Session 3:

Pre-Admission Entry Test Guidance

GENERAL GUIDELINES

- Admission test will constitute of **three** parts – MCQs, General Civil Engg. Question and Analytical Writing

- 70-80 MCQs from following key areas of civil engineering:

  - Structural Engineering
  - Surveying and Transportation Engineering
  - Water Resources and Coastal Engineering
  - Geotechnical Engineering
  - Construction Engineering & Management

- General civil engineering question covering basic fundamentals of civil engineering knowledge and practice

- One argumentative analytical writing assignment to judge your:
  - Analytical skills
  - Grammar and Vocabulary
  - Argument Development/ Interpretation Skills

Surveying

- Distance Measurements (horizontal and vertical distance measurement method and devices)
- Levelling Techniques (equipment used and its different application)
- Angles and Direction
- Curves (vertical and horizontal curves)

Some questions may be related to advanced topics in surveying engineering like;

- Hydrographic Surveys (Bathymetric Surveying)
- Global Position system (GPS)
- Photogrammetry and Remote sensing (RS)

Transportation Engineering

- Transportation Planning and Management
- Highway Engineering (design, construction and maintenance)
- Traffic Engineering (Theories, implementation and application)
- Railway engineering (design and maintenance)
- Airport Engineering (A review of runway design)
- Coastal Engineering (Ports and Harbour)

Construction Engineering and Management

- Quantity and Cost Estimation
- Project Scheduling (CPM, PERT, AOA, AON, activity duration calculation etc.)
- Earthworks and Site Layout
- Construction Equipment Productivity and Economics
- Engineering Economics (Cash Flow, B/C analysis, Payback period, NPW, etc.)
- Probability and Statistics (Probability distributions, hypothesis, descriptive statistics etc.)
- Construction Contracts (contract types, payment schemes, bonds, delivery methods etc.)
- Construction methods (foundations, piles, excavation, compaction, concreting, block masonry, finishes etc.)

Coastal and Water Resources Engineering

- Specific weight, surface tension, viscosity etc.
- Pascal's Law, Bernoulli's equation
- Pipe Network Analysis, Hardy Cross Method
- Pipe flow problems, Weirs
- Major and Minor losses
- Open channel, Manning's and Chezy's equation
- Watercycle, runoff, groundwater, Evapotranspiration
- Water quality, COD, BOD, EIA

Structural Engineering

- **Degree of indeterminacy** and degree of freedom in beam, trusses and frames
- **Reactions in determinate** beam, frame and trusses
- **Deflection** in determinate members
- **Moment of Inertia**, Polar Moment of Inertia
- **Stresses in beams** (Axial, Shear and Flexure)
- **Deformation in bar** elements

- **Adequacy** of simply supported reinforced concrete beam
- **Minimum and Maximum reinforcement** in beam, slab and columns
- **Nominal capacities** of rectangular sections in shear, moment
- **Isolated Footing Sizes** for given loading

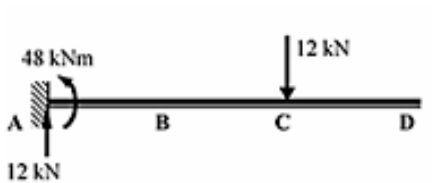
Geotechnical Engineering

1. ORIGIN AND FORMATION OF SOIL
2. COMPOSITION & PHYSICAL PROPERTIES OF SOIL
3. SOIL CLASSIFICATION
4. SOIL COMPACTION
5. STRESS DISTRIBUTION IN SOIL
6. SHEAR STRENGTH OF SOIL
7. SUB SOIL INVESTIGATION
8. SETTLEMENT ANALYSIS
9. BEARING CAPACITY
10. LATERAL EARTH PRESSURE
11. STABILITY OF SLOPES

Examples

1. As per ACI Code the modulus of elasticity for 4000psi concrete is
   a. 2600 ksi
   b. 3600 ksi
   c. 4600 ksi
   d. 5600 ksi

2. For the given cantilever beam rotation at point D is
   a. Larger than rotation at C
   b. Smaller than rotation at C
   c. Equal to rotation at C
   d. Zero



Examples

1. In railway track which of the following component use to hold the rail in their correct gauge and alignment,

a) Sleepers

b) Ballast

c) Bearing plate

d) None of the above

2. Which soil relatively get more compacted ……

a. Well graded
b. Poorly graded
c. Gap graded
d. saturated

Examples

1. Identify the example that would NOT usually be considered a project.
   a. Routine manufacture of a car
   b. Developing a computer software application program
   c. Designing a new product
   d. Installing new equipment in an existing production line

2. Based on the list of activities below, which of the following can be said?
   a. Activity D can begin as soon as both activities A and C are complete
   b. Activity C can begin as soon as activity B is complete
   c. Activity C can begin as soon as activity A is complete
   d. Activity D can begin as soon as both activities A and B are complete

3. Which of the following represents the correct project life cycle?
   a. Planning → Initiating → Executing → Closing
   b. Planning → Executing → Initiating → Closing
   c. Initiating → Planning → Executing → Closing
   d. Initiating → Executing → Planning → Closing

Examples

1. The hydraulic radius of a circular pipe of radius 5 cm is:
2.5 cm (c) 2.5 cm2
2.25 cm (d) 1.25 cm

2. The infiltration of water into the subsurface is the _____ .
influent
effluent
discharge
recharge

3. The past fertile land in upper Sindh can be improved significantly again by:
a. applying more water b. changing soil
c. installing drainage system d. applying more fertilizer

General Civil Engineering Question

This part will comprise of 10 MCQs based on a general civil engineering question to assess fundamental knowledge & practice of civil engineering.

Analytical Writing

What is the role of ethics in professional practice in Engineering? Discuss with examples how a professional engineer should conduct himself in the engineering profession.