

SOUTH WESTERN RAILWAY

Syllabus for Written Examination for conducting suitability test for Technical category posts of JE/ Works, P. Way, Bridges in PB Rs.9300-34800 with GP Rs.4200/- against appointment on compassionate grounds.

Works:

1. Specification and quality control for items of works commonly used in Building and Bridge works – Cement, Steel, Structural steel, coarse aggregate, Fine aggregate, Stone Masonry, Brick work, RCC, PSC, Plumbing work, White Washing / Colour washing, Distemping, Painting etc.
2. Schedule of rates- Preparation of rate analysis.
3. Inspection and maintenance of buildings, roads, structures, water supply and sanitary arrangements.
4. Surveying, Leveling and setting out of works.
5. Earth work in Embankment and cutting, estimation of quantity.
6. Estimation of quantities for building works.
7. Wood work Quality and its maintenance.
8. Elements of plain and Reinforced Cement Concrete & PSC. Basic concepts on Limit State method of designing of structures.
9. Water Supply – Requirement, quality and treatment, storage and distribution.
10. Rain Water harvesting, waste water recycling and Importance of Tree plantation.

Bridges:

11. Strength of materials and Basic design of steel structures.
12. Types of bridges, waterway, catchment area, rainfall data, runoff, afflux, River training and its necessity.
13. Cause way, cross drainage structures, FOB ROB, RUB, Canal crossing bridge, open Web Bridge, through bridge, Girder Bridge, Deck Bridge & Bed block.

Track:

14. Types of Rails, Sleepers, gauge in use in Indian Railway and world Railway.
15. Basic Knowledge on Curves: Vertical & horizontal, relation between Speed & super elevation in curves. Cant & cant gradient, Transition curve. Points and crossing.

General:

16. General Knowledge – 15 marks.
17. Basic knowledge of Hindi

4/10 (30)
132

SYLLABUS FOR THE POST OF JUNIOR ENGINEER/MECHANICAL
(Compassionate Ground Appointment)
IN SCALE OF Rs.9300 – 34800 + 4200 (Grade Pay)

PART I – General

1. **ENGLISH**
Parts of speech, usage of simple prepositions, usage of tenses, articles, synonyms & antonyms, spot the error in sentences.
2. **TEST OF REASONING**
Analogy, Logic, Diagrammatic representation.
3. **QUANTITATIVE APTITUDE**
Average, Ratio & Proportion, Percentage, Profit & Loss, Simple Interest, Time & Distance, Arithmetic series, Linear Equations, Areas and Perimeter of simple figures like Rectangle, Square, Circle and Triangle. Volume of simple solids like Cube, Cuboids, Cylinder, Cone and Sphere.
4. **GENERAL KNOWLEDGE**
Railways, Countries and Capitals, Inventions & Discoveries, Indian Polity, Geography of India, Sports, Abbreviations.

PART II – Technical

1. **APPLIED MECHANICS**
Basic Concepts- Force, Work, Power, Energy, Plane & Circular motion, Friction.
2. **THEORY OF MACHINES**
Basic Concept of all types of mechanisms, Brakes & dynamometers, Governors, Cams, Power Transmission in Belts, Rope, Gear and Chain Drive, Clutches.
3. **WORKSHOP TECHNOLOGY**
Welding methods, Lathe, Drilling, Boring, Milling, Shaper & Grinding Machines, Cutting Tools & its Materials, Jigs and Fixtures.
4. **STRENGTH OF MATERIALS**
Simple stresses and Strains, Elastic Constants, Beams - SFD, BMD, Bending Stress, Torsion
5. **MACHINE DESIGN**
Design of keys, shafts, & Couplings, Riveted & threaded joints,
6. **THERMODYNAMICS & HEAT ENGINES**
Properties of gases, Air cycles -Carnot, Otto, Diesel. Working principles & types of IC engines like 2 & 4 stroke IC engines, Petrol & Diesel Engine.
7. **MATERIAL SCIENCE**
Mechanical properties of Materials, Ferrous & Non-Ferrous Metals and their Alloys. Heat Treatment.
8. **HYDRAULICS**
Introduction- Types of fluid, Properties of fluid, Pressure and its Measurement, Buoyancy & floatation, Bernoulli's equation, Flow through orifices & pipes, Hydraulic Turbines and Pumps.
9. **INDUSTRIAL ENGINEERING**
Organisation structure, Plant Location, Layout, Material Handling, Work study, Incentives, Inventory Control.

