

PUBLIC SERVICE COMMISSION, WEST BENGAL

161A, S.P. Mukherjee Road, Kolkata – 700 026

IMPORTANT ANNOUNCEMENT

Schedule of forthcoming Written Examination

Name of the Post	Advertisement No.	Date, Time & Venue
Assistant Architect in the West Bengal General Service under the Public Works Department, Govt of W.B.	16(3)/2018	24th February, 2019 (Sunday) from 11.00 a.m. to 1.00 p.m. & 2.00 p.m. to 4.00 p.m. in I.T.I, Gariahat

Scheme & Syllabus of the aforesaid examination along with all the details are available in the Commission's Website at <http://www.pscwbapplication.in> as well as in the Commission's Enquiry. The candidates can download their admit card from the Commission's Website at <http://www.pscwbapplication.in> on and from the **14th February, 2019 at 11:30 a.m. onwards. No admit card will be issued from the office of the Commission.** All the candidates whose applications have been received in this connection through online are allowed provisionally to appear at the said Examination. In case of any inconvenience, the candidates may contact in person to the commission's office on **21.02.2019** and **22.02.2019** between 11.00 a.m. and 3.30 p.m.

Scheme of Examination

Ref.: Recruitment to the post of Assistant Architect in the West Bengal General Service under the Public Works Department vide Advt. No-16/2018, Item no – 3.

DATE OF WRITTEN TEST: 24th FEBRUARY, 2019

**TIME OF EXAMINATION: Paper I – 11:00 a.m. to 01:00 p.m. &
Paper II – 02:00 p.m. to 04:00 p.m.**

PAPER – I : Objective type consisting of 100 MCQ from technical subjects (100 marks),

PAPER – II : Architectural drawing from technical subjects (100 marks).

There will be Negative marking in Paper – I (MCQ type) for each wrong answer. 1/3 of full marks for each question will be deducted for each wrong answer.

Note: The Commission shall have discretion to fix qualifying marks in each part of the examination and in aggregate and the standard of the examination.

The final merit list will be prepared on the basis of total marks obtained in the Written Examination and Personality Test.

Note: The Commission shall have discretion to fix qualifying marks in each part of the examination and in aggregate and the standard of the Examination.

f) Syllabus for Examination

1. EVOLUTION OF ARCHITECTURE

(a) Definition of Architecture and architect. The origin of architecture and its development as a profession. Practice of the subject in the contemporary period. General pieces of service as provided by an architect. Relationship of the subject with various other interdisciplinary subjects. Relationship of the profession with the other related professions. Architectural education - scope and objects.

(b) Influences governing the development of architecture. General - physical, emotional and intellectual; Natural climate, topography, vegetation, available materials; Man - social, culture and religious attitudes; Technological intellectual advancement, Progress in science & technology, construction, materials etc.

(c) Development of Architecture from caves and huts of prehistoric era. Principles of layout of Vedic villages to mounds, mausoleums, stupas and such structures as were developed in the Indus Valley, Egyptian, Mesopotamian and South-east Asian regions. Renovated natural caves of the Buddhist period as methods of obtaining large internal spaces. Examples are to be presented as expressive forms of attitudes towards greatness, fear, pride, possession, protection, seclusion etc.

(d) The Earliest Remains of Indian Architecture - The Earliest Temples of India - Early and Later Dravidian Temples, The Temples of Orissa, Islamic Architecture in India, Influence of Western Architecture in Indian Architecture;

(e) Space: Study of transformation of internal space from mono-spatial structures of Greek temples to multi-spatial structures of the Egyptian and expanding space of the Byzantine periods; Linear spatial forms of early Christian churches to the inter-weaving space of the Gothic cathedrals.

(f) Character: Extrovert character of Greek buildings and Introvert nature of those of the Romans; Static Symmetry of earlier examples to multiplicity of forms and massive works of the Romanesque period.

