भारतीय प्रौद्योगिकी संस्थान भुवनेश्वर
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File No: 2-2/2023- Estt. Date: 15/05/2023

NOTICE

The undersigned is to convey that the Competent Authority has given approval to commence the process of Limited Departmental Examination (LDE) for the following Gr- B & C (Technical) employees as per the provision stated in RPP-2021.

Accordingly, Written / Trade / Skill Test shall be conducted on 22/05/2023 (Monday) from 09.30. AM onwards and interaction /interview from 2.30 P.M. onwards for the following eligible Technical employees:

Junior Technical Superintendent - (Pay Level- 6), Group- B

Sl. No.	Emp. Code	Name of the Employee	Dept. / Section / School
1	190014	Shri Pratap Gudesenapalli	School of Earth, Ocean & Climate Science
2	190015	Shri Sushanta Sahoo	School of Electrical Sciences
3	190017	Shri Vidya Sagar Vajja	Central Research Instrumentation Facility
4	190029	Shri Ramakrishna Pantangi	School of Minerals, Metallurgical and Materials Engineering

Senior Library Information Assistant - (Pay Level- 6), Group- B

Sl. No.	Emp. Code	Name of the Employee	Dept. / Section / School
1	190007	Shri Dillip Kumar Parida	Central Library

Physical Training Instructors - (Pay Level- 6), Group- B

Sl. No.	Emp. Code	Name of the Employee	Dept. / Section / School
1	170009	Smt. Sunita Verma	Gymkhana
2	170011	Shri Biswajit Pegu	Gymkhana

Technician - (Pay Level- 5), Group- C			
Sl. No.	**Emp. Code**	**Name of the Employee**	**Dept. / Section / School**
1.	140004	Shri Dillip Kumar Biswal	School of Electrical Sciences
2.	140005	Shri Birata Keshari Nanda	School of Electrical Sciences
3.	140020	Shri Raimohan Behera	School of Electrical Sciences
4.	140027	Shri Bikram Ranjan Behera	School of Electrical Sciences
5.	140023	Shri Dillip Kumar Sahoo	School of Mechanical Sciences
6.	140010	Shri Sunil Kumar Pradhan	School of Mechanical Sciences
7.	140012	Smt. Akasmika Sarangi	School of Infrastructure

Lab Assistant- (Pay Level- 5), Group- C			
Sl. No.	**Emp. Code**	**Name of the Employee**	**Dept. / Section / School**
1.	140006	Shri. Samir Kumar Jena	School of Basic Sciences

1. Candidate must report at **9.00 A.M.** sharp at the respective School Head Office, failing which the candidate will not be allowed to appear in the Examination.
2. School / Department-wise Syllabus for the above positions are attached at Annexure-I to IX.

Deputy Registrar (Estt.)

Annexure- I (A)

School / Department	Syllabus
School of Electrical Sciences **Discipline:** (Electronics & Communication Engineering)	**Part-A: Written Syllabus (*for* 25 Marks):** **Unit-I: ELECTRONIC DEVICES AND CIRCUITS** Semiconductor diodes – Varactor diode – Zener diode – Clippers and Clampers- Transistors– FETs – UJT (characteristics only) – Power supplies – Rectifiers and Filters, Transistor amplifiers, Biasing techniques – Stabilization in amplifiers, Stability factor, Differential amplifier – Feedback, Power and Tuned amplifiers - LC and Crystal oscillators – Operational amplifiers **Unit-II: CIRCUIT THEORY** Ohms' Law, KCL & KVL-Mesh current and Node voltage analysis –- Constant K LPF & HPF – T type & π type Attenuator – Network theorems– Star to Delta and Delta to Star transformations. Series and Parallel Resonance – Transient analysis-RC and RL, Linear wave shaping circuits. Transmission Lines **Unit-III: COMMUNICATION SYSTEMS** Analog modulation– Need for modulation – Types of modulation – AM, FM , PM, SSB, VSB – Modulation Index in AM & FM– Bandwidth in AM & FM – Frequency deviation in FM – Need for pre-emphasis and de-emphasis– Transmitters –Antennas –Wave Guides –Microwave components, Satellite communication – Uplink and Downlink frequencies **Unit-IV: DIGITAL ELECTRONICS** Number systems – Logic gates – Boolean algebra – Digital IC logic families TTL , CMOS IC's – Adders and Subtractors, Multiplexers, De multiplexers-Encoders-Decoders, Comparators – Flipflops– Registers and Counters – Memories –D/A converters – Binary weighted,R-2R Ladder, A/D Converter **Unit-V: MICROCONTROLLERS, PROGRAMMING, INTERFACING & APPLICATIONS** Block diagram of 8051 Architecture – Pin diagram of 8051 – Instruction Set of 8051 – Addressing modes of 8051 – Subroutines – Use of input and output machine related statements – Time delay program – Internal memory organization – Interrupts of 8051 – Peripheral ICs – 8255 - Interfacing. **<u>Part-B-Skill Test Syllabus (*for* 25 Marks):</u>** 1. Testing, troubleshooting, and repairing of standard equipment like power supplies, function/signal generators, DSO, CRO etc., 2. Experiments related to the BTech(ECE) Lab at IIT Bhubaneswar in the area of MICROCONTROLLERS, PROGRAMMING, INTERFACING & APPLICATIONS. 3. Experiments related to the BTech(ECE) Lab at IIT Bhubaneswar in the area of DIGITAL ELECTRONICS. 4. Experiments related to the BTech(ECE) Lab at IIT Bhubaneswar in the area of COMMUNICATION SYSTEMS. 5. Experiments related to the BTech(ECE) Lab at IIT Bhubaneswar in the area of CIRCUIT THEORY. 6. Experiments related to the BTech(ECE) Lab at IIT Bhubaneswar in the area of ELECTRONIC DEVICES AND CIRCUITS.

