

MEGHALAYA ENERGY CORPORATION LIMITED

CORPORATE AFFAIRS

Lumjingshai, Short Round Road, Shillong – 793001

CIN-U40101ML2009SEC008374

No.MeECL/CA/GA/Recruitment/188/8

Dated : Shillong, the 7th September, 2015

ADVERTISEMENT

The Meghalaya Energy Corporation Limited (MeECL), Corporate Affairs, invites application for the following posts.

1. 31 (Thirty one) posts of *Assistant Engineer (Electrical/Mechanical)*
2. 06 (Six) posts of *Assistant Engineer (Civil)*
3. 01 (One) post of *Assistant Engineer (Environmental)*.

Interested applicants are required to log on to the MeECL official website www.meecl.nic.in for details.

-Sd-
(Shri D.Warjri)
Deputy Secretary.

Memo No.MeECL/CA/GA/Recruitment/188/8(a)

Dated : Shillong, the 4th September, 2015

Copy to :-

1. The P.S. to Chairman-cum-Managing Director for kind information of Chairman-cum-Managing Director.
2. The Chief Executive Member, KHADC, Shillong/ JHADC, Jowai/GHADC, Tura.
3. The Director (Finance), MeECL, Shillong.
4. The Director (Distribution), MePDCL, Shillong.
5. The Director (Generation) MePGCL, Shillong.
6. The Director (Transmission), MePTCL, Shillong.
7. All Deputy Commissioners, East Khasi Hills District, Shillong/West Khasi Hills District, Nongstoin/ South West Khasi Hills District, Mawkyrwat/Ri-Bhoi District, Nongpoh/, East Jaintia Hills District, Khliehriat/ West Jaintia Hills District, Jowai/, West Garo Hills District, Tura, /East Garo Hills District, Williamnagar,/ South Garo Hills District, Baghmara/North Garo Hills District, Resubelpara/South West Garo Hills District, Ampati.
8. The Director of Information & Public Relation (DIPR), Government of Meghalaya, Shillong with a request to kindly publish the Advertisement in two issues of the Shillong Times, Shillong and Tura edition, U Mawphor, Kjatsngi and Salantini Janera.
9. The Employment Officer, Employment Ex-change, Shillong/, Nongstoin/ Mawkyrwat/ Nongpoh/, Khliehriat/ Jowai/Tura/ Williamnagar,/ Baghmara/ Resubelpara/ Ampati.
10. The Company Secretary, MeECL, Shillong.
11. All Chief Engineers, MePDCL/MePGCL/MePTCL.
12. The Director, HRDC, MeECL, Umiam, with a request to upload the Advertisement in the the MeECL official website.
13. The Public Relations Officer, MeECL, Shillong.
14. All Officers, Corporate Affairs, Shillong.

(Shri D.Warjri)
Deputy Secretary.

INSTRUCTIONS AND PROCEDURE FOR FILLING UP AND SUBMISSION OF APPLICATION FOR THE POST OF ASSISTANT ENGINEER IN MeECL.

Applications are invited from Indian Citizens for filling up the temporary posts of Assistant Engineers (Electrical/Mechanical/Civil/Environmental Engineering) in MeECL. These posts are liable to be terminated, at any time, without assigning any reasons thereof.

1. Assistant Engineer (Electrical/Mechanical/Civil/Environmental Engineering):

1.1 Essential Qualification: Candidates should possess a degree in the respective discipline from any Indian University/Institute recognised by the Government of Meghalaya or UGC or AICTE, as below:-

- (a) For the post of Assistant Engineer (Electrical/Mechanical) –A minimum of bachelor degree in Electrical Engineering OR Mechanical Engineering OR Electrical & Electronics Engineering.
- (b) For the post of Assistant Engineer (Civil) – A minimum of bachelor degree in Civil Engineering.
- (c) For the post of Assistant Engineer (Environmental)–A minimum of bachelor degree in Environmental Engineering.

1.2 Age:

- (i) Candidates should not be less than 21 years of age and not more than 30 years as on 01.01.2015.
- (ii) Upper age limit is relaxable up to 5 (five) years in case of ST/SC candidates.
- (iii) Upper age limit is further relaxable up to 2 (two) years for post graduate candidates.
- (iv) Upper age limit is further relaxable by 5 (five) years for candidates already working in MeECL as Junior Engineers.

1.3 Scale of Pay: Rs.18, 880 – 470(4)-20,760 – 560(9)-25,800 – 760(15)-37,200/-plus usual allowances as admissible under Corporations' rules.

