

Post name - Junior Engineer (Civil)

PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961
PART-2 (Subject Knowledge)	
6.	Civil Engineering
	1) Structural Engineering Mechanics: Bending moment and shear force in statically determinate beams, Simple stress and strain relationship, buckling of column, combined and direct bending stresses.
	2) Structural Analysis: Analysis of statically determinate trusses, arches, beams, displacements in statically determinate structures, Basic concepts of matrix methods of structural analysis.
	3) Concrete Structures: Concrete design- basic working stress and limit state design concepts, design of members subjected to flexure, shear, compression and torsion by limit state methods. Basic elements of pre-stressed concrete.
	4) 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. Rivet and Bolted Connections.
7.	Geotechnical Engineering
	1) Soil Mechanics: Origin of soils, soil classification, three-phase system, fundamental definitions, relationship and interrelationships, permeability & seepage, effective stress principle, consolidation, compaction, shear strength.
	2) Foundation Engineering: Sub-surface investigations- scope, drilling bore holes, sampling, penetration tests, plate load test. Stability of 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.
8.	Water Resources Engineering
	1) 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.
9.	Hydrology: Hydrologic cycle, rainfall, evaporation, infiltration, stage discharge relationships, unit hydro graphs, flood estimation, reservoir capacity, reservoir and channel routing. Well hydraulics.
10.	Irrigation: Duty, delta, estimation of evapo-transpiration, waterways, head works, gravity dams and spillways. Types of irrigation system, irrigation methods. Water logging and drainage.
11.	Environmental Engineering
	1) 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 waste water, sludge disposal.
12.	Transportation Engineering	
	1)	Highway Planning: Geometric design of highways, estimation, testing and specifications of paving materials, flexible and rigid pavements.
13.	Traffic Engineering: Traffic characteristics, theory of traffic flow, traffic signs and signal design, highway capacity.	
14.	Surveying: Importance of surveying, principles and classifications, mapping concepts, coordinate system, map projections, measurements of distance and directions, levelling, theodolite traversing, plane table surveying, errors and adjustments, curves.	
15.	Building Materials & Construction	
	1)	Construction Materials: Properties of concrete, basics of mix design, aggregates, admixtures; stones, bricks and flooring tiles; cement; cement mortars; damp-proofing and water proofing materials, termite proofing, paints, epoxy coatings and resins.
	2)	Building components and functions: Brick masonry, types of floors & roofs, ventilators, introduction to repairs and retrofitting in buildings. Building orientation, circulation, grouping of areas, privacy concept and concepts of energy efficient buildings; provisions of National Building Code, building estimates and specifications, cost of works, valuation.

Post name - Junior Engineer (E&M)

PART-1	
1	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उतान्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करुन शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961
PART-2 (Subject Knowledge)	
6.	Electrical Engineering
1)	Fundamentals of electrical engineering: DC/ AC series & parallel circuits, network theorems, transients in AC network, star delta transformation, solutions of balance & unbalance three phase circuits.
2)	Electrical machines : Basic Principles for Single / Three phase transformers, efficiency & regulation, parallel operations, auto transformers, single phase/three phase induction Motors & characteristics, motor starting methods, Control panels, Generators & AMF panels.
3)	Power systems: Basic power generation concept, transmission, distribution system & performance, cables, insulation coordination, power factor, power tariffs, fault analysis of symmetrical & unsymmetrical systems, sources of harmonics, power quality problems & mitigations.
4)	Electrical measurements : Measuring instruments, types, analog & digital measurements of voltage, current, power parameters, instrument transformers, functions & uses of multi-meters, megger, earth tester.
5)	LT distribution system : Layout of sub-station, selection for indoor & outdoor equipments, LT panel basic design, RMUs, compact sub-station, sizing, selection & erection of bus bars, MCBs, LT breakers, isolators, capacitors, lightning arresters, relays, CTs, cables, cable jointing, panel wirings, for different LT systems, earthing types and related Indian standards.
6)	Pumps & pumping system: Pumps types, performance characteristics & applications, efficient pumping system operation & maintenance, control valves & flow control strategies, energy conservation opportunities, pumping system for water/sewage/effluent, sizing of pumps, fans & compressors.
7)	Lighting system : Light source, choice of lighting, luminance requirement, energy conservation avenues, light emitting diodes, metal halides, fluorescent tube lights, compact fluorescent lights, street lighting, lighting system design for different installations, Knowledge of lifts/escalators, DGs, UPS, batteries, different technologies, specifications, sizing calculations, maintenance, testing & commissioning, industrial, residential & commercial installation wirings, safety measures according to relevant norms/codes.
8)	Switchgears & Protection : Circuit breakers, types, applications & testing of breakers, protective relays, Protection of transformers & generators, static relays, fuses etc.
9)	Energy Scenario: Indian & Maharashtra energy scenario. Conventional & non-conventional energy

		sources. Energy conservation act 2001 & its features, Electricity act 2003, safety regulation 2010, Schemes of Bureau of Energy efficiency, Indian Electricity rules 1956,
7		Mechanical Engineering
	1)	Internal combustion engine : Basic engine nomenclature, engine classification, working of engine, two stroke/four stroke, spark ignition/compression ignition engine, combustion of CI engine, ignition system, performance of SI & CI engine, cooling & lubrication system, fuel used, measurement of engine power,, specific fuel consumption, thermal efficiency.
	2)	Refrigeration & Air conditioning : Principles of refrigeration, system types, common refrigerants & properties, compressor types & application, selection of suitable refrigeration system, energy efficiency in refrigeration plant, energy saving opportunities.

Post name - Assistant

1	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961

Post name - Clerk Typist

1	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961

Post Name- Senior Accountant

PART-1	
1	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961
PART-2 (Subject Knowledge)	
6.	Financial Accounting
1)	Accounting as a financial information system
2)	Accounting Standards in India and international accounting standards (only outlines)
3)	Final Accounts.
4)	Depreciation accounting, Depreciation policies as per accounting standard.
5)	Accounts of non-trading institution.
6)	Partnership accounts.
7)	Advanced problems of company accounts.
8)	Amalgamation, absorption and reconstruction of companies.
9)	Valuation of shares and goodwill.
10)	Consolidated books of holding company with one subsidiary only.
11)	PWD Accounting system, Manual and code
12)	Taxation
13)	Corporate Finance
14)	Basic of Financial Management
15)	Basic of Project Finance
16)	Bank Reconciliation
7.	Cost Accounting
1)	Nature and functions of cost accounting
2)	Accountancy for material, labour and overheads
3)	Job costing and Contract costing
4)	Process costing
5)	Marginal Costing; Techniques of segregating, semi-variable costs into fixed and variable costs
6)	Cost-volume-profit relationship; aid to decision making including pricing decisions, shutdown etc.
7)	Techniques of cost control and cost reduction
8)	Costing of joint and by production. Reconciliation of cost and financial accounts
9)	Budgetary control, flexible budgets
10)	Standard costing and variance analysis.
11)	Responsibility accounting, investment, profit and cost centres.
8.	Auditing
1)	Considerations for commencing an Audit

