INSTITUTION OF ENGINEERS SINGAPORE

CHARTERED ENGINEERING TECHNOLOGIST OF SINGAPORE

COMPETENCY STANDARD & ASSESSMENT STATEMENT

The Institution of Engineers, Singapore
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PART 0 – RECORD OF REVISIONS

Revision	Date of Revision	Page / Section	Purpose of Revision
0	NA	All	Initial release
1	1 Oct 2023	Section 11	The CEB is the authority for dispute resolution.

PART 1 - INTRODUCTION

1 REGISTRATION AS CHARTERED ENGINEERING TECHNOLOGIST OF SINGAPORE

1.1 The registration for Chartered Engineering Technologist of Singapore by the Institution of Engineers Singapore (IES) is to recognise persons who have demonstrated that they are able to practise competently in their practice area.

1.2 The level of professional competency which IES's Chartered Engineering Technologist is expected to meet, is listed as Competency Standard in Part 4 of this Assessment Statement. This set of Competency Standards has been developed with reference to the Technical Skills & Competencies (TSCs) in the Skills Framework[1].

1.3 The IES will keep a register of Chartered Engineering Technologists, which will list individuals who have been registered as Chartered Engineering Technologists. These Chartered Engineering Technologists will be able to use the post-nominal "CETg (SG)" to their names.

1 The Skills Framework can be downloaded from SSG's website: https://www.skillsfuture.gov.sg/skills-framework

PART 2 - REGISTRATION POLICY

2 CHARTERED ENGINEERING BOARD (CEB)

2.1 **For the purpose of the registration of Chartered Engineering Technologist of Singapore, the IES Council has constituted the Chartered Engineering Board (CEB). The CEB will manage the assessment and registration process, and approve engineering technologists to be registered as Chartered Engineering Technologist of Singapore.**

2.2 **The IES Council shall appoint Board Members of CEB who may be representatives from government, industry, relevant professional associations, or higher education institutions delivering engineering programs.**

2.3 **CEB will approve the registration of each successful engineering Technologist by positive vote of more than half of the total number of Board Members in the CEB.**

2.4 **The contact person for CEB is:**
Secretary
Chartered Engineering Board
The Institution of Engineers, Singapore
70 Bukit Tinggi Road
Singapore 289758
Tel: (65) 64695000
Email: ceb@iesnet.org.sg

PART 3 - ELIGIBILITY REQUIREMENTS

3 REQUIREMENTS FOR REGISTRATION

3.1 An engineering technologist has to fulfil the following requirements in order to qualify for registration as Chartered Engineering Technologist:

(i) member of IES;
(ii) has met the criteria in either of the pathways for registration as stated in 4.1;
(iii) has a letter of recommendation to be a Chartered Engineering Technologist provided by his/her employer or user of service;
(iv) attends an interview if requested by the assessment panel;
(v) agrees to pursue continuing professional development at a satisfactory level prescribed by the CEB; and
(vi) agrees to be bound by the IES's Rules for Professional Conduct.

4 PATHWAYS FOR REGISTRATION

4.1 Engineering technologists seeking registration as Chartered Engineering Technologist of Singapore through one of the following two pathways –

<u>Pathway A</u>
An engineering technologist who meets the following criteria can qualify for registration as a Chartered Engineering Technologist –
i) passed the Technical & Skills Competencies assessment for a specific industry sector (listed in Appendices) conducted by the CEB accredited assessment centre(s) listed in Annex B; and
ii) obtained at least 6 years of relevant practical work experience as an engineering technologist.

<u>Pathway B</u>
An engineering technologist who meets the following criteria can qualify for registration as a Chartered Engineering Technologist –
i) completed an engineering diploma course or any substantially equivalent academic programme recognised by the IES[2]; and
ii) passed the Technical & Skills Competencies assessment for a specific industry sector (listed in Annex A) conducted by the CEB accredited assessment centre(s) listed in Annex B; and
iii) obtained at least 3 years of relevant practical work experience as an engineering technologist.

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[2] **A list of qualifications that has been deemed as substantially equivalent to an engineering diploma course can be found in IES's website on registration as Chartered Engineering Technologist of Singapore.**

5 INDUSTRY SECTOR OF ENGINEERING PRACTICE

5.1 CEB will identify and approve a list of recognised engineering practice from various industry sectors and an engineering technologist shall be assessed under a recognised engineering practice in the list. (The list of industry sectors of engineering practices, as shown in Annex C, will be updated to include new industry sectors and tracks as necessary.) The registration of Chartered Engineering Technologists will be based on the engineering practice in his/her specific track of the industry sector.

