

I/2194/2022

F.No. ADMN-41019/3/2021-ADMN

**GOVERNMENT OF INDIA
NORTH EASTERN COUNCIL SECRETARIAT
MINISTRY OF DEVELOPMENT OF NORTH EASTERN REGION
NONGRIM HILLS :: SHILLONG - 793 003.**

Sub: Written Test for engagement as Consultant (Civil Engineering) on contract basis in the NEC Secretariat, Shillong.

With reference to this office Advertisement File No.ADMN-41019/3/2021-ADMN dated 15th November, 2021, it is to inform that written test for Consultant (Civil Engineering) will be held on 19th March, 2022 from 10.00 AM to 12.00 Noon at NIT Meghalaya, Bijni Complex, Laitumkhrah, Shillong-793003.

The details of the eligible candidates along with Roll Numbers, the General Information for the exam, the blank Admit Card are attached herewith.

All the candidates are requested to bring the Admit Card duly filled up the details therein at the time of examination failing which the candidate will not be allowed to enter the examination hall. No TA/DA will be paid for the purpose of appearing the exam.

Signed by L Beimopha

Date: 28-02-2022 10:55:23

(L. Beimopha)

Deputy Secretary (Admin)

U.O. No. ADMN-41019/3/2021-ADMN









Dated: the 28th February, 2022

To,









Sr. Technical Director, NIC, NEC for necessary action for uploading in NEC website.

List of eligible candidates for written test examination to be held on 19th March, 2022 at NIT Meghalaya from 10.00A.M to 12.00 Noon in the field of Consultant (Civil Engineering) on contractual basis in NEC

Sl. No.	Name of candidate with Date of Birth	Photo of the Candidate	Roll No.
1	2	3	4
1	Mr. Ajay Langstang DOB: 30-12-1995		1
2	Ms. Gifty Alba Nongtdu DOB: 12-06-1994		2
3	Mr. Mainkumar Kharbuki DOB: 19-08-1994		3
4	Ms. Magreen Kharbhih DOB: 06-11-1989		4
5	Ms. Henafiducia H Bareh DOB: 28-01-1993		5
6	Mr. Mohit Abishek DOB: 28-12-1995		6
7	Mr. Raynold Marwein DOB: 03-09-1993		7

Sl. No.	Name of candidate with Date of Birth	Photo of the Candidate	Roll No.
8	Ms. Mebadashisha Marbaniang DOB: 25-05-1994		8
9	Ms. Graceful Khyllait DOB: 23-01-1994		9
10	Mr. Tennyson Shylla DOB: 23-04-1994		10
11	Mr Thoithoiba Nongthombam DOB: 01-02/1995		11
12	Mr. Subankar Sarkar DOB: 26-10-1995	 <small>Subankar Sarkar 14092021</small>	12
13	Mr. Saurav Bhattacharjee DOB: 22-12-1993		13
14	Mr. Prabir Kumar Talukdar DOB: 06-05-1990	 <i>Prabir K. Talukdar</i>	14
15	Ms. Jereen Cindy K Marwein DOB: 11-01-1993	 <i>J. Marwein</i>	15

Sl. No.	Name of candidate with Date of Birth	Photo of the Candidate	Roll No.
16	Mr. Successful Myria DOB: 03-12-1992		16
17	Mr. Lashanlang Rynjah DOB: 11-12-1993		17
18	Mr. Stevenly Lyngdoh Tron DOB: 19-11-1994		18
19	Mr. Khrawlang Khongsit DOB: 07-10-1994		19
20	Ms. Aibanecia Marwein DOB: 03.07.1995		20
21	Mr. Mebanphira Marbaniang DOB: 26-03-1995		21
22	Mr. Donly S. Kharnaior DOB: 07-11-1995		22
23	Mr. Banteikupar Syiemlieh DOB: 17-08-1995		23
24	Ms. Haphishisha Iongdhar DOB: 07-01-1995		24

Sl. No.	Name of candidate with Date of Birth	Photo of the Candidate	Roll No.
25	Mr. Artreki Tariang DOB: 21-04-1993		25
26	Mr. Risukka Nellie Pyrbot DOB: 22-01-1995		26
27	Mr. Khrawbok Savio Marbaniang DOB: 13-10-1995		27
28	Mr. Ibankerlang Kharsynteng DOB: 29-06-1995		28
29	Mr. Banteilang Marbaniang DOB: 29-07-1993		29
30	Mr. Easterlang Rymbai DOB: 23-06-1992		30
31	Ms. D. Wasambhasaka Rymbai DOB: 30-03-1990		31
32	Mr. Neil Patrick Diengdoh DOB: 18-04-1993		32