	2)	Audit of cash transactions, expenses, incomes, purchases, sales.
	3)	Internal check system.
	4)	Valuation and verification of assets with special reference to fixed assets, stocks and debts
	5)	Verification of liabilities
	6)	Audit of limited companies; appointment, removal, powers, duties and liabilities of company auditor, significance of 'true and fair', MAOCARO report.
	7)	Auditor's report: Standard and qualified.
	8)	Special points in the audit of different organizations like clubs, hospitals, colleges, charitable institutes
	9)	Investigations of fraudulent activities
	10)	Audit Approach-EDP and mechanical systems
	11)	Social Auditing
9.	Business Finance	
	1)	Financial Analysis as a diagnostic tool.
	2)	Concepts of Valuation-Valuation of firm's Fixed Income, Securities and Common Stocks.
	3)	Dividend and Retention Policy-Residual Theory-Dividend Policy- Other Models- Actual Practices.
	4)	Capital Structure-Leverages-Significance of Leverages-Theories of Capital Structure with special reference to Modigliani and Miller approach. Planning the Capital Structure of a Company; EBIT-EPS Analysis, Cash-flow ability to service debt, Capital Structure Ratios, other methods, receivable agency

Post name - Steno (Lower Grade)

Post name - Steno (Lower Grade)	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961

Post name - Surveyor

Post name - Surveyor	
PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
5.	MIDC Syllabus
a	MID Act 1961
PART-2 (Subject Knowledge)	
ITI-Surveyor	
6.	Tools & Equipments, Scales, Geometrical Construction, Classification of Survey, Signs & Symbols, Compass Survey, Plane table Survey,

Post name - Driver (GR.II)

Post name - Driver (GR.II)	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

Post name - Peon / Helper

Post name - Peon / Helper	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

Post name - Technical Assistant (GR-II)

PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

PART-2 (Subject Knowledge)	
ITI-Technical Assistant	
1.	Importance of module, importance of safety, architect office organization. Code of practice for general and architecture drawing.
2.	Basic engineering drawing Use of drawing instruments and materials, lay out of drawing sheet, drawing conventional line according to IS code, Folding of sheet
3.	Importance of lettering, sizes proportion etc., as per BIS Dimensioning technic ,types of dimensioning Scales - recommended scales for drawing with reference to IS code, choice of scale
4.	Different types of line, and symbolic representation of Architectural material. Importance of using symbols of different fittings
5.	Introduction about building construction Types of buildings Structural system of building. Different parts of building Site selection Orientation and ventilation of building
6.	Main considerations of architectural design, Bye-law of the locality,Climate and its effects, Materials and method of its construction, People and their requirements.
7.	Building plans Introduction Types of plan Typical floor plan Foundation plan Structural plan Terrace plan
8.	Conventional symbols Construction materials Doors and windows Sanitary items Electrical items
9.	Introduction about Building Construction: Its importance, types of buildings, site selection of different types of buildings, Name the different parts of the building, orientation and ventilation of the building.
10.	Types of building materials, Solid material - brick, stone, iron, timber Brick- Size, classification, Uses, Stone- Size, classification, uses, Steel - Types of steel, varieties of steel, Timber- Uses of timber, Importance of timber in construction work.
11.	Cementing material, Cement - Uses, varieties grades, ingredients. Lime- Uses, varieties grades, ingredients. Mortar- Uses of mortar, preparation of mortar, ingredients in mortar, proportions in mortar.
12.	Protective material, Paint - uses, different types, ingredients. Varnish - uses, different types, ingredients. Plastering - purpose of plastering, proportion, curing ,purpose of curing, plastering method.
13.	Foundation Objects of foundation Requirements of a good foundation Types of foundation, Methods of setting out of foundation trench
14.	Masonry:- Types of masonry Tools used in masonry work Materials used in masonry work Different types of bond Arch and lintels
15.	Damp proof course Different materials used Causes of dampness Methods of damp proofing

16.	Flooring, Types of flooring material, Tools and instruments used, Types of floor finishings, Floorings suitable for different situations, Methods of laying.
17.	Units of measurement for different works in M.K.S. and F.P.S. system, conversion of units
18.	Measurements, Linear measurements, Angular measurements, Instruments used for taking measurements, Measurement of length by chain and tape, Calculation of area of a plot
19.	Levelling:- Purpose of surveying Principles of surveying Types of surveying Levelling instrument Types of levelling Methods of levelling Plotting level
20.	Estimating and costing, Need and importance, Types of estimate
21.	Items of work, Measurement of items, Calculation of quantities of various items
22.	Estimate of one room building by centre line method and separate wall method
23.	Technical terms in carpentry, Carpentry, Joinery, Planing, Moulding, Rebating, Chamfering, Sawing, Tools used in carpentry, Boring tools, Cutting tools, Hammers, Marking tools, Planing tools, Miscellaneous tools
24.	Classification of joints, Lengthening joint, Widening joint, Angle joint, Framing joint, Bearing joint
25.	Fastenings, Bolts, Conectors, Dogs, Nails, Pin, Screw, Sockets, Spikes, Straps Wedges
26.	Timber :- Uses of timber in construction work, Importance of timber in construction work, Different parts of structure of tree, Hard wood, soft wood - uses, Commonly used timber trees in construction work.
27.	Seasoning, Purpose of seasoning, Methods of seasoning, Preservation of timber Types of preservation, Application of preservatives, Causes of decay of timber.
28.	Wood products, Industrial forms of timber, Veneer, Laminated sheet, Fibre board Hard board, Plywood
29.	Familiarization with trade, safety precautions, first aid in electrical shop, fire accident, symbols and measuring unit of work, power, energy and force
30.	Basic electricity and its units Conductor insulator semi-conductor wires, cables, cable joint, wire joint, measurement of cable
31.	Fuses and its types, Rewriteable HRC fuse, MCB soldering ELCB, RCCB, ABCB, MCCB AC and DC, AC fundamentals, poly phase.
32.	Work, Power Energy, Force, Unit Introduction to electrical wiring Accessories, ISI rules of wiring Types of wiring
33.	Estimate and costing of wiring Fault finding
34.	Earthing , types of earthing
35.	Electrical appliances Care and maintenance Fault finding Illumination
36.	Explanation and working of different type of transformers and its classification
37.	Use of plumbing tools Materials used in plumbing - Ferrous , non ferrous and non- metal
38.	Different types pipes and fittings Joints, GI, PVC, AC,SW, CI, lead ,steel Properties and use in plumbing work
39.	Method of cutting and joining, Elbow joint, socket joint, Tee joint, reducing elbow joint, floor trap joint
40.	Water supply Sources of water Water requirements Purification Storage of water Distribution of water
41.	Different types of valves used in plumbing, Types of damages in taps , valves and water meter and tanks, Method of rectification
42.	Sanitary Technical terms - sewer, sewage, sullage etc. -Soil pipe and waste pipe fitting
43.	Different types of water closets Different types of urinal port Kitchen sinks Bath tub Wash basin
44.	Definitions and terms related to concrete technology Applications of concrete technology and modern trends
45.	Types of cement, relevant IS codes comparative study of their physical & chemical properties, significance of different properties, Hydration of cement Selection of cement, Storage of cement, Factors affecting strength of cement

