

SOUTH CENTRAL RAILWAY

मुख्यालय /Headquarters Office
कार्मिक विभाग /Personnel Department
सिकंदराबाद /Secunderabad.
दिनांक Date: 19.09.2025

सं. No .SCR/P-HQ/CBT/QB/SY/Mech
2 office No.

WPO/LGD

Sub: - Unified Syllabus for JE/Mech/WS (Work Shop) against 25% Promotional Quota in Mechanical department – Reg

Ref: - Railway Board's Lr.No E(NG)I/2025/PM1/3 dated 26.05.2025.

In terms of RBE No. 19/2025, Railway Board has given guidelines on conduct of Computer Based Test for departmental examination. In (Work shops) of Mechanical department, for promotional quota, the following post is identified and planned to conduct the CBT examination.

1) JE/Mech/WS -Against 25% Promotional Quota

In view of the above, for the above departmental examination, the competent authority(i.e CWE) has approved the standardised unified syllabus and question bank. The same is enclosed herewith for further course of action at your end please.
Encl: as above

M. V. Prasad
(M V Prasad) 19/09/25
APO/M&EL

for Pr. Chief Personnel Officer

C/- PCME, CWE, Secy to PCME – for kind information
C/- Dy.CPO/Rectt&Chairman – for kind information

E. office no. 507396

TINSMITH SHOPSection-A

1. Layout water tanks and pipe connection in ICF and BEML Coaches, with sketches capacities of different types of water tanks.
2. A) Details of plumbing work during POH on ICF and BEML Coaches-Repair practices of pipe flanges/joint
B) Methods for obtaining leak proof piping system. Points to be observed for avoiding public complaints
3. Procedures for renewal of water tanks, time required at each stage.
4. Soldering, threading and bending processes on water carrying pipes used in tinsmith work.
5. Overhauling and testing of water system, and its components like water tanks, flush valve, Jayson cocks etc.
6. Modifications in water system of AC and Non-AC coaches.
7. Tig welding of water tanks of AL & SS.
8. Bio toilets fitment and modifications for different types of coaches and study of drawings.
9. Vacuum Bio-toilets.

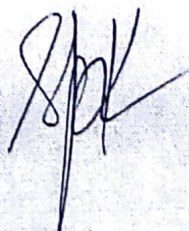


SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER

PAINT SHOP

Section -A

1. POH cycle of coaches.
2. a) Knowledge of painting schedule of coaches ICF/RCF, LHB & other coaches.
b) Procedure of coach painting in workshop (Exterior & Interior).
3. Defects developed on painting surfaces and reasons for the same.
4. Tests to assess the quality of paints.
5. Knowledge of mixing of paints.
6. Types of paints & its specification for different types of coaches (ICF/RCF & LHB Hybrid coaches)
7. Knowledge of screen printing of letters on coaches.
8. Powder coating on coach components.
9. Standard lettering to be available on the coach.
10. Types of brushes.
11. Difference in paint quality between interior and exterior paints of a coach.
12. Knowledge on Poly vinyl wrapping on coaches.
13. Knowledge on PU painting & procedure of application on coaches.
14. Tools & Plants used for painting in workshop.
15. Safety equipments for painting.
16. Knowledge of paint booth working procedure.
17. Quality assessment tools for painting.
18. Knowledge of ICF/RCF, LHB (Hybrid) BOGIE painting procedure



SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

CB&UF

Section-A

1. Bogie overhauling

- Types of bogies (ICF Bogie , EMU Power Car , DEMU Power Car Bogie ,EMU Bogie ,Tower Car Bogie and LHB Fiat ,Bogie) and their components.
- Lifting and Running out of bogies.
- Bogie dismantling and assembling and testing procedure.
- Lowering of coaches and Buffer height.

2. Air Brake system

- Bogie mounted Air brake system ,Overhauling of components, repairs practices and testing.
- Principle and operation of Air brake system.
- Air brake system of
 - ICF Coach
 - DEMU Power Car
 - Tower Car
 - LHB Coach (Disc Brake system)
 - EP Brake system (EMU Coaches)

3. Wheel and Axle arrangement ICF, LHB & Special Stock.

- Wheel tyre turning and working on wheel lathe machine
- Pressing of Wheels and working on wheel press
- Wheel disc bore and working on VTL, AJTB
- Overhauling of Axle box and Roller bearing

4. a) Draw gear, buffing gear , CBC and Schaku Couplers

- Vestibule repair practices.