PART 4 - COMPETENCY STANDARD

6 LEVELS OF COMPETENCY STANDARD

6.1 The Competency Standard[3] is the ability to perform at the level of Technical Skills & Competencies that represents broad practice areas of professional engineering performance. These levels of Technical Skills & Competencies are adapted from the Skills Framework.

6.2 The Competency Standard of Chartered Engineering Technologist to be referred is pegged to level 2, 3 or 4 of Technical Skills & Competencies and is shown in Table 6.1 below.

Table 6.1

Level	Responsibility (Degree of supervision and accountability)	Autonomy (Degree of decision-making)	Complexity (Degree of difficulty of situations and tasks)	Knowledge and Abilities (Required to support work as described under Responsibility, Autonomy and Complexity)
2	Work with some supervision. Accountable for a broader set of tasks assigned.	Use limited discretion in resolving issues or enquiries. Work without frequently looking to others for guidance	Routine	• Understand and apply factual and procedural knowledge in a field of work • Apply basic cognitive and technical skills to carry out defined tasks and to solve routine problems using simple procedures and tools • Present ideas and improve work
3	Work under broad direction May hold some accountability for performance of others, in addition to self.	Use discretion in identifying and responding to issues, work with others and contribute to work performance	Less routine	• Apply relevant procedural and conceptual knowledge, and skills to perform differentiated work activities and manage changes • Able to collaborate with others to identify value-adding opportunities
4	Work under broad direction Hold accountability for performance of self and others.	Exercise judgement; Adapt and influence to achieve work performance	Less routine	• Evaluate and develop factual and conceptual knowledge within a field of work • Select and apply a range of cognitive and technical skills to solve non-routine/abstract problems • Manage work activities which may be unpredictable • Facilitate the implementation of innovation

[3] Competency Standard is an indication of level of performance expected of a professional engineering Technologist and Technician.

6.3 Details of the knowledge and abilities for each of the Technical Skills & Competencies in each of the industry sectors are provided in the Appendices.

6.4 Only assessment centres with assessment programme accredited by CEB are allowed to carry out assessment for each of the Technical Skills & Competencies. The list of assessment centres with accredited assessment programme is shown in Annex B.

PART 5 - ASSESSMENT

7 ASSESSMENT

7.1 CEB will appoint the Sector Committee (SC) for each industry sector, to review and assess applications for registration as Chartered Engineering Technologist.

7.2 The SC will appoint one or more independent assessors to be part of the assessment panel to evaluate the engineering technologist on his/her Technical & Skills Competencies of the specific industry sector.

7.3 The SC will make their recommendations to CEB on whether an engineering technologist should be registered through a review of the application form and documents therein.

8 AVOIDANCE OF CONFLICT OF INTEREST

8.1 In order to avoid possible conflict of interest, members of the SC and assessment panel are not expected to have or have had a close, active association with the engineering technologist or his/her work experience. Close/active association are, for example

a) being a relative of the engineering technologist by birth or marriage;
b) being in a position of financial or personal interest, either currently or within the past 6 years, directly related to the engineering technologist; and
c) being employed, either currently or within the past 6 years, as staff or consultant by the organisation in which the engineering technologist's work experience was obtained.

PART 6 - OBLIGATIONS OF AND RULES GOVERNING CHARTERED ENGINEERING TECHNOLOGISTS

9 BOUND BY RULES OF PROFESSIONAL CONDUCT

9.1 Chartered Engineering Technologists of Singapore are assessed for skills & competencies in their domain of engineering practice in a specific industry sector. Chartered Engineering Technologists shall therefore not claim competency by virtue of their registration as Chartered Engineering Technologist in other areas of engineering practice that lie outside their area of expertise

9.2 Chartered Engineering Technologists are bound by the IES's Rules for Professional Conduct.

9.3 Chartered Engineering Technologists are required to maintain their continuing professional development at a satisfactory level, which should not be less than the level as prescribed by the CEB in Annex D. CEB may carry out random audit (of between 2% and 5% of records for the past year) of participation in CPD programme.