	<p>Rejection of cement AGGREGATE, Classification (IS : 383), Grading, Characteristics (grading, fineness modules), Bulking of fine aggregate, Deleterious substances, Factors affecting strength of concrete WATER</p> <p>Quality, Water requirement for hydration & workability, Effect of impurities present in water ADMIXTURE, Meaning of terms, Functions, Classification</p> <p>Water proofing and permeability reducing admixture, CONSTRUCTION CHEMICALS, Interpretation of specifications manufactures, Meaning of terms</p> <p>Functions, Classification (IS : 4082), Water proofing and permeability reducing admixture</p>
46.	<p>Preparation of concrete, Methods used, merits and demerits of methods, tools and equipment used and precautions to be taken for the following processes :</p> <p>Batching, Mixing, Transportation, Placing, Compaction, Curing, Finishing, Strength & durability requirements (IS : 456 - 2000), Stripping of form work</p> <p>Application of Modern Power Tools</p>
47.	<p>Classification & specifications of concrete, Classification of concrete according to grade, weight & methods of mixing, Ready mixed concrete, self levelling concrete, nominal mixed and design mixed concrete, Properties of concrete</p> <p>Workability & consistency, Segregation, Bleeding, Strength, Durability, Impermeability, Volume stability</p>
48.	<p>Reinforced cement concrete, Definition, purpose and types of reinforcement</p> <p>Methods and tools used for bar bending, Precautions to be taken Joints:</p> <p>Joints in concrete structure, Quality control of concrete Precast concrete</p> <p>Concrete cracks, Points to be observed while supervising concrete</p>
49.	<p>Scaffolding & form work, Definitions of common terms, Types & applications</p> <p>Different materials used in form work, Safety precautions to be observed in scaffolding</p>
50.	<p>Steps in rate analysis, Material, Labour, Plant and machinery Overhead charges Profit, Specification, General and detailed specification</p>
51.	<p>Form work & bar bending, Technical terms used in form work & bar bending</p> <p>Plain cement concrete (PCC) & Reinforced cement concrete (RCC)</p> <p>Properties of PCC & RCC in green state and hardened state</p> <p>Importance of form work and reinforcement in construction</p>
52.	<p>Form work, Common terms used and their meanings, Different material used for form work, Techniques of fixing forms at different location, Defects in form work</p> <p>Deshuttering /removal of forms, Form release agents, Maintenance & repair of form work, Precaution in form work</p>
53.	<p>Bar bending, Technical terms & their meanings, Symbols, conventions used in bar bending, Specifications of material, Physical properties of reinforcing bars</p> <p>Estimate the quantity of material, Structural elements & characteristics (simply supported, continuous, fixed, cantilever, overhang), Importance of use of reinforcement in concrete, Tools used in bar bending, Correct use of tools</p> <p>Different operation in bar bending (straightening of bars, cutting of bars, bending of bars, placing of bars, binding of bars, fixing of cover blocks), Use of relevant BIS codes & tables, Guidelines for laying reinforcement</p>
54.	<p>Methods used, merits and demerits of methods, tools and equipment used and precautions to be taken for the following processes : Batching, Mixing, Transportation, Placing, Compaction, Curing, Finishing, Strength & durability , requirements (IS : 456 - 2000), Stripping of form work, Application of Modern Power Tools</p>
55.	<p>Definitions and terms related to concrete technology, Applications of concrete technology and modern trends</p>
56.	<p>Pile foundation, uses of piles, types of piles, materials used in the construction of load bearing piles, Factors considered selection of piles, Pile driving& equipments used for pile driving,</p>
57.	<p>Damp proof course, Terms & definitions, Different materials used, Laying damp proof course using different materials, Termite treatment</p>
58.	<p>Plastering & pointing Special materials used in plastering Types of plaster finishes Tools used, Defects and remedies of plastering</p>
59.	<p>Flooring, Meaning of terms, Different material used in flooring, Different types of flooring, Tools & instruments for flooring, Grinding & polishing of floor .</p>
60.	<p>Annual Repair White washing Flooring, Replacing of glass, Re-polishing of floor</p>

	Removal of stains from terrace and floor
61.	Special repair, Foundation failure, Strengthening of foundation, Rectification of leaking roof, Repair to expansion joint
62.	Anti - termite treatment, Pre construction treatment, Post construction treatment
63.	Plumbing, Layout of house plumbing and drainage plan, Tracing leakage, repair to service main, repairing of waste outlet, Cleaning of sanitary installation, Scrapping and painting of pipes
64.	Water meter, Installation of water meter, Removal of air lock,
65.	Plastering, Special materials used in plastering, Types of plaster finishes
66.	Adhesive and joint filler, Introduction, Types, Adhesive used in timber, construction, Adhesives used in ceramic tile fixing, Adhesives used in joining concrete, Joint filler, Sealing compound
67.	Construction equipments, Classification, Selection of equipments, Sources of equipments
68.	Excavation equipment, Tractor, Bull dozer, Excavator
69.	Hoisting equipment, Crane, Pulley, Cable way
70.	Conveying equipments, Belt conveyer, Rope way, Pumping equipments, Drilling equipments, Types of drills, Classification of drill, Drill bits, Selection of drilling pattern
71.	Construction management, Management of man materials, machines with economy

Post name - Fitter (GR-II)

PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

PART-2 (Subject Knowledge)	
ITI-Fitter	
1.	Importance of safety and general precautions required for the trade. Basic Bench fitting
2.	Fitter's common hand tools - names, description and Material from which they are made. Description, types and uses of holding device , hammers & cold chisels, cutting tools Description of simple fitting operations hack sawing, punching and filing. Types of files used commonly. Marking instruments and their use. Description of different types of Locking and fastening devices.
3.	Standard pipe threads. Description of simple drilling machine. Method of using drills taps and dies. Description of simple bench drilling Machine.
4.	Description and uses of Carpenter's hand tools used for simple operations such as marking, sawing, planing and making simple joints. Common types of wood- their description and use.
5.	Gas & Arc welding : Purpose of gas and Arc welding Method of gas & arc welding, Equipments and tools for hot gas welding and electric hot plate for PPR pipe joints
6.	Safety precautions to be observed Methods of soldering and brazing - & Types of fluxes uses Description of Plumber's materials Lead, tin, Zinc, solder, copper, red lead etc. and their uses. Hard & soft solders -their properties, composition and uses.
7.	Identify plumbing services required for each type of building according to usage. Description of plumber tools and Equipments- ratchet, brace, threading die, pipe wrench, sliding wrench, spanner set, chain Wrench etc. and their safety. Care & use of tools.
8.	Masons hand tools: Names, description and their uses. -Method of making holes in walls and Floors. Types of tools used and various Processes. Concept of bricks, lime and cement. Preparation of mortars with various materials of varying composition. Common brick joints, Description of bonds, Scaffolding & plastering. Method of construction of manhole etc. Plain cement concrete, RCC and its proportion, grades of coarse aggregate and fine aggregate, Define-concrete with cement mortar and lime mortar, Knowledge of waterproofing compound
9.	Different types of pipes and pipe fittings - GI, C.I, PVC/CPVC, PPR, AC and HDPE etc., Methods of joining and their uses, Precautions to be taken while fixing.
10.	Importance of Plumbing Symbols and coding practice in layout, Describe the pipe dies, their uses, care and precaution, P.V.C. Description, Properties & use in plumbing work ,PVC Pipe fitting -bends, elbows, sockets, tees, unions etc. Their description, specification and use Metric

	specification of various pipes. Standard pipe threads, Method of Joining and fixing PVC pipe. Joining material for water and gas piping system
11.	Describe bending machine -types -working principle -application- Method of bending pipes by hot and cold process.
12.	Method of bending heavy & light pipe and tubes. Use of blow lamp. Defects, causes & remedies of bending.
13.	Description, identify the parts of pumps types, and their uses (Centrifugal pump, reciprocating, submersible pumps, etc.)
14.	Application -care & maintenance of pumps
15.	Describe water meter -types, working principle- application, merit, specification.
16.	Laying of Branches of piping system Inspection and testing of water supply system, General points to be observed when choosing water supply system
17.	Description of cocks & valves-their types, Application ,working principle, materials & advantages, specification as per IS: Sources of water, Composition of water: Hard & Soft water, temporary hardness & permanent hardness. Action of water on lead- water softness -tests for water, Water purification stages and methods, Impurities of water - organic and inorganic impurities
18.	Water supply system of a small town. . Storage tanks for general water supply purpose, Static water pressures and measurement of pressures, Bursting pressure, Expansion of water on freezing and heating Bernoulli's principles, Pascal's law, Pressure of water on the sides of cistern or tank. Water hammer in pipes. Water distribution system, method of distribution Electric water heating system
19.	Description of sanitary fittings (bath tub, floor traps , kitchen sink , wash basin etc, Trouble shooting of sanitary system, Testing of drainage lines smoke test, water test, smell test, ball test, mirror test.
20.	Trouble shooting of sanitary system, Testing of drainage lines smoke test, water test, smell test, ball test, mirror test.
21.	Erecting rain water and drainage pipe system, Description of sanitary fittings, types application, specification of water closets & urinals, General points to be observed when selection of sanitary fittings.
22.	Methods of tracing out the leakages in water supply system (hydraulic gradient lines, sounding rod, Direct observation etc) Leaks in pipes and noises in plumbing.
23.	Causes and remedies of Air locks in pipe and pipe fittings
24.	Use of hummed and asbestos pipes of different sizes. Method of laying out pipes alignment and joining.
25.	Inspection chamber and septic tank, Layout of drainage system , types application, specification ,IS Code
26.	Description of drains, chess pools, soaks pits etc. Traps-types and their uses applications, specification , IS Code
27.	Describe the soil pipe, types, materials, Fittings, joints, specification, Application, Testing. Uses of Air vent, etc.
28.	Selection of waste and drain pipes and fittings , Specification Method of testing drainage pipe lines
29.	Describe the testing of drainage lines, methods and application. Fixing of ventilating pipe. Precaution against air Poisoning
30.	Describe the Rain water harvesting system, types, methods, application, Care and maintenance.
31.	Describe rain water gutter, outlet and grounding pipe, Accessories Care and maintenance.
32.	Method of dismantling and renewal of the taps and valves Spares for particular work, Describe types, parts and function, constructional features of flushing tank.
33.	Concept of heat and temperature, Method of transmission of heat, Heating system by different thermal units, Description of Domestic solar water heater and cooker, General layout, specification of materials required for Domestic boilers and Geysers.
34.	Preventive maintenance of all types of pumps. Calculation of head of pumps.
35.	Suction limitation of pumps, defects in pumping, causes and remedies of pumping

36.	Precautions to be taken before entering the tanks and sumps.
37.	Causes and remedies of blockages. Sensor system for urinals and was basin, describe, types, specifications and materials required for the sensor system
38.	Describe pressure test, equipments, types, method , calculation of pressure, application
39.	Trouble shooting of leakage testing of sanitary systems.
40.	Plumbing symbols and plumbing colour codes Corrosion - causes and remedies, Prevention, Corrosion due to electrolytic action.
41.	Describe, types, functioning, Specification, of Fire main systems, hydrants & Sprinklers.
42.	Introduction of Auto CAD for Plumbing Features of Auto CAD, 2D CAD Commands, Applications for Creating Drawing, Methods of Developing the CAD drawings.

