

# ગુજરાત જાહેર સેવા આયોગ

જા.ક્રમાંક - ૯૩/૨૦૧૫-૧૬

સરકારી ઇજનેરી કોલેજ ખાતેના ઓટોમોબાઇલ એન્જીનીયરીંગના સહાયક પ્રાધ્યાપક, વર્ગ -૨

પ્રાથમિક કસોટીનો અભ્યાસક્રમ (ભાગ-૧ સામાન્ય અભ્યાસ)

માધ્યમ - ગુજરાતી

કુલ પ્રશ્નો-૧૦૦

કુલ ગુણ-૧૦૦

૧.	ગુજરાતની ભૌગોલિક, આર્થિક અને સામાજિક ભૂગોળ
૨.	ગુજરાતનો સાંસ્કૃતિક વારસો - સાહિત્ય, કલા, ધર્મ અને સ્થાપત્યો.
૩.	ભારતની ભૂગોળ-ભૌગોલિક, આર્થિક, સામાજિક, ખેતી, કુદરતી સંશાધનો અને વસતી અંગેની બાબતો.
૪	વિશ્વ ભૂગોળની સામાન્ય ભૌગોલિક માહિતી
૫.	ભારતનું બંધારણ: (૧) આમુખ (૨) મૂળભૂત અધિકારો અને ફરજો (૩) રાજ્યનિતીના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજ્યપાલશ્રીની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને સમાજના પછાત વર્ગો માટેની જોગવાઈઓ (૯) એટર્ની જનરલ (૧૦) નીતિ આયોગ (૧૧) પંચાયતી રાજ (૧૨) નાણા પંચ (૧૩) બંધારણીય સંસ્થાઓ - ભારતનું ચૂંટણી પંચ, સંઘ લોક સેવા આયોગ, રાજ્ય સેવા આયોગ, કોમ્પ્રોલર અને ઓડિટર જનરલ
૬.	ભારતની અર્થવ્યવસ્થા
૭.	ભારતનો ઇતિહાસ
૮.	સામાન્ય વિજ્ઞાન, પર્યાવરણ તથા ઈન્ફર્મેશન એન્ડ કોમ્યુનિકેશન
૯.	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી
૧૦.	ખેલ જગત
૧૧.	માહિતી (મેળવવાનો) અધિકાર અધિનિયમ ૨૦૦૫
૧૨.	ગુજરાતી વ્યાકરણ (૧) જોડણી (૨) સમાનાર્થી-વિરુદ્ધાર્થી શબ્દો (૩) સંધિ (૪) સમાસ (૫) રૂઢિપ્રયોગ અને કહેવતો
૧૩.	<b>English Grammar</b> (1) Tenses, Gerund and Participles. (2) Agreement between Verb and Subject, order of words, punctuations etc. (3) Usage of Articles, Nouns, Pronouns, Adjectives, Prepositions, Auxiliaries, Conjunctions and Question Tag etc. (4) Idioms and Phrasal Verbs. (5) Active and Passive Voice. (6) Common Errors of Usage.
૧૪.	પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવ.

Sr. No.	Topic	Syllabus
1	Basic Mechanical engineering	<ul style="list-style-type: none"> <li>• <u>Physical &amp; Mechanical properties of structural materials:</u> Properties related to axial, bending, and torsional &amp; shear loading, Toughness, hardness, proof stress, factor of safety, working stress, load factor.</li> <li>• <u>Simple stresses &amp; strains:</u> Elastic, homogeneous, isotropic materials; limits of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials. Strains: Linear, shear, lateral, thermal and volumetric, Poisson's ratio. Stresses: Normal stresses, axial –tensile &amp; compressive, shear and complementary shear, thermal and hoop stress.</li> <li>• <u>Properties of gases:</u> Gas laws, Boyle's law, Charle's law, Combined gas law, Gas constant, Internal energy, Relation between Cp and Cv, Enthalpy, Non-flow process, Constant volume process, Constant pressure process, Isothermal process, Poly-tropic process, Adiabatic process.</li> <li>• <u>Properties of Steam:</u> Steam formation, Enthalpy, Specific volume of steam and dryness fraction of steam, Internal energy, Steam tables, Non-flow process, dryness fraction, Throttling calorimeter, Separating calorimeter, Combined calorimeter. Steam Boilers: Simple vertical boiler, Vertical multi- tubular boiler, Cochran type, Lancashire boiler, Locomotive boiler, Babcock and Wilcox boiler, High Pressure boiler ,performance ,mounting and accessories.</li> <li>• <u>Pumps:</u> Reciprocating pump, Centrifugal pumps, Priming, Rotary pumps. Work for compression, Power required, Reciprocating compressor efficiency, Multistage reciprocating compressors, Rotary compressors.</li> </ul>
2	Basic Civil engineering	Classification of surveying, Plans and maps, Levelling, levelling instruments, methods of levelling, Plani meter, Civil Engineering materials like Stone, Bricks, Lime, Cement, Ferrous and Non Ferrous Metals, Ceramic Materials, Timber, Sand, Aggregate, Mortar and Concrete.
3	Engineering Graphics	BIS–SP 46 , Engineering Curves , Loci of Points, Projections of Points & Lines, Projections of Planes, Projections of Solids & Section of Solids, Development of Lateral Surfaces, Orthographic Projections, Isometric Projections and Isometric View.
4	Manufacturing process	Basic Machine Tools: working and auxiliary motion sin machine tools, Primary cutting motion sin machines tools, Lathes , drilling, milling, boring, shaper, slotting, planner, broaching, grinding, abrasive, machines, machining time of cutting the jobs, casting and foundry, joining processes , forming processes.