(g) Expression: Trabeated to Arcuated construction; Corbelling of vaults to buttresses of the gothic pointed arches; The changing expression of a building designed for a few to that for the mass; Gradual supremacy of technology over ornamentation; studies are to be illustrated from selected examples of Egyptian, West Asiatic, Saracenic, Byzantines, Romans, Early Christian, Romanesque, Gothic, Renaissance and Baroque periods of architectural history with special emphasis of relative growth in relation to the prevalent social, political, religious, cultural, economic and technological base.

2. DESIGN FUNDAMENTALS

(a) Definition of Design. Comparison between designed and non-designed objects. Appreciation of design criteria; Orientation of design (general) process.

(b) Visual properties of two-dimensional forms of both geometric and non-geometric surfaces - Line, Shape, Form, Figure-ground relationship, Direction, Contrast. Visual textures and tonal variations - colour, contrast, brightness, hatch etc. applied to the above exercises.

- (c) Principles of two-dimensional compositions - Spatial tension, Likeness basis, Balance, Movement, Scale, Proportion, Rhythm Dominance and Subordination.
- (d) Principles of three-dimensional composition - Form, Mass, Volume, Scale, Surfaces of solids, Voids, Planes etc. their combination, variation, assimilation, orientation etc.
- (e) Elementary principles of Architectural Design on the basis of structure, function and aesthetics.
- (f) Structure- mechanics of load distribution, tension, compression, stress, strain (visual and conceptual), nature of materials for architectural uses.
- (g) Function - Anthropometrics, circulation, light, ventilation, basic services and utilities.
- (h) Aesthetics - composition, form, volume, mass, etc. with site and landscaping.

3. MATERIALS AND METHODS OF CONSTRUCTION

- (a) Materials of building construction: Sources, general & special characteristics of materials. Composition and Properties of building materials both physical and chemical. Behaviour towards other materials and environment. Identification of needs, Prospective areas and locations of use of building materials. Advantages and disadvantages of use of various building materials. Various usage of the material and a comparative analysis; Sustainability of use. Materials in combination and use of the same in buildings. Innovative use, Variation in use and study of alternative building materials.
- (b) Introduction to various fundamental tools and instruments used in building construction.
- (c) Basic methods of taking measurement of building works.
- (d) Elaboration on various established methods of construction related to different materials and their comparison; Study of characteristics, advantages and disadvantages, needs and usage of various methods of construction.
- (e) Upgradation, modification and revision of various methods of construction.
- (f) Natural material: Brick, Stone and Timber - characteristics, needs and properties.
- (g) Studies of Materials : Stone, Timber, Bricks, Concrete, Steel, Glass, Timber joinery etc. and their variations.
- (h) Foundation, load bearing wall, stone & brick masonry.
- (i) Floors and flooring materials.
- (j) Roof: Pitched roof, Concrete roof; Roof Coverings : Clay tiles, A.C. Sheets etc.

4. STRUCTURAL MECHANICS

Equilibrium of forces ; concurrent forces ; composition and resolution of forces; Polygon of forces; analytical and graphical methods, Bow's notations and vector diagram; Parallel forces; Moments; Couples; Maxwell's diagrams; Trusses of simple nature' Definition of' statically determinate and indeterminate structures; centroid and centre of gravity - applications; Moment of Inertia; Section Modules. Tutorial Problems with application shall be worked out.

Stress, Strain and Elasticity; Stress-strain curves; Factor of Safety; Working stresses' problems of direct stress and strain; Thermal stress Poisson's ratio; Elastic constants, simple theory of bending. B.M. and S.F. diagrams; Bending stresses; Moment of resistance. Tutorial Problems with application shall be worked out.

5. DESCRIPTIVE GEOMETRY

- (a) Geometry and Graphics in architecture. Drawing point, line, polygon, circle, ellipse and other geometrical forms (manually or with computer graphics or both);

(b) Principles of Orthographic projection and other projection systems; Principles of projection of lines, Isometric and Axonometric views; Sciography.

6. ARCHITECTURAL GRAPHICS

(a) Basic principles of drawing Perspective views; Concept of vanishing points, Concept of One point, Two point and Three Point Perspectives; Manual Perspective drawings and Computer aided Perspective Drawings,

(b) Methods of division of lines; placement of objects of given height at a desired places like human figures, trees, street furniture, etc.

