



Written test (Mahagenco Advt. No.08/2009) for the post of Junior Engineer & Junior Engineer (Civil) .

- ❖ The exam for the post of Junior Engineer is tentatively scheduled at 14th March 2010. All concerned may please note and watch for further announcement.

Syllabus

A. Subject paper (60 Questions in all)

Civil Engineering :-

- Mechanics (Applied)
- Structural Analysis
- Concrete Structures
- Steel Structures
- Soil Mechanics
- Foundation Engineering
- Fluid Mechanics and Hydraulics
- Hydrology
- Irrigation / Dam / reservoirs
- Water requirements
- Air Pollution / Water Pollution / Treatment plants
- Municipal Solid Wastes
- Highway Planning
- Traffic Engineering
- Surveying

Electronics :-

- Analog Circuits
- Digital circuits
- Signals and Systems
- Control Systems
- Networks
- Electronic Devices
- Communications
- Electromagnetics

Electrical Engineering :-

- Electric Circuits and Fields
- Signals and Systems
- Electrical Machines
- Power Systems
- Control Systems
- Electrical and Electronics Measurements
- Analog and Digital Electronics
- Power Electronics and Drivers

Mechanical Engineering :-

- Engineering Mechanics
- Strength of Materials
- Theory of Machines
- Vibrations
- Design
- Fluid Mechanics
- Heat-Transfer
- Thermodynamics
- Applications
- Engineering Materials
- Metal Casting
- Forming
- Joining
- Machining and Machine Tool Operations
- Metrology and Inspection
- Computer Integrated Manufacturing
- Production Planning and Control
- Inventory Control
- Operations Research

Instrumentation Engineering :

- Basics of Circuits and Measurement Systems
- Transducers, Mechanical Measurement and Industrial Instrumentation
- Analog Electronics
- Digital Electronics
- Signals, Systems and Communications
- Electrical and Electronics Measurements
- Control Systems and Process Control
- Analytical, Optical and Biomedical Instrumentation

B. For Aptitude test (90 questions in all).

Topics:

- Reading Comprehension – English
- Verbal Ability – English
- Quantitative Techniques
- Data Interpretation
- Reasoning Ability
- General Awareness

Please refer following pages for sample question paper.

List of eligible / not eligible candidates for the written test will be displayed on <http://www.mahagenco.in>.

If the two inputs of a J-K flip-flop are connected and held as a single input, the resulting circuit is

- 1] S-R flip-flop 2] T flip-flop 3] D flip-flop 4] not a flip-flop anymore

Given registers R1 and R2 has the values a and b respectively. What are their respective values after the following sequence of instructions? (Convention: In "Add R1, R2, R3", the leftmost operand R1 is the destination)

Add R1, R1, R2
Sub R1, R2, R1
Add R2, R1, R2
Sub R2, R2, R1
Sub R2, R2, R1

- 1] a, a+b 2] b, a 3] a, b 4] -a, a+b

Simplest form of the Boolean expression $AB'C' + A'BCD' + B'CD' + A'B'C'$ is

- 1] $B'C' + B'D' + A'CD'$ 2] $B'C' + B'CD' + A'CD'$ 3] $A'D' + A'C' + B'C'D$ 4] $A'D' + A'BC' + B'C'D$

CIVIL ENGINEERING

The cementing property of cement is mainly due to:

- 1] Lime 2] Silica 3] Iron oxide 4] Alumina

State whether the following statement is True or False:

Compaction takes place due to expansion of Pore Soil.

- 1] True 2] False

The absolute minimum radius of curve for safe operation for a speed of 110 kmph is:

- 1] 110 m 2] 220 m 3] 440m 4] 577m

Transverse fillet welds are designed for:

- 1] Tensile strength 2] Compressive strength 3] Shear strength 4] Bending strength

If the section modulus of a beam is increased, the bending stress in the beam will

- 1] decrease 2] not change 3] increase 4] None of these

MECHANICAL ENGINEERING

Heat treatment process is

- 1] hardening by quenching 2] normalizing 3] annealing 4] All of these

State whether the following statement is True or False:

Pelton wheel is a type of impulse turbine

- 1] True 2] False

A single cylinder four stroke engine runs at 30 r.p.s. The brake load is 3 kg at 400 mm radius and the mechanical efficiency is 75%. What is the indicated pressure (in W)?

- 1] 46.3 2] 1775.2 3] 2218.9 4] 2773.7

