

**FURTHER DETAILS REGARDING MAIN TOPICS OF  
PROGRAMME NO.3/2014 (Item No.4, 5 & 6)**

**DRAFTSMAN GR-II/ TOWN PLANNING  
SURVEYOR GR-II**

**TOWN AND COUNTRY PLANNING**

**(CATEGORY NO.688/2012, 689/2012 & 656/2012)**

**PART .I QUESTIONS BASED ON NTC SURVEY**

- 1 Uses of Instrument Box, board, Tee-square, set square, protractors and other instrument used for survey drawing, their types and uses.
- 2 printing letters and figures by different methods of inking of letters using stencil, colouring.
- 3 scales -different types, their principle method of construction and reading calculating least count.
- 4 Geometrical constructions lines, angles ,triangles, conic sections, quadrilaterals, polygons, circles, ellipse, parabola & hyperbola
- 5 Surveying -their classification, plane, survey, geodetic survey, different purpose of survey, instruments used in survey, Nature of surveyors work - importance of system. Accuracy and speed in field and office work, Common terms and definitions used in surveying conventional signs used in field book and survey maps,.uses of Legends, linear measuring instrument based by surveyors, their description and uses, types of chain.
- 6 chain survey and principles location of points-off- sets and instrument used for the same, their descriptions testing of the chain, tape, cross staff and optical square.
- 7 Procedures in conducting chain survey-preliminary steps -conditions to be satisfied by survey lines.
- 8 Field book types -methods of entry of check lines -its importance.
- 9 Location of details-types off-sets and their limit-town survey traversing with chain procedure in plotting chain lines skeleton, its check and filling in details.

- 10 Measurements on undulated sloppy ground types of obstacles in chaining and method of overcoming them. Care and maintenance of chain and its accessories .
- 11 Errors in chain survey and their remedies, problems in chain survey- degree of accuracy required in chain survey and its relevant to field work In field work-procedure in inking and colouring.
- 12 Use of magnetic needle in survey works-types of compasses - description, constructional features and uses measurement of directions.
- 13 Technical terms used in compass survey, difference between angles and bearings-magnetic and true meridians-declination and its variations, local attraction, its detection, and elimination.
- 14 Method of locating details by bearings, method of survey with compass -traversing Methods. Methods of determining true meridians and declination- methods of plotting closed compass traverse- adjustment of closing errors-limit of precision required field book entries.
- 15 Relaying of old service errors in compass survey. Testing and adjustment of compass.
- 16 Plane table survey advantage and dis-advantages of plane table survey-equipment in plane table surveying, general instruction for plane table survey.
- 17 Methods of plane tabling-radiation-intersection-traversing -resection.
- 18 Two point and three point problems triangles of error and its elimination -Lehman's rule - mechanical and graphical method.
- 19 Errors in plane tabling and their elimination instruments used in combination with plane tabling, their construction and use.
- 20 Tangent clinometers (Indian pattern clinometer), telescopic alidade.
- 21 Survey maps -care and maintenance at plane table accessories, procedure of plane tabling.

- 22 levelling survey-the level parts, kinds -types of levels cook's reversible level and dumpy level-their construction and parts -types of diaphragm. Types of levelling staff, their description and use -technical terms used in levelling.
- 23 Permanent adjustment of various levelling instrument, repeating the same with precautions.
- 24 Methods of observation ,booking and reduction of levels, forms of levels, forms of field books for levelling and methods of entry rules for checking up readings and calculation. Reciprocal levelling -effect of earth's curvature and refraction in levelling. Common sources of error in levelling and their elimination -degree of accuracy in levelling. Introduction to contour.
- 25 Working out problems on field book reduction, reciprocal levelling and permanent adjustment.
- 26 Classification of levelling staffs. Purpose of sectioning consideration of distance between points , precautions.
- 27 Steps in plotting section -selecting of scales -factors affecting deflection of formation level -prismoildal formula and its application, calculation of earth work.
- 28 Construction and uses of boning rods and ghat tracer.
- 29 Types of surveys for the location of a road , points to be considered during reconnaissance, preliminary and final location surveys. Alignment of roads - relative importance of length of road height of embankment and depth of cutting -road gradients-sub grades and road foundations, drainage camber curves and supper elevation, road surface ,such as earth road, water bound macadam cement concrete payment.
- 30 Introduction to theodolite- Temporary adjustment of theodolite-procedure in setting up- methods of measurement of horizontal angles -repetition and reiteration systems.
- 31 General forms of field notes used in theodolite surveys-adjustment of errors while laying a given angle by repetition. Method of setting out straight lines establishing lines at given angles lines.