Annexure- I (B)

School / Department	Syllabus
School of Electrical Sciences **Discipline:** (Electrical Engineering)	**Part-A: Written Syllabus (*for* 25 Marks):** **1. Basic Electrical Engineering** DC Circuits; A.C Fundamental and circuits; Superposition, Thevenin's and Norton Theorem; Maximum Power Transfer Theorem; 3-ph circuits. **2. Electric Machines** DC Generators; DC Motors; Single Phase Transformer; Auto Transformers; 3-Ph transformer; 1-ph & 3-ph Induction Motor; Synchronous Motor; Alternator. **3. Electrical Measurement & Instrumentation** Measuring instruments; Analog ammeters and voltmeters; Wattmeter and measurement of power; Energy meters and measurement of energy; Measurement of speed, frequency and power factor; Measurement of Resistance, Inductance& Capacitance. **4. Electronics** p-n junction diode; rectifier circuits & filters; transistors; operational amplifiers. **5. Control System Engineering** Mathematical model of a system; Block diagram algebra & signal flow graphs; Time response analysis. **6. Power System** Line Parameter; Overhead lines; Performance of short & medium lines; Underground cable; Power Factor Improvement; Types of tariff; Fuses; Circuit breakers; Protective relays. **Part-B-Skill Test Syllabus (*for* 25 Marks):** 1. Testing, troubleshooting, and repairing of standard equipment like power supplies, auto transformer, rheostat, voltmeter, ammeter, wattmeter etc.., 2. Experiments related to the BTech(EE) Lab at IIT Bhubaneswar in the area of Electrical Machines. 3. Experiments related to the BTech(EE) Lab at IIT Bhubaneswar in the area of Power Electronics. 4. Experiments related to the BTech(EE) Lab at IIT Bhubaneswar in the area of Measurement & Electronic Instruments. 5. Experiments related to the BTech(EE) Lab at IIT Bhubaneswar in the area of Control Systems. Experiments related to the BTech(EE) Lab at IIT Bhubaneswar in the area of Power Systems.

Annexure- II	
School / Department	**Syllabus**
School of Infrastructure	Soil classification, Atterberg's limits of soil, gradation of soil, laboratory tests of permeability of soil. Compaction tests, field compaction tests, strength tests of soil, Quality control of concrete, concrete mix design, tests on workability of concrete, tests on quality of concrete.

Annexure- III

School / Department	Syllabus
School of Mechanical	**Machining operations** (Lathe, Milling, drilling, shaping, EDM, ECM, CNC machining) **Casting process** (fundamentals and different types of casting methods) **Welding processes** (fundamentals and different welding methods, gas welding, TIG welding, MIG welding) **Heat transfer:** conduction, convection and radiation; Fins: Rectangular and pin fins; Fin effectiveness and efficiency; Biot number; **Convection**: Introduction, Newton's law of cooling, Concept of natural and forced convection; **Radiation**: Laws of radiation, definition of black body, intensity of radiation, emissivity, reflectivity, transitivity; **Heat Exchangers**: Types of heat exchangers, parallel and counter flow types. **Refrigeration:** Refrigerant; COP; components; Vapour Compression system: components, working &applications; **Air conditioning:** Classification of Air-conditioning systems: Comfort and Industrial Air-Conditioning; Summer Air-Conditioning system, Winter Air-Conditioning system, Year-round Air-Conditioning system. **I.C. Engines:** Brief description of Carnot, Otto and Diesel cycles; Internal and external combustion engines; Classification of I.C. engines; Knowledge of important parts and their functions, Comparison of two stroke and four stroke engines; Comparison of C.I. and S.I. engines; Valve timing and port timing diagrams for four stroke and two stroke engines; Brake power; Indicated power; Frictional power; Concept of means effective pressure and specific fuel consumption; Brake and Indicated thermal efficiencies; Mechanical efficiency. **Properties of fluid:** Density, Specific gravity, Specific Weight, Specific Volume, Dynamic Viscosity, Kinematic Viscosity, Surface tension, Capillarity, Vapour Pressure, Compressibility; **Fluid Pressure &** **Pressure Measurement:** Fluid pressure, Pressure head, Pressure intensity, Concept of vacuum and gauge pressures, atmospheric pressure, absolute pressure, Simple and differential manometers; Types of fluid flows; Continuity equation; Bernoulli's theorem; Principle of Venturimeter, Orifice Meter and Pitot Tube; cavitation.

