PUNJAB PUBLIC SERVICE COMMISSION

BARADARI GARDEN, PATIALA- 147001

WEBSITE : http://ppsc.gov.in

PUBLIC NOTICE

RECRUITMENT TO 01 POST OF ASSISTANT ARCHAEOLOGICAL ENGINEER (GROUP-A) IN THE DEPARTMENT OF TOURISM AND CULTURAL AFFAIRS, GOVERNMENT OF PUNJAB.

1. With reference to advertisement No. 2022101 published on 26.08.2022 for the ibid post, the commission has decided to revise pattern and the syllabus for the ibid post.
2. The **revised pattern** for the written competitive examination as mentioned in clause 6.2 of "General Information for the candidates" shall be as follows:

S.No.	Topic	No. of Questions	Marks (Each Question carries 4 marks)	Type of Questions
1.	Questions from the Subject (Part A of Syllabus)	90	360	MCQs (Multiple Choice Questions)
2.	Questions from General Knowledge & Current Affairs (Part B of Syllabus)	10	40	
3.	Questions from General Mental Ability, Logical Reasoning & Quantitative Aptitude (Part C of Syllabus)	10	40	
4.	Punjabi (Part D of Syllabus)	10	40	
	Total	**120**	**480**	

3. The revised syllabus for the ibid post is annexed as **Annexure-A.**
4. The Procedure of Selection will remain same as mentioned in Clause 6.1 of the General Information.
5. All other conditions such as reservation of the post, age, eligibility, essential qualification, etc. of of the advertisement shall remain same as mentioned in "General Information for the Candidates".

Sd/-

Secretary (Examinations)
Punjab Public Service Commission
Patiala

Dated 26/06/2023

ANNEXURE (A)

SYLLABUS

PART-A (SUBJECT)

1. Surveying

Different types of surveys. Selection of base line and stations, obstacles in chaining. Prismatic compass survey, local attraction and its elimination, adjustment of closing error, Plane Table Survey, Leveling, Contouring, Theodolite: Different types of Theodolites, temporary & permanent adjustment, traversing with a Theodolite. Curves: Different types of curves, their degree and calculation of ordinates and angles. Tachometric Survey, Triangulation: Measurement of baseline, corrections for the baseline, selection of stations.

2. Building Materials and Construction

Building Stones, Bricks, lime, cement, timber: General, classification, Qualities, Deterioration, Uses and Various tests. Paints and varnishes, Distempering, white and color washing: Asphalt and Bitumen. Masonry: Stone & Brick: Brick masonry, Bonds and junctions. Damp proof course. Anti-termite treatment. Form Work and Scaffolding. Foundations: Types and suitability. Concrete Ingredients. Mix Design- factors influencing mix proportion I.S. Code method. Strength of Concrete, Shrinkage and temperature effects, creep of concrete, Corrosion, Permeability and Durability. Definition of Heritage Building. Criteria for listing Heritage Building, Methodology of listing, Grading of Heritage Buildings, Factors deteriorating Heritage building, Heritage conservation and preservation techniques.

3. Fluid Mechanics

Concept of fluid, Continuum concept of fluid: density, specific weight and relative density. viscosity and its dependence on temperature, vapour pressure and cavitation, compressibility and bulk modulus. Concept of pressure, Pascal's law and its engineering Buoyancy and floatation, stability of floating and submerged bodies, Metacentric height and its determination. Classification of fluid flows, velocity and acceleration of fluid particle, local and convective acceleration, flow rate and discharge mean velocity, continuity equation in Cartesian co- ordinates. Laminar and Turbulent flows: Flow regimes and Reynolds number, critical velocity and critical Reynolds number. Flow measurement: Manometers, Pitot Tube, Venturimeter. Dimensionless numbers.

4. Solid Mechanics

Simple Stresses and Strains, stress-strain curves for elastic materials, Hookes' Law, Young's modulus of elasticity, Bulk modulus, modulus of rigidity, temperature stresses, relation between elastic constants. Pure shear, principal stresses and Principal planes. Bending moment & shear force diagrams, Types of beams, supports and different types of loading. Relationship between Bending moment and Shear Force. Bending and Shear Stresses, assumptions made in theory of simple bending. Torsion of shafts and springs, Power transmitted, Sections subjected to combined bending and torsion, Deflection of Beams: Derivation of basic equation of elastic curve, deflection in beams with different end conditions and different loadings. Columns and Struts, Euler's buckling loads for columns with different end conditions, limitations of Euler's formula.