2. Instruction for filling up the application form.

- a. Application Form shall be available in the MeECL website at www.meecl.nic.in
- b. The candidate shall print the filled-in Application Form and Admit Card and submit the same as detailed at Serial 3 below.

3. The following documents are to be submitted to the office of the Director Corporate Affairs, MeECL, Lum Jingshai, Short Round Road, Shillong – 793001, on working days between 11:00 am to 4:00 pm from 8th September, 2015 to 21st September, 2015. Documents received after the date and time mentioned above shall be summarily rejected.

- (i) Printed Application Form and Admit Card duly filled in as instructed in Serial 2 above. Incomplete Application Form OR Application Form submitted in any other format shall be summarily rejected.
- (ii) A Bank Draft of Rs. 460/- for General Candidates and Rs. 230/- for ST/SC candidates, payable at Shillong, in favour of the Principal Account, MeECL, Shillong.
- (iii) 3 (three) recent passport size colour photographs.
- (iv) Self-attested copy of the following :-
 - (a) Birth Certificate.
 - (b) Educational qualification Certificates and Mark Sheets from Matriculation onwards.
 - (c) ST/SC Certificates.

4. All applications shall be screened for eligibility vis-à-vis post applied for. Therefore, candidates must bring the originals of above documents for verification.
5. Candidates found (a) submitting false/incorrect certificates/information or (b) **not having studied the subjects mentioned in the syllabus** or (c) submitting educational qualification certificates **not commensurate with the post applied for**, shall not be allowed to appear in the written test. If such instances go undetected during the screening process but are detected subsequently, such candidates shall be disqualified with retrospective effect.
6. Candidates will be required to appear for a written test, which is tentatively scheduled in the 2nd week October 2015. The Date and Venue of the written examination shall be placed in the website of MeECL and all candidates are required to check the MeECL website for the same. **No separate letter/email about the date and venue of the written examination shall be sent by post to any candidate.**
7. Details of written examination.
 - a. The syllabus for the written test is as indicated in **ANNEXURE I**.
 - b. The total marks shall be 300, with 180 marks for the technical paper, 60 marks for general studies and 60 marks for personal interview.
 - c. The duration of the written test shall be 3 (three) hours.
 - d. The examination shall be conducted using the optical marking recognition (OMR) system.
 - e. All electronic gadgets, e.g., cellular/mobile phones, calculator, laptop, MP3 players, smart watches, etc, are not allowed inside the examination hall. Any candidate found violating these instructions shall be disqualified, including debarment from future examination/recruitment.
8. Only those candidates who qualify in the written test shall be called for a personal interview on the date to be notified later.
9. Reservation Policy of the Government of Meghalaya will apply.
10. Canvassing directly or indirectly or in any form will disqualify the candidate automatically.
11. No TA/DA will be admissible to candidates for appearing in the written test or personal Interview.
12. The MeECL reserves the right to reject the applications of any or of all the candidates without assigning any reason thereof.
13. The MeECL reserves the right to cancel the Advertisement without assigning any reason thereof

(Shri D.Warjri)
Deputy Secretary.

ANNEXURE I

SYLLABUS FOR THE RECRUITMENT TEST TO THE POST OF ASSISTANT ENGINEERS (ELECTRICAL/MECHANICAL)

Total	- 300 Marks	Duration - 3 Hours
General Studies	- 60 Marks	
Technical Paper	- 180 Marks	
Personal Interview	- 60 Marks (for short listed candidates only).	
General Studies:	- (60 Marks)	- General English, General Knowledge, Aptitude.

Technical Papers. (180 Marks)

Part A Common for Electrical and Mechanical Engineers – 60 Marks

1. Magnetism – Nature of Magnetism, Laws of Magnetic force, Magnetic field, Field Intensity, Flux density, Magnetic Potential, Tangent law, Gauss's Theorem, Electromagnetism, Magnetometers.
2. Electrostatic - Nature of Electricity, Electric charge, Coulomb's law, Electric field and intensity, Electric Flux, Electric Potential, Gauss's Theorem Electrometers, Capacitance
3. Electromagnetic induction
4. Magnetic Effect of Current
5. Circuit Theory - Ohm's law, Kirchhoff's laws, Network Theorems, etc.
6. Work, Power and Energy
7. Alternating Current (AC) –AC Fundamentals and AC circuits
8. Transformer- Fundamentals
9. Conversion from AC to DC – Single phase.
10. Cells - Primary Cells, Standard Cells, Secondary Cells, Batteries
11. Fundamentals of DC and AC generators
12. Elementary Electronics - Semiconductors, Diodes, Transistors and their applications
13. Thermo-electricity
14. Photo-electricity
15. Computer Fundamentals
16. Thermodynamics
17. Hydraulics, Hydraulic turbines and pumps
18. Fundamentals of Internal Combustion Engines
19. Common Electrical Appliances.