(c) Defects of standard projection method, Improvement on it.

Each of the items listed below are to be done by the use of instruments along with Tee and set-squares.

Following items are also to be done with the help of computer graphic packages (excepting items 5):

(1) Line work and architectural lettering.

(2) Measurements, divisions and building up simple geometric figures (ellipses, polygons etc.).

(3) Measurements, divisions and building up of simple 3.D forms (e.g. cones, cylinders etc.).

(4) Isometric and axonometric drawings.

(5) Orthographic presentation, Complex Orthographic drawings.

(6) Principles of casting shades and shadows.

(7) Basic principles of perspective drawings. Complex perspective drawings.

(8) Drawing of simple plans, elevations and sections of small objects like furniture, part of a building, etc.

7. FREEHAND DRAWING

- Techniques of drawing lines of various gradations and inclinations

- Finding Visual proportions and principles of perspective

- Free-hand drawing of simple objects in single and group formation

- Free-hand drawing of simple furniture

- Outdoor sketching of natural objects/ buildings/ any relevant structure, etc.

- Study on shades and shadows, on contrasts of light and on textures.

8. BASIC DESIGN

Comparison of designed and non-designed objects (I) exercises in line, shape, form applied to figure & ground relationships and patterns.

Two dimensional composition based on the elements as specified in Design Fundamentals.

Drawings of the three dimensional compositions and elementary architectural spaces.

Design of elementary three dimensional and architectural spaces and their

(a) Study and analysis

(b) Presentation of Architectural Designs

9. CLIMATE AND ARCHITECTURE

(a) Necessity of study of climatology in architecture.

(b) Concept of Thermal Comfort; different factors determining thermal comfort of human being in a built environment.

- (c) Effect of Sun in architecture; orientation of Sun; azimuth and altitude; mathematical equations to determine azimuth and altitude of Sun from latitude of a location and date & time; study and method of drawing sun path diagram; study of shading devices in buildings.
- (d) Study of airflow: global and regional, in and around city and buildings.
- (e) Thermal conductivity of building materials and study of its impact in thermal comfort.
- (f) Impact of various climatic elements in different regions of our country in building design with a special emphasis on Bengal.
- (g) Energy efficient building design.
- (h) Drawing sun path diagram and utilizing it for design of buildings and shading devices;
- (i) Air flow and architecture.
- (j) Thermal conductivity of building materials and study of its impact in thermal comfort.
- (k) Study/documentation of buildings giving due consideration to the impact of various climatic elements such as sun, airflow, precipitation etc. in different climatic regions of the country, with special emphasis on the climate of Bengal.
- (l) Study and Documentation on the latest developments in the field of climate and architecture; materials and methods, technology, research, fieldwork etc.

10. ARCHITECTURAL CONSTRUCTION

Study of the sequences Techniques of construction of various elements of Masonry building, Foundation, load bearing walls & partitions, cavity wall etc.

Openings: Jamb, Sill, Lintel, Chajja, Sunshade.

Floor: Concrete floor, timber floor, brick flooring.

Roofs: Timber Trusses, Steel Trusses, R.C.C. beam.

Roof Coverings: Clay tiles, A.C. Sheet, G.K. Sheet. R.B. Slab. Etc.

R.C.C. Slab etc.

Damp Prevention: (i) Materials, D.P.C. Cement Plaster, Lime Terracing, Tar felting etc. (ii) Design: Overhang, mouldings, drip courses, copings etc.

Moving Elements: Doors, Windows, Ventilators, Skylights etc.

Miscellaneous Elements: Threshold, Staircase, Paving, Veneering etc.

Chemical Agents: Plasticizer, fillers, quick setting, retarding, adhesives, anti-termite, anti-fungi etc.