10 DISCIPLINARY ACTION

10.1 A complaint against any Chartered Engineering Technologist relating to contravention of the rules of professional conduct shall be lodged with the Secretary of the CEB.

10.2 If CEB has determined the complaint to be bona fide, CEB will set up an Investigation Committee to investigate into the complaint and make recommendations to the CEB.

10.3 Any action to be taken by the CEB against the Chartered Engineering Technologist, including removal from the register, shall not be taken unless the Chartered Engineering Technologist has been given an opportunity of being heard.

11 DISPUTE RESOLUTION

11.1 An engineering technologist may appeal against the refusal to be placed on the register.

11.2 A Chartered Engineering Technologist may appeal against the decision of the CEB to remove him/her from the register.

11.3 An appeal must be made in writing to the Secretary of CEB within 30 days after receiving notification of refusal or removal. The appeal should be accompanied by a clear statement of the grounds for appeal.

11.4 The CEB will appoint an Appeal Committee comprising not less than 3 members to consider the appeal and to submit its findings and recommendations within 60 days.

11.5 The CEB will consider the findings of the Appeal Committee and arrive at a final decision within 90 days after the formation of the Appeal Committee.

11.6 If the appeal is denied, the CEB will provide the appellant with reasons for the decision.

11.7 If a review of the registration is necessary, the CEB will appoint another Assessment Panel to carry out the review.

11.8 If appeal for reinstatement on the register is successful, CEB will reinstate the Chartered Engineering Technologist on the register.

11.9 The CEB may impose a fee for lodgement of an appeal. The fee will be refunded to appellant's membership account if the outcome is in appellant's favour, but there will be no refund if the original decision is upheld.

PART 7 - APPLICATION GUIDANCE

12 APPLICATION FORM

12.1 The Application Form is available for download from the IES web site.

13 WHO IS ELIGIBLE TO APPLY

13.1 Application for registration as Chartered Engineering Technologist is open only to members of IES.

13.2 CEB may refuse to register an engineering technologist who in its opinion is not of good character or reputation.

14 RENEWAL OF REGISTRATION

14.1 Every Chartered Engineering Technologist who wishes to renew his/her registration has to fulfil the following requirements:

a) Obtain a minimum of 20 PDUs every year over the renewal qualifying period
b) Update particulars on the IES Chartered Technologist database
c) Pay the IES Chartered Technologist renewal fee
d) Make the necessary declarations in the renewal application form.

14.2 Refer to Annex D for more details.

PART 8 - BIBLIOGRAPHY

1. International Engineering Technologist Agreement Version 1.4
2. Agreement for International Engineering Technicians Version 1.4
3. International Engineering Alliance – "Graduate Attributes and Professional Competencies", June 2013
4. IPENZ – Chartered Professional Engineer Competence Standard
5. The Institution of Mechanical Engineers, UK – Chartered & Incorporated Engineers Application Guidance
6. The Professional Engineers Board, Singapore – Continuing Professional Development for Professional Engineers
7. Skills Framework - https://www.skillsfuture.sg/skills-framework

ANNEX A – TECHNICAL SKILLS & COMPETENCIES FOR EACH OF THE INDUSTRY SECTORS

A.1 Skills Framework

A1.1 In the Skills Framework, there is a unique set of Technical Skills & Competencies (TSCs) for each of the industry sectors and tracks. In each set of TSCs, there are TSC map and reference documents as shown in the Appendices

A1.2 To be Chartered Engineering Technologist, he/she has to pass the assessment for the set of TSCs stipulated in the Appendices for the particular industry sector and track. The assessment on the set of TSCs is conducted by the assessment centres as listed in Annex B.

ANNEX B – ACCREDITED TECHNICAL & SKILLS COMPETENCIES ASSESSMENT CENTRES

B.1 The following are accredited Technical & Skills Competencies assessment centres which have been approved by the CEB:

Sector	Track	Assessment Centre	Effective Date
Land Transport / Railway & Transportation	Automotive	Singapore Bus Academy	January 2020
Land Transport / Railway & Transportation	Railway	Singapore Rail Academy	December 2022

ANNEX C - LIST OF INDUSTRY SECTORS AND TRACKS

Industry Sector	Track	Start of Registration
Land Transport	Automotive	January 2020
Land Transport	Railway	December 2022
Railway & Transportation	Automotive	May 2023
Railway & Transportation	Railway	May 2023

ANNEX D - CONTINUING PROFESSIONAL DEVELOPMENT (CPD) FRAMEWORK

D1 CPD Policy

D1.1 In the prevailing fast changing environment, there is a need for Chartered Engineering Technologists in Singapore to pursue lifelong learning to maintain and update their professional competence on a continuing basis.

