KOKRAJHAR UNIVERSITY

Syllabus for PG entrance test

Session: 2026-27

Full marks: 100

Guidelines: All students are advised to carefully go through the prescribed syllabus and prepare thoroughly from the topics outlined therein. The syllabus for each subject/department has been officially prescribed and serves as the basis for academic preparation and evaluation. Students should familiarize themselves with the course contents and ensure that their preparation covers all the topics mentioned in the respective syllabus

Academic Registrar (i/c)

Kokrajhar University

Syllabus for PG Entrance Examination 2026

Dept of Assamese

Kokrajhar University

Unit-1: History of Assamese Literature-	20
Unit-2: Linguistics and Grammer	20
Unit-3: Assamese Drama	20
Unit-4: Literary Criticism	20
Unit-5: Assamese Culture	20

Kokrajhar University
Department of Bengali
Bengali Post Graduate Entrance Syllabus

Total Marks= 100

Question Type= 80 Multiple choice question 80X1= 80

04 Analytical Question 4X5= 20

Total=100 marks Time: 2 hrs

Unit-I

প্রাচীন ও মধ্যযুগের বাংলা সাহিত্য (OLD AND MEDIEVAL PERIOD BENGALI LITERATURE)

Course Content:

প্রথম এককঃ প্রাচীন ও প্রাক্-চৈতন্য সময়

চর্যাপদ- আবিষ্কার ও প্রকাশ, নামকরণ, কাব্যবৈশিষ্ট্য ও পদকর্তার সম্যক পরিচয়

শ্রীকৃষ্ণ কীর্তন- রচনাকাল, আবিষ্কার ও প্রকাশ, কবি-পরিচয়, কাব্যবৈশিষ্ট্য

বৈষ্ণব পদাবলী সাহিত্য- বিদ্যাপতি,চণ্ডীদাস

অনুবাদ সাহিত্য- কৃত্তিবাসী রামায়ণঃ-কবি-পরিচয়, কাব্যবৈশিষ্ট্য

টীকাঃ- জয়দেব, কবীন্দ্রবচন সমুচ্চয়, সদুক্তি কর্ণামৃত, তুর্কি আক্রমণ, হুসেন শাহু, মালাধর বসু, কবীন্দ্র পরমেশ্বর , নারায়ণ দেব, বিজয়গুপ্ত ।

দ্বিতীয় এককঃ চৈতন্য ও চৈতন্যোত্তর সময়

শ্রী চৈতন্যদেবঃ চৈতন্য ও চৈতন্য সমকালীন বাংলার সামাজিক-রাজনৈতিক-সাংস্কৃতিক প্রসঙ্গ ।

চৈতন্য জীবনী কাব্যঃ চৈতন্য ভাগবত, চৈতন্য চরিতামৃত

বৈষ্ণব পদাবলী সাহিত্যঃ জ্ঞানদাস, গোবিন্দদাস

মঙ্গলকাব্যঃ কবিকঙ্কন মুকুন্দ, ভারতচন্দ্র রায়গুনাকর

অনুবাদ সাহিত্যঃ কাশীরাম দাস, সৈয়দ আলাওল

টীকাঃ- ষড় গোস্বামী, বলরাম দাস, খেতুরী মহোৎসব, কেতকাদাস ক্ষেমানন্দ, রূপরাম চক্রবর্তী, চন্দ্রাবতী, দৌলত কাজী, রামপ্রসাদ, কমলাকান্ত, শিবায়ন, গোরক্ষবিজয়

গ্রন্থ

১. বাঙ্গালা সাহিত্যের ইতিহাস,(খণ্ড-১, ২, ৩), সুকুমার সেন।
২. অসিতকুমার বন্দ্যোপাধ্যায়, বাংলা সাহিত্যের ইতিবৃত্ত, (খন্ড-১ম, ২য়, ৩য়),মর্ডান বুক এজেন্সি।
৩ অসিতকুমার বন্দ্যোপাধ্যায়, বাংলা সাহিত্যের সম্পূর্ণ ইতিবৃত্ত, (মডার্ণ বুক এজেন্সি)।
৪. গোপাল হালদার, বাংলা সাহিত্যের রূপরেখা, (খন্ড- ১ম), এ মুখার্জি এন্ড কোম্পানি।