Construction of special items like (a) Both way swinging and sliding folding types of doors built of timber or of extended metal sections like Aluminum; (b) Rolled up doors; (c) Sliding types of casement windows;

(d) Veneering wall surfaces with timber and tiles; (e) Suspended ceilings with method of suspension, framing materials of timber, pressed steel, aluminum, covering materials like acoustic boards, gypsum boards, P.V.C. tiles etc. with special considerations for fire and acoustical insulation; (f) Construction material, technological alternatives, application methods and details essential to create barrier free environment.

11. THEORY OF ARCHITECTURE

Space as protagonist of Architecture:

Representation of space - Evolution of spatial qualities through the ages - Form and function - Form and technology - Scale and proportion - Solids & voids and their contrasting effects - Colour planes and their effects and impacts on architecture;

Occidental and Oriental expressions in architecture.

Basic principles & Design -Integration of function. Architecture as Art and Science of Building; Structure & Aesthetics.

Stages of design -Design methods -Design procedure -Visual design- Perception of space/architecture analysis of colour, texture, form, shape and line - and other human perceptions involved. Total composition and assimilation as a whole by synthesis.

Environmental conditions -Basic structural systems -Basic building services -Orientation of buildings, solar and other factors -Circulation, planning and efficiency; anthropometry & ergonomics in architecture; Facilities for physically handicapped persons;

12. THEORY AND DESIGN OF STRUCTURES

Principal stress, shear stress, normal stress, conjugate stress, Mohr diagram, Bending and shear stresses in beams, Area moment Theorem, Principle of superposition, Deflection of beams, determinate and propped cantilever, Fixed and continuous beams, Columns and struts, Euler's theory of long columns, Empirical formulas for design of columns Short columns and piers with eccentric loading (small eccentricity).

Rivets and design of rivetted joints, eccentric connection.

Welded joints.. Design of M.S. truss members, joints. Design of R.S.J. beams and columns. Theory of reinforced concrete, properties and assumptions,

Design of singly reinforced rectangular and T. beams: Slabs spanning in one direction. R.C. columns.

Strain Energy: Castigliano's theorems, Analysis of indeterminate structures and use of moment distribution method, Effect of wind and earthquake on structures.

Doubly reinforced concrete beams, two way R.C. slabs, sections subject to combined bending and thrust.

Design of M.S. plated beams and compound columns, tests for measuring workability and strength of concrete.

13. COMPUTER AIDED DELINEATION

Elements of Graphics and Visualization Basics of two- and three-dimensional computer graphics systems: Computer aided drawing and 3-D modeling and rendering, and selected graphics software APIs. Other topics may include Interactive graphics, animation, graphical user interfaces, and the graphical presentation of information.

14. STRUCTURE FOR ARCHITECTS

Study of new structural systems with emphasis on limitation and scope of these systems - multistoried R.C.C and steel buildings, pre-stressing, shells, folded plate, space frame, suspension structures. Emphasis will be given to the structural philosophy and not on the rigorous calculation. Models of structural form.

15. ARCHITECTURAL DESIGN

(a) Design of a small building with respect to function, structure and aesthetics.

(b) Analysis and documentation of architecture of a village or neighbourhood of a city.

(c) Design of a small complex of buildings of not more than two floors in rural or low-density urban environment.

(d) Design of vital components, details of structure, building services, etc. Rendering techniques in various media:

(e) Design studio-Introducing to the processes of critical inquiry specifically as it relates to architecture investigations. These processes are seen as interrelated and always informed by the societal, technological, and historical contexts within which architects work. Parallel instruction in drawing, computing, and construction technology are integrated within the work of this studio. Technology 1: The technology aspects focus on discovering the basic systems used to create space such as structural systems, enclosure types, and systems for movement. Emphasis is placed upon construct ability and sustainability. Computing: Explorations with the Computer focus on both the development of a fundamental knowledge of 3-D modeling and 2-D image manipulation software and a nontraditional application of this knowledge to design representations. The computer media (3-D modelling "space," Computer printouts, video projections) are conceived of as yet another "physical" material for experimentation, and are integrated in this way with the studio design projects. Drawing: The drawing segment consists of freehand drawing exercises that relate to studio projects and help students develop basic drawing skills and a familiarity with two-dimensional design concepts, taken in conjunction with Design Studio.