Post name - Electrician (GR-II)

PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

PART-2 (Subject Knowledge)	
ITI-Electrician	
1.	Occupational Safety and Health, Basic safety introduction, Personal protection. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution and personal safety message. Use of Fire extinguishers. Visit and observation of sections. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard.
2.	Identification of Trade-Hand tools- Specifications , Uses and their care maintenance.
3.	Fundamental of electricity. Electron theory- free electron, Fundamental terms, definitions, units and effects of electric current Explanation, Definition and properties of conductors, insulators and semi-conductors. Wires/cable & its specification. Types of wire joints & uses.
4.	Solders, flux and soldering technique. Brazing. Types & properties of resistors Specific Resistance.
5.	Ohm's Law - Simple electrical circuits and problems. Resistors -Laws of Resistance. Series, parallel and combination circuits. Kirchoff's Laws and applications.
6.	Wheatstone bridge principle and its applications. Effect of variation of temperature on resistance. Different methods of measuring the values of resistance.
7.	Introduction of National Electrical Code Voltage grading of different types of Insulators, Temp. Rise permissible. Types of wires and cables standard wire gauge. Specification of wires and Cables-insulation and voltage grades -Low , medium and high voltage Precautions in using various types of cables / Ferrules
8.	Common Electrical wiring Accessories, their specifications in line with NEC - Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & switches, Use & specification of Fire alarm, MCB, ELCB, MCCB.
9.	Chemical effect of electric current- Principle of electrolysis. Faraday's Law of electrolysis.
10.	Basic principles of Electroplating and Electro chemical equivalents. Explanation of Anodes and Cathodes. Cells - Primary & Secondary Lead acid cell-description, methods of charging- Precautions to be taken & testing equipment, Ni-cadmium & Lithium cell, Cathodic protection, Electroplating, Anodising.
11.	Different types of lead acid cells. Application of battery/cell in Inverter, Battery Charger, UPS, etc., Lead Acid cell, general defects and remedies, Nickel Alkali Cell-description charging. Power and capacity of cells. Efficiency of cells. Rechargeable dry cell, description advantages and disadvantages. Care and maintenance of cells, Grouping of cells of specified voltage and current, Sealed Maintenance free Batteries, Solar battery.

12.	Introduction of fitting trade. Safety precautions to be observed Description of files, hammers, chisels hacksaw frames and blades- their specification and grades. Care and maintenance of steel rule, try square and files.
13.	Marking tools description and use. Description of carpenter's common hand tools such as saws planes, chisels mallet claw hammer, marking, dividing and holding tools-their care and maintenance.
14.	Types of drills description and drilling machines, proper use, care and maintenance. Description of taps and dies, types of rivets and riveted joints. Use of thread gauge.
15.	Description of marking and cutting tools such as snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Different types soldering materials, fluxes and process. Types of different soldering irons and their proper uses. Use of different bench tools used by sheet metal worker.
16.	Magnetism - classification of magnets, methods of magnetising, magnetic materials. Properties, care and maintenance. Para and Diamagnetism and Ferro magnetic materials. Principle of electro-magnetism, Maxwell's corkscrew rule, Fleming's left and right hand rules, Magnetic field of current carrying conductors, loop and solenoid. MMF, Flux density, reluctance. B.H. curve, Hysteresis, Eddy current. Principle of electro-magnetic Induction, Faraday's Law, Lenz's Law.
17.	Electrostatics: Capacitor- Different types, functions and uses.
18.	Alternating Current -Comparison and Advantages D.C and A.C. Related terms, frequency, Instantaneous value, R.M.S. value Average value, Peak factor, form factor, Generation of sine wave, phase and phase difference. Inductive and Capacitive reactance Impedance (Z), power factor (p.f). Active and Reactive power, Simple problems on A.C. circuits, single phase and three-phase system etc. Problems on A.C. circuits.
19.	Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load.
20.	Earthing - Principle of different methods of earthing. i.e. Pipe, Plate, etc Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB). In absence of latest revision in respective BIS provision for Earthing it is recommended to follow IEC guidelines.
21.	Basic electronics - Semiconductor energy level, atomic structure 'P' type and 'N' type. Type of materials -P-N-junction. Classification of Diodes - Reverse and Forward Bias, Heat sink. Specification of Diode PIV rating. Explanation and importance of D.C. rectifier circuit. Half wave, Full wave and Bridge circuit. Filter circuits-passive filter.
22.	Working principle and uses of an oscilloscope. Explanation of principle of working of a transistor & configuration. Types of transistors & its application. Specification and rating of transistors. Explanation of transistor Amplifiers, Amplifiers. - class A,B and C Power amplifier
23.	Explanation of oscillator-working principle Explanation of stages and types. Multivibrator - applications. Introduction of basic concept of ICs, U.J.T., F.E.T. Basic concept of power electronics devices e.g. S.C.R., Diac, Triac, power MOSFET, G.T.O and I.G.B.T., Digital Electronics -Binary numbers, logic gates and combinational circuits,
24.	Electric wirings, I.E. rules . Types of wirings both domestic and industrial. Specifications for wiring. Grading of cables and current ratings. Principle of laying out in domestic wiring. Voltage drop concept. Wiring system - P.V.C., concealed system. Maintenance and Repairing data sheet preparation. Specifications, standards for conduits and accessories: - - Power Wiring - Control Wiring - Information Communication - Entertainment Wiring. Testing of wiring installation by meggar.
25.	Study of Fuses, Relays, Miniature circuit breakers (MCB), ELCB, etc.
26.	D.C. Machines - General concept of Electrical Machines. Principle of D.C. generator. Use of Armature, Field Coil, Polarity, Yoke, Cooling Fan,

