radiation?

119. What are the small cylinders sometimes fitted on the slide valve casing cover of vertical engines? Explain their action. To what are they connected by a pipe? Why so?

120. Name the principal pipes in connection with the engine boilers of a steamer? And state to what the ends of these pipes are connected?

121. Through what cocks or valves, pipes and chambers does the water pass on its way from the sea inlet rose plate to the water space of the boiler with a jet condenser?

122. Through what cocks or valves, pipes and chambers does the circulating water of a surface condenser pass?

123. Through what cocks or valves, pipes and chambers does the steam pass from the boiler until it is in the form of water in the hot well?

124. Name the pieces of the engine through which the pressure of the steam is transmitted from the piston to the screw propeller. Name them in the order in which they act?

125. What is an air vessel? How does it act? At what parts of an engine or of its fittings are air vessels generally applied?

126. What is the construction of a mud box? Where should mud boxes be placed? Why are they necessary? How should the space be divided by the rose plate and why?

127. What is a trunk engine? When used in a horizontal engine for a right-hand screw propeller, at which side of the vessel should cylinders be placed? Why so?

128. What is an oscillating engine? For what steamers are oscillating engines generally adopted? How is the steam conveyed to and from the slide valve casing?

129. Of what parts does the valve motion gear of an oscillating engine consists?

130. For what have geared engines sometimes been used? Of what were the cogs of the large wheel made?

131. At what part of a screw steamer is the pressure that propels it applied to the hull?

132. At what part of a paddle steamer is the pressure that propels it applied to the hull?

133. About how much fuel per indicated horse-power per hour is required modern engines, common compound and triple expansion?

134. What is the explanation of the economy of the surface condense?

135. What is the construction of a surface condenser? Of what are its tubes made? How are they fixed? How are they kept tight? What is done aspli tube?
136. Whereas do surface condensers foul? How are they cleaned?

137. What non-conducting substances are employed to prevent radiation and how are they applied?

138. In the construction of smoke box and of dry uptakes, what provision is made to lessen the amount of radiation?

139. How can the formation of block smoke be prevented? Describe smoke-preventing apparatus.

140. What is meant by "circulation" in a boiler? And what are the results of defective circulation?

141. What means are sometimes adopted to improve in the circulation in a boiler?

142. By what arrangements is the circulation promoted in a "haystack" boiler?

143. Describe a ship's side air-pump discharge valve; in what respect does it sometimes differ from a common step valve; and what attention does it require?

144. What is the construction of a feed-escape valve, to what is its discharge connected and how is its loading regulated?

145. When there is no feed-escape valve what is the arrangement of the fed valve cocks?

146. What is the measure of a horse-power? How is indicated horsepower ascertained?

147. Has nominal "horse-powers" a fixed meaning? What is the use of this expression? What is generally taken as the measure of one horsepower nominal?

148. What is "Back Pressure" in a cylinder? About how much is it in each of the cylinders in your last steamer? It excessive cushioning ever a trouble in certain condition in modern engines? Say when and why and in which cylinder this occurs?

149. What is meant by "speed of piston"? About how much is the speed of piston in modern marine engines?

150. What is "atmospheric pressure"? What is its average amount? What instrument tell this amount?

151. What is "gross pressure" or "absolute pressure"? What pressure is it that is shown by the steam-gauge?

152. What is meant by "cutting of steam"? How is it done? What part of the valve regulate the cut off?

153. What is a piston slide valve? Describe its construction. Why are such frequently employed in place of the common slide valves. What is a great drawback to the use of these valves?

154. What fixes the time of closing the exhaust? After the exhaust is closed and before the port opens for steam, what becomes of the steam that is in the cylinder?

155. What is the "load" of the valve? What is its object? About what amount is it?

156. What is the 'cover' or 'lap' of the valve? What is its object? About what amount is it?

157. What is the "exhaust cover" of a slide valve? What is its effect upon cushioning and upon exhaust?

158. What is "minus cover" or "minus lap" on the exhaust? What is its effect upon the exhaust and upon cushioning?

159. What is "ushicking" or "compression" in a steam cylinder? How is it affected by the amount of cover or of minus cover there may be upon the exhaust? How is it affected by the exhaust pressure?

160. What is mean effective pressure? How is its amount ascertained?

161. What is a dial vacuum gauge? What is its construction? For what is it used? About what amount should it show when the engine is working all right? What effect has the variation it indicates on the performance of the engine?

162. Does the vacuum gauge enable to tell what pressure that is in the condenser or must you have recourse also to the barometer to arrive at that? How would you ascertain the actual amount back pressure there is in the condenser?