Design Problem related to group of buildings accommodating different uses.

Problem having given due regard to environmental and ecological requirements; Special attention is to be given to create barrier free environment for disabled and elderly.

16. LANDSCAPE ARCHITECTURE

1. Principles of Landscape Architecture a) Historical background Oriental and occidental, (b) Man, building and Landscape, (c) Elements of outdoor space organization, (d) Contemporary thoughts on Landscape Architecture (e) Application of design fundamentals ...a brief study of contemporary works.
2. Materials of Landscape Architecture: Plants, Water, Land, Rock, Nature -work, Man -made elements and outdoor furniture etc.
3. Guidelines for Landscaping of Specific Areas: (a) Residential -Individual and group of building, (b) Commercial and Shopping, (c) Recreational -parks and play areas, (d) Plaza and Squares, (e) Signage
4. Technical Aspects of Construction and Maintenance: Planting, water forms, paving, illumination, street furniture & vocabulary etc.

17. ANALYSIS OF CONTEMPORARY WORKS

Analysis of the evolution of various concepts in Contemporary Architecture in different phases on chronological or thematic basis from the end of nineteenth century; Future Trend and Realism in Contemporary Architecture. Analysis of the creations of notable Architects to evaluate their contributions in Contemporary Architecture; Future Trend;

18. SERVICES & EQUIPMENTS

- (a) Water supply, sources (surface and underground), Methods of lifting storage and supply, Standard of portable water and methods of removal of impurities, Standard of requirement of water for daily uses, Simple principles of design for water supply, system for low as well as high buildings.
- (b) Equipment for water supply- pipes, pumps, tube well, reservoirs and cisterns for storage, different types of pipes and accessories, controlling fixtures like valves, taps, etc. receptacles like wash basins, sink bath- tubs, shower-trays, etc.
- (c) Drainage- Different types of drainage for rain water waste and soil, systems of collection carriage and disposal; simple graphical methods of determining sizes, jointing system of pipelines and fixtures.

Equipment like- trap, yard outlines, man-holes, water closets, urinals, slop sinks, septic tanks, etc.; Garbage disposal, Incinerators, protective devices against insects, rodents, etc.

(d) Minimizing pollution; Recycling processes; Fire fighting in buildings - regulations and requirements, different types- dry and wet risers, sprinkler system/chemicals.

(e) Ventilation- Natural and Forced or mechanical, standard of requirement quantity, and velocity for different conditions of living and works; principles of natural ventilation and simple methods of induced or forced ventilation; Air-conditioning- Control of quality, quantity, temperature and humidity, conditions for comfort, principles refrigeration and its commercial application in air-conditioning. Simple calculations for finding cooling load, major equipment used, their characteristics and suitable place for location; consideration and reduction of heat gain and for economic layout for supply and return air ducts.

(f) Mechanical equipment for vertical transport, recommended use for escalators and elevators; simple calculation to determine number if type of escalators and elevation sketch drawings showing the air-conditioning system of an auditorium, multistoried hotel and office buildings. Plan and section of elevators, machine room and escalators.

(g) Various methods of building automation, general overview.

19. WORKING DRAWING

Preparation of working drawing for small residential, commercial and special types of building, Preparation of details to clarify constructional techniques and use of material.

20. QUANTITY SURVEYING; SPECIFICATION

Standard method of measurement and unit, procedure of taking out quantities, abstracting and preparation of bills of quantities; Specifications of different materials and constructions, various test and properties related; Normal specification for different methods of construction in general and also specific items. General principles of Valuation on the basis of area and volume Definitions: value, Price, Market Value, Book Value, Replacement Value, Depreciation, Sinking Fund, Gross Rent, Ground Rent, Net Rent, Gross Income, Outgoing, Net Income, Year's Purchase, Free-hold Property, Simple Workouts on Valuation by Rent, Depreciation, Year of Purchase of land and building.

