

Appendix A : Syllabuses of the written examination

The syllabuses cover the following areas:-

- 1) Comprehension of relevant statutes, International Standards and codes of practice:
 - a) Lifts and Escalators Ordinance (Chapter 618);
 - b) Code of Practice on the Design and Construction of Lifts and Escalators;
 - c) Code of Practice for Lift Works and Escalator Works;
 - d) Relevant International Standards (e.g. BS 5655(EN81) / BS5656(EN115));
 - e) Requirements of Fireman's Lift;
 - f) Factories and Industrial Undertakings (Goods Lifts) Regulations (Chapter 590) and Code of Practice for Safety at Work (Lift and Escalator) issued by the Labour Department;
 - g) Code of Practice on Building Works for Lifts and Escalators, relevant parts of Code of Practice for Fire Safety in Buildings and Design Manual — Barrier Free Access issued by the Building Authority;
 - h) Guidelines on Safety of Lift Shaft Works issued by Construction Industry Council.

- 2) Knowledge of:
 - a) Lift/escalator theories –
these include, but not limited to:
 - Mechanics of lifts and escalators
 - Calculations and formula derivation for clearance distances required for lift car and counterweight under various situations.
 - Calculations and formula derivation for braking load required.
 - Calculations and formula derivation for gravity stopping distance.
 - Calculations and formula derivation for coefficient of friction and wrapping angle on traction sheaves required.
 - Calculations and formula derivation for type tests of various critical components of lift and escalator systems as required in BS5655/EN81, BS5656/EN115.
 - Calculations on capacity of lift and escalator systems.
 - Calculations on dead weight loading on supporting structure & deflection values of escalator systems.
 - Other lift and escalator knowledge
 - b) Circular letters from EMSD related to Lifts and Escalators.

- 3) Practical experience in connection with the installation, commissioning, testing, maintenance and operation of machinery and safety equipment/components of lifts/escalators.

Appendix B : Sample questions of the written examination

Lift part:

- Q.1(a) For a traction drive lift of 1.5 m/s rated speed, determine the required minimum clearance above the roof of the car enclosure when the counterweight rests on a fully compressed buffer. Your answer should be accompanied with appropriate sketches.
- Q.1(b) Explain the meaning of “gravity stopping distance at 115% of rated speed” and clarify its importance.
- Q.1(c) In case reduced stroke buffers are used for a high speed lift (for example, rated speed faster than 4 m/s), does the calculation of top clearances have still to follow that of part (a) above, or it can be reduced? If it can be reduced, explain why and how.
- Q.2 Please explain and describe the complete procedure in the periodic examination and testing of an existing lift. Your answer shall include, but not limited to the following points:
- * Tests and examinations required and their appropriate timing.
 - * Components and devices to be examined or tested.
 - * The expected outcome of these test and examinations under normal situations.
 - * Certificates and reports involved.
 - * The process in handling unsatisfied circumstances.

Escalator part:

- Q.1(a) Suppose you are now to put up an escalator of 10 metre rise which is used to connect a street (outdoor situation) and a shopping mall, state and explain the constraints on the choice of speed, the angle of inclination and any other additional appropriate requirements.
- Q.1(b) For some events stipulated in the Clause 10.3.2.4 in the Part 4 of Section E of the Code of Practice on the Design and Construction of Lifts and Escalators, some electrical safety devices of escalators should operate, which may cut off the supply to contactors or relay contactors. Describe and explain:
- * The construction requirements of such a safety contacts.
 - * The resulting action on the escalator equipment after the operation of any such devices.
- Q.2 State ‘True’ or ‘False’ with your justifications for each of the following statements. No mark will be given for answers without justifications.
- (i) The safety factor for any part of the driving machine constructed of cast iron, based on the static load, shall be not less than 10.
 - (ii) The radius of curvature of a passenger conveyor in the upper transition from incline to horizontal shall be at least 1 m for rated speed at or below 0.5 m/s and at least 1.5 m for rated speed exceeding 0.5 m/s.
 - (iii)
 - (iv)