5. Structure Analysis

Classification of structure, support conditions, Equations of static equilibrium, Degree of static and kinematic indeterminacy, Maxwell reciprocal theorem. Determination of forces in member of truss by method of joints and method of sections. Construction of Influence lines for reaction, shear forces and bending moment for simply supported, overhauling and compound beams. Analysis of three hinged parabolic, circular arch at same level and different level support. Cables and suspension bridges:- shape of a loaded cable, cable carrying point loads and UDL. Analysis of fixed beams, continuous beams, fixed end moments due to different types of loadings, Bending moment and shear force diagrams for fixed beams, slope and deflection of fixed beams, analysis of continuous beams by the three moment equation (Clapeyron's theorem). Parabolic and circular two hinged Arches, Bending Moment Diagram for various loadings, Temperature effects.

6. RCC

Reinforced concrete, definition, properties of materials, grades of concrete and reinforcing steel, stress-strain curves, permissible stresses, concrete structural systems-slabs, beams, columns and foundations, design philosophies working stress design, ultimate strength and limit state design method. Limit State Design Method: Introduction, Limit States, Characteristic values, characteristic strength, characteristic loads, design values for materials and loads, factored loads. Limit State of Collapse (Flexure). Type of failures and assumptions for analysis. Analysis of beams: Moment of Resistance. Limit State of Collapse (Shear, bond and torsion). Limit State of Serviceability. Deflection, effective span to effective depth ratio, modification factors. Analysis and design of one and two-way slabs. Design of axially loaded Short columns. Flats Slabs: Advantages and disadvantages of flat Slabs, Action of Flat Slab. Analysis and design of square, rectangular and circular foundation. Overhead tanks, intze type tanks and their design including staging and foundation.

7. Steel Design

Structural steels and their specifications, design specifications as per IS: 800. Riveted/Bolted Connection: Riveting and bolting, their types, failure of riveted joint, efficiency of a joint, stresses in bolts. Welded Connection: Types of welded joints, design of welded joint subjected to axial loads. Axially loaded columns, effective length, slenderness ratio, allowable stresses, general specifications, design of axially loaded members. Tension Members: Types of tension members, net area, net effective area for angles, tees, design of tension members. Flexural Members (Beams): Design criteria, permissible stresses, laterally supported beams and their design, web buckling, web crippling. Design of Steel Roof Truss: design of members for the given loads.

8. Introduction to Prestressed Concrete

Basic concepts, Advantages of PSC over RCC, Disadvantages of PSC over RCC, classification and types of prestressing, Losses of prestress, Analysis of simple prestressed rectangular and T- sections:

9. Geotechnical Engineering

Basic Soil Properties: weight-volume relationships, soil grain properties, soil aggregate properties, grain size analysis, sieve analysis, sedimentation analysis, grain size distribution curves, consistency of soils, consistency limits and their determination. Classification of soils, classification on the basis of grain size, classification on the basis of plasticity. Permeability of Soils, Darcy's law and its validity, discharge velocity and seepage velocity, factors affecting permeability. Compaction: laboratory determination of optimum moisture content, moisture density relationship, compaction in field, compaction of cohesionless soils, moderately cohesive soils and clays, field control of compaction. Compressibility and Consolidation: components of total settlement, consolidation process, one-dimensional consolidation test, typical void ratio pressure relationships for sands and clays, normally consolidated and over consolidated clays. Terzaghi's theory of one-dimensional primary consolidation. Determination of coefficients of consolidation. Shear Strength: relationship between principal stresses at failure, shear tests, direct shear test, unconfined compression test, tri-axial compression tests, drainage conditions and strength parameters. Soil Investigation: Object of soil investigation for new and existing structures. Depth of exploration for different structures. Types of soil sample. Open Drive samples, Stationery piston sampler, Bore Hole log for S.P.T. Earth Pressure. Lateral earth pressure. Earth pressure at rest. Rankine states of plastic equilibrium, Ka and Kp for horizontal backfills. Ultimate bearing capacity, safe bearing capacity and allowable bearing capacity of soil. Rankine's analysis and Terzaghi's Analysis. Types of failures. Plate load test and standard penetration test.