21. BUILDING DISEASES AND TREATMENT (Building Maintenance and Repair)

1. Definition and identification of "Building Diseases and Treatments", i.e. distress, defects, decay, damage, etc.

2. Historical background of the subject.

3. Determination of age and strength of structural members of a building under diagnosis.

4. Foundation - related problems and treatments.

5. Masonry and concrete walls - causes, effects and remedies of - a) dampness; condensation, efflorescence, b) cracks in walls. Insertion / replacement of DPC.

6. Effect of age, weather, environment and temperature variation on masonry structure and mud-walls.

7. R.C.C. and Steel Structures - a) R.C.C. Structures - factors affecting durability of concrete and remedial measures, diagnosis and treatment of distressed structures R.C.C. Floor / Roof - preventive measures, waterproofing, leaking, treatments, expansion joints; R.B.C. construction, buildings affected by atmosphere near seashore, fire resistance, treatment to R.C.C. structure damaged due to fire; b) Steel Structures - maintenance and repair.

8. Timber Works - diagnosis of decay and treatment; new materials substitute to timber works in building.

9. Studies on Natural Calamities - preventive and remedial measures for earthquake, flood, storm, etc.
Tutorial Diagnostic studies in the form of report illustrated by graphics, sketches, drawings, charts, tables, illustrations, photographs with site visits of necessary and important places of maintenance / repair and restoration of the items mentioned in the theory.

22. ENVIRONMENTAL SYSTEMS

An exploration of the fundamental principles of human physiology, thermal and luminous comfort, and indoor quality. Emphasis is on bioclimatic and psychometric climate analysis and its relationship to architectural design, understanding the energy exchange between body in space, the natural meaning of enclosures, and non-structural materials and systems. The focus is on passive heating, cooling, and day lighting systems and their design. Exercises include Vital Sign analysis of existing spaces (thermal, air, luminous), forming hypotheses of building performance, using scientific instrumentation, tenant survey techniques, and physical modeling and simulation techniques related to day-lighting and shading techniques.

23. HOUSING - I (Urban, Rural)

(a) Urban

- * Study of principles of housing standards: Housing for all classes, Housing cost.
- * Financing the housing for the Economically weaker section of the population, working class.
- * Housing for special groups such as single or aged persons.
- * Different methods for providing housing such as housing Co-operatives, Employees housing, etc., their applicability to the different parts of the country; their prospects and problems.
- * Slums and bustees and causes for their growth, Arresting growth of slums and bustees; measures adopted to control growth and development of slums and bustees.

(b) Rural

- * House in rural areas; study of houses in different climatic zones in India with emphasis on rural housing in West Bengal.
- * Efficiency of rural houses at different climatic zones, Roof insulation, ventilation, Damp and Moisture prevention, Planning and Circulation, sanitation, Health and Hygiene.
- * Available materials in different regions and their impact on planning and Architecture of rural housing, Innovation and introduction of new materials and new ideas.
- * Housing economics and public policy.

24. URBAN DESIGN

- * Introduction to Urban Design: Introduction to urban design concept and house Community and environment, community and technology, individual & Collective needs, Social physical : economic constraints.
- * Urban Sociology: Fundamentals of Sociology, Social pattern and problems of urban settlements (including high rise and over-crowding). Social pattern of rural settlements. Study of behaviour of individuals & groups and their Interactions. Migration Problems & issues related to hawkers squatters and evicted persons.
- * Introduction to Research Methods and Techniques: Introduction to fundamentals of research and investigation basic theories and methods. Different research methods and techniques. Application of research methods to Architecture, Urban Design and Planning including field study.

25. SERVICES & EQUIPMENT (Illumination and domestic wiring)

- * Importance of light in architecture; perception of light and color; photometry.
- * Lamps, luminaries; their characteristics and their field of application.
- Standard levels of illumination for different visible tasks; architectural effects through illumination; different indices.
- * Design directives for illumination in interiors and exteriors-in homes, public places, centre of performing arts, art galleries, display & shop windows, parks and play grounds, indoor play spaces, factories, offices and conference halls, dining halls etc.
- * Domestic wiring systems (exposed and concealed) for small residence and high-rise buildings. Sub-station, protection against lightning, earthing.