	Commutator, slip ring Brushes, Laminated core. Explanation of D.C. Generators -types, parts. E.M.F. equation-self excitation and separately excited Generators-Practical uses. Brief description of series, shunt and compound generators.
27.	Explanation of Armature reaction, inter poles and their uses, connection of inter poles, Commutation. Losses & Efficiency of D. C. Generator, Parallel Operation of D. C. Generator. Application of D.C. generators. Care, Routine & preventive maintenance.
28.	DC Motors - Terms used in D.C. motor- Torque, Brake Torque, speed, Back-e.m.f. etc. and their relations, Types of D. C. Motor. Starters used in D.C. motors Related problems Characteristics of D.C.Motor, Losses & Efficiency, Application of D.C. motors. Care, Routine & preventive maintenance.
29.	Types of speed control of DC motors in industry. Control system. AC-DC, DC-DC control.
30.	Working principle of Transformer . Classification C.T., P.T. Instrument and Auto Transformer(Variac), Construction, Single phase and Poly phase. E.M.F. equation, parallel operation of transformer, their connections. Regulation and efficiency. Type of Cooling for transformer. Protective devices. Specifications, simple problems on e.m.f. Equation, turn ratio, regulations and efficiency. Special transformers. Transformer - Classification of transformer. Components, Auxiliary parts i.e. breather, Conservator, buchholze relay, other protective devices. Transformer oil testing and Tap changer (off load and on load). Dry type transformer. Bushings and termination.
31.	Electrical Measuring Instruments - types, indicating types. Deflecting torque, Controlling torque and Damping torque, PMMC & MI meter (Ammeter, Voltmeter) -Range extension - Multimeter(Digital/Analog) -Wattmeter, P.F. meter Energy meter (Digital/analog) -Insulation Tester (Megger), Earth tester. -Frequency meter Phase Sequence meter -Multimeter -Analog and Digital -Tong tester -Techometer.
32.	Three phase Induction motor - Working principle -Production of rotating magnetic field, Squirrel Cage Induction motor, Slip-ring induction motor. Construction , characteristics and Speed control, Slip & Torque . Control & Power circuit of starters D.O.L Starter, Star /Delta starter, Autotransformer starter, Rotor resistance starter, etc Single phasing preventer.Losses & efficiency. Application of Induction Motor Care, Routine & preventive maintenance.
33.	Single phase induction motor- Working principle, different method of starting and running (capacitor start, permanent capacitor, capacitor start & run, shaded pole technique). FHP motors, Repulsion motor, stepper motor, Hysteresis motor, Reluctance motor. Application of Single phase induction motor Universal motor -advantages, Principle, characteristics, applications in domestic and industrial appliances, Fault Location and Rectification. Braking system of motor. Application of Universal motor.
34.	Alternator :- Explanation of alternator, types of prime mover, efficiency, regulations, phase sequence, Parallel operation. Specification of alternators and Brushless alternator. Verify the effect of changing the field excitation and Power factor correction of Industrial load
35.	SYNCHRONOUS MOTOR - Working principle, effect of change of excitation and load. V and anti V curve. Cause of low power factor. Method of power factor improvement.
36.	Rotary Converter- Inverter, M.G. Set description, Characteristics, specifications- running and Maintenance. Solid state controller and Invertors.
37.	TRANSFORMER Winding , Small Transformer winding techniques
38.	DC machine Winding -- Armature winding terms, pole pitch, coil pitch, back pitch, front pitch , Lap and Wave winding , Progressive and retrogressive Winding, developed diagram. Growler construction, working & application
39.	AC machine Winding — Motor winding terminology - classification of conducting and insulating materials used in winding - Types and methods of winding in single and three phase motors. Stator winding terms, coil side, end coil and grouping of coils. Connection to adjacent poles,

	connected stator winding, alternate pole connection, developed diagram.
40.	Illumination , Laws of Illuminations, terminology used , Illumination factors, intensity of light - importance of light, human eye factor, , units. Types of illumination Type of lamps -Neon sign Halogen, Mercury vapour, sodium vapour, Fluorescent tube, CFL, LED, Solar lamp & photo cell applications, Decoration lighting, Drum Switches, efficiency in lumens per watt, Calculations of lumens. Estimating placement of lights, fans and ratings.
41.	Industrial wiring . Code of practice and relevant span. Wiring of electric motors, control panel, etc. Types, specifications, advantages of different types of circuit brackets construction and maintenance. Working principle and construction of domestic and agricultural appliances-their maintenance.
42.	Complete House-wiring layout. Splitting load wire in accordance with NEC I.E.E. Rules. Multi-storeyed system. Fault finding and trouble shooting.
43.	Control Elements : Isolator, pushbutton switches, Indicating lamps, MCB, Fuse, Contactor, Relays, Overload Relay, Timers, Rectifier, Limit switches, control transformers. Wiring Accessories: Race ways/ cable channel, DIN Rail, Terminal Connectors, Thimbles, Lugs, Ferrules, cable binding strap & buttons, nylon cable ties, sleeves, Gromats & clips
44.	Domestic Appliances : Working principles and circuits of common domestic equipment and appliances. - Calling Bell, Buzzer, Alarms, Electric Iron, Heater, Light Electric Kettle, Heater / Immersion Heater, Hot Plate, Oven, Geysers, Cooking range, Mixer, Washing machine, , Motor Pump set, etc. Concept of Neutral and Earth.
45.	POWER GENERATION : Generation sources of energy, Comparison of energy resources. Types of fuels. Advantages of liquid fuel & solid fuel. Various ways of electrical power generation. • Thermal • Hydro electric • Nuclear • Non- Conventional Thermal Coal based, diesel based & Gas based Turbine. Constituents in steam power station.
46.	Hydro Electric : Schematic arrangement of HydroElectric Power Station. Constituents of Hydro Electric Plant. Types of Hydro Electric Power station. Advantages & disadvantages.
47.	Nuclear : Schematic arrangement of Nuclear Power Station. Composition of an atomic Nucleus. Advantages & disadvantages. Comparison of above Power Plant.
48.	Non-Conventional An introduction to Power generation through non- conventional power generation such as Solar, Bio-Gas, Wind energy and Micro-hydel, Tidal waves, etc. Basic principal, Advantages & disadvantages of each.
49.	TRANSMISSION OF ELECTRICAL POWER Electrical Supply System : Comparison of AC and DC transmission. Advantages of High transmission voltage. Introduction to Single phase , three phase-3 wire system in transmission lines Overhead Lines: Main components of overhead lines-Types of power line Low voltage line medium Voltage line & high voltage line Voltage standard Conductor materials, line supports, Insulators, types of Insulators
50.	Under Ground Cable : Construction of cables. Material for cables, its insulation. Classification of cables, cables for 3-phase service, Laying of underground cable. Types of cable faults and their location.
51.	DISTRIBUTION OF POWER Function and equipment used in substation. Classification of distribution system-AC distribution, Overhead v/s underground distribution system.

	Essential features of switchgears. Isolator, Switch gear equipments, bus-bar arrangement, Short circuit, faults in power system. Circuit breakers - Introduction & Classification of circuit breakers lightening arrestors used in HT lines.
52.	Introduction, Construction & Working of power transistor, thyristor. Introduction, Construction, Working, Parameters & application of DC drive
53.	Speed control of 3 phase induction motor by using VVVF/AC Drive. Introduction, Construction, Working, Parameters & application of AC drive
54.	Schedule of electrical preventive maintenance. Break down, Routine & Preventive maintenance of DC/AC machines, Voltage stabilizer, U.P.S. & Equipments.

Post name - Pump Operator (GR-II)

PART-1	
1.	English - Synonyms word, Antonyms word, common Vocabulary, Sentence Structure, Grammar, Use of Idioms and phrases & their meaning and comprehension of passage.
2.	मराठी - समानार्थी शब्द, विरुद्धार्थी शब्द तसेच सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि उपयोग तसेच उताऱ्यावरील प्रश्नांची उत्तरे
3.	सामान्य ज्ञान - चालू घडामोडी (जागतिक तसेच भारतातील), इतिहास विशेषतः महाराष्ट्राचा, महाराष्ट्राचा भूगोल, भारतीय अर्थव्यवस्था, भारतातील राज्यव्यवस्था तसेच पर्यावरण
4.	बुद्धीमापन चाचणी - उमेदवार किती लवकर व अचुकपणे विचार करून शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.

