

SYLLABUS FOR COMPUTER BASED TEST FOR SUPERVISOR (SURVEY)

Indicative Syllabus

Section-I

- 1. General Intelligence & Reasoning:** The Syllabus for General Intelligence would include questions of both verbal and non-verbal type. The test may include questions on analogies, similarities, differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationships, arithmetical computations and other analytical functions.
- 2. General Awareness:** Questions will be aimed at testing the candidate's general awareness of the environment around him/her and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining to History, Culture, Geography, Economic Scene, General Polity and Scientific Research, etc. These questions will be such that they do not require a special study of any discipline.

Section-II: Branch (Survey)

1. Importance of survey or trade Job after completion of training, Introduction of First aid. List of the instrument equipment to be used during training Layout of drawing sheet. Dimensions of drawing sheet, margin, frame, title block etc., Method of folding of drawing sheet of different size.
2. Details layout of lettering, lines & dimensioning system. Introduction of surveying, types. of surveying, use, application principle. Knowledge of different types of scales, determine of R.F & uses of scales. Different types of projection views orthographic, sectional, isometric view. Use & application of conventional signs & symbols, free hand sketching.
3. Uses of Chain/ tape, testing of a chain & correction. Ranging (direct & indirect), Principle of chain survey, application. Terms used in chain survey, offset, types of offsets, limit of offset, field book, types of field book, entry of field book method of chaining in slopping ground. Field procedure of chain survey errors in chain survey. plotting procedure. Calculation of area (regular & irregular figure). Knowledge of site plan.
4. Basic terms used in compass survey. Instrument & it setting up. Conversion of bearing WBC to R.B. Calculation of included angle from bearing local attraction, magnetic declination and true bearing, closing error. Adjustment of closing error, precaution in using prismatic compass.
5. Plane table survey, principle, merits & demerits. Instrument used in plane table survey setting up the plane table (centering, levelling, orientation). Methods of plane table survey (radiation, intersection, resection, traversing). Error in plane table survey.

6. Introduction to Theodolite. Types of Theodolite, parts of Theodolite, Terms used in Theodolite survey. Temporary adjustment of Theodolite, Angle measurement process Reading of angles, field book entry of measured angles Permanent adjustment of Theodolite. Traversing using theodolite (closed & open), traverse computation, determination of consecutive coordinates, independent co-ordinate, checking & balancing of traverse, preparation of gales traverse table, computation of area using co- ordinates, calculation of omitted measurement.
7. Introduction to levelling. Types of levelling instrument. Technical terms used in levelling Temporary & permanent adjustment. Different types of levelling Entry of level book. (Reduced level calculation method) Curvature & refraction effect sensitivity of bubble tube. Common error and their elimination. Degree of accuracy, tracing of grade contour-trace the contour gradient for alignment of roads, railways etc.
8. Introduction of tachometry & terms use advantages and disadvantages. Tachometric constants & its determination. Determination of horizontal & vertical distances by various methods.
9. Contouring, contour interval selection of contour interval, characteristics of contour, uses of contour contouring by various method. Interpolation of contour by various methods, drawing of contours, computation of volume establishment of gradient by abney level.
10. Curves, Purpose, Types of curves - simple, compound, reverse, transition, vertical. Elements of simple curve, computation of elements of simple curve. Various methods for setting out simple, compound, reverse, transition & vertical curve.
11. Familiarization with modern survey instruments. Parts of Total station, temporary adjustment of TS, working procedure of T.S, Differential Global Positioning System (DGPS) etc.
12. Familiarisation with cadastral map, term used in cadastral survey, preliminary knowledge for prepare a site plan. Calculation of area by digital planimeter.
13. Types of surveys for location of a road. Points to be considered during reconnaissance survey. Classification of roads and terms used in road engineering, alignment of roads relative importance of length of road, height of embankment depth of cutting & filling, road gradients super elevation etc.
14. Details knowledge for preparation of topographical map. Details knowledge for preparation of cadastral map. Details knowledge for preparation of a road project.
15. Importance of cartographic projection. Uses of various types of cartographic projection for mapping.
16. Introduction of GIS& GPS. Elements of GPS/DGPS. Observation principles. Sources of error & handling of error in GPS. Various type of GPS application. Concept & use of its software.
17. Introduction to hydrographic survey, practice various methods of water depth measurement process, flow velocity measurement & determination of cross-sectional area of a river. Handling of eco sounder, current meter etc.

18. Basic terms used in transmission line survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey. Use of sag template, various type of tower, construction of tower foundation.
19. Basic terms used in railway line project survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey.
20. Specification & uses of various types of building material, types of foundation, knowledge of R.C.C. works, & other construction related items. Procedure of prepare a detail estimate.
21. Basic Knowledge of different types measurement units used in survey works.
22. Application of Computers & Software in Surveying for generation of Topographical plan, Contour, cross section etc. (such as Autocad, LISCAD etc.)

In addition to above syllabus it is proposed to include following:

DOMAIN KNOWLEDGE

- 1) Basic Engineering Drawing
- 2) Linear and Angular Measurements.
- 3) Area & Volume calculations
- 4) Theodolite traversing. Levelling.
- 5) Trigonometry & Rectangular Co-ordinate calculations.
- 6) True North determination.
- 7) Triangulation.
- 8) Topographic Survey.

- 9) Tachometry Survey.
- 10) Survey Adjustments & Theory of Errors.
- 11) Contouring.
- 12) Underground Surveys & Terrestrial Surveys.
- 13) Correlation of underground & Surface Surveys.
- 14) Surveys for Construction and Development of Hydro Power Project. Setting out Geometrical Elements. Setting out Rail Curves on Surface & Underground.
- 15) Hydrographic Survey, various methods of water depth measurement process, River cross section, handling of Echo sounder etc.
- 16) Duties & Responsibilities of a Surveyor as per latest guidelines/codes for Survey of Hydro Power Projects and as per latest circulars of CWC regarding survey for Hydro Power Project.
- 17) Total Station, DGPS, 3DTLS & Drone surveying in river valley.
- 18) Application of Computers & Software in Surveying (CAD, LISCAD etc.)
- 19) Elementary Knowledge in –Remote Sensing & GIS, Geomatics.