Admit Card

ROLL NUMBER	
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Self Attested Recent passport Photograph to be pasted

1. Post Applied For : Consultant (Civil Engineering)
2. Name of the candidate :
3. Father's Name :
4. Mother's Name :
5. Full Address :
6. Category :
7. State :
8. e-mail & Mobile No.
9. Venue of the examination : **NIT Meghalaya, Bijni Complex, Laitumkhrah, Shillong-793003.**
10. Date of Examination : **19th March, 2022.**

SOP and Instructions to the Candidates

1. **Candidates' are advised to report NIT Meghalaya sharply at 9.30 AM.**
2. **Admit card and body temperature will be checked at the gate.**
3. **Physical distancing of at least 6 feet to be followed as far.**
4. **Use of face covers/masks is mandatory.**
5. **Spitting shall be strictly prohibited.**
6. **Use of mobile phone and written materials are not allowed to carry inside the NIT Meghalaya.**
7. **Candidates have to bring their own writing tools like blue ballpoint pen and calculator.**

General Information for the Written Examination for the post of Consultant in the field of Civil Engineering

Venue: National Institute of Technology Meghalaya, Bijni Complex, Laitumkrah, Shillong 793003
Date & Time: 19th March 2022 & 10.00 AM-12.00 PM

1. Syllabus

Section 1: Structural Engineering

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Kinematics of point mass and rigid body; Centre of mass; Euler's equations of motion; Impulse-momentum; Energy methods; Principles of virtual work.

Solid Mechanics: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Construction Materials and Management: Construction Materials: Structural steel - composition, material properties and behaviour; Concrete - constituents, mix design, short-term and long-term properties; Bricks and mortar; Timber; Bitumen. Construction Management: Types of construction projects; Tendering and construction contracts; Rate analysis and standard specifications; Cost estimation; Project planning and network analysis - PERT and CPM.

Concrete Structures: Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete; Analysis of beam sections at transfer and service loads.

Steel Structures: Working stress and Limit state design concepts; 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.

Section 2: Geotechnical Engineering

Soil Mechanics: Origin of soils, soil structure and fabric; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Darcy's law; Seepage through soils - two-dimensional flow, flow nets, uplift pressure, piping; Principle of effective stress, capillarity, seepage force and quicksand condition; Compaction in laboratory and field conditions; One- dimensional consolidation, time rate of consolidation; Mohr's circle, stress paths, effective and total shear strength parameters, characteristics of clays and sand.

Foundation Engineering: Sub-surface investigations - scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes - finite and infinite slopes, method of slices and Bishop's method; Stress distribution in soils - Boussinesq's and Westergaard's theories, pressure bulbs; Shallow foundations - Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations - types of piles, dynamic and static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.

Section 3: Water Resources Engineering

Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth.

Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow.

Hydrology: Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, flood estimation and routing, reservoir capacity, reservoir and channel routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's law.

Irrigation: Duty, delta, estimation of evapo-transpiration; Crop water requirements; Design of lined and unlined canals, head works, gravity dams and spillways; Design of weirs on permeable foundation; Types of irrigation systems, irrigation methods; Water logging and drainage; Canal regulatory works, cross-drainage structures, outlets and escapes.

Section 4: Environmental Engineering

Water and Waste Water: 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, effluent discharge standards. Domestic wastewater treatment, quantity and 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.

Section 5: Transportation Engineering

Transportation Infrastructure: Highway alignment and engineering surveys; Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments; Geometric design of railway track; Airport runway length, taxiway and exit taxiway design.

Highway Pavements: Highway materials - desirable properties and quality control tests; Design of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible pavement using IRC: 37-2012; Design of rigid pavements using IRC: 58-2011; Distresses in concrete pavements.

Traffic Engineering: Traffic studies on flow, speed, travel time - delay and O-D study, PCU, peak hour factor, parking study, accident study and analysis, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Control devices, signal design by Webster's method; Types of intersections and channelization; Highway capacity and level of service of rural highways and urban roads.

Section 6: Geomatics Engineering

Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves.

Photogrammetry - scale, flying height; Remote sensing - basics, platform and sensors, visual image interpretation; Basics of Geographical information system (GIS) and Geographical Positioning system (GPS).

2. Exam Pattern

S. No	Question paper pattern	Exam Date & Timing	Total marks
1	50 number of objective type questions	19 th March 2022 & 10 AM to 12 PM [2 hour]	100

*No negative marking

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