163. What is a barometer? What is its construction? Is a barometer sometimes used instead of a vacuum gauge? In what respect does the weather barometer differ from the vacuum gauge barometer?

164. The common vacuum gauge and the common steam gauge, in which of them are the graduations marked from atmospheric pressure? Does either of them tell what is the true actual pressure in the boiler or in the condenser?

165. Do steam and vacuum gauges vary with the variations of the weather barometer? When the weather barometer varies from 28 to 31, how much will the vacuum gauge vary and how will that affect working of the engine? Why so?

166. Vacuum is generally stated as so many inches. What is meant by say 20 inches vacuum? What does that tell us about the absolute pressure than in the condenser?

167. From what depth will pump draw water? Is there any limit? Why?

168. What is vacuum? Can vacuum move a piston? When the temperature of the water in the condenser is 212°, what is the greatest degree of vacuum there can then be in the condenser?

169. What is a thermometer? Its construction? What is the property of matter, that is, the principle of its construction? What temperatures are regularly noted by careful engineers?
What is the temperature of (1) melting ice, (2) boiling water, (3) of steam about 60 lbs. pressure by the steam gauge, (4) of steam about 100 lbs. and (5) of steam about 150 lbs also (6) of smoke in the funnel, and (7) of water in the hot well?

What is meant by the conduction of heat? Give examples of it in the boiler and in the engine.

What is meant by the "convection" of heat? Give examples of it in the boiler and in the engine.

What is meant "radiation" of heat? Give examples of it in the boiler and in the engine.

Which is convection which is radiation, and which is conduction in the following cases: (1) Heat from the glowing fuel to the furnace crown; (2) Heat passing from one side of furnace crown plate to the other (2) Heat passing from the steam pipe in the engine rooms (4) The heat of evaporation?

What are the effecting heating surfaces of a marine boiler? What is an objection to vertical heating surfaces?

What parts of a marine engine are exposed to danger when the temperature is below freezing point?

What precautions are necessary in cold climates when the temperature is below freezing point?

State as many ways as you can by which a boiler might not get its full food; that is, a boiler or one of the set of boilers gets short or water although the feed valve is open its proper amount; to what causes might this be due?

Of what are furnace bars generally made? About what thickness are they at top? About what space is between them? Whether are the bars put further apart for New Castle coal or for Welsh coal?

Which burns faster, New castle coal or Welsh coal? Which is the flaming coal? Which makes smokes?

About how many tons of steam coal will be burnt per day in four furnaces, each 3' 6" wide and of about the usual length? On what grounds do you say so?

About how many tons of steam coal will be burnt per day with good compound engines to drive an ordinary steamer of 45 ft. beam 10 knots an hour by steam alone? On what grounds do you say so? What percentage more coal would be required to propel the same steamer 1 knot faster?

About how many tons of steam coal will be burnt per day with a good compound engine, surface condensers, the low pressure cylinder 70 inches diameter, doing average work? On what grounds do you say so?

A pair of inverted cylinder direct acting engine there is a liner half an inch thick between the ahead eccentric rod and the eccentric strap, in over hauling the engine this piece is lost and forgotten; what difference will its commission make in the working of the engine on the admission, on the cut off and of the exhaust of the steam? Which will take place earlier and which latter, distinguishing between the up stroke and the down stroke?

A pair of inverted cylinder direct acting engines driving a right hand screw; on which of the crosshead guide bars is the pressure greatest in the up stroke, and on which in the down stroke.

A screw propeller is getting loose, it has a little plate on the shaft, side ways on the key or feather; how will this show in the engine-room?

How would you prove whether the centre line of the trunnion of and oscillating cylinder be fair with the centre line of the main shaft?

How can the fairness of a line of screw shafting be tested without lifting the shafts?

Where are steel gorgings generally used in marine engines?

What is the composition of nickel steel? Where is it sometimes used in engines and boilers?

How is forced draught generated on board ship and supplied to boiler furnaces? Is the air heated before delivery? If so, how?

What is the "induced" draught? Compare the merits of "forced" and of "induced" draughts.

How is the intensity of the draught measured? What is the usual pressure employed in the merchantile marine?

An explosive gas is liberated from bunker coal. Usually in well ventilated bunkers this gas escapes into the atmosphere without doing harm. In ill-ventilated bunkers the gas, after mixing with a certain proportion of common air, has been known to explode when a naked light has been brought in contact with. What is the composition of the gas? Where is it found? In bunkers, between docks, pockets and coal sheets? How may it be get rid of as soon as it evolves from the coal? How many cubic feet of air to one of the gas forms a violent explosive mixture?

