भारतीय पेट्रोलियम और उर्जा संस्थान
INDIAN INSTITUTE OF PETROLEUM AND ENERGY

ADVT. NO.: IIPE/NTS/02/2021-22 DATED 04TH JUNE, 2021

SCHEME OF THE EXAMINATION
FOR THE POSTS OF
TECHNICIAN, TECHNICAL ASSISTANTS, LAB ASSISTANTS &
SECRETARY TO REGISTRAR

The Examination will be conducted in TWO stages

Stage-1 : Written Examination (Part-A & Part-B);

Stage-2 : Skill/ Trade Test.

Scheme of Stage 1 & Stage-2 Examinations:

Stage	Part	Subject	Number of Questions	Maximum Marks	Total Marks	Time allowed
Stage-1	Part-A	General Intelligence & Reasoning	10	10	75	150 Minutes
		Quantitative Aptitude	10	10		
		General Awareness	10	10		
		General English	10	10		
		Computer Awareness	10	10		
	Part-B	Specific Domain (work related) Knowledge	25	25		
Stage – 2	Skill/ Trade Test	Work Related Knowledge	-	25	25	-
Total Marks					**100**	

Note : For VH/ OH (afflicted with Cerebral Palsy/ deformity in writing hand will be considered for extra time.

Stage-1 Written Examination paper will consist of Objective Type, Multiple choice questions. The questions will be set in English only. There will be no negative marking for wrong answer.

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INDICATIVE COMMON SYLLABUS FOR STAGE – 1(PART-A)

WRITTEN EXAMINAITON

(COMMON FOR ALL POSTS: TECHNICIAN, TECHNICAL ASSISTANTS, LAB ASSISTANTS & SECRETARY TO REGISTRAR)

General Intelligence & Reasoning: It would include questions of both verbal and non-verbal type. This component may include questions on Directions, Cubes and Dice, Arithmetical Reasoning, Mirror & Water Images, Embedded Figures etc., Problem Solving, Blood Relations, Number Ranking, Syllogistic Reasoning, Analogies, Visual Memory, Non-Verbal Series, Coding-Decoding, Judgment, Decision Making, Clocks & Calendars, Number Series, Alphabet Series, Venn Diagrams, Statements & Conclusions, Statements & Arguments, Critical thinking, Emotional Intelligence, Social Intelligence.

Quantitative Aptitude: The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of Number Systems, Time and Distance, Allegation or Mixture, Height and Distance, Volume and Surface Area, Ratio and Proportion, Boats and Streams, Simple Interest, Probability, Problems on H.C.F & L.C.M, Pipes and Cistern, Simplification, Square Root and Cube Root, Compound Interest, Clocks & Calendars, Data Interpretation, Area, Problems on Ages, Partnership, Logarithm, Surds and Indices, Chain Rule, Blood Relations, Average, Permutation and Combination, Decimal Fraction, Time and Work, Profit & Loss, Percentages, Trigonometry

General Awareness: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him/her and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India especially pertaining General Polity, Indian Constitution, History, Art & Culture, Geography, Economic Scene, Books, Sports and Games, Awards and Honors.

General English: Candidates' ability to understand correct English, his/ her basic comprehension and writing ability, etc. would be tested. The scope of the test will be on Comprehension passage, Para Completion, Fill in the blanks, Passage Completion, Antonyms, Active Voice and Passive Voice, Direct & Indirect Speech, Idioms and Phrases, Substitution, Spotting Errors, Sentence Improvement, Sentence Completion, Prepositions, Joining Sentences, Synonyms, Sentence Arrangement, Spot the error, Detecting Mis-spelt words.

Computer Awareness : Questions in this component will be aimed at testing the candidates' basic knowledge on use of computers such as Basics of Hardware and Software, Windows Operating System Basics, Internet Terms and Services, Basic Functionalities of MS-Office (MS-Word, MS-Excel, MS-PowerPoint), History of Computers, Networking and Communication, Database Basics, Basics of Hacking, Security Tools and Viruses.