10. Estimating and Costing

Different kinds of estimates, different methods of estimation, Estimating of Plastering, White-washing, Distempering and painting, doors and windows, lump sum items, Estimates of canals, roads etc. Necessity of specifications, types of specifications, general specifications, specification for bricks, Cement, sand, water, lime, reinforcement; Detailed specifications for Earthwork, Cement, concrete, brick work, floorings, D.P.C., R.C.C., Cement plastering. Rate Analysis: Purpose, importance and requirements of rate analysis, preparation of rate analysis, procedure of rate analysis for items of Earthwork, concrete works, R.C.C. works, reinforced brick work, plastering, painting, finishing (white-washing, distempering). Contract, types of contracts, their advantages and disadvantages,

Tender and acceptance of tender, Earnest money, security money, retention money, measurement book, cash book, preparation, examination and payment of bills, first and final bills, administrative sanction, technical sanction.

11. Water Supply Engineering

Water demand, per capita demand and variation in demand. population forecasting. Sources of water supply: surface and underground sources, development of wells, storage reservoir balancing and service storage, capacity determination. Intake and transmission system distribution systems. Necessity for examination of water impurities in water, sampling of water, physical, chemical and bacteriological quality for domestic water supply. System of water supply houses connections, internal distribution, and sanitary fittings pipe joints, different types of pipes and pipes materials.

12. Irrigation Engineering

Water requirements of crops, factors affecting water requirement, consumptive use of water, water depth or delta and crop relation, Duty of water, relation between delta, duty and base period, Soil crop relationship and soil fertility. Sprinkler irrigation, Planning of sprinkler irrigation, drip irrigation. Classification of canals. Canal alignment. Silt theories Kennedy's theory, Lacey's theory. Design of unlined canals based on Kennedy & Lacey's theories. Lined Canals, Types of lining, selection of type of lining. Losses in Canals, Water Logging and Drainage Losses. Drainage of land. Theories of Seepage, seepage force and exit gradient, salient features of Bligh's creep theory and Khosla's theory. Determination of uplift Pressures and floor thickness. Weirs versus barrage, Diversion Head Works: Functions and investigations: component parts of a diversion head work, silt control devices. Distributary Regulators: Off-take alignment, cross-regulators. Distributary head regulators. Cross-Drainage works, Aqueducts their types, Canal Out-lets.

PART-B

(a) General Knowledge & Current affairs

General Knowledge and Current affairs of National and International importance including:

(i) Economic issues

(ii) Polity issues

(iii) Environment issues

(iv) Geography

(v) Science and Technology

(vi) Any other current issues

(vii) (a) History of India with special reference to Indian freedom struggle movement

(b) History of Punjab- 14th century onwards

PART-C

(a) General Mental Ability, Logical Reasoning & Quantitative Aptitude.

(i) Logical reasoning, analytical and mental ability, etc.

(ii) Basic numerical skills, numbers, magnitudes, percentage, numerical relation appreciation, etc.

(iii) Data analysis, Graphic presentation charts, tables, spreadsheets, etc.

PART-D (PUNJABI)

1. ਬਹੁਅਰਥਕ ਸ਼ਬਦ, ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਾਰਥਕ ਸ਼ਬਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ।
2. ਪੰਜਾਬੀ ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ।
3. ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ, ਸ਼ਬਦਜੋੜ।
4. ਸਬਦ ਦੇ ਭੇਦ।
5. ਅਗੇਤਰ/ਪਿਛੇਤਰ।
6. ਲਿੰਗ ਅਤੇ ਵਚਨ ਬਦਲੋ।
7. ਵਿਸ਼ਰਾਮ ਚਿੰਨ।
8. ਵਿਆਕਰਨ।
9. ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਅਤੇ ਵਾਕਾਂ ਦਾ ਪੰਜਾਬੀ ਵਿੱਚ ਸ਼ੁੱਧ ਰੂਪ।
10. ਅੰਕਾਂ, ਮਹੀਨੇ, ਦਿਨਾਂ ਦਾ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਰੂਪ।
11. ਭਾਸ਼ਾ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ।
12. ਸ਼ਬਦ ਬੋਧ।
13. ਪੰਜਾਬ ਦੇ ਇਤਿਹਾਸ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
14. ਪੰਜਾਬ ਦੇ ਮੇਲੇ, ਤਿਉਹਾਰ ਅਤੇ ਸਭਿਆਚਾਰ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
15. ਅਣਡਿੱਠੇ ਪੈਰੇ ਵਿਚੋਂ ਪ੍ਰਸ਼ਨ।