5	Thermo dynamics	Microscopic & macroscopic point of view, Thermo dynamic system and control volume, Thermodynamic properties, processes and cycles, Thermo dynamic equilibrium, Quasi-static process, pure substance, vapour-liquid-solid phase in a pure substance, p-v-t surface ,critical and triple point of pure substance. First law of Thermodynamics. Second law of Thermodynamics and entropy, Availability, Irreversibility, Carnot cycle, Rankine cycle, modified Rankine cycle, cycle efficiencies. Carnot, Otto, diesel, dual, Atkinson and Brayton cycle. Air standard efficiencies, mean effective pressure, brake thermal efficiencies, relative efficiencies of I.C. engine.
6	Kinematics and dynamics of machines	Simple mechanism, velocity and acceleration diagram, gear drive, belt drive, gyroscope, cam, single degree of vibration ,balancing of rotary and reciprocating masses.
7	Material science and metallurgy	Imperfection in crystals, Elastic and plastic deformation of metallic materials, Cold working and annealing, effects of grain size, alloying elements and heat treatment on properties of single phase and two phase materials, Processing of metals. Non-destructive tests.
8	Machine Design	Design of Fasteners-welded, riveted and cotter joints. Design of shaft, keys and coupling, power screw and levers. Design of gears and gear box. Design of I.C. Engine components and fly wheel. Limits fits and tolerance. Design of clutch, brakes and propeller shaft.
9	Fluid Mechanics	Fluids and Their Properties, Pressures measurement. Static Forces on Surface and Buoyancy, Motion of Fluid Particles and Streams, The Energy Equation, Bernoulli's theorem, flow measurement through pipes and open channel, Dimensional Analysis And Similarities, Viscous Flow- HAGEN-POISEVILLELAW, Compressible Fluid and turbulent Flow.
10	I. C. Engines and fuels	Engines and classifications ,Fuel supply in S.I and C.I engines, Combustion in S.I. and C.I. engines, Engine cooling , lubrication , intake and exhaust systems, engine alternate fuels like Biogas, Biodiesel, Hydrogen, LPG, CNG and alcohols. Air pollutions and performance testing. Fuel properties, S.I. engine ignition systems.
11	Automobile systems and transmissions	Vehicle layouts, Chassis Frames and Body, Performance of Vehicle. Clutches, brakes and gear box, drive lines and axles, wheels and tyres, steering geometry and suspensions.
12	Transport Management and Laws	Economics of Road Transport, Organization of Transport Services, Motor Vehicle Act , Taxation, Insurance & Finance, Laws Related to Pollution Under Control (PUC)
13	Automobile Air Conditioning System	Vapour compression refrigeration system, vapour absorption refrigeration system, Air conditioning for passengers, isolated vehicles, Refrigerated transport vehicles, refrigerants, Air conditioning service and distribution systems and its control systems.
14	Vehicle dynamics	Dynamic loads in moving vehicle, braking performance and steady state cornering, ride comfort. Aero dynamics of vehicles. Tyre traction.

15	Special purpose vehicles	Tippers, shovels, loaders, Excavators, Dumpers, Dozers, Fork Lift truck, Road rollers. Farm Tractor , Articulated Vehicles, Electric Vehicles, Solar Vehicles and Hybrid Vehicles
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