D1.2 As a Chartered Engineering Technologist may be operating under circumstances which are unique to him/her, the focus of the CPD activities is best left to each Chartered Engineering Technologist to decide. The principle is that the relevant CPD activities must be those related to the scope of practice of each Chartered Engineering Technologist. There is therefore no prescribed rules as to the nature and type of activities to be undertaken but each Chartered Engineering Technologist will be given the flexibility to select from amongst a broad range of activities. The range of activities in this CPD programme is not intended to be exhaustive but to act as a general guide. The activities that would be relevant are those that will enable one to

a) maintain, improve, or expand his/her technical skills and knowledge;
b) keep abreast of changing procedures and standards;
c) understand and apply advances in technology;
d) better serve the engineering profession, community and environment;
e) develop communication and management skills; and
f) broaden into related fields, such as those covering management, financial or legal aspects.

D2 Definitions

D2.1 The terms used in this document have the following meanings

a) "contact hour" refers to an attendance or involvement lasting one hour;
b) "professional development units" or "PDU" refers to the unit of measure for effort in continuing professional development program;
c) "renewal qualifying period" refers to a 24-month period immediately preceding the application for renewal of registration;

D3 Activities

D3.1 The types of relevant CPD activities are as follows:

a) Accredited formal study courses, lectures, short courses, conferences, workshops, seminars and in-house training (e.g. Relevant degree, diploma, and WSQ skills-based courses on engineering and/or project management);

b) Participation in Professional Boards, Committees and Societies (e.g. Member of Boards of local Professional institutions or relevant government agencies);
c) Contribution to relevant engineering or management knowledge (e.g. Conduct accredited lectures, seminars, conferences or training courses for the first time);
d) Self-study of relevant topics (e.g. Reading of relevant technical, professional, financial, legal or business literature;
e) Informal In-house training and discussion;
f) Non-accredited engineering activities.

D4 Carrying over of excess PDUs

D4.1 If a Chartered Engineering Technologist exceeds the biennial requirement in one renewal qualifying period, a maximum of 20 PDUs from excess PDUs may be carried forward into the next renewal qualifying period.

D5 Insufficient PDU for renewal of registration

D5.1 A Chartered Engineering Technologist who has not obtained sufficient PDUs in the renewal qualifying period to meet the requirement for renewal of his registration may apply to have his registration renewed by providing reasons for the failure to meet the requirement. The CEB may renew his/her registration and may impose a condition that the shortfall in PDUs in that renewal qualifying period has to be obtained during the following renewal qualifying period. The PDUs to be obtained in the next renewal qualifying period to meet the shortfall would not be used for the renewal of the registration for the next renewal period.

D6 Reinstatement after a lapse of 3 years

D6.1 A Chartered Engineering Technologist whose registration had lapsed for 3 years or more will be removed from the register.

D7 Exemptions

D7.1 A Chartered Engineering Technologist may be exempted, subject to review and approval of the CEB, from CPD requirements if he/she experiences physical disabilities, prolonged illness or other extenuating circumstances.

D8 Records

D8.1 When applying for renewal of registration, a Chartered Engineering Technologist is to submit the Biennial Renewal Form (which can be downloaded from the IES web site) which contains a form to record the PDUs obtained during the renewal qualifying period. Chartered Engineering Technologists do not have to submit documentary evidence together with the Biennial Renewal Form. However, Chartered Engineering Technologists are advised to retain their CPD documentary evidence for a period of at least 4 years.