UNIT-II

আধুনিক যুগের বাংলা সাহিত্যের ইতিহাস (History of Bengali Literature Modern Period)

Course Content:

প্রথম এককঃ কাব্য-কবিতা

ঈশ্বরচন্দ্র গুপ্ত
মাইকেল মধুসূদন দত্ত
বিহারীলাল চক্রবর্তী
রবীন্দ্রনাথ ঠাকুর
জীবনানন্দ দাশ

টীকাঃ- কবিগান,হেমচন্দ্র বন্দ্যোপাধ্যায়, নবীনচন্দ্র সেন, মানকুমারী বসু, কামিনী রায়, নজরুল ইসলাম, সত্যেন্দ্রনাথ দত্ত, বিষ্ণু দে, সুধীন্দ্রনাথ দত্ত, বুদ্ধদেব বসু, সমর সেন, শক্তি চট্টোপাধ্যায়, শঙ্খ ঘোষ ।

দ্বিতীয় এককঃ গদ্যসাহিত্য

ফোর্ট উইলিয়াম কলেজ,
রামমোহন রায়,
ঈশ্বরচন্দ্র বিদ্যাসাগর,
বঙ্কিমচন্দ্র চট্টোপাধ্যায়,
রবীন্দ্রনাথ ঠাকুর।

টীকাঃ- শ্রীরামপুর মিশন, অক্ষয়কুমার দত্ত, দেবেন্দ্রনাথ ঠাকুর, কালীপ্রসন্ন সিংহ, প্যারীচাঁদ মিত্র, প্রমথ চৌধুরী, অবনীন্দ্রনাথ ঠাকুর, সমাচার চন্দ্রিকা, সমাচারদর্পণ, সংবাদ প্রভাকর, তত্ত্ববোধিনী, বঙ্গদর্শন, ভারতী, প্রবাসী, সবুজপত্র, কল্লোল, পরিচয় ।

গ্রন্থ

১. বাঙ্গালা সাহিত্যের ইতিহাস (খণ্ড- ৩য় থেকে ৫ম), সকুমার সেন, আনন্দ পাবলিশার্স।
২. অসিতকুমার বন্দ্যোপাধ্যায়, বাংলা সাহিত্যের ইতিবৃত্ত, (খন্ড-৪র্থ, ৯ম), মর্ডান বুক এজেন্সি।
৩. অসিতকুমার বন্দ্যোপাধ্যায়, বাংলা সাহিত্যের সম্পুর্ণ ইতিবৃত্ত, (মর্ডান বুক এজেন্সি)।
৪. বাংলা সাহিত্যের রূপরেখা, গোপাল হালদার, (খন্ড- ২য়), এ মুখার্জি এন্ড কোম্পানি।
৫. সাহিত্যসঙ্গী,শিশিরকুমার দাশ, সাহিত্য সংসদ।

UNIT-III **বাংলা ভাষার ইতিবৃত্ত- (HISTORY OF BENGALI LANGUAGE)**

Course Content:

প্রথম এককঃ পৃথিবীর ভাষা বংশ (ইন্দো-ইউরোপীয় , ভোট-চীনীয়) ; ভারতীয় আর্য ভাষা।

দ্বিতীয় এককঃ বাংলা ভাষার উদ্ভব ও ক্রমবিকাশ, প্রাচীন-মধ্য-নব্য বাংলা ভাষার কাল ও বৈশিষ্ট্য, সাধু ও চলিত ভাষা, বাংলা উপভাষা।

তৃতীয় এককঃ শব্দার্থতত্ত্ব ও শব্দার্থ পরিবর্তনের ধারা, বাংলা শব্দভান্ডার।

ধ্বনি পরিবর্তন (স্বরভক্তি, স্বরসঙ্গতি, অপিনিহিতি, অভিশ্রুতি, সমীভবন, ক্ষতিপূরক দীর্ঘীভবন, নাসিক্যীভবন, মূর্ধণ্যীভবন।)

গ্রন্থ

১. বাঙ্গালা ভাষাতত্ত্বের ভূমিকা, সুনীতিকুমার চট্টোপাধ্যায়, কলিকাতা বিশ্ববিদ্যালয়।
২. ভাষার ইতিবৃত্ত, সুকুমার সেন, আনন্দ পাবলির্শাস।
৩. সাধারণ ভাষাবিজ্ঞান ও বাংলা ভাষা, পুস্তক বিপণি।
৪. সংসদ ব্যাকরণ অভিধান, অশোক মুখোপাধ্যায়, সাহিত্য সংসদ।