PART B: For Electrical Engineers only - 120 Marks

1. ELECTRO MAGNETIC THEORY.

Electric and magnetic fields. Gauss's Law and Amperes Law. Fields in dielectrics, conductors and magnetic materials. Maxwell's equations. Time varying fields. Plane Wave propagating in dielectric and conducting media. Transmission lines.

2. ELECTRICAL MATERIALS

Band Theory, Conductors, Semiconductors and Insulators. Superconductivity. Insulators for electrical and electronic applications. Magnetic materials. Ferro and ferri magnetism. Ceramics, Properties and applications. Hall effect and its applications. Special semi conductors.

3. NETWORK THEORY

Circuits elements. Kirchoff's Laws. Mesh and nodal analysis. Network Theorems and applications. Natural response and forced response. Transient response and steady state response for arbitrary inputs. Properties of networks in terms of poles and zeros. Transfer function. Resonant circuits. Three phase circuits. Two port networks. Elements of two element network synthesis.

4. ELECTRICAL MACHINES

Magnetic Circuits Analysis and Design of Power transformers. Construction and testing. Equivalent circuits. Losses and efficiency. Regulation. Autotransformer, 3phase transformer. Parallel operation. Basic concepts in rotating machines. EMF, torque, basic machine types. Construction and operation, leakage losses and efficiency.

D.C. Machines. Construction, Excitation methods .Circuit models. Armature reaction and commutation. Characteristics and performance analysis. Generators and motors. Starting and speed control. Testing, Losses and efficiency.

Synchronous Machines. Construction. Circuit model. Operating characteristics and performance analysis. Synchronous reactance. Efficiency. Voltage regulation. Salient pole machine, Parallel operation. Hunting. Short circuit transients.

Induction Machines. Construction. Principle of operation. Rotating fields. Characteristics and performance analysis. Determination of circuit model. Circle diagram. Starting and speed control. Fractional KW motors. Single phase synchronous and induction motors.

5. MEASUREMENT AND INSTRUMENTATION

Units and Standards. Error analysis, measurement of current, Voltage, power, Power factor and energy. Indicating instruments. Measurement of resistance, inductance, Capacitance and frequency. Bridge measurements. Electronic measuring instruments. Digital Voltmeter and frequency counter. Transducers and their applications to the measurement of nonelectrical quantities like temperature, pressure, flowrate displacement, acceleration, noise level etc. Data acquisition systems. A/D and D/A converters.

6. ELECTRICAL POWER SYSTEM.

Types of Power Stations, Hydro, Thermal and Nuclear Stations. Pumped storage plants. Economics and operating factors. Power transmission lines. Modeling and performance characteristics. Voltage control. Load flow studies. Optimal power system operation. Load frequency control. Symmetrical short circuit analysis. ZBus formulation. Symmetrical Components. Per Unit representation. Fault analysis. Transient and steady state stability of power systems. Equal area criterion. Power system Transients. Power system Protection Circuit breakers. Relays. HVDC transmission.

7. ANALOG AND DIGITAL ELECTRONICS AND CIRCUIT

Semiconductor device physics, PN junctions and transistors, circuit models and parameters, FET, Zener, tunnel, Schottky, photo diodes and their applications, rectifier circuits, voltage regulators and multipliers, switching behaviour of diodes and transistors. Small signal amplifiers, biasing circuits, frequency response and improvement, multistage amplifiers and feedback amplifiers, D.C. amplifiers, Oscillators. Large signal amplifiers, coupling methods, push pull amplifiers, operational amplifiers, wave shaping circuits. Multi vibrators and flipflops and their applications. Digital logic gate families, universal gates combination circuits for arithmetic and logic operational, sequential logic circuits. Counters, registers, RAM and ROMs.

8. POWER ELECTRONICS AND DRIVES

Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters fully controlled and half controlled; principles of choppers and inverters; basis concepts of adjustable speed dc and ac drives.

9. MICROPROCESSORS

Microprocessor architecture, Instruction set and simple assembly language programming. Interfacing for memory and I/O. Applications of Microprocessors in power system.

PART C :For Mechanical Engineers only - 120 Marks.