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SYLLABUS FOR STAGE – 1(PART-B)
DOMAIN SPECIFIC (WORK RELATED) KNOWLEDGE
WRITTEN EXAMINAITON

Post No.	Name of the Post	Indicative Syllabus
Post No. 3	Technician	Basic Electrical System & UPS knowledge, soldering, welding; High Pressure Cylinder Safety; Fire safety and prevention; Handling potentially dangerous substances (acid, highly flammable gas and crude oil etc); Basic idea about pump, compressor, valve, high pressure gas regulator, bearing, pressure gauge; Hydraulic Fracturing; Knowledge about fabrication with metal, glass, acrylic; Mechanical fitting, connection, calibration of instruments.
Post No. 4	Technical Assistant (Academic/ Administration/ & Procurement)	VII CPC Academic & Non Academic Pay Levels, Pay Scale Fixation, DA, Increments, HRA, Transport Allowance, Travelling Allowance, LTC, CEA,CGHS, Conduct Rules, DPC, Discipline Rules, Income Tax, Leave Rules, Medical Attendance Rules, Reservations and Concessions in Appointments, Service Record & other Service conditions, RTI Act, Office Procedures. GFR, Tendering, Public Procurement System, GeM & CPPP Procedures, Contract Management, Inventory Management, Hiring of Outsourced Services,. Act, Statutes & Ordinances, Role and functions of Board of Governors, Senate, Finance Committee,, BWC Committee of IITs System/ IIPE. Grade Point System, CGPA/SGPA, National Policy on Education, Higher Education System in India, Regulatory Bodies in Higher Education and Educational Statistics.
Post No.5	Lab Assistant (Mechanical Engineering)	Engineering Drawing, Machine Drawing, CAD/CAM Basics, Manufacturing processes: Machining process (Turning, shaping, drilling, Milling and grinding), Fabrication, Casting, forging, rolling, drawing, extrusion, press tool work, plastic moulding and powder metallurgy, Joining Processes: Welding, brazing and crimping Semi-finishing and finishing processes, Bolted and riveting joints, Machine tools Jigs and Fixtures.

Post No. 5	Lab Assistant (Chemical Engineering)	**Fluid Mechanics**: Properties of fluids, Flow through pipeline systems, Frictional loss, Flow meters, pumps and compressors, Weirs, fluidization. **Mechanical Operations**: Size reduction, Bonds law, Rittingers law and Kicks Law, Size analysis, Free and hindered settling, cyclones, centrifuge, filtration, froth flotation. **Heat transfer**: Steady and unsteady conduction, convection, radiation, Evaporation, condensation, heat exchangers. **Mass transfer**: Fick's law, Distillation, Adsorption, Absorption, Extraction, drying, humidification. **Process control**: Response of first order and second order systems, Block diagrams, Open loop and closed loop transfer function, P, PI, and PID controllers, tuning of controllers using Cohen and Coon, and Ziegler Nichols. Stability analysis of open and closed loop transfer functions, frequency response, feedforward control. **Reaction Engineering**: Theories of reaction rates, single and multiple reactions in Ideal reactors; Non-ideal reactors, RTD studies, heterogeneous reactions.
Post No.5	Lab Assistant (Petroleum Engineering)	**Reservoir Engineering**: Permeability, Porosity, surface tension, contact angle, Rheology, safety norms related to high pressure equipment & cylinders., core plugging. **Drilling Fluid**: Formulation of drilling fluids. Properties of drilling fluids, fracturing fluid, emulsions, API recommended procedures. **Production Engineering**: BS&W in crude oil, dew point, phase separation, multiphase flow in pipe, core flooding, boiling point curve for crude oil, crude oil properties, viscosity, emulsions, analysis of produced brine, calorific analysis of natural gas, total acid number, measurement of flow rate, pump & compressor.

