

Framework and Contents of Entrance Examination Syllabus

Section	Course	Weightage
A	Mathematics	25
B	Fundamentals of Construction	25
C	Construction Planning and Management	25
D	Structure and others	25
		100
Number of questions: Total number of questions shall be of 100.		
Duration of exam: A minimum duration of entrance exam shall be of 2 hours		
Types of questions: All the questions shall be multiple-choice question (MCQ)		

Section A: Mathematics [25 Marks]

1. Probability and Statistics - Probability, Mean, Median, Mode, Standard deviation, Variance
2. Algebra - Basic algebraic techniques, Matrix algebra, Linear equation, Inequalities, Basics of Vector Algebra.
3. Geometry and Mensuration - Angles, Triangles, Pythagorean theorem, Parallelogram, Trapezoid, Area, Volume, Surface area, Quadrilateral, Circle, Graph, Y-intercept.
4. Calculus – Differentiation, Integration, several variables including applications with coordinate geometry, trigonometry, differential equations and other branches of mathematics.

Section B: Fundamentals of Construction [25 Marks]

1. Surveying – Compass, Levelling, Traversing, Contouring, Setting out of horizontal and vertical curves, GPS and GIS.
2. Building materials and technology - ABC classification of construction materials, Benefits of technology, Impact of technology on culture, tradition, social values, environment and society.
3. Estimating and costing - Type of estimate, Analysis of rates, Detailed estimate of two storied building and Earthwork in road construction, Property valuation.
4. Geotechnical engineering – Soil classification, permeability and seepage, Shear strength,

Earth pressure, Stability of slopes and retaining wall, Soil exploration, Bearing capacity, Foundation types and uses of piles.

Section C: Construction Planning and Management [25 Marks]

- 1. Project engineering** - Characteristics and classification of project, Techniques of project formulation, Project proposal and project appraisal, Project planning, Project scheduling with Bar chart, CPM and PERT, Elements of project monitoring and control, Project management information system, Project risks and its management, Project finance, Capital budgeting techniques.
- 2. Construction management** - Construction planning, Resources management, Time cost tradeoff, Tendering process, Contract document, , Conditions of contract, Construction equipment, Selection of appropriate equipment, Site management, Personnel management, Health and safety at work place, Purpose and importance of specification, Payment of bill, Contract administration, Conflict and dispute management.
- 3. Professional practice** - Ethics and profession, Nepal engineering council Act, Code of conduct, Duties of an engineer/architect, Liability and negligence, Building code and bylaws, Labor Act of Nepal, Intellectual property right.
- 4. Engineering economics** - Interest and time value of money, Net present value, Internal rate of return, Method of engineering economic analysis, Methods of depreciation.

Section D: Structure and others [25 Marks]

- 1. Structure** - Stress and strain, Shear force and bending moment diagram, Single and double reinforced section, Design criteria of foundation, short column, beam, slab and trusses. Concrete types and uses, Mix design, Quality control, Strength, Testing, Corrosion of reinforcement bars in concrete.
- 2. Transportation** - Classification of roads (NRS), Road alignment, Geometric elements of roads and design parameter, Road materials, Hill roads, Flexible pavements, Rigid pavement, Drainage system.
- 3. Water resources** – Fundamentals of hydrology (The hydrological cycle, water balance components, unit hydrograph, flood hydrology); Fundamentals of fluid flow and pressure
- 4. Water supply and sanitary** - Sources of water, Quality of water, Water treatment process, Reservoir and distribution system. Sewage, Sewers, Sewage disposal, Solid waste management.