A lighted lamp or candle has sometimes been lowered into an apparently empty paraffin tank and produced an explosion resulting in injury to the person holding the light. What did the tank probably contain, and what produced the explosion?

In vessels carrying coal cargoes it has been observed that, generally speaking, the gas which escapes from the body of the coal is found more abundantly at the forward end of the hold that at the after end. Why should this be so?

In recently opened ballast tanks, double-bottoms, and boilers, a light lowered into either has sometimes been extinguished. What would, in all probability cause this?
198. In double-bottom steamers where does the bilge water lie, and where are the roses of the bilge pipes fitted?

199. What is the advantage of a large rose over a small one?

200. Why specially in vessels carrying cargo liable to shift, should engine room bilge suction be fitted to both wings of the bilge?

201. In a heavily listed vessel, why is it difficult to keep steam?

202. If the engine bilge pumps get choked and water accumulated in the stokehold bilges, what effect does the water have upon the bilge boards and stokehold plates, when the ship is rolling violently?

203. In a triple-expansion engine, what spare gear do you consider necessary in the case of a foreign-going ship? Also what stores would you provide for a voyage to New Zealand?

204. What means are sometimes provided for temporarily coupling together the broken parts of, say, a tunnner-ghost? Describe the fitting.

205. Does the pressure on the trust-collars vary with the horsepower or with the speed of the ship, or how?

206. If the holding down belts of a thrust bearing should become slack, what effect would it have upon the working of the engines?

207. In an engine with three cranks, which of the three is subject to the greatest torsional stress, (1) in going astern, (2) in going ahead?

208. Is it usual to make the crank shafts of a triple or quadruple expansion engine in one piece? Is the diameter of the shaft uniform and to end? Give your reasons for the practice which prevail?

209. In a "built" crank shaft how are the webs rigiscured to the pins and to the body of shaft?

210. There are various descriptions of donkey engines in use on board ship for pumping purposes. Some pumps are fitted with escape-valves, some are not, why should this be?

211. Explain the function of an air-vessel fitted to a feed pump. Make rough hand sketch of (1) a satisfactory vessel? (2) an unsatisfactory vessel where, say the air-spring has been destroyed by carelessness, or has never been properly provided.

212. Should cocks or escape-valves be fitted to air vessels, why or why not?

213. Where, by preference, should the escape-valves of a feed pump be placed? Why?

214. Scum cocks are sometimes fitted to boilershells at a height convenient for engineers to manipulate when standing in the stokehold; the scum pipes in such cases are led upward, inside the boiler, to a little above the combustion chamber tops, what danger may arise from this arrangement?

215. Cocks for testing the water level of boilers are sometimes fitted within reach of the engineer who is standing in the stokehold. These may have internal pipes leading upward and terminating at various levels. Under what circumstances may these become misleading?

216. Why should the pipe which leads from the bottom of the water gauge column to the bottom of the boiler front, or back, be covered with non-conducting materials? Why also should it never have lengthy horizontal bends?

217. In your own experience, how frequently is this pipe removed and cleared?

218. Why, even with the best of water-gauges, is it advisable to occasionally use the drain cock?

219. Steam hope have sometimes been inadvertently made in this length of piping leading from the top of the water-gauge column to the top of the boiler. Roughly sketch such loop and explain the danger arising from its existence.

220. Describe your method of thoroughly testing the water gauge system to satisfy yourself that all the cocks and pipes are clear. Your answer can be written on a supplementary sheet of foolscap which the examiner will hand you. Hand sketches, more lines indicating pipes and circles indicating cocks, should be made. Identify the cocks and pipes by letters or numerals.

221. Describe the construction of a water-tube boiler mentioning the type selected?

222. In a water tube boiler, how is an economiser fitted, and what is its duty.

223. How is the water gauge fitted? Are glass-gauges used?

224. The pressure of the steam in water tube boilers is sometimes greater than at the engines. Why is this, and what percentage above the engine pressure does it amount to? How is the difference of pressure maintained?

225. Describe any automatic method of feeding water-tube boilers. Of what material are the tubes made?

226. Describe the construction of any steam turbine you are acquainted with, which is used on board ship. How is the expansion of steam effected? How many propeller shafts are employed, and how many propellers?