26. ARCHITECTURAL ACOUSTICS

- * Sound, musical sound, noise-echo, reverberation-reverberation time-Live room. Plane wave and its propagation in two different media-reflection, Absorption coefficients.
- * Design of an auditorium-size, shape-sitting arrangement.
- * Effect of noise on hearing in auditorium -Effect of regeneration on hearing of speech-variation of reverberation with frequency.
- * Design of a school building-site selection -building layout and design of school auditorium. Characteristics of a musical room-its rating and design. Specification of different sound absorbing /insulating materials for different uses. Design of an open air theatre-site selection.
- * Design and modification for auditorium used for sound picture theatre.

27. INTERIOR DESIGN

Elements of Interior Design. Colours, Craping furniture, furnishings, fittings/fixture, construction materials, illumination, plant materials.

28. PRINCIPLES OF URBAN AND RURAL PLANNING

Definition and scope: definition of town in India; classification of towns according to population (Indian census), Criteria of urban settlement in ancient time. Towns according to forms, Indian (Manasara, Gridiron, Radisi, Linear, Ribbon Development, Growth and development of Towns (Urban Settlements): Ancient: Egyptian, Indus, and West Asiatic.

Classic: Greek Roman, Mediaeval: Renaissance, Pre-industrial. Town planning concept since industrial revolution: Impact of industrial revolution on planning. Planning concepts by utopians: Cadbury, Lever brothers, etc. Patric Geddes Sir. Ebenezer Howard and Garden City concept; Letchworth, Wylwin Town planning laws.

Survey : Zoning, Master Plan, Roads and Communication, Recreational areas, open spaces, Residential areas, Neighbourhood unit, etc. New Towns, Harlows, Stevenage, Chandigarh, Brasilia, Contemporary Planning. The background of rural planning and development socially, economically and physically. Review of rural development in India generally, Rural planning in West Bengal.

Importance of Community Development concept on rural planning and development in post-Independence period. Rural services & infrastructure, Sanitation, Water supply. Conservation, development energy planning and environmental protection, rural industry.

Administration

Case studies

29. ENTREPRENEURSHIP DEVELOPMENT

- * Strategy and the privately-held company transition
- * Managing change in the family-owned business
- * Next generation leadership development
- * Family enterprise and economic development

30. PROFESSIONAL PRACTICE

- * Study of relevant building rules, bye-laws (Calcutta, Salt Lake);
- * West Bengal Municipal Act, 1993 with amendments upto date;
- * National Building Code.
- * Tender and its different constituents:
 - (a) Conditions of engagement.
 - (b) Specifications of Workmanship & Materials.
 - (c) Specifications of different items of works.
 - (d) Schedule of quantities.
- * Supervision of projects.
- * Checking and certifying contractor's bills.

31. BUILDING ECONOMICS & PROJECT MANAGEMENT

- * Detail study on PERT, CPM, Bar Chart.

Building Economics**Economic Principles:-**

- (i) Definition of Economics and Economic System.
- (ii) Factors of production with special emphasis on land.
- (iii) Types of Business organization.
- (iv) Business units.
- (v) Cost of production.

Accounting :

- (i) Definition of Accounting -Types of Accounting.
- (ii) Definition of cost classification and Interpretation of cost.
- (iii) Preparation of cost sheet.
- (iv) Marginal costing and Management Decision.
- (v) Contract costing.
- (vi) Accounting Ratios.
- (vii) Value analysis and project evaluation.

All the above factors should be considered with respect to Building Operation as economic activity.