D9 Audit Process

D9.1 CEB will conduct random audit on compliance with CPD. Those selected will be asked to produce documentary evidence of their CPD participation during the particular period. The documentary evidence may take any one of the following forms:

- **a) Summary of diary records or a log showing the activities claimed;**
- **b) Course enrolment record;**
- **c) Receipts;**
- **d) Certificate of attendance;**
- **e) Attendance list from course organiser;**
- **f) Employer's report or certification.**

APPENDIX I – LAND TRANSPORT / RAILWAY & TRANSPORTATION (AUTOMOTIVE) TECHNICAL SKILLS & COMPETENCIES

Technical Skills & Competencies Assessment

	Knowledge	Abilities	Interview
Pre-requisite	• Minimum 10 years of relevant working experience • Minimum NITEC/CTS Level 2 • Supervisory role with minimum 3 direct reporting technicians for at least 2 years	Pass MCQ assessment	Pass MCQ & Practical Assessment
Duration	1 hours	Max 4 hours	Max 1 hours
Format	30 MCQs	1 integrated module practical assessment	1 session

Technical Skills and Competencies Map

Chartered Technologist (Land Transport / Railway & Transportation - Automotive)		
Sector	Land Transport / Railway & Transportation	
Track	Automotive (Bus)	
	Technical Skills & Competencies	
Skills & Competencies	Bus Air-Conditioning Systems Maintenance	Level 4
	Bus Brake Systems Maintenance	Level 4
	Bus Drivetrain Systems Maintenance	Level 4
	Bus Electrical and Electronic Systems Maintenance	Level 4
	Bus Engine System Maintenance	Level 4
	Bus Steering and Suspension Systems	Level 4

Technical Skills and Competencies Reference Document

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Air-Conditioning Systems Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus air-conditioning systems • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus air-conditioning systems and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements • Perform fault analysis to address systemic failures on bus air-conditioning systems • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified on bus air-conditioning systems • Analyse performance of bus air-conditioning systems to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus air-conditioning systems to ascertain effectiveness of maintenance procedures • Propose new and/or enhanced bus air-conditioning systems maintenance WI in reference to OEM technical recommendations

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Brake Systems Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus brake systems and its components • Principles of braking dynamics • Types and causes of systemic failures of bus brake systems • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus brake systems and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements • Perform fault analysis to address systemic failures on bus brake systems • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified in bus brake systems • Analyse performance of bus brake systems to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus brake systems to ascertain effectiveness of maintenance procedures

	• Propose new and/or enhanced bus brake systems maintenance WI in reference to OEM technical recommendations

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Drivetrain Systems Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus drivetrain systems • Types and causes of systemic failures on bus drivetrain systems • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus drivetrain systems and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements • Perform fault analysis to address systemic failures on bus drivetrain systems • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified on bus drivetrain systems • Analyse performance of bus drivetrain systems to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus drivetrain systems to ascertain effectiveness of maintenance procedures • Propose new and/or enhanced bus drivetrain systems maintenance WI in reference to OEM technical recommendations

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Electrical and Electronic Systems Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus electrical and electronic systems • Types and causes of systemic failures on bus electrical and electronic systems • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus electrical and electronic systems and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements • Perform fault analysis to address systemic failures on bus electrical and electronic systems • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified on bus electrical and electronic systems

	• Analyse performance of bus electrical and electronic systems to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus electrical and electronic systems to ascertain effectiveness of maintenance procedures • Propose new and/or enhanced bus electrical and electronic systems maintenance WI in reference to OEM technical recommendations

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Engine System Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus engine system • Types and causes of systemic failures on bus engine system • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus engine system and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements • Perform fault analysis to address systemic failures on bus engine system • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified on bus engine system • Analyse performance of bus engine system post maintenance and repair activities to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus engine system to ascertain effectiveness of maintenance procedures • Propose new and/or enhanced bus engine system maintenance WI in reference to OEM technical recommendations

Technical Skills and Competencies (TSC) Reference Document	
TSC	**Bus Steering and Suspension Systems Maintenance**
TSC Proficiency	**Level 4**
Knowledge	• Operating principles of bus steering and suspension systems • Types and causes of systemic failures on bus steering and suspension systems • Types of failure investigation and prevention methods • Types of diagnostic tools and equipment • Diagnostic procedures for bus steering and suspension systems and components • Organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical recommendations • Methods to develop maintenance WI
Abilities	• Establish failure investigation and specify functional testing requirements

	• Perform fault analysis to address systemic failures on bus steering and suspension systems • Review data gathered from diagnostic procedures to recommend rectification solutions for recurring faults identified on bus steering and suspension systems • Analyse performance of bus steering and suspension systems to evaluate effectiveness of recommended rectification solutions • Review corrective and preventive maintenance regime of bus steering and suspension systems to ascertain effectiveness of maintenance procedures • Propose new and/or enhanced bus steering and suspension systems maintenance WI in reference to OEM technical recommendations