- 32 Instrumental errors and-elimination-permanent adjustments of theodolite care and maintenance of theodolites.
- 33 Method running traverses-different methods of angles and bearings.
- 34 Methods of plotting traverses - checking of measurements of closed and open traverse use of traverse table closing errors and its adjustment.
- 35 Omitted measurements and their calculation -practice in working our problems.
- 36 Technical terms in connection with simple triangulation - base line measurements and its correction- procedure of measuring angles -methods of calculating sides forms triangulation, data check, errors and precautions.
- 37 Methods of calculating area of a closed traverse from co-ordinates.
- 38 Working out problems on finding out areas of closed traverses, height and distances-box sextant, its description and use. Abney's level and its description.
- 39 Topographic survey and principle-instrument and accessories used in topographic survey- contours and their characteristics.
- 40 Vertical intervals horizontal equivalents methods of determining counters- comparison of different methods and their application.
- 41 Interpolation of contours by different methods and preparing contours maps -preparation of field record for topographic surveys-height book-height tracing and colour trace.
- 42 Different methods of finding area of irregular figures-planimeter-its principle, construction, use of precautions -working out problems of areas by using planimeter enlarging and reducing of plans, use of proportions, compass and pantograph and their parts.
- 43 Irrigation:- types of supply of water-rain fall catchment areas ,run off over best site for construction a reservoir, water spread area factors affronting the consideration of the height of dam and capacity of reservoir

- 44 Working problems on simple curves by chain and tape offset method and successive by section of arch.
- 45 Compound curves working problems on compound curves and types of transition curves.
- 46 Different types of vertical curves and its working problems .Parts of pantagraphs and planimeter with their uses.
- 47 Methods of taking off-sets on obstructed lines and offset lines, field measurement in triangle and offset system. Method of fixing survey maps on boundaries.
- 48 Astronomical surveying introduction. Definition of spherical triangle. Astronomical triangle observation of sun and stars. Calculation for Azimuth and time. Coordinate system and its conversion of mean solar time into side real time or vice versa. Determination of the meridian and Azimuth
- 49 Procedure in typing field numbers, printing names and inter setting topographical details in maps.
- 50 Comparison of field and village boundaries and side measurements procedures to prepare of transfer paper and transfer drawings- Lithography-incography Vandyke process cordography.
- 51 Convergence of meridian- substance bar and use.Grossery of terms.
- 52 Computation of latitudes and azimuth, solution of spherical triangles - computation of spherical triangles,, values of village tri-junction, maps - projection methods of reducing values of points from one origin to other .Land laws & rules.
- 53 What is computer? General terms used in computer. MS-Word and their uses. M S Office. Operating System Software, window command and their uses. Auto CAD Command and use .of different menus of Auto CAD

- 54 Types of bonds, English bond, Flemish bonds, Tee joints, wall junctions, stone masonry, random rubble, coarsed and Aslar stone masonry, type of Arch, king post and queen post, doors & windows RCC simple beams and lintel
- 55 Glossary terms of building construction and building materials,
- 56 Glossary terms of roads irrigation
- 57 Estimating & costing for a simple building in details and specification for different works
- 58 Total station survey- Study of the instrument- temporary adjustment- calculation of distance, area, volume, stake out etc

## **PART .II QUESTIONS BASED ON NTC CIVIL**

- 1 Conventional signs and symbols asper BIS Bricks characteristics of good bricks, hollow bricks and manufacture of bricks.
- 2 Tiles, terracotta, stone wate and earthen ware, Sand types, characteristics, cement, lime.
- 3 Introduction: Sequence of construction of a building. Names of different parts of building. Bricks masonry - principles of construction of bonds. Tools and equipment used. Scaffolding.
- 4 Stone masonry, terms used, principles of construction, classification, composite masonry and strength of walls. Timber: Structure - Indian timber uses.
- 5 Foundation: Purpose, causes of failure of foundation, bearing capacity of soils, dead and live loads, examination of ground. Types of foundation. Drawing of footing foundation, setting out of building on ground excavation, shorting & simple machine foundations.
- 6 Dampness in building and damp proof course. Method of prevention of dampness in building. Mortar - types, proportion& mixing. Plastering & pointing. White washing & distempering.