PART-2 (Subject Knowledge)	
ITI-Pump Operator	
1.	Occupational Safety and Health Basic safety introduction, Personal protection, Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution and personal safety message. Use of Fire extinguishers, Visit and observation of sections, Various safety measures involved in the Industry, Elementary first Aid, Concept of Standard.
2.	Identification of Trade-Hand tools- Specifications
3.	Fundamental of electricity, Electron theory- free electron, Fundamental terms, definitions, units and effects of electric current Explanation, Definition and properties of conductors, insulators and semi-conductors, Wires/cable & its specification. Types of wire joint & use.
4.	Solders, flux and soldering technique, Types & properties of resistors Specific Resistance.
5.	Ohm's Law - Simple electrical circuits and problems. Resistors -Law of Resistance. Series and parallel circuits. Kirchhoff's Laws and applications. Wheatstone bridge principle and its applications. Effect of variation of temperature on resistance. Different methods of measuring the values of resistance.
6.	Introduction of National Electrical Code, Voltage grading of different types of Insulators, Temp. Rise permissible, Types of wires and cables standard wire gauge, Specification of wires and Cables-insulation and voltage grades -Low , medium and high voltage Precautions in using various types of cables / Ferrules
7.	Chemical effect of electric current, Principle of electrolysis, Faraday's Law of electrolysis, Basic principles of Electroplating and Electro-chemical equivalents. Explanation of Anodes and Cathodes. Cells - Primary & Secondary Lead acid cell-description, methods of charging-Precautions to be taken & testing equipment, Ni-cadmium & Lithium cell, Cathodic protection, Electroplating, Anodising, Different types of lead acid cells, Application of battery/cell in Inverter, Battery Charger, UPS, etc. Lead Acid cell, general defects and remedies. Nickel Alkali Cell-description charging. Power and capacity of cells. Efficiency of cells. Rechargeable dry cell, description advantages and disadvantages. Care and maintenance of cells Grouping of cells of specified voltage and current, Sealed Maintenance free Batteries, Solar battery.

8.	Introduction of fitting trade, Safety precautions to be observed. Description of files, hammers, chisels hacksaw frames & blades, punch, etc- their specification and grades. Care and maintenance of steel rule, try square and files. Marking tools description and use. Description of carpenter's common hand tools such as saws planes, chisels mallet claw hammer, marking, dividing and holding tools-their care and maintenance.
9.	Types of drills description and drilling machines, proper use, care and maintenance. Description of taps and dies, types of rivets and riveted joints. Use of thread gauge.
10.	Description of marking and cutting tools such as snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Different types soldering materials, fluxes and process. Types of different soldering irons and their proper uses. Use of different bench tools used by sheet metal worker.
11.	Common Electrical wiring Accessories, their specifications in line with NEC - Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & switches. Use & specification of Fire alarm, MCB, ELCB, MCCB.
12.	Magnetism - classification of magnets, methods of magnetising, magnetic materials. Properties, care and maintenance, methods of magnetising magnetic materials. Para and Diamagnetism and Ferro magnetic materials. Principle of electro-magnetism, Maxwell's corkscrew rule, Fleming's left and right hand rules, Magnetic field of current carrying conductors, loop and solenoid. MMF, Flux density, reluctance. B.H. curve, Hysteresis, Eddy current. Principle of electro-magnetic Induction, Faraday's Law, Lenz's Law. Electrostatics: Capacitor- Different types, functions and uses.
13.	Alternating Current - Comparison and Advantages D.C and A.C. Related terms frequency Instantaneous value, R.M.S. value Average value, Peak factor, form factor. Generation of sine wave, phase and phase difference. Inductive and Capacitive reactance Impedance (Z), power factor ; Active and Reactive power, Simple problems on RLC A.C. circuits, Single phase and three-phase system etc. Problems on A.C. circuits. Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage & current and power in a 3 phase circuits with balanced and unbalanced load.
14.	Earthing - Principle of different methods of ear thing. i.e. Pipe, Plate, etc Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB).
15.	Basic electronics- Semiconductor energy level, atomic structure 'P' type and 'N' type. Type of materials -P-N-junction. Classification of Diodes - Reverse and Forward Bias, Heat sink. Specification of Diode Explanation and importance of D.C. rectifier circuit. Half wave, Full wave and Bridge circuit. Filter circuits-passive filter.
16.	Type of measuring instruments - MC & MI, Construction & working principles of Ammeter, Voltmeter, Ohm-meter ,Wattmeter, Energy meter, P.F. meter, frequency meter, multi meter, clamp meter, Megger & earth tester. Introduction of Digital meters. CT & PT. Tong tester / Clip on Meter.
17.	Introduction and explanation of electrical wiring systems, cleat wiring, casing & Capping, CTS, Conduit and concealed etc., I. E. Rules. Related to wiring, National Building codes for house wiring, specification and types, rating & material.
18.	Branching of circuits with respect to loads such as lighting and power. CTS/PVC Conduit-surface and concealed/metal conduit/PVC casing and capping. IE rules regarding clip distance. Fixing of screws, cable bending etc
19.	Description of different electrical fittings and accessories such as lamp holders, switches, plugs brackets, ceiling rose, cut out etc. IS 732-1963.Wiring materials used for P.V.C. cables I.E. rules, Indian standards regarding the above wiring such as-clip distance fixing of screws, cable bending etc.
20.	Description of Rowel tools and Rowel plugs, their sizes, plugging, compound, plugs- wall jumper and their sizes and uses. Introduction to estimation procedure, P.V.C. casing and capping materials, sizes and grades etc.