1. THEORY OF MACHINES.

Simple Mechanism; Friction; Belt, Rope and Chain Drive; Gears; Governors; Brakes and Dynamometers; Cams; Gyroscope.

2. MANUFACTURING SCIENCE.

Basic Machining Process; Types of Machine Tools; Extrusion; Welding; Drilling; Shaping; Boring; Reaming; Milling; Grinding; Finishing Processes; Patternmaking and Foundry.

3. INDUSTRIAL ENGINEERING.

Plant Layout; Material Handling; Work Study; Economic Analysis; Break Even Analysis; Present Value Criterion; Inventory Control; Network Analysis; PERT; CPM.

4. FLUID MECHANICS.

Hydrostatics; Buoyancy; Hydrokinematics; Hydrodynamics; Orifices, Mouthpieces and Nozzles; Flow over Notches and Weirs; Flow in Pipes, Open Channels; Viscous Flow; Flow around Immersed Bodies.

5. HYDRAULIC MACHINES.

Hydraulic Turbines; Pumps;

6. THERMO-DYNAMICS

Properties of Gases; Properties of Steam; Power Cycles; Steam Boilers; Steam Engines; Condenser; Fuels; Combustion of Fuels.

7. I.C. ENGINES.

C.I. and S.I. Engines; Detonation; Properties of Fuels; Fuel Injection; Carburettor; Performance and Testing, Turbojet and Turboprop.

8. HEAT TRANSFER, REFRIGERATION.

Refrigeration Cycles; Refrigeration Equipments; Refrigerants; Psychometrics; Comfort, Cooling and Dehumidification.

**SYLLABUS FOR THE RECRUITMENT TEST TO THE POST OF
ASSISTANT ENGINEERS (CIVIL)**

Total	- 300 Marks	Duration - 3 Hours
General Studies	- 60 Marks	
Technical Paper	- 180 Marks	
Personal Interview	- 60 Marks (for short listed candidates only).	

General Studies:(60 Marks) - General English, General Knowledge, Aptitude.

Technical Papers: (180 Marks)

1. STRUCTURAL ENGINEERING

Mechanics: Bending moment and shear force in statically determinate beams. Simple stress and strain relationship: Stress and strain in two dimensions, principal stresses, stress transformation, Mohr's circle. Simple bending theory, flexural and shear stresses, unsymmetrical bending, shear centre. Thin walled pressure vessels, uniform torsion, buckling of column, combined and direct bending stresses.

Structural Analysis: Analysis of statically determinate trusses, arches, beams, cables and frames, displacements in statically determinate structures and analysis of statically indeterminate structures by force/ energy methods, analysis by displacement methods (slope deflection and moment distribution methods), influence lines for determinate and indeterminate structures.

Basic concepts of matrix methods of structural analysis.

Concrete Structures: Concrete Technology- properties of concrete, basics of mix design. Concrete design- basic working stress and limit state design concepts, analysis of ultimate load capacity and design of members subjected to flexure, shear, compression and torsion by limit state methods. Basic elements of prestressed concrete, analysis of beam sections at transfer and service loads.

Steel Structures: Analysis and design of tension and compression members, beams and beam columns, column bases. Connections- simple and eccentric, beam-column connections, plate girders and trusses. Plastic analysis of beams and frames.

2. GEOTECHNICAL ENGINEERING

Soil Mechanics: Origin of soils, soil classification, three-phase system, fundamental definitions, relationship and interrelationships, permeability & seepage, effective stress principle, consolidation, compaction, shear strength.

Foundation Engineering: Sub-surface investigations- scope, drilling bore holes, sampling, penetration tests, plate load test. Earth pressure theories, effect of water table, layered soils. Stability of slopes- infinite slopes, finite slopes. Foundation types- foundation design requirements. Shallow foundations- bearing capacity, effect of shape, water table and other factors, stress distribution, settlement analysis in sands & clays. Deep foundations- pile types, dynamic & static formulae, load capacity of piles in sands & clays, negative skin friction.

3. WATER RESOURCES ENGINEERING

Fluid Mechanics and Hydraulics: Properties of fluids, principle of conservation of mass, momentum, energy and corresponding equations, potential flow, applications of momentum and Bernoulli's equation, laminar and turbulent flow, flow in pipes, pipe networks. Concept of boundary layer and its growth. Uniform flow, critical flow and gradually varied flow in channels, specific energy concept, hydraulic jump. Forces on immersed bodies, flow measurements in channels, tanks and pipes.