5. RSP modifications, CAIs, TSOs and other RDSO modifications & Trial items Pertaining to bogie and Under frame of the coach.

CORROSION SHOPSection -A

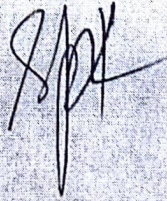
1. Knowledge of design and construction of ICF & RCF coaches under frame and shell.
2. Knowledge of corrosion and repairs practices carried out on coaches.
 - a) Knowledge of various types of welding processes (Arc welding, Co2 welding, Metal Arc welding, metal inert gas welding, Tungsten inert gas welding) including MS, stainless steel and cast iron welding.
 - b) Knowledge on various welding machines used in above process and their basic preventive maintenance.
3. Knowledge of PVC and compreg flooring.
4. IS specification and methods of prevention of Corrosion in coaching stock CMI I & CMI IV.
5. Procedure for laying vinyl sheets in coaches.
6. Preparation before welding, post treatment, HAZ etc.
 - a) Gas cutting equipment's flames used type of gas used and handling of Gas cutting equipments.
 - b) Knowledge of laser cutting process, laser cutting machining usage and basic preventive maintenance
7. Necessity for Corrosion repairs of steel bodied coaches and procedure for carrying out corrosion repairs at the following location on coaches.
 - a) Sole bar at lavatory ends.
 - b) Lavatories/bath rooms at critical locations like lavatory frames particular and floor members.
 - c) Trough floor in luggage compartment.
 - d) Buffer seats.
 - e) Side panels.
8. Knowledge on CIA's, TSO's AND OTHER CMG modifications which are to be carried out during Corrosion repairs.
9. LHB body and under frame construction.

SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

TRIMMING SHOP

Section -A

1. a) Description of various activities in Trimming shop.
b) POH cycle for repairable items in Trimming shop, Sequence of various trimming operations and time required at each stage.
2. a) Berth classifications, types and sizes ,Nature of damages and inspection .
b) Special features of Trimming work .AC two tier coaches AC first class coaches, chair cars and inspection carriages.
3. a) Knowledge of adhesives used for up-holstery work.
b) Specification of Rexine, curtain cloth and rubberised coir cushion etc.
4. Details of trimming work in connection with the furnishing of coaches.
5. Role of Trimming shop in providing i) Passenger amenities ii) Modifications on coaches iii)Standardization.
6. Working of seats and Berths on LHB coaches.
7. Attention towards AC chair car seats and back rests repair.



SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II**CARRIAGE SHOP****Section-A**

1. Targets for POH, Special repairs, cushioning, and revamping and alarm signal system etc., of the coaches.
2. Details of POH repairs of coaching stock of ICF TYPE AND Special stock (EMU, DHMU & DEMU, LHB, TC, RA & SPART)
 - a) Stages in the POH cycle and time required at each stage.
 - b) Details of work content at each stage and methods to be adopted for timely completion of work.
3. Passenger amenities in different types of coaches and the role to be played by Carriage shop.
4. Repair practices on Door, Windows, Shutters, sliding doors, toilets furnishing etc.
5. Present CAIs being carried out by the Carriage shop on ICF and BEML coaches.
6. RSP modifications and other modifications pertaining to carriage interior in view of passenger amenity and safety.
7. Knowledge of New coaches/Trains (Utkrisht, Deendayalu, Antyodaya, Tejas, Vande Bharath, Train 18)

SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II**COMPONENT SHOP****Section -A**

1. Various fabrication process like

a) Shearing and bending

b) Welding

c) Sheet metal working

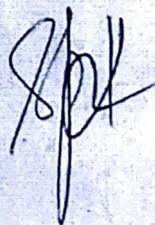
2. a) Repairs to carriage components like doors, windows, battery boxes etc.

b) Repairs to Bogie components.

3. Working principle of drilling, press tools.

4. a) Description and illustration of jigs and fixtures, Details of preparation of templates and profile gauges.

b) Various dies and punches used in metal cutting, FRP pressing dies and sheet metal pressing dies.