21.	Conduit pipe wiring materials and accessories, types and sizes of conduit.
22.	Layout of Light points, fan points etc. Layout of heating leads etc.- their controls, main switches, distribution boards as per I.E. rules. I. E. Rules for earthing conduits using earth clips and earth wire as per IS 732-1963.
23.	Introduction of Illumination- Terms & definitions, laws of illumination, illumination factors, intensity of light -importance of light, colour available. Construction, working & applications of - Incandescent lamp, Fluorescent tube, CFL, Neon sign, Halogen, Mercury vapour and types, sodium vapour etc. Decoration lighting, Drum Switches etc.
24.	Connections of different types of motors used in industry, their normal methods of wiring, Control , starting and protection devices-their connections, layouts and earthing Code practice for earthing of Industrial Wiring. Wiring methods & types in workshop & factories.
25.	Wiring in commercial building- their special precautions as per I.E. rules. Introduction to LAN wiring.
26.	Power drives - Introduction, types, advantages & disadvantages. UPS- Introduction, types, Load calculation, Backup time calculation.
27.	Computer networking - Identification of network hardware / component. CAT-6 cable, RJ-45. DTH- Introduction of direct to home system, Music channel wiring/interconnecting couplers.
28.	General idea of fixing meter boards & taking service connection. Sealing of I.C. cut out & meters as per I.E. Rules, General Electric Appliances using heating effect - their capacities, voltage ranges, Calculation of current
29.	Explanation of inter connection wiring circuits in the main building and auxiliary blocks, meter boards and its locations. Study of layout symbols in the preparation of layout diagrams
30.	Block diagram of computer, main parts inside the system unit, ports & connectors, of PC parts & peripherals associated with PC like-keyboard, Mouse, Printers, Scanners, Camera, Modem, External Storage Devices & UPS. Features of Operating System like M.S. Windows, Components of Windows- Calculator, Notepad, Paint, Windows Explorer. INTERNET : Websites, Browsing, Downloading Creating and Using E-mail ID's Using it for Communications.
31.	LED , Diode, types of transistor, UJT, SCR, regulator ICs and Zener diode uses and its application
32.	IC - voltage regulator pin configurations and applications.
33.	Common Electrical Accessories, their specifications- Explanation of switches, lamp holders, plugs and sockets etc. Development of domestic circuits using switches, fuse, MCB, sockets, lamp, fan, calling bell/buzzer, Two way switch, I.C.T.P, I.C.D.P, MCCB, ELCB, RCCB etc. Importance of Neutral, effect of opening of neutral wire Soldering- Solders, flux and soldering techniques. Types of soldering irons-their proper use.
34.	Introduction to D.C. Generators and working principle, parts of D.C. Generator. Classification of Generators- Self excited and separately excited- their application in practical field.
35.	Types and characteristics of D.C. Generators - Series, Shunt and compound, their applications. Explanation of Armature reaction, interlopes, commutation and EMF equation of DC generators. Parallel operation of Generators
36.	Introduction to D.C. Motor-Working principle, types of motors Explanation of terms used Torque, speed, Back E.M.F. etc. Characteristics, Speed control of DC motors
37.	Necessity of starter- Types of starters, 2 point 3 point and 4 point starters, Protective devices used. Methods of speed control, advantages, disadvantages & Industrial applications. Trouble shooting and fault rectification.
38.	Introduction to A.C. Poly phase systems-advantages, 3 phase star delta. Terms used in 30 systems, connection and their relations w.r.t. current and voltage. Principle of measurement of A.C. 3 ph. Power. Simple calculation of A.C. 3 phase circuit parameter - I, V, Z & P.F. etc.
39.	Parts and construction of Alternators, principle of working, types of Alternators, EMF equation. Various applications and power rating of alternators. General idea of loading and regulation of Alternator. Parallel operation of Alternators, synchronising methods.
40.	Introduction to A.C single phase motors and types. Capacitors start/run- start and run. FHP motors and their uses. Various application of A.C single phase motors.

41.	<p>Three phase Induction motor: - Construction, Principle of operation of Three phase induction motor. Squirrel cage induction motor and slip ring induction motor. Rotor slip, rotor frequency and rotor torque. factors affecting torque.</p> <p>Effect of variation in applied voltage. Starting methods. Speed control methods. Importance of phase sequence in three phase induction motor. Single phasing preventer.</p>
42.	Starters - DOL starter, Star - delta starter and Auto transformer starter.
43.	Description of starter delta starter (manual, semi and Auto). Internal arrangement of a motor resistance starter for slip ring induction motor. Motor control circuit and starting devices. Power and control wiring circuits of AC motors.
44.	<p>TRANSFORMERS -</p> <p>Power Transformer - Its construction, working, performance, parallel operation of transformer, their connections. Cooling of transformer, S.C. & O.C. tests. Regulation and efficiency, Specifications, problems on e.m.f. Equation, transformation ratio. Characteristics of ideal transformer. Construction of core, winding shielding, auxiliary parts breather, conservator. Buchholz's relay, other protective devices.</p> <p>Transformer oil testing and Tap changing off load and on load.</p> <p>Transformer bushings and termination. Auto transformer- Its construction, working, performance & uses.</p>
45.	<p>GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICAL POWER</p> <p>Generation of Electricity and their types. General idea about overhead transmission, distribution (LV,MV& HV) and their types of accessories used. General arrangement and maintenance of outdoor type of substation. Explanation of overhead bus bar, side by bar. Bus trunking and rising mains. I.E. rules regarding panel erection, bus bar, spacing bus bar chamber, danger boards. Connection of high voltage metering equipment used with bus bar.</p>
46.	Types of Distribution, Explanation of line protecting devices and their general principle. Brief description of connection of places of use.
47.	<p>SUBSTATION EQUIPMENTS</p> <p>Switchgear-CBs - ACB,VCB, SF6, OCB etc. protection schemes, CT/PT-Protective relays, lightning arrestors,</p> <p>Explanation of different types of switches and switches gears multi Range switches, rotary switches, cooker control panels, power circuit switches, thermostat, mercury switches etc.</p>
48.	<p>TYPES OF SUBSTATIONS - INDOOR, OUTDOOR & POLE MOUNTING</p> <p>Substation construction:</p> <ol style="list-style-type: none"> i. Outdoor and Indoor substation. ii. E.H.T. substation iii. H.T. substation iv. Medium & low voltage substation (Pole mounting type)
49.	<p>U.G. CABLE</p> <p>Construction of cable, Types , Application & methods of jointing UG cable & testing General idea of laying method and jointing precautions to be observed and different accessories used for medium voltage termination.</p>
50.	Need of Synchronizing, various methods, precautions to be observed while Synchronizing.
51.	Control Panel elements, types and specifications. Layout and installation of panel board , Panel board wiring methods, colour coding of cables for its easy identification. Grouping and numbering of cables by
52.	<p>Importance and advantages of maintenance. Points to be observed to maintain the installation, preventive maintenance and routine tests.</p> <p>Common faults, causes and remedies in domestic and industrial wiring installation, Methods of Locating faults.</p>
53.	Concept and Principle of plan, estimation and cost. Preparation of complete house wiring layout, industrial wiring, commercial wiring for office Lodge, Hospital, Bank, Hotels etc. I.E. rules for Multi-storied buildings.