Syllabus for PG Entrance Examination, 2026-27
Department of Bodo
Kokrajhar University

Total Marks: 100

Course Title: Language, Literature and Culture of the Bodo

Unit-I: History and the origin of the Bodo language, demography of the Bodo speakers, phonology, morphology, syntax, semantics, using script in writing of the Bodo language (prescribed UG level syllabus under) =25

Unit-II: History of the Bodo literature, all round development of the Bodo literature (specially Bodo prose, magazine, poetry, short story, novel, drama) =25

Unit-III: Folk literature of the Bodos, Folklore and folk society, folklore and its sub-genres, folk Religion, folk beliefs, superstition =25

Unit-IV: Bodo Culture, material culture of the Bodo, traditional custom of the Bodo =25

Sd/-

Head of the Dept. Bodo
Kokrajhar University

KOKRAJHAR UNIVERSITY

SYLLABUS FOR M.Sc. BOTANY ENTRANCE EXAMINATION, 2026

(For Admission to M.Sc. Botany Semester-I, Academic Session 2026–2027)

UNIT-1: Microbiology and Plant Pathology

- Discovery and history of microbiology
- Structure and classification of viruses
- TMV, bacteriophages, lytic and lysogenic cycles
- General characteristics of bacteria
- Bacterial cell structure
- Reproduction in bacteria
- Genetic recombination: Conjugation, Transformation, Transduction
- Fungi – cellular structure, mode of nutrition, reproduction
- Major groups of fungi
- Economic importance of microorganisms
- Plant diseases and disease management
- Host-pathogen interactions
- Microbial fermentation and industrial applications

UNIT-2: Algae

- Classification of algae
- General characteristics and life cycles
- Important genera:
  - Chlamydomonas
  - Volvox
  - Oedogonium
  - Vaucheria
  - Ectocarpus
  - Polysiphonia
- Economic importance of algae

UNIT-3: Bryophytes

- General characters
- Classification
- Morphology, anatomy and reproduction
- Marchantia, Riccia, Anthoceros and Funaria
- Alternation of generations
- Economic and ecological significance

UNIT-4: Pteridophytes

- General characters
- Classification
- Morphology and anatomy
- Lycopodium, Selaginella, Equisetum, Pteris
- Heterospory and seed habit
- Evolution of stele

UNIT-5: Gymnosperms

- General characters
- Classification and evolution
- Cycas, Pinus, Gnetum
- Reproduction and life cycles
- Economic importance

UNIT-6: Paleobotany

- Fossilization processes
- Geological time scale
- Fossil pteridophytes and gymnosperms
- Evolution of land plants

UNIT-7: Plant Taxonomy and Systematics

- Principles of taxonomy
- Botanical nomenclature
- Classification systems:
  - Bentham & Hooker, Engler & Prantl, APG System
- Systems of classification:
  - Artificial – Linnaeus
  - Natural – Bentham & Hooker (comparison with Engler & Prantl)
- Phylogenetic – Hutchinson, Takhtajan, Cronquist, APG IV (Angiosperm Phylogeny Group).
- Herbaria, botanical gardens, botanical nomenclature (ICN), type concept, keys (indented, bracketed)
- Selected families for detailed study:
  - Dicots: Ranunculaceae, Brassicaceae, Malvaceae, Fabaceae, Solanaceae, Cucurbitaceae, Apiaceae, Asteraceae, Lamiaceae, Euphorbiaceae, Rubiaceae, Apocynaceae
  - Monocots: Liliaceae, Poaceae, Orchidaceae, Arecaceae, Musaceae
- Diagnostic features, floral formula, floral diagram, economic importance, advanced vs. primitive characters

UNIT-8: Plant Anatomy

- Tissues – meristems (apical, lateral, intercalary), simple tissues (parenchyma, collenchyma, sclerenchyma), complex tissues (xylem, phloem)
- Structure of dicot and monocot root, stem, leaf
- Anomalous secondary growth – Dracaena, Boerhaavia, Bougainvillea, Beta, Mirabilis
- Wood anatomy – growth rings, heartwood, sapwood, tyloses; hardwoods vs. softwoods
- Nodal anatomy – unilacunar, trilacunar, multilacunar
- Periderm formation, lenticels
- Secretory structures – nectaries, hydathodes, glands, laticifers (non-articulated/articulated)
- Stomatal types (anomocytic, paracytic, diacytic, etc.) and development
- Adaptive anatomy – hydrophytes, xerophytes, halophytes, epiphytes