227. Is the same power available to go astern as to go ahead?

228. Of what material are the propellers made?

229. How many pounds of coal per indicated horsepower per hour are burnt with this type of engine? Name the type of boiler in use?
230. Describe the construction of a feed water-heater and give name of its manufacturer.

231. Describe any well-known ash-ejector.

232. Describe any well-known independent feed pumps?

233. Are independent feed pumps automatic in their action? Explain the action.

234. What advantage, if any, have independent feed pumps, over feed pumps worked by the main engines.

235. To about what temperature is the feed water raised by passing through a feed heater?

236. What fittings are usually placed on a feed-heater? Why are they necessary.

237. Describe the construction of a feed fitter enumerating its valves and cock.

238. How can the fitter be cleaned? And ingredients are generally removed when cleaning takes place?

239. What is the intercepting material made of? how is it fitted?

240. Describe an evaporator; and mention the types.

241. What fitting are necessary with evaporator?

242. How is the brine got rid of?

243. How may the coils be cleaned?

244. What is a dynamo? Describe its various parts. For what is it used?

245. In what respect does an electric motor differ from a dynamo? Where are electric motors sometimes used on board ship?

246. Describe a system of electric lighting employed on board ship.

247. How is the position of a fault in the circuit discovered?

248. What is “sparking” and may it under some circumstances (naming them) be a danger?

249. What is “short-circuiting” And to what evil may it give rise?

250. What means are employed to prevent any part of the circuit becoming overheated?

251. Describe the features of an arc lamp.

252. Describe the construction of glow-lamp?

253. What is the usual candle-power of the small glow-lamps in general use on board ship?

254. Define the following terms: Ampers, volt, ohm, watt, what is the measure of an electrical horse power?

255. Explain the uses of switches, brushes, commutators, cutouts, field magnets, armatures and resistance-coils?

256. Why is it desirable to fit a dynamo in a cool place on board ship?

257. What undesirable effect will ultimately occur to an electric wire, whose section area is constantly diminishing, say through corrosion?

258. What danger might arise from loading electric wire through coal bunkers.

259. Is it better to load electric wires above or below sidecuttes, why?

260. What instruments are used on board ship to ascertain the strength of an electric current.

261. Many ocean-going steamers are fitted with hydraulic cranes, etc. From where do they obtain their power? How is the hydraulic pressure kept at a relatively constant amount?

262. Is any difficulty experienced in working hydraulic cranes in frosty weather? If so, why?

263. Describe any steam steering gear you are acquainted with?

264. When the helm is put hard over and the ship is going full speed ahead what prevents the rudder returning to the amidship position?

265. In the case of steamship under way, does the officer, or man manipulating the steam steering wheel overcome any resistance exerted by the rudder?

266. Explain clearly what is being done by a helmsman manipulating the wheel of a steam steering engine.

267. Is there any difference between the amount of horse-power required to put a helm hard over in a given time when the vessel is going full speed ahead, and when she is going full speed astern? This question refers to a case of a steamer fitted with one rudder on and demands as more complete answer than merely “yes” or “no”.

268. What precautions should be taken before removing a manhole door from a steam boiler and why are these precautions necessary. In the absence of such precautions what casualties might occur?

269. Describe the chief features of the engine-governor fitted to a steamer you have served in. Describe its action. Give the mark's name and name of ship.

Note: The following six questions refer to oil motors fitted to launches which carry passengers:

270. Name the principal parts of an oil motor, and briefly state their functions. Give the name of the marks of the motor.
First Class Master of an Inland Vessel, I do hereby in pursuance of Central Act 1 of 1917 grant you this Certificate of Competency as such First Class Master.

By order and in the name of the Governor of Goa.

This ______ day of ______ 19 ______

Secretary/Under Secretary to the Government of Goa.

Registered at the Office of the Captain of Ports, Panaji-Goa. (On the reverse) (Page-2)

No. of Certificate Date of passing Examination Bearer:

Date* and place of Birth showing Village, Taluka and District: Residence, showing Village, Taluka and District: Height:

Personal description, stating particularly any permanent marks or scars Signature or L. H. T. I.

Any master who fails to deliver up a certificate which has been cancelled or suspended is liable to a penalty not exceeding Rs. 500/-.

N. B.— Any person other than the owner thereof, becoming possessed of this Certificate is required to transmit it forthwith to the Captain of Ports, Panaji-Goa.

Issued at Panaji on the ______ day of ______ 19 ______

Captain of Ports, Panaji.

* If not known exactly shall be stated on the best information or evidence.

Page 3 Photograph of the holder, renewal every ten years.

Pages 4 and 5 Endorsements.