E-office No. 507396

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SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

SMITHY (SPRING) SHOP

Section-A

1. Different types of springs used in various Coaching stock (ICF, LHB, & Special stock)
2. C-8419 (Rev-I)
3. CAI, TSO and other RDSO modifications related to springs.
4. Comparison between deflection ranges and color coding with pairing.
5. Difference type of springs steels use in Railways.
6. Cleaning procedure of springs.
7. Load testing.
8. Electro Magnetic Crack Detection (EMCD) testing.
9. Painting & Color coding.
10. Understand spring code.
11. Calculate age of springs.
12. Handling of measuring tools and working tools.
13. Shot Blasting, Shot Peening, Grit Blasting and Sand Blasting.
14. Record maintenance.
15. Cattle guard stripping, repair and fitment procedure.
16. Different types of cattle guard.
17. Screw coupling reclamation procedure.
18. LHB Springs, schedules and pairing



SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-IIWELDING SHOPSection-A

1. Knowledge of
 - a) Welding process and equipments by electric arc method
 - b) Cutting process and equipments by Oxy-Acetylene gas.
 - c) Application of CO₂, TIG, Plasma cutting to different types of works on coaches i.e welding of body side panels, trough floor, buffer seats and sole bars, advantages over arc welding.
2. Welding of bogie components like
 - a) Bogie frame
 - b) Equalizing stay
 - c) Lower plank
 - d) Bolster etc.
3. Welding plant and electrodes specifications and application.
4. Knowledge about pre-heating HAZ and cooling.
5. Various welding joints and their advantages. (PA to PF & Direction of Welds)
6. Welding of cast iron, aluminum, shouldering and brazing
7. Handling and safety precautions of welding technology
8. Knowledge of TIG, MAG, MIG, PLASMA, MMAW and other non-conventional welding techniques.
9. S.S welding Techniques.
10. ISO 3834-2, WPS
11. Identification of metals SS to MS, SS to A1, by metallurgical Technique.



SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

MACHINE SHOP

Section-A

1. Types of machines available in Machine shop & Wheel shop.
2. Important specifications (capacity, length of the job can be done, accuracy, repeatability, resolution & different operations/processes can be done on the machine) of each capacity.
3. Safety precautions to be taken while a) starting b) working
4. Shutting down/stopping of each machine available in machine shop and wheel shop.
5. Working of wheel lathe, wheel press, AJTB.
6. Different types of operation and maintenance of tools used in machine operation, wheel lathe, AJTB, wheel press, centre lathe.
7. All types of measuring tools & gauges used in welding machine operation, wheel lathe, AJTB, wheel press, centre lathe.
8. Different types of machining operation which is being done in machine shop and wheel shop and their application to rolling stock.
9. Preventive maintenance schedules (daily and weekly/fortnightly) to be attended on various machines.
10. Coolants & consumables used in/on various machines.
11. Tolerance, allowance, fit, surface finish, least count, resolution, accuracy, repeatedly, various symbols/schematic representation for representing tolerance and surface finish on the drawing.
12. Gauges, calibration, jigs & fixtures.
13. Down time of the machine, mean time between failure (MTBF), reliability, availability, maintainability of the machines.
14. Various types of cutting tools their composition and use.
15. Speeds and feeds for cutting different types of materials and drills to be used on different machines.
16. Description and illusion of jigs and fixtures, Details of preparation of GO-NO gauges and profile gauges.
17. Knowledge of assessment of workload and requirement of machinery.



SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-IICENTRAL TOOL ROOMSection-A

1. Various measurement tools used in coaching workshop
 - a) Knowledge on Tolerance, Surface finish, Accuracy, Repeatability, Run out, Least count.
 - b) Knowledge on Calibration of various tools, Measuring Instruments & Gauges
2. Overhauling of DV, Brake cylinder
3. LHB: Air Brake system working, different components of Air brake system and their basic preventive maintenance system and POH of each component.
4. Tower Car Air Brake system working, different components of Air brake system and their POH maintenance system.
5. SPART/DHMU: Air Brake system working, different components of Air brake system and their basic preventive maintenance system.
6. DEMU: Air Brake system working, different components of Air brake system and their basic preventive maintenance system and POH of each component.
7. Working Principle of Hydraulic Shock Absorbers. Procedure for Overhauling of Various types of Shock Absorbers used on Coaching Stock.
8. LHB disc brake system: Working principle and various components of LHB disc brake system. Final testing procedure of WSP and Disc Brake system

SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

MILLWRIGHT SHOP

Section-A

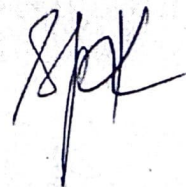
1. Preventive maintenance & trouble shooting of machinery and plant.
 - a) CNC wheel, AJTB, Axle Turning centre lathes, Wheel press, VTL.
 - b) Road vehicles, platform trucks, fork lift truck, mobile cranes.
 - c) Air compressor, spray painting machines, pneumatic tools and cranes.
 - d) EOT cranes, Traverser.
 - e) Axle box cleaning plant, Roller bearing cleaning plant, in depth Heaters.
2. Testing of wire ropes and chains of Workshop (break down cranes and EOT cranes.)
 - a) POH of wire Ropes of EOT cranes
3. Maintenance of FLT and knowledge of screw coupling testing, Testing of load test & Draw hook and Draw bar.
 - a) Knowledge of material handling equipment employed in LGD shops.
 - b) Knowledge of Lifting Jacks, VTL, FLT, Plot trucks.
4. Heat treatments of steel-Hardening, case hardening, annealing, normalizing and tempering. Application of heat treatment to important components like gears, gear shafts, clutch plates etc.

SYLLABUS FOR THE SELECTION OF THE POST OF JUNIOR ENGINEER-II

COMMON TO ALL TRADES/SHOPS

Section-B

1. i) Organization of Mechanical Department on South Central Railway
ii) Various shops/ Sub –shops/Sections in Carriage Workshops, Lallaguda and their functions.
2. Duties and responsibilities of Junior Engineer.
3. Methods for maintaining /improving the productivity targets in both quantity and quality.
 - i) Tools & Plants used
 - ii) Ordinary measuring instruments : (1) Metric Rule (2) Outside Callipers (3) Inside Callipers (4) Feeler gauges and their principle and applications.
 - iii) Precision measuring instruments: (1) Micrometers (2) Vernier Callipers (3) Depth gauge (4) Bevel Protractor (5) Dial Indicator their principle and applications.
 - iv) Principles of work study and work simplification /rationalization for refining Workshop practices.
4. Fundamental Establishment Rules: Knowledge of a) Leave Rules b) Pass Rules c) Pay & Allowances.
5. Discipline and appeal rules
6. Working of Incentive System:
 - a) With special reference to utility of the various forms/sheets./cards(P.1 to P.15)
 - b) Procedure of calculating allowed time , knowledge of man hours on important POH activities pertaining to the concerned shop/Trade.
7. Knowledge of Mechanical code ,PCO, Workshop practice ,Accounts and Stores procedures.
 - a) Stock and non-stock items
 - b) Procedure for local purchase
 - c) PAC, AAC,SAF ,1313 and 1302 forms, Condemnation, Material assistance etc.
8. a) Factory Act with special reference of safety .welfare , Health , accidents and special rules , WCA etc., for workshop staff in Railways.
b) Safety precautions to be observed in the concerned Trade / shop
9. Knowledge of Integrated Management System, 5S, IS3834, Six Sigma.
10. Knowledge on Computers, Networking, applications, E-mail, FAX, Internet etc.
11. Rajbhasha
12. Knowledge on Destructive Test, Non-Destructive Test, Heat Treatment, etc.



Syllabus for POWER CAR

- AIR INTAKE & EXHAUST SYSTEM
- FUEL OIL SYSTEM
- LUBRICATION OIL SYSTEM
- COOLING WATER SYSTEM
- HYDRAULIC OIL SYSTEM
- TRANSMISSION OIL SYSTEM

Syllabus for LOFP

- APPLICATION OF OVAE FOR SIDE SEALING
- SIDE SEALING OF FILTER MEDIA
- INSERTION OF SPIRAL TUBE
- WRAPPING OF OPWS FOR FILTER SUB-ASSEMBLY
- DISPENSING OF OVC IN END CAPS
- FILTER MEDIA END SEALING


16/9/22