Dimensional analysis and hydraulic modeling. Kinematics of flow, velocity triangles and specific speed of pumps and turbines.

Hydrology: Hydrologic cycle, rainfall, evaporation, infiltration, stage discharge relationships, unit hydrographs, flood estimation, reservoir capacity, reservoir and channel routing. Well hydraulics.

Irrigation: Duty, delta, estimation of evapo-transpiration. Crop water requirements. Design of: lined and unlined canals, waterways, head works, gravity dams and spillways. Design of weirs on permeable foundation. Types of irrigation system, irrigation methods. Water logging and drainage, sodic soils.

4. ENVIRONMENTAL ENGINEERING

Water requirements: Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, basic unit operations and unit processes for surface water treatment, distribution of water. Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment Unit operations and unit processes of domestic wastewater, sludge disposal.

Air Pollution: Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits.

Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

Noise Pollution: Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.

5. TRANSPORTATION ENGINEERING

Highway Planning: Geometric design of highways, testing and specifications of paving materials, design of flexible and rigid pavements.

Traffic Engineering: Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity.

6. SURVEYING

Importance of surveying, principles and classifications, mapping concepts, coordinate system, map projections, measurements of distance and directions, leveling, theodolite traversing, plane table surveying, errors and adjustments, curves.

7. CONSTRUCTION PLANNING AND MANAGEMENT

Bar Chart, CPM, PERT, Estimating and Costing.

**SYLLABUS FOR THE RECRUITMENT TEST TO THE POST OF
ASSISTANT ENGINEERS (ENVIRONMENT)**

Total

- 300 Marks

Duration - 3 Hours

General Studies

- 60 Marks

Technical Paper

- 180 Marks

Personal Interview

- 60 Marks (for short listed candidates only).

General Studies : (60 Marks) - General English, General Knowledge, Aptitude.

Technical Papers: (180 Marks)

1. ENVIRONMENTAL CHEMISTRY & MICROBIOLOGY

Components, natural cycles of matter in the environment, Kinds of microorganisms, Applications of principles of chemistry for solving Environmental Engineering Problems. Combustion related air pollution, global environmental problems, Biodegradation.

2. AIR POLLUTION AND CONTROL ENGINEERING

Global implications, Classification of air pollutants, Effects of air pollutants, Ambient air quality and standards, Design of gravitational settling chamber, Air pollution control & control devices for particulate contaminants.

3. SOIL AND WATER CONSERVATION ENGINEERING

Soil conservation, Soil erosion, Methods of soil erosion control, water conservation, Flood management.

4. HEALTH SAFETY AND ENVIRONMENT

Fire hazards, fire safety, Protection & prevention measures of accidents & hazards. Industrial risk & Disaster management.

5. EARTH AND ENVIRONMENT.

Major environmental concerns; natural hazards and processes, dams and environment, channelisation and environment, global climate and hazards,

6. ENVIRONMENTAL POLICY & LEGISLATION

The public Liability Insurance Act and Rules on water, air, environment, Municipal solid waste act/rule, Bio-medical waste act/rule-2004,

7. ENVIRONMENTAL ECONOMICS

Economy and Environment, Economic Incentive and Environmental Protection, Pollution Taxes, Tradable Pollution Permits, Transboundary pollution problem, international organizations for environmental protection.

8. ENVIRONMENTAL IMPACT ASSESSMENT AND AUDIT

Environmental Impact Assessment planning, Activities, Role of Regulatory agencies & control boards, Role of the Public, Environmental Audit, Pollution prevention and control laws & acts, Guidelines of preparation of project report and its evaluation, methods of clearance from the concern authorities at various labels.

9. DISASTER MANAGEMENT

Natural Hazards and Disasters. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Man induced hazards & Disasters, Emerging approaches in Disaster Management, Natural Disaster Reduction & Management.

10. INTEGRATED IMPACT ASSESSMENT

Introduction & an Overview of IIA Defining IIA; Biodiversity and Health Impact Assessment, Handling Social Issues: the SIA Approach

11. ENVIRONMENTAL RISK ASSESSMENT

Environmental Risk, environmental risk management, Models, boundaries and contexts, Selection of techniques, environmental monitoring and health surveillance, Risk evaluation and national policies

12. ENVIRONMENTAL SYSTEM SIMULATION

Surface Water Quality Modeling

13. WATER RESOURCES ENGINEERING

Water Resources planning and management, Assessment of surface water resources of India, Intra & interbasin development concepts .

14. INTEGRATED WATERSHED MANAGEMENT

Water harvesting, land management.