

Appendix 6 - Syllabus for AMSA Oral Examination, Certificates of Competency, Engineer Class 1

Boilers

- Water gauge
- Local
- Remote
- Manhole doors
- Feed check V/Vs
- Blowdown V/Vs
- Safety Valves
- Operations
- Furnace purging
- Uptake fires
- Superheater fires
- Raising steam
- Shutting down, lay up
- Water testing
- Water hammer
- Priming and foaming
- Construction arrangement
- Automatic controls
- Survey
- Combustion
- Associated Systems & Equipment

Diesel Propulsion

- Operation
- Crankcase explosion
- Scavenge fires
- Air line explosion
- Manoeuvring
- Emergency
- Warming through
- Shutting down
- Parameters
- Fuel consumption
- Combustion
- Associated Systems & Equipment
- Slow, Medium and High speed
- Manoeuvring controls
- Protection devices
- Construction

- Combustion
- Timing
- Lubrication
- Alignment
- Automation
- Gear boxes and clutches
- Vibration dampers
- Thrust bearing
- Turbo chargers
- Diesel electric
- Survey
- Diesel alternators
- Water treatment

Steam Propulsion

- Operation
- Warming through
- Shutting down
- Manoeuvring
- Emergency
- Parameters
- Turbines
- Protection devices
- Thrust bearing
- Gland steam
- Flex coupling
- Manoeuvring V/V
- Automation
- Protection devices
- Lubrication
- Impulse, reaction
- Gear boxes
- Survey
- Alignment
- Turbo electric
- Turbo alternators
- Operation and construction
- Associated Systems & Equipment

Water Treatment

- Evaporators
- Distillers
- Ion exchange
- Reverse osmosis
- Testing
- Chemicals

Feed Systems

- Arrangement
- Feed pumps
- Deaerators and heaters
- Air ejector
- External pumps
- Condenser
- Water testing
- Auto controls
- Corrosion

Steering Gear & Rudders

- Emergency operation
- Construction
- Control
- Lubrication
- Survey

Air Compressors

- Safety devices
- Compressor
- Receiver
- Air line
- Operation
- Lubrication
- Starting air
- Service and control air
- Receivers
- Automation
- Survey

Fire

- Prevention
- Extinction
- Hoses, extinguishers
- BA sets
- Procedures

- Fixed installations
- Detection
- Sensors, systems
- UMS requirements
- Structural fire protection

Pumping Systems

- Fire main
- Oily water separator
- Bunkering
- Bilge and ballast systems
- Salt water system
- Fresh water cooling
- Sewage plant
- Fuel oil and diesel oil systems
- Inert gas system
- Lubricating oil system
- Cargo system
- Sanitary system
- Purifiers, clarifiers
- Heaters
- Pumps: positive displacement, etc

Refrigeration Systems

- Safety
- Direct and indirect expansion
- Air conditioning
- Compressors

Materials

- Properties
- Destructive & non-destructive Testing

Propellers & Thrusters

- Fixed pitch
- Attachment
- Survey
- Controllable pitch
- Operating system
- Attachment
- Survey
- Stern tube bearing
- Screw shafts
- Cross thrusters

- Fixed and CP prop
- Voith Schneider, etc
- DP systems

Dry Docking

- Supply of fire fighting water
- Supply of electrical power
- Stability
- Measurement of wear, down, clearances
- Measurement of alignment
- Certificates of survey
- Annual
- Safety Equipment
- Safety Construction
- Load line
- Classification
- Ships structure
- Corrosion, erosion
- Cavitation
- Mechanical damage
- Cleaning, protection

Tanks

- Safety precautions
- Entering
- Pressure testing
- Survey

Stability

- Free surface
- Damage control

Electricity

- Emergency generators
- Operation
- Construction
- Statutory requirements
- Testing
- Fault detection
- AC generators
- Operation
- Construction
- Control equipment
- Fault detection

- Protection devices
- DC generators
- as per AC
- Distribution
- Isolation
- Electric shock
- Protection devices
- Fault detection
- Main switchboard
- Emergency switchboard
- Distribution boards
- Flame proof
- Drip proof
- Intrinsically safe
- Transformers
- Two wire
- Non-earthed and earthed neutral
- Motors
- AC: single and three phase

Deck Machinery

- Davits and winches
- Windlass
- Cranes
- Derricks
- Hatches
- Other

Automation & Control

- Bridge control
- UMS
- Fault detection
- Requirement
- Transfer from manual to auto
- Measuring devices
- Testing
- Calibration
- Survey

Machinery Records

- Oil Record Book
- Log books
- Trend recording
- Official records
- Combustion analysis
- Condition monitoring

Maritime Law

- MARPOL, SOLAS
- ISM Code
- Marine Orders
- Other

Management

- Training of Engine-room staff
- Management and organisation of Emergency response staff/dept