Civil Engineering Syllabus
for
Competitive Examinations by Karnataka Public Service Commission (KPSC)
for the post of
Draughtsman (Civil)

1. INTRODUCTION TO DRAUHGTING

Drawing instruments, care & maintenance, safety precautions. Introduction to IS code of practice and architectural drawings. Free hand sketching of simple geometrical object. Use of drawing instruments and materials. Lay out of drawing sheets. Drawing conventional lines according to IS code. Folding of sheets.
Lettering-basics, vertical & inclined, forms and proportions. Types of lettering- strokes, composition, fonts (Gothic, Roman, etc.), writing sentence. Construction of plain geometrical figures (lines, angles, triangles, rhombus, quadrilaterals, polygons, ellipses, parabola, hyperbola, etc.). IS codal specifications.
Principles, representation and construction of different types of scales, graphic scales, recommended scales for drawing with reference to IS codes. Choice of scales.
Types of lines and symbols, and their conventional representation as per IS.

2. PROJECTIONS

INTRODUCTION: Definition and types of projections. Methods of projection as per IS. Projection of points, lines, planes and solids. Sections of solid and their true shapes.
ISOMETRIC PROJECTIONS: Principle of Isometric & Axonometric projection, difference between Isometric drawing & Isometric projection, Isometric scale, dimensioning an Isometric drawing. Isometric projection of different objects, combination of objects including furniture, etc. Conversion of Orthographic projection to Isometric projection and vice-versa. Reducing and enlargement technique by graphically and by instrument.
PERSPECTIVE PROJECTIONS: Definition of picture plane, station point, horizontal line, vanishing point, cone of vision, central visual ray, spectator, eye level focus, fundamentals - diminution, foreshortening, convergence. Drawing of parallel or one point perspective projection of room with furniture in it. Determining vanishing points, change in perspective by changing vanishing points.
BUILDING PROJECTIONS: One point and two point perspective projection of a building. Method of drawing of two point perspective. Comparative study of perspective by changing the position of spectator, vanishing point. Distortion, limits of exactness, limitation of field of vision.

3. BUILDING MATERIALS AND CONSTRUCTION

Building materials: Clay products like bricks, tiles, terracotta, earthenware; stoneware, stone, cement, lime, surki, sand, timber, glass, paints, texture etc.
Building Construction: Sequence of construction of a building. Names of different parts of building. Bricks masonry – principles of construction of bonds. Tools and equipment used. Showing arrangement of bricks in differing parts of bonds, in walls, pillars coping drawing of shoring.

4. DRAWING OF BUILDING COMPONENTS

Drawing of scaffolding. Drawing of brick and stone masonry including joints. Drawing of different types of doors including panelled, glazed and flush door. Drawing of windows and ventilators. Drawing of pitched roof including king & queen post, roof trusses. Drawing of a wooden roof truss, showing details of connections. Drawing details of upper floor, wooden floor, stone, jack arch and madras terrace. Drawing details of brick, stone, wooden, steel & RCC stairs. Preparing drawing of details of parts of wooden stair. Drawing of straight, dog legged geometrical and bifurcated stairs & spiral stairs. Drawing different types of foundations - footing, piles, grillages, foundation raft & well foundation. Layout drawing of water supply &

sanitary arrangements. Drawing of electrical wiring connections. Drawing details of pitched roof including king & queen post, roof trusses. Drawing details of a wooden roof truss, showing details of connections.

5. DRAWING OF DAMP PROOF COURSES

Damp proof course, Sources and effects of dampness, method of prevention of dampness in building, periodic repair and care for prevention. Anti-termite treatment. Drawing details of damp proof courses and plinth protection.

6. GENERAL CIVIL ENGINEERING DRAWING

Cross-sections showing the different types of roads. Drawing typical cross-section of railway tracks embankment, layout plans of railway platforms, marshalling yards siding, loop lines. Signalling points & crossing. Drawing typical cross section of railways tracks.

Preparing drawing of a masonry culvert and take out various quantities of items of work & prepare abstract of cost. Preparing drawing of an arched bridge.

Drawing of different types of irrigation structures –viz. dams barrages, weir etc. with the help of given sketch & data. Longitudinal section of distributaries.

Preparation of drawings showing various pipe joints for underground drainage, method of sanitary fittings in multi storied building. Manholes and septic tank. Water supply system.

7. SURVEYING

Surveying – classification, plane survey, geodetic survey, purpose of survey – instruments used. Common terms and definitions used in surveying conventional signs used in field book and survey maps. Chain survey, compass survey, plane table survey and leveling, Survey using digital theodalite and total station. Surveying of a building site with entering field book & plotting & calculating the area of site. Surveying of a building site for computing earth work. Level plotting of longitudinal cross-sections of a proposed road from given reduced levels. Calculation of earth work. Block levelling and drawing of contours.

8. ESTIMATION, COSTING AND SPECIFICATIONS

Building Estimating. Types of estimate, standard method of taking out quantity, labour & material detailed & abstract estimate. Analysis of rates for simple items of work. Schedule of rates, specifications. Preparation of estimate for residential building, culverts, septic tank, underground reservoir and over head reservoir etc.

9. DRAWINGS OF RESIDENTIAL BUILDINGS

Principles of planning, type of residential building, rooms services, utilities which constitute as dwelling house. Estimating quantities for a single storied residential building. Drawing details of single storied residential house with single room (for both pitched and flat roofs). Drawing the plan, elevation, and section with aid of line diagrams. Lay out and detailing of residential building.

10. DRAWINGS OF REINFORCEMENT AND BAR BEDING DETAILS, TRUSSES

Drawing details of RCC members. Rectangular beams, lintel chajjas, slab, stair including column with footing & continuous columns showing disposition of reinforcement.

Drawing details of reinforcement drawing of different structures viz. column, footing, beams, slabs, staircase, lintels etc. Preparation of bar bending schedules.

Drawing of different types of steel roof trusses.

11. WORKING DRAWING OF BUILDINGS

Preparation of the working drawing of public building such as rest house, hospital, primary health centre high school, shopping complex, workshop building of an ITI. Tracing &Blue printing.

12. COMPUTER SOFTWARE SKILLS

Elementary windows knowledge of editor, CAD commands and use of different menus of CAD - File Management, different coordinate systems, Geometrical drawing and 2 D Drawing, Editing of drafting, Creating Library. Practice of Building Drawing and structural Drawing using CAD software