Post No.5	Lab Assistant (Earth Sciences)	Stress-Strain measurements, Elastic Properties and Strengths of Rock, Assessment of localized defects, determination of crack depth, measurements of P&S-wave, velocities and estimation of dynamic elastic properties and compressive strength, Petrology, Proppant transport, Rock fracturing, fracturing fluid, Structure contour mapping, isopach mapping, cross-sections; software for mapping and well, well log.
Post No.5	Lab Assistant (Computer Science)	C Programming; Data Structures and Algorithms; Computer Organization & Architecture; Operating Systems; Computer Networks; Databases; Network Administration; Web development; Windows/Linux System Administration.
Post No. 6	Secretary to Registrar	Office Procedures; Noting & Drafting Skills; Types of correspondence; Precedence of Correspondence & Handling of Correspondence; Record Management & Retention schedules; Channel of Correspondence with various Govt. Agencies; Parliamentary Procedures; Starred/ Unstarred Questions (Lok Sabha & Rajya Sabha); RTI Act; Board, Senate, BWC & Finance Committee in IITs System/ IIPE; Email Etiquettes; Telephone Etiquettes.

STAGE -2 : SKILL/ TRADE TEST

Post No.	Name of the Post	Indicative Syllabus
Post No. 3	Technician	Soldering, Welding, fittings Identifying setup based on line/ Schematic diagram Analyse connections of petroleum engineering related lab equipment such as permeameter, porosimeter; Hydraulic fracturing and proppant transport setup.
Post No. 4	Technical Assistant (Academic/ Administration/ & Procurement)	Use of Computer applications such as MS Word, MS Excel, MS Power Point; Typing Skills; Letter Drafting Skills (on computer); Short Essay on work related topics (on computer).

Post No.5	Lab Assistant (Mechanical Engineering)	The applicant should have through knowledge in 2D and 3D modelling. Candidates must show their skill set by creating a given 3d/2d model in Solid Works. Candidate may be asked to prepare a job based on various machining and manufacturing process. Use of MS word, excel etc.
Post No. 5	Lab Assistant (Chemical Engineering)	Experiment/ practical concept related to any one of the following subjects/ labs (i) Fluid Mechanics (ii) Heat Transfer (iii) Mechanical Operations (iv) Mass Transfer (v) Process Control (vi) Chemical Reaction Engineering
Post No.5	Lab Assistant (Petroleum Engineering)	Experiments/practical concepts related to the followings: (i) Drilling fluids (determination of viscosity, density, preparation of samples, sand content); (ii) Determination of thickening time of cement slurry; (iii) Petroleum Production (determination of rheology, Core flooding, determination of water content, pH, TDS, calorific value, dew point; centrifuge, multiphase flow); (iv) Reservoir Engineering (core plugging, removal of core samples from permeameter, core flooding, IFT, measurement of core dimensions, porosity determination); Preparation & maintenance of records, stock register, safekeeping of chemicals & glassware, equipment. Use of MS word, excel.
Post No.5	Lab Assistant (Earth Sciences)	Experiments/practical concepts related to the followings: Test procedures and determination of RQD of rocks, Protodyaknov index of a given rock sample, point load index strength of a given rock sample, porosity of rocks, uniaxial compressive strength and elastic properties, tensile strength of a given rock sample using Brazilian method, shear strength of rocks, modulus of elasticity of given rock sample using strain gauge, triaxial strength of rock and drawing of Mohr's envelope, slake durability of rocks and drillability index of rocks. Sample preparation of the above tests and Rock Thin Sections, knowledge related to software, contour map, geological map. Preparation & maintenance of records, stock register, safekeeping of chemicals & glassware, equipment. Use of MS word, excel and power point.

Post No.5	Lab Assistant (Computer Science)	Programming and Debugging Skills in - structural languages (C) - Object-oriented languages (Python/Java); Implementing/Using basic data structures (arrays, linked lists, stacks, queues, trees); Command over Windows, Linux environments; Network Troubleshooting; Database Management;
Post No. 6	Secretary to Registrar	Use of Computer applications such as MS Word, MS Excel, MS Power Point; Typing Skills; Letter Drafting Skills (on computer); Short Essay on work related topics (on computer).

Note:- The questions will be selected from any or all the topics listed above and the answers to the questions will be solely based on the contents in standard material commonly available.

Date: June, 2021

Registrar (I/c)