

Syllabus for the Post of Junior Draftsman (Electrical) in NDMC

1. Basics of **electricity generation technologies** including conventional & non- conventional ways of electricity generation. Knowledge of different factors e.g. load factor, demand factor, etc.
2. **Concept of impedance & admittance.** Different types of loads (R, RL, RC, RLC); their series & parallel connections along with phasor diagrams.
3. **Types of powers** i.e. Active, Reactive, Apparent & complex power.
4. Concept of **power factor**; effects of different types of loads on power factor.
5. **Types of supply & load connections:** Basics of single phase & three phase connections such as star & delta connections, voltage & current relations in balanced star & delta connected loads.
6. Working principles of **DC motors** (shunt, series, compound) & knowledge of their characteristics to understand their applications.
7. Working principles of **single phase & three phase AC motors**(induction, synchronuos, etc.) & knowledge of their characteristics to understand their applications.
8. Working principles of **transformers**, types of connections & respective applications.
9. Knowledge of **energy conservation** & simple techniques to achieve it.
10. Basic operation principles of all household electrical appliances.

11. Basic knowledge of **Power Quality** & effects of different types of loads on power quality.

12. Basic knowledge of **Solar PV** energy generation systems.

13. And last but not the least, **CONCEPT OF EARTHING/GROUNDING**

The following additional points are submitted as under:-

1.Importance of safety:

Basic first aid , Disposal of waste material, Occupational safety and health Fire safety, Safety practice - fire extinguishers.

2. Scales:

Introduction, Representative Fraction, Scales on Drawings, Types of Scales.

3. Basic Engineering drawing:

Drawing equipment's - Drawing of board mini drafter , Types of lines and angles , Circles , Quadrilaterals and their properties, Polygons and their properties , Layout of drawing sheet and title block, Folding of drawing sheet, Types of lines and their applications (conventions) , Lettering styles, Conic sections , Involute helix and spiral curves , Dimensioning, Plain scale, comparative scales and scale of chords Diagonal scale - vernier scale.

4. Methods of Projections

Principle of Orthographic projection, Methods of Orthographic Projection, Methods of Orthographic Projection, Perspective projection.

5. Projection of points

Projections of a Point in the First Quadrant, Projections of a Point in the Second Quadrant, Projections of a Point in the Third Quadrant, Projections of a Point in the Fourth Quadrant.

6. Projection of Straight lines

Introduction, Line Parallel to one or both the planes, Line Contained by one or both the planes, Line Perpendicular to one of the planes, Line inclined to one planes and Parallel to other, Line inclined to both the planes, Projection of Lines inclined to both the planes, Line Contained by one a plane Perpendicular to both the reference planes, True length of straight line and its inclinations with the reference planes, Trace of a Line.

7. Projection of plane

Introduction, Traces of Planes, Orientation of Planes, Projection of Planes.

8. Projection- orthographic views of prisms cylinders - pyramids - cone frustum of cone and sphere.

9. Types of sectional views

10. Sectional views conventions:

Different types of conventions and symbols used in drawing.

11. Development of solids:

Development of surface of solids and oblique cone, Intersection of solids.

12. Isometric projection:

Introduction, Pictorial projection, Oblique projection, Isometric drawing of Planes or plane figures, Isometric drawing of prisms and Pyramids, Isometric drawing of Cylinders, Isometric drawing of Cones, Isometric drawing of Sphere.

13. Computer Aided drafting practice:

- Introduction to AutoCAD and its working.
- Operating system ,Hardware & software, CAD,3D modeling concept in CAD, 3D coordinate systems to aid in the construction of 3D objects.
- Learning AutoCAD essentials, including creating basic drawings, symbols, and annotations.
- Creating wiring and circuit layouts for residential and commercial buildings.
- Designing layouts for power distribution, lighting systems, and emergency systems.

14. Electrical Design Drawing

Electrical Symbols and Simple Light and Alarm Circuits, Electrical installation of small residential buildings, Electrical installation of commercial buildings.

15. Concept of Resistance(R), their series & parallel connections.

16. Concept of power factor, effects of different types of loads on power factor.

17. Working principles of **DC motors , Transformer, DC Generator and Induction motor.**

18. Knowledge of **energy conservation** & simple techniques to achieve it.

19. Basic operation principles of all household electrical appliances.

20. Basic knowledge of **Power** & effects of different types of loads on power quality.

21. Basic knowledge of Solar PV energy generation systems, Concept of earthing/grounding in electrical system.

22. Power Systems: Basic concepts of electrical power generation, transmission systems, Distribution systems.

23. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study, Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade Estimation and costing - Problems on estimation and costing.

24. Basic knowledge of B.I.S. & International standards, conventional representation to show common building and engineering elements with or without detailed drawing, such as:

- Architectural elements: doors, windows, stairs
- Electrical symbols: switches, sockets, lights, fans

25. Basic knowledge of Workshop Calculation & workshop Science.