APPENDIX II – LAND TRANSPORT / RAILWAY & TRANSPORTATION (RAILWAY) TECHNICAL SKILLS & COMPETENCIES

Technical Skills & Competencies Assessment

	Knowledge	Abilities	Interview
Pre-requisite	• Minimum 10 years of relevant working experience • Minimum NITEC/CTS Level 2 • Supervisory role with minimum 3 direct reporting technicians for at least 2 years	Pass MCQ assessment	Pass MCQ & Practical Assessment
Duration	1 hours	Max 4 hours	Max 1 hours
Format	30 MCQs	1 integrated module practical assessment	1 session

Candidate needs to fulfil the Technical Skills and Competencies for one of the following tracks:

1) **Rail (Rolling Stock)**
2) **Rail (Signal)**

1) Rail (Rolling Stock) - Technical Skills and Competencies Map

Chartered Technologist (Land Transport / Railway & Transportation - Rail)		
Sector	Land Transport / Railway & Transportation	
Track	Rail (Rolling Stock)	
	Technical Skills & Competencies	
RS Depot	1. Rolling Stock Air Condition and Ventilation Systems Maintenance	Level 2
	2. Rolling Stock Auxiliary Systems Maintenance	Level 2
	3. Rolling Stock Bogie Maintenance	Level 2
	4. Rolling Stock Brake Systems Maintenance	Level 2
	5. Rolling Stock Car Body Maintenance	Level 2
	6. Rolling Stock On-Board Control Systems Maintenance	Level 2
	7. Rolling Stock Power Systems Maintenance	Level 2
	8. Rolling Stock Propulsion Systems Maintenance	Level 2
RS Workshops	9. Heavy Lifting Machinery Operation	Level 2

	10. Engineering Trains and Rolling Stock Operation	Level 2
	11. Rolling Stock Air Production Systems Maintenance	Level 2
	12. Wheel Lathe Machinery Operation	Level 2
	13. Wheel Press Machinery Operation	Level 2
	14. Specialist Testing Equipment Operation	Level 2
	15. Electrical System (Component) Maintenance	Level 2
	16. Bogie System (Component) Maintenance	Level 2
	17. Aircon System (Component) Maintenance	Level 2
	18. Propulsion System (Component) Maintenance	Level 2
RS Plant	19. Heavy Lifting Machinery Maintenance	Level 2
	20. Rail Road Shunting Vehicle Maintenance	Level 2
	21. Bogie Turntable Maintenance	Level 2
	22. Train Wash Plant Maintenance	Level 2
	23. Bogie Workstation Maintenance	Level 2
	24. Automatic Storage & Retrieval System (ASRS) Maintenance	Level 2
	25. Wheel Press Machinery Maintenance	Level 2
	26. Specialist Testing Equipment Maintenance	Level 2
	27. Wheel Lathe Machinery Maintenance	Level 2
	28. Condition-based Assets Monitoring	Level 3
	29. Data and Statistical Analytics	Level 3
	30. Maintenance Scheduling	Level 3
	31. Asset Management	Level 3
	32. Internet of Things Application	Level 3

2) Rail (Signal) - Technical Skills and Competencies Map

Chartered Technologist (Land Transport / Railway & Transportation - Rail)		
Sector	Land Transport / Railway & Transportation	
Track	Rail (Signal)	
	Technical Skills & Competencies	
Skills & Competencies	1. Signal Interlocking Systems Maintenance	Level 3
	2. Signalling Auxiliary Device and Equipment	Level 3
	3. Trackside Automatic Train Control Equipment Maintenance	Level 3
	4. Platform Screen Door Maintenance	Level 3
	5. Train Supervisory System Maintenance	Level 3
	6. Network Systems Maintenance	Level 3
	7. Train-borne Automatic Train Control Equipment	Level 3
	8. Communication Auxiliary Systems Maintenance	Level 3
	9. Radio System Maintenance	Level 3
	10. Travel Information System Maintenance	Level 3
	11. Video Surveillance System Maintenance	Level 3
	12. Condition-based Assets Monitoring	Level 2
	13. Technology Application	Level 3

	14. Data and Statistical Analytics	Level 3

Technical Skills and Competencies Reference Document

Refer to the Skills Framework under the Public Transport sector and Rail System Maintenance category to find out the details of the Knowledge and Abilities for each of the Technical Skills & Competencies titles listed in the Technical Skills & Competencies Map.