

જગ્યાનું નામ: સરકારી વિનયન, વાણિજ્ય અને વિજ્ઞાનની કોલેજો ખાતે ઇલેક્ટ્રોનીક્સના મદદનીશ પ્રાધ્યાપક, ગુ. શ. સે. વર્ગ-૨ (કો.શા) જાહેરાત ક્રમાંક ૮૩/૨૦૧૬-૧૭

વિષય: પ્રાથમિક કસોટીમાં ભાગ-૧ અને ભાગ-૨ ના ૧૫૦ મિનિટના સંયુક્ત પ્રશ્નપત્રનો અભ્યાસક્રમ

ભાગ-૧ સામાન્ય અભ્યાસ

માધ્યમ: ગુજરાતી	પ્રશ્નો: ૧૦૦	કુલ ગુણ : ૧૦૦
૧	ભારતની ભૂગોળ- ભૌગોલિક, આર્થિક, સામાજિક, કુદરતી સંસાધન અને વસ્તી અંગેની બાબતો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૨	ભારતનો સાંસ્કૃતિક વારસો- સાહિત્ય, કલા, ધર્મ અને સ્થાપત્યો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૩	ભારતનો ઇતિહાસ- ગુજરાતના ખાસ સંદર્ભ સાથે	
૪	ભારતની અર્થવ્યવસ્થા અને આયોજન	
૫	ભારતીય રાજનીતિ અને ભારતનું બંધારણ: (૧) આમુખ (૨) મૂળભૂત અધિકારો અને ફરજો (૩) રાજ્યનીતિના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજ્યપાલની 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 તથા વૈધનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, સંઘ લોક સેવા આયોગ, રાજ્ય લોક સેવા આયોગ, કોમ્પ્રોલર એન્ડ ઓડિટર જનરલ; કેન્દ્રીયસતર્કતા આયોગ, લોકપાલ તથા લોકાયુક્ત અને કેન્દ્રીય માહિતી આયોગ	
૬	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી	
૭	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઇન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી	
૮	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો	

Syllabus of Preliminary Test

part-1

Medium: Gujarati

Questions: 100

Total Marks- 100

1	Geography of India-Physical, Economic, Social, Natural Resources and population related topics- with special reference to Gujarat
2	Cultural heritage of India-Literature, Art, Religion and Architecture- with special reference to Gujarat
3	History of India with special reference to Gujarat
4	Indian Economy and Planning
5	<u>Indian Polity and the Constitution of India:</u> (1) Preamble (2) Fundamental Rights and Fundamental Duties (3) Directive Principles of State Policy (4) Composition of Parliament (5) Powers of the President of India (6) Powers of Governor (7) Judiciary (8) Provisions for Scheduled Castes, Scheduled Tribes and backward classes of the society (9) Attorney General (10) NITI Aayog (11) Panchayati Raj Institutions (12) Finance Commission (13) Constitutional and Statutory Bodies: Election Commission of India, Union Public Service Commission, State Public Service Commission, Comptroller and Auditor General; Central Vigilance Commission, Lokpal and Lokayukta, Central Information Commission
6	General Mental Ability
7	General Science, Environment and Information & Communication Technology
8	Daily events of Regional, National and International Importance including Sports

भाग-२ (विषयने लगतो अभ्यासक्रम)

Marks:200

Questions:200

Medium : English

1. Electronic Transport in semiconductor, PN Junction, Diode equation and diode equivalent circuit. Breakdown in diodes, zener diodes, Tunnel diode, Semiconductor diodes, characteristics and equivalent circuits of BJT, JFET, MOSFET, IC fabrication-crystal growth, epitaxy, oxidation , lithography, doping, etching, isolation methods, metallization, bonding, Thin film active and passive devices
2. Superposition, Thevenin, Norton and Maximum Power Transfer Theorems, Network elements, Network graphs, Nodal and Mesh analysis, Zero and Poles, Bode Plots, Laplace, Fourier and Z-transforms. Time and frequency domain responses. Image impedance and passive filters, Two-port Network Parameters. Transfer functions, Signal representation. State variable method of circuit analysis, AC circuit analysis, Transient analysis.
3. Rectifiers, Voltage regulate ICs and regulated power supply, Biasing of Bipolar junction transistors and JFET. Single stage amplifiers, Multistage amplifiers, Feedback in amplifiers, oscillators, function generators, multivibrators, Operational Amplifiers (OPAMP)-characteristics and Applications, Computational Applications, Integrator, Differentiator, Wave shaping circuits, F to V and V to F converters, Active filters, Schmitt trigger, phase locked loop.
4. Logic families, flip-flops, Gates, Boolean algebra and minimization techniques, Multivibrators and clock circuits, Counters-Ring, Ripple. Synchronous, Asynchronous, Up and down shift register, multiplexers and demultiplexers, Arithmetic circuits, Memories, A/D and D/A converters.
5. Architecture of 8085 and 8086 Microprocessors, Addressing modes, 8085 instruction set, 8085 interrupts, Programming, Memory and I/O interfacing, Interfacing 8155, 8255, 8279, 8253, 8257, 8259, 8251 with 8085 Microprocessors, Serial communication protocols, Introduction of Microcontrollers (8 bit)- 8031/8051 and 8048.