UNIT-9: Embryology

- Microsporogenesis – anther development, pollen wall formation (sporopollenin)
- Megasporogenesis – ovule types (atropous, anatropous, campylotropous), embryo sac development (monosporic – Polygonum, bisporic – Allium, tetrasporic – Peperomia, Fritillaria)
- Pollination, pollen-pistil interaction, self-incompatibility (gametophytic, sporophytic)
- Double fertilization, triple fusion
- Endosperm types – nuclear, cellular, helobial
- Embryogeny – dicot (Capsella) and monocot (Lilium)
- Polyembryony – true and false
- Apomixis – adventive embryony, diplospory, apospory
- Parthenocarpy, seed dormancy, germination

UNIT-10: Cell Biology

- Cell theory
- Prokaryotic and eukaryotic cells
- Cell organelles
- Cell membrane (structure and function) and transport across the membranes, endomembrane system
- Cell cycle, cell cycle regulation, apoptosis
- Mitosis and meiosis
- Cytoskeleton
- Cell signaling

UNIT-11: Genetics

- **Mendelian genetics** – laws, modifications: incomplete dominance, codominance, multiple alleles (ABO blood group), lethal genes, epistasis (recessive, dominant, duplicate, complementary, supplementary, inhibitory), polygenic inheritance, pleiotropy
- **Chromosomal basis of inheritance** – sex determination (XX-XY, XX-XO, ZW, haplodiploid), sex linkage (X-linked, Y-linked).
- **Linkage and recombination** – coupling and repulsion, recombination frequency, crossing over (mechanism, theories), linkage maps, interference, coefficient of coincidence
- **Extra-chromosomal inheritance** – organelle genetics (mitochondria, chloroplasts), maternal effects, cytoplasmic male sterility (CMS)
- **Mutation** – types (point mutation, frame shift, deletion, duplication, inversion, translocation), causes (mutagens – physical, chemical), DNA repair mechanisms.
- **Population genetics** – Hardy-Weinberg equilibrium, forces of evolution (mutation, gene flow, genetic drift, natural selection), inbreeding depression, heterosis
- Chromosome structure, Polyploidy, Aneuploidy.

UNIT-12: Molecular Biology

- **Structure of DNA and RNA** – Watson-Crick model, A, B, Z DNA, supercoiling, topoisomerases, nucleosome, chromatin remodeling, heterochromatin vs. euchromatin
- **DNA replication** – semiconservative, replication fork, enzymes involved, prokaryotic vs. eukaryotic, telomerase
- **Transcription** – RNA polymerase, promoter structure (TATA box, CAAT box, GC box), initiation, elongation, termination (ρ-dependent/independent), post-transcriptional modifications.

- **Translation** – ribosome structure, genetic code, tRNA charging, initiation, elongation, termination in prokaryotes and eukaryotes, post-translational modifications
- **Regulation of gene expression** – prokaryotic operons (lac operon – Jacob & Monod, trp operon – attenuation).

UNIT-13: Plant Physiology and Biochemistry

Water Relations
- Diffusion, Osmosis, Water potential, Transpiration, Ascent of sap

Mineral Nutrition
- Essential elements, Deficiency symptoms, Nutrient uptake

Photosynthesis
- Photosynthetic pigments
- Light reaction
- Calvin cycle
- C3, C4 and CAM pathways
- Photorespiration

Respiration
- Glycolysis
- Krebs cycle
- Electron transport chain
- Oxidative phosphorylation

Plant Growth Regulators
- Auxins, Gibberellins, Cytokinins, Ethylene, ABA

Plant Biochemistry
- Carbohydrates
- Proteins
- Lipids
- Enzymes, Enzyme kinetics
- Nitrogen metabolism
- Biological nitrogen fixation

UNIT-14: Ecology and Environment
- Ecosystem concept
- Food chains and food webs
- Ecological pyramids
- Biogeochemical cycles
- Population ecology
- Community ecology
- Ecological succession
- Biodiversity
- Conservation biology
- Environmental pollution

- Climate change
- Biodiversity hotspots of India
- Endemism, Phytogeographical division of India.