SYLLABUS FOR SELECTION TO THE POST OF JUNIOR ENGINEER
IN SCALE RS. 9300-34600 (GP- 4200) IN ELECTRICAL DEPARTMENT
AGAINST CGA (GENERAL SERVICES)

(Ref: CPO/SVR's Letter No. SWR/P.263/CGA/JE/SE dtd 11.09.2012)

01. GENERAL ENGLISH

- (a) Adequate knowledge of English for dealing with correspondence and for understanding technical & other instructions concerning his work.
- (b) Simple Essay writing
- (c) Fill in the blanks.
- (d) Simple Grammar.
- (e) Opposite words.
- (f) One word answers etc.

02. GENERAL KNOWLEDGE

Adequate General knowledge about the happenings in India & around the World. History, Places of importance, Present events, Past events etc.

03. MATHEMATICS

Having knowledge of simple arithmetic, trigonometry, calculus etc. equivalent to High School level.

04. PROFESSIONAL SUBJECTS

Should have knowledge of:


- Principles of Electricity & Magnetism (Static & current), RL, RC, RLC, circuits, resonance, filter circuits, rectifiers, Ohms laws & related calculations etc. Should be conversant with erection practices, Maintenance & Operation of OH/underground power distribution arrangements.
- Indian Electricity Act & Rules, Rules for safe working on electrical equipments.
- Safety rules & regulations connected with the working of HT & LT electrical equipments/installations. Should have knowledge of earthing practices and methods for improving the earth resistance values. Should have knowledge for treatment of electric shock.

Contd.,

20/09/12
BY L. S. HIR

NAY

- Basic principles of Electronics application with emphasis of power electronics.
- Basic principles including testing, repair, overhauling, fault location of various types of AC & DC Motors/Generators with allied starting/control switchgears.
- Various types of conductors and cables, their current carrying capacities, cable jointing techniques. Should be able to calculate sizes of fuses, switchgears etc. required for electric installations of LT & HT circuits.
- Power factor and its improvement, its merits and demerits in LT & HT networks. Should have knowledge of maximum demand and measures to be adopted for achieving economy in utilization of electrical energy.
- Maintenance & operation of transformers, HT switchgears, LT circuit breakers, etc.
- Earth tests, insulation tests, transformer oil tests, etc., and use of electrical instruments for measuring current, voltage, power, etc.
- Working of central, package and room air conditioners, refrigerators, water-coolers, their maintenance and operation. Should be conversant with the use of refrigerants used on AC equipments, charging, etc. Use and erection practices of refrigeration piping arrangements, jointing techniques testing.
- Should have knowledge of working and maintenance of diesel engine, generator sets and their controls.
- Wiring practices, circuits, sub-circuits used in service buildings, residential colonies etc. including domestic appliances.
- Drawings & circuit diagrams, preparation of layout diagrams, schematic diagrams, diagrams of connections for machines and switchgear.
- Computer Basics
- Adequate working knowledge of Hindi for dealing official work.


 20/09/12
 Dy. Commr. A.R.

Engineer in S&T Dept of educational qualification in Diploma (Electrical & Electronics Engineering) is as under for further necessary action:-

- 1) **Basic Electronics:** - Resistors, Capacitors, Inductors, Transformers, Basic Circuit analysis, Kirchoff's laws.
- 2) **Electronic Devices & Circuits:** - Semi conductors, Diodes, Transistors, Basic amplifier configurations CE, CB & CC, Class of Amplifiers, Class-A, B & C, Operational Amplifier, Transistor Amplifier, FET, Oscillators, Integrated Circuits, Rectifiers, Filters, SMPS.
- 3) **Digital Electronics:** - Binary Arithmetic, Logic gates, Boolean Algebra, Adders, Flip-Flops, Counters, Registers, Multiplexers, Multivibrators, D/A Convertors & A/D converters,
- 4) **Communication system:** - TDM, FDM, Modulation Amplitude Modulation, Frequency Modulation, Phase Modulation, PAM, PCM, Wave propagation, Antennas.
- 5) **General Knowledge**
- 6) **General English**
- 7) **General Arithmetic**
- 8) **General Reasoning**