32. VALUATION

- * General Principles of Valuation;
- * Concepts : Value, Price and Cost;
- Market : Perfect, Imperfect and Monopoly, Law of Demand, Supply and Pricing;
- * Definitions : Value In Use and Value In Exchange, Market Value, Reproduction Value; Replacement Value; Re-installment Value, Book Value, Salvage Value / Scrap Value, Capital Value / Sinking Fund;
- * Depreciation and Obsolescence

- * Rent : Ground Rent, Gross Rent, Rack Rent, Net Rent, Leases and Reversion : examples by sums on rent and valuation of Lease-holds;
- * Net Income : Tear's Purchase, examples by sums on Income Computation;
- * Property : Freehold, Lease-hold, Condominiums and Co-operatives, Timeshared Property, Developmental Rights;
- * Principal Methods of Valuation : Cost Approach, Income Approach, Market Approach

33. DESIGN METHODOLOGY

- (a) Meaning of Architectural Design; usefulness of design methods in architecture; short-comings in the knowledge of architectural design method; impact of high capacity electronic computer and new trend in the study of design method; different approaches in the architectural design process.
- (b) Meaning of system; natural and man-made systems; built-environment as a system; steps in system design.
- (c) Rational and creative approaches: application in architectural design solution : need for both approaches.
- (d) Model: different methods of representing architectural design - Iconic, analog and symbolic models; applying modelling techniques in architecture - housing in particular.
- (e) Identification of multiple criteria in architecture; study different criteria; identifying architectural design solution as a multi-criteria decision making problem.
- (f) Optimization: graphical optimization with two variables; linear programming : application in architecture and its short-comings; non-linear optimization; multi-criteria decision-making process; genetic algorithm.
- (g) Concept of Pattern Language; modern developments in the concept of space representation: Dimensionless Rectangular Dissection, Shape Grammar, Space Syntax.

34. ARCHITECTURAL CONSERVATION AND RESTORATION PROJECT

To study the definition, theory and values of conservation. To study the conservation ethics and the principles defined in the Venice Charter and Burra Charter. Students have to study a historic building appropriate for conservation in context of the various conservation values, study the architectural style and survey to prepare a floor plan layout, inspect its structural and physical condition and suggest the possible method of restoration.

35. ENERGY EFFICIENT BUILDINGS

To study the different energy-efficient principles of a building and their various application techniques in different climatic zones prevailing in India including solar active and passive features. The students have to take individual or group projects dealing with at least one or more than one technique

36. DISASTER RESISTANT BUILDINGS

Study of Factors causing disaster for buildings, Design of Earthquake Resistant Buildings, environmental conditions in coastal areas, cyclones and tornados, Wind resistant buildings, Fire protection provisions in buildings, infrastructure provisions for flood mitigation.

37. ENVIRONMENTAL STUDIES

Natural Environment, Man-made Environment, Air and Water in urban environment, Air Pollution, Water Pollution, Open and Green Spaces, Environmental Impact Assessment, Natural Disasters and their Impacts on Urban Environment.

38. SUSTAINABLE BUILDING DESIGN

To study Climate, indoor environment quality and energy use for Energy conservation, Conservation of historic buildings, Sustainable management of existing building stocks, Recycling of building materials, parts of buildings and debris, Conservation of water, energy and infrastructure, proper Management of wastes, Environmental Impact Assessment and Tools, Environmental ethics and sustainable building design practices.

39. INFRASTRUCTURE PLANNING

Study of the definitions of Infrastructure. Necessity and Importance for Infrastructure. Various Public Infrastructural Facilities like Roads, Water Supply System, Drainage and Sewerage Systems, Waste Disposal System, Electrification, Gas Supply System, etc. Government Organizations, Public Agencies associated for Planning of such Infrastructure. Planning strategies of various Infrastructural facilities in a new and existing town. Planning for infrastructure of rural areas of the country. Current National and International trends in Infrastructural Planning. Technology for execution of such Infrastructure.

- 4. Appointing authority:** The appointing authority in relation to the posts shall be the authority as specified in rule 6(1) of Part-III of the West Bengal Services (Classification, Control and Appeal) Rules, 1971, with its subsequent amendments.
- 5. Number of chance :** No candidate shall be allowed to take more than three chances in case of direct recruitment.
- 6. Repeal and Saving :** Notwithstanding anything contained in these rules the persons appointed on regular basis or substantively to the posts covered under these rules prior to coming into force of these rules shall be deemed to have been appointed under these rules.

By order of the Governor,

[ILLEGIBLE]

Principal Secy. to the Govt. of West Bengal.