

જાહેરાત ક્રમાંક: ૪૭ /૨૦૧૬-૧૭, ગૃહ વિભાગ હસ્તકની ન્યાય સહાયક વિજ્ઞાન કચેરી હેઠળની સાયન્ટીફિક ઓફિસર (બાયોલોજી), સામાન્ય રાજ્ય સેવા વર્ગ-૨ જગ્યા પર ભરતી માટેની પ્રાથમિક કસોટીમાં ભાગ-૧ અને ભાગ-૨ ના ૧૦૦ મિનિટના સંયુક્ત પ્રશ્નપત્રનો અભ્યાસક્રમ

પ્રાથમિક કસોટીનો અભ્યાસક્રમ	
માધ્યમ: ગુજરાતી :૧૦૦	પ્રશ્નપત્ર-૧ પ્રશ્નો -૧૦૦ કુલ ગુણ
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 ઈન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી
૮	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો

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Syllabus of Preliminary Test

Medium: Gujarati  
100

Paper-1  
100 Questions

Total Marks-

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	<u>Indian Economy and Planning</u>
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) NITIAayog (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

**SCIENTIFIC OFFICER (BIOLOGY GROUP)**

**Fundamentals of Biology**

- Scope of Biology –Structure and Function of Cell – Plant cell and animal cell.
- General idea of Human anatomy and physiology.
- Cell cycle – Meiosis and mitosis.

**General Botany**

- Morphological and anatomical characteristics of plants yielding drugs of abuse like opium, Cannabis, Coca plant, Tobacco, etc
- Morphological and anatomical characteristics of poisonous plants like Strychnos nux-vomica, Aconitum, Abrus, Oleander, Castor, etc.
- Examination of starch, pollen grains, seeds and diatoms.

**Hair examination**

- Morphological, anatomical & Microscopic examination of hair.
- Characteristics of hair to determine the species origin and sex.

**Forensic Entomology**

- Definition and medico legal importance

**Cell Biology and Basic Biochemistry**

- Structure and function of cell and cellular organelles: Endoplasmic Reticulum, Golgi complex, Mitochondria, Chloroplast and Lysosomes. Organization of Nucleus and nuclear transport.
- Amino acids – structure and functional group properties.
- Proteins and peptides – Composition of proteins – Primary, Secondary and Tertiary structure of protein.

- Chemistry of Carbohydrates - Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides, Polysaccharides. Structures of starch, glycogen and glycosoaminoglycans.
- Chemistry of Lipids - Definition, Biological importance and classification, Fats and fatty acids, Introduction to compound lipids, Hydrophobic and hydrophilic groups, Cholesterol, Bile salts, Micelle. Bimolecular leaflet, Lipoproteins.

### **Serology**

- Origin of species and its techniques.
- Blood, its composition and forensic examination.
- Structure and function of Hemoglobin.
- Blood Typing/Grouping – ‘ABO’ system and its significance in forensic investigation.
- Determination of ABO blood group typing by forensic methods.
- Secretors and non-secretors
- Other blood group antigens - ‘Rh sub types’, MN, I, P, Kell, Duffy, Kidd, Lewis, Lutheran and Bombay blood group
- Forensic examination of semen and other body fluids – vomit, feces, urine, saliva and vaginal secretions.
- Basic concept of immunology, antigen and antibody, structure, properties and types of immunoglobulins.

### **Microbiology**

- Introduction to microbiology, microscopy, cell wall composition of Gram positive and Gram negative bacteria.
- Sterilization techniques - Physical agents: Dry heat, wet heat and cold sterilization, filtration, radiation; Chemical agents (Disinfectants, antibiotics, alcohols) and their mechanisms.
- Different methods for isolation of microorganisms from forensic samples like vomit, stool, stomach wash and residual food.
- Introduction to biological warfare, general properties of various biological warfare agents and their toxic effects.
- General idea of Protista and Fungi.

## **Molecular Biology**

- Basic of molecular biology: Definition of Heredity, Variation, Gene, Allele, Locus, Homozygous, Heterozygous, Dominant and Recessive.
- Mendel's work, Morgan's work and variation from Mendel's work – Incomplete dominance, co-dominance, multiple allele.
- Chromosomal aberration – Structural changes – Addition, Deletion, Duplication, Translocation and Inversions genetic consequences of these changes.
- Mutation, Molecular mechanism of mutation.

## **Basics of DNA analysis**

- Chemical structure of DNA and RNA.
- Overview of DNA replication, transcription and translation.
- Procedure for collection and preservation of biological sample for DNA analysis.
- Techniques of DNA isolation and its quantitation.
- DNA separation techniques.

## **Basic Methodologies in DNA analysis**

- History of DNA fingerprinting and DNA polymorphism.
- Genes and DNA markers in forensic DNA analysis.
- Fundamentals of RFLP and PCR based (STR) DNA typing.
- Introduction to mitochondrial DNA analysis and Y-STR analysis and their importance in forensic investigation.

## **Bio-Technology**

- General introduction, meaning, scope and importance.
- Genetic Engineering – Definition, importance and achievements.
- Plant tissue culture – Introduction, history, scope and techniques.
- Biomagnification – Biomagnification of pesticides and heavy metals and its consequences.

## **Anthropology**

- Introduction to anthropology
- Identification of individuals (living)
- Identity of missing person by superimposition techniques
- Facial reconstruction method.

## **Odontology**

- Identification of individuals and age determination from teeth.

## **Basic Techniques**

- Biochemical Techniques – Principles and types of Electrophoresis.
- Principles and types of automated DNA extraction module.
- Principles and types of DNA quantification module.
- Types of PCR amplification systems.
- Principle and importance of fragment analysis module.