6. Introduction of High-level programming Language, Introduction of data in C. Operators and its precedence, Various data types in C, Storage classes in C, Decision-making and forming loop in program, Handling character, Arrays in C, Structure and union, User defined function, Pointers in C, Advanced pointer. Pointer to structures, pointer to functions, Dynamic data structure, file handling in C, Command line argument, Graphics-video modes, video adapters, Drawing Various objects on screen, Interfacing to external hardware via serial/parallel port using C, Applying C to electronic circuit problems, Introduction to object-oriented Programming and C++.
Introduction of FORTRAN language, programming discipline, statements to write a program, intrinsic functions, integer-type data, type statement, IF statement, Data validation, Format-directed input and output. Subscripted variables and DO loops. Array, Fortran Subprogram.
7. Maxwell's equations, Time varying fields, Wave equation and its solution, Rectangular waveguide, Propagation of wave in ionosphere Poynting vector, Antenna parameters, Half-wave antenna, Transmission lines, Characteristic of Impedance matching, Smith chart, microwave components-T, Magic-T, Tuner. Circulator isolator, Direction couplers, Sources-Reflex Klystron, Principle of operation of magnetron, Solid State Microwave devices; Basic Theory of Gunn, GaAs FET, Crystal Deflector and PIN diode for detection of microwaves.
8. Basic principles of amplitude, frequency and phase modulation, Demodulation, Intermediate frequency and principle of superheterodyne receiver, Spectral analysis and single transmission through linear systems, Random signals and noise, Noise temperature and noise figure, Basic concepts of information theory, Digital modulation and Demodulation; PM, PCM, ASK, FSK, PSK, Time-division Multiplexing, Frequency-Division Multiplexing, Data Communications-Circuits, Codes and modems. Basic concepts of signal processing and digital filters.
9. Characteristics of solid state power devices-SCR, Triac, UJT, Triggering circuits, converters, choppers, inverters, converters. AC-regulators, speed control of a.c. and d.c. motors. Stepper and synchronous motors; Three phase controlled rectifier; Switch mode power supply; Uninterrupted power supply.

10. Optical sources-LED, Spontaneous emission, Stimulated emission, Semiconductor Diode LASER, Photodetectors-p-n photodiode. PIN photodiode, phototransistors, Optocouplers, Solar cells, Display devices, Optical Fibres-Light propagation in fibre, Types of fibre, Characteristic parameters, Modes, Fibre splicing, Fibre optic communication system-coupling to and from the fibre, Modulation, Multiplexing and coding, Repeaters, Bandwidth and Rise time budgets.
11. Transduces-Resistance, Inductance Capacitance, Piezoelectric, Thermoelectric, Hall effect, Photoelectric, Technogenerators, Measurement of displacement, velocity, acceleration, force, torque, strain, speed and sound temperature, pressure, flow, humidity, thickness, pH, position.
Measuring Equipment-Measurement of R, L and C, Bridge and Potentiometers, voltage, current, power, energy, frequency/time, phase, DVMS, DMMs, CRO, Digital storage oscilloscope, Logic probes, Logic State Analyzer, Spectrum Analyzer, Recorded, Noise and Interference in instrumentation, Instrumentation amplifiers, Radio Telemetry.
Analytical Instruments-Biomedical instruments-ECG, blood pressure measurements, spectrophotometers, Electron Microscope, X-ray diffractometer.
12. Open-loop and close-loop control system. Error amplifier, on-off controller, Proportional (P), Proportional-Integral (PI), Proportional-Derivative (PD), PID controllers, Dynamic Behaviour of control systems-servomechanism characteristics parameters of control systems-Accuracy, Sensitivity, Disturbances, Transient response, Stability, Routh-Hurwitz criterion, Bode plots, Nyquist criterion, Controlling speed. Temperature and position using analog/digital control circuits.