- 7 Arches - technical terms- brick and stone centering -lintel, various forms and sizes
- 8 Carpentry joints- terms, classification of joints.
- 9 Plumbing- common hand tools- description and use, plumbing operations
- 10 Window and ventilators: including steel windows ventilators and curtain walls - fixtures and fastenings used in doors, windows and ventilators.
- 11 Roof: Pitched roof types, roof covering, and component parts of roof. Theory of truss, King and queen post trusses
- 12 Classification and construction of upper floors including waterproofing, general Principles of construction of masonry & RCC
- 13 Method and find out quantities for a single storied residential building.
- 14 Safety precautions & elementary first aid- carpenter's hand tools, their names, screws, hinges, dowels etc. Preparation of glue & putty. Grinding & sharpening of tools. Their care & maintenance. Use of different types of joints. Properties and uses of different timbers used in construction work.
- 15 Details of different bonding wall and section according to BIS
- 16 Introduction: Chain surveying principles
- 17 Instruments employed, use, care & maintenance. Field problems. Field book plotting. Introduction to plane table survey. Instruments employed, use, care & maintenance. Prismatic compass, Planimeter and pentagraph.
- 18 Instruments and accessories - their uses and description level book. Differential levelling. Application of chain and levelling to building construction. Plotting, preparation of contour computing earth work by spot level and contours. Setting out work.

- 19 Road: Introduction to roads, general principles of alignment. Classification and construction of different types of roads.
- 20 Indian Railways - their gauges, construction of permanent ways. Different rail sections. Use of stone ballast in railway track. Use and types of sleepers, types of signals, fixtures & fastening in Railway Tracks including base plates and fishplates
- 21 Bridges: Introduction to bridges, component parts of a bridge. Classification of culverts (IRC). Bridges types, location of a bridge. Tunnels rules used for the sizes of different members.
- 22 Introduction of Water Resources Engineering: Definition of terms used in irrigation. Hydrology like duty delta, intensity of irrigation. Hydrograph, peak flow, runs off, catchments area CCA, crops like, Rabi, Kharif etc. Storage/diversion head works definitions: Types of Dam Masonry, concrete & Composite Dams, gravity Dam, Arch and Buttress Dams, Earth and Rock fill dams. Reservoir - types of reservoir viz., single purpose and multipurpose area/capacity curves of Reservoir Canals: Canals, classification of canals and distribution system, canal structures viz. Head Regulators, canal outlet, escape, etc. drawing of canal alignment including longitudinal and cross sections of canals with the given data, types of cross drainage works viz. aqueducts, Super passage, Syphon Aqueducts syphon super passage, level crossing, Irrigation, Culvert- Inlets and Outlets, General Description, Element of Water power development and Various civil engineering structure of Hydro - Electric Schemes, ie, fore bay penstock, Turbines, power house etc. Types of water supply system and purification
- 23 Introduction to RCC uses, materials proportions and form work, including bending of bars and construction reference to BIS code. Reinforced brick work. Materials used for RCC, construction selection of materials coarse aggregate, fine aggregate cement - water, reinforcement, characteristics. Method of mixing concrete - hand and machine, Slump test
- 24 Forms of rivets, proportions. Types of riveted joints
- 25 Introduction to structural drafting. Arrangements of drawing, Standard drawing practice to represent thread, nuts, bolts and structural steel sections. Reference to BIS code. Type designs.



- 26 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
- 27 Knowledge about Architectural Desk top and creating modelling

### **PART III- GENERAL KNOWLEDGE, CURRENT AFFAIRS, INDIAN NATIONAL MOVEMENT & RENAISSANCE IN KERALA**

#### **General Knowledge**

Geography of India- Physical Features- Climate-

Soils- Rivers- Famous Sites -Etc

Demography- Economic and Social Development-Poverty Alleviation-Economy and Planning-Etc

History of India-Period from 1857 to 1947 National Movement-

#### **Current Affairs**

Important World, National and Regional Events related to the Political and Scientific fields, Sports, Cinema and Literature etc.

#### **Facts-about Kerala**

Geographical Facts- Physical Features- Climate-Soils- Rivers- Famous Sites – Etc.

#### **Renaissance of Kerala**

**Important Events/Movements/Leaders:-** Brahmananda Swami Sivayogi, Chattampi Swami, Sree Narayana Guru, Vagbhatananda, Thycaud Ayya, Ayya Vaikundar, Poikayil Yohannan (Kumara Guru), Ayyankali, Pandit Karuppan, Mannathu Padmanabhan, V.T.Bhattathirippad, Dr Palpu. Kumaranasan, Vakkom Moulavi, Blessed Kuriakose Elias Chavara Etc

***NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.***