Annexure- IV

School / Department	Syllabus
School of Basic Sciences **Discipline :** Physics	1. **Waves and oscillation:** Simple pendulum, Coupled pendulum, Damped harmonic oscillation, Forced Oscillation, Superposition of waves 2. **Optics:** Reflection, Refraction, Interference, Diffraction, Polarization, Laser 3. **Modern physics:** Photoelectric effect, de Broglie hypothesis, Wave-particle duality, Uncertainty principle, Zeeman effect

Annexure- V

School / Department	Syllabus
School of Minerals, Metallurgical and Materials Engineering	Material processing (including sand metal casting, permanent mould casting, powder metallurgy, heat treatment and other plastic deformation processing like rolling, forging etc.), Material testing (including universal tensile testing, hardness testing, impact testing etc.), Sample preparation (including metallography, etching, sample storage etc.), Basic optical microscopy and allied techniques, Basic working of furnaces like resistance furnace, induction furnace etc.

Annexure- VI

School / Department	Syllabus
Central Research Instrumentation Facility	1) Atomic Structure of Materials: Crystallography 2) Structure determination by X-ray Diffraction, Scanning Electron Microscopy and Transmission electron microscopy X-ray Diffraction: Bragg's Law, Reciprocal space, Ewald sphere construction, Diffraction analysis: Atomic scattering factors, scattering by the unit cell, Structure factor, diffraction intensities, X-diffraction methods- Powder diffraction, rotating single crystal method, Thin film analysis, Scherrer formula and grain size determination. Scanning Electron Microscopy: Fundamentals principles of SEM, sample preparation techniques, SE and BSE imaging modes, and X-ray mapping (EDS and WDS). Transmission Electron Microscopy: Wave properties of electron, electron-matter interactions, Ring patterns, spot patterns, Resolution limitation and lens aberrations sample preparation techniques. Thermal Analysis: Thermometric Titration (TT), Thermal Mechanical Analysis (TMA), Differential Scanning Calorimetric (DSC), Thermal Gravimetric Analysis (TGA), Differential Thermal Analysis (DTA).

Annexure- VII

School / Department	Syllabus
Central Library	• Library Management • Foundations of Library and Information Science • Library Automation • Information Sources, Systems and Services • Knowledge Organization • Information and Communication Technology • Library and Information System • Web designing • Digital Library, Knowledge management • General Knowledge • Current Affairs • Current Library Trends

Annexure- VIII

School / Department	Syllabus
Gymkhana	1. **Written Test Total Marks - 25** **Objective type questions on below topics** **MAJOR GAMES** Measurements, Equipment, Rules and regulations, Fundamental skills, and officiating of the following games and sports: **Cricket, Football, Badminton, Table Tennis, Tennis, Swimming, Squash, and Volleyball.** **SAFETY MEASURES, PREVENTION, AND MANAGEMENT OF INJURIES** Safety measures and prevention of sports injuries Management of sports injuries Causes and remedies for sports injuries Physiotherapy, rehabilitation, and massage First aid **SPORTS NUTRITION** Balanced Diet & Nutrition: Macro & Micro Nutrients Energy requirements of athletes in general and specific events Nutritional requirements of athletes: pre, during, and post-competition phases. Health related & Skill related fitness and its components. Obesity and its management. Energy system – ATP-PCr system. **SPORTS TRAINING** Meaning & Concept of Sports Training Principles of Sports Training Warming up & limbering down Training methods and specific training programme for development of various motor qualities. Training Load and periodization. Technical and Tactical preparation for sports short- term and long-term training plans. **ANATOMY AND PHYSIOLOGY** Concepts and meaning of anatomy and physiology. Physiology of muscular activity. Physiology of blood circulation. Physiology of respiratory system. **Skill and Fitness Test – 25 Marks** 2. Skill and Trades test on Particular Games and sports. 3. Physical Fitness test best on Performance. 1. 1000 meter Run 2. Overhead Medicine ball back throw. (3 kg Men) & (2 kg Women) 3. Standing Broad Jump.

Annexure- IX

School / Department	Syllabus
School of Earth Ocean & Climate Sciences	➢ Hard rock sample processing- Rock cutting, Thin section preparation, Ball mill operation ➢ ERT equipment maintenance and handling , Seismometer maintenance and handling, Gravimeter maintenance and handling ➢ Maintenance and stereo zoom & polarizing microscope & servicing ➢ Stock maintenance of chemicals & consumable ➢ Minerals and rock storage and inventory ➢ General trouble shoot, operation and maintenance of common equipment of wet geochemical laboratory, AMC, purchase order ➢ Geophysical survey, Data collection & demonstration ➢ Basic arrangement for geological & geophysical field visits ➢ Overall function of geochemical laboratory operation and maintenance of microwave digestion system, hot air oven, freeze dryer, coal palate preparation, grinding machine maintenance. ➢ Equipment purchase procedure thorough GEM. Preparation of technical bid & others relevant documents.