Level I Machinery Lubrication Technician

The Level I MLT Body of Knowledge is an outline of concepts that one should have in order to pass the exam.

References from which exam questions were derived can be found in the Domain of Knowledge.

I. Maintenance Strategy (5%)
A. Why machines fail
B. The impact of poor maintenance on company profits
C. The role of effective lubrication in failure avoidance

II. Lubrication Theory (10%)
A. Fundamentals of tribology
B. Functions of a lubricant
C. Hydrodynamic lubrication (sliding friction)
D. Elasto-hydrodynamic lubrication (rolling friction)
E. Mixed-film lubrication

III. Lubricants (15%)
A. Base-oils
B. Additives and their functions
C. Oil lubricant physical, chemical and performance properties and classifications.
D. Grease lubrication
   1. How grease is made
   2. Thickener types
   3. Thickener compatibility
   4. Grease lubricant physical, chemical and performance properties and classifications.

IV. Lubricant Selection (15%)
A. Viscosity selection
B. Base-oil type selection
C. Additive system selection
D. Machine specific lubricant requirements
   1. Hydraulic systems
   2. Rolling element bearings
   3. Journal bearings
   4. Reciprocating engines
   5. Gearing and gearboxes
E. Application and environment related adjustments.

V. Lubricant Application (25%)
A. Basic calculations for determining required lubricant volume.
B. Basic calculations to determine re-lube and change frequencies.
C. When to select oil; when to select grease.
D. Effective use of manual delivery techniques.
E. Automatic delivery systems.
   1. Automated deliver options.
      a) Automated grease systems
      b) Oil mist systems
      c) Drip and wick lubricators
   2. Deciding when to employ automated lubricators.
   3. Maintenance of automated lubrication systems.

VI. Preventive and Predictive Maintenance (10%)
A. Lube routes and scheduling
B. Oil analysis and technologies to assure lubrication effectiveness.
C. Equipment tagging and identification.
VII. Lube Condition Control (10%)
A. Filtration and separation technologies.
B. Filter rating.
C. Filtration system design and filter selection.

VIII. Lube Storage and Management (10%)
A. Lubricant receiving procedures.
B. Proper storage and inventory management.
C. Lube storage containers
D. Proper storage of grease-guns and other lube application devices.
E. Maintenance of automatic grease systems.
F. Health and safety assurance.

To become certified, an individual must meet the following requirements:

- **Education and/or Experience** - Candidates must have at least 12 months experience in the field of lubricant-analysis-based machinery condition monitoring. The months of experience are based on 16 hours minimum per month of sampling and analysis experience.

- **Training** - Candidate must have received 24 hours of documented formal training as outlined in the Body of Knowledge of the MLA I.

Note: ICML does not require, recommend, endorse or authorize any specific training course as official or approved. It is the responsibility of each candidate to research the training options available in his/her area and make a decision as to the training provider of his/her choice. ICML recommends the outline of the course of choice be compared to the exam's Body of Knowledge. It is in the person's best interest and their responsibility as an ICML candidate to ensure they are being trained in the same subject areas in which they will be tested. ICML's Bodies of Knowledge are of public domain and can be utilized by companies in the development of courses, as well as by any prospective candidate for evaluating the appropriateness of chosen training.

**Examination** - Each candidate must successfully pass a written, 100 question, multiple-choice examination that evaluates the candidate's knowledge of the topic. Candidates have three hours to complete the closed-book examination. A score of 70% is required to pass the examination and achieve certification. Contact ICML about the availability of the exam in other languages.

**Domain of Knowledge**


These references can be purchased from the following organizations:

Amazon.Com
ASTM
Barnes and Noble
Noria Corporation