UNIT-15: Biotechnology

- **Recombinant DNA technology** – restriction enzymes (types I, II, III), cloning vectors, shuttle vectors, expression vectors, cDNA libraries, genomic libraries, PCR, DNA sequencing.
- **Plant transformation methods** – Agrobacterium tumefaciens (Ti plasmid, binary vector), biolistics (gene gun), polyethylene glycol (PEG), protoplast fusion, electroporation, chloroplast transformation
- **Plant tissue culture** – totipotency, callus, organogenesis, embryogenesis, micropropagation, somaclonal variation, somatic hybridization (protoplast fusion), cybrids, synthetic seeds, cryopreservation, secondary metabolite production (hairy root culture)

UNIT-16: Bioinformatics

- Objectives, branches and applications
- Biological databases
- GenBank, ENA, DDBJ, PIR, SWISS-PROT, PDB
- NCBI resources
- BLAST
- Sequence alignment
- Phylogenetic analysis
- Genomics and proteomics

UNIT-17: Economic Botany and Ethnobotany

- Centre of origin of cultivated plants
- Cereals
- Pulses
- Oil yielding plants
- Fibres
- Spices
- Medicinal plants
- Forest resources
- Ethnobotany of India
- Traditional knowledge systems
- Biodiversity conservation

UNIT-18: Laboratory techniques and instrumentation

- **Microscopy** – light, phase contrast, fluorescence, confocal, electron (SEM, TEM), sample preparation
- **Spectrophotometry, chromatography** (TLC, HPLC, GC), electrophoresis
- **Centrifugation** – differential, density gradient (sucrose, CsCl)
- PCR technique
- **Bioinformatics** – biological databases (NCBI, EMBL, GenBank), sequence alignment (BLAST, ClustalW), phylogenetic tree (MEGA), primer design
- Autoclave, Hot air Oven, pH meter, Laminar air flow, Incubator
- Staining methods for botanical specimens

- Herbarium techniques
- Pure culture techniques
- **Statistical methods** – mean, median, mode, standard deviation, t-test, chi-square test.

UNIT-19: Mushroom cultivation and Biofertilizer technology

- Benefits of edible and medicinal mushrooms.
- Cultivation of oyster, button and paddystraw mushrooms.
- Wild edible mushrooms and poisonous mushrooms.
- Benefits of Biofertilizers.
- Types of biofertilizers.
- Mass production methods of important biofertilizers.
- Micorrhizal biofertilizers.
- Organic cultivation.
- Green manure.
- Vermicomposting.

Syllabus of PG Entrance Test-2026

Subject: Chemistry

Unit 1: Gaseous State

Postulates of Kinetic theory and derivation of the kinetic gas equation; collision frequency; collision number, collision diameter; mean free path. Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Behaviour of real gases: Deviations from ideal gas behavior, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waals equation of state, its derivation and application in explaining real gas behaviour, other equations of state Berthelot, Dietrici, virial equation of state; calculation of Boyle temperature. critical coefficients, relation between critical constants and van der Waals constants, law of corresponding states.

Unit 2: Thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics. First law: Concept of heat, q, work, w, internal energy, U, and statement of first law; enthalpy, H, relation between heat capacities, calculations of q, w, U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions. Law of equipartition of energy, degrees of freedom and molecular basis of heat capacities.

Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions. Adiabatic flame temperature, explosion temperature.

Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes.

Unit 3:Aromaticity

Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation,

nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directing effects of the groups.

Unit 4: Coordination Chemistry

Coordination compounds, types of ligands, Werner's theory, IUPA nomenclature and isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers.

Unit 5: Hydrocarbons

Carbon-Carbon sigma bonds Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Corey-House reaction, Free radical substitutions: Halogenation - relative reactivity and selectivity. *Carbon-Carbon pi bonds:* Formation of alkenes by elimination reactions, Wittig reaction, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1, 2- and 1, 4- addition reactions in conjugated dienes, and Diels-Alder reaction; Allylic and benzylic bromination by NBS and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene.

Unit 6: Introduction to Spectroscopy

The nature of electromagnetic radiation. The regions of spectrum. Mechanism of interaction of electromagnetic radiation with matter. Absorption and emission spectroscopy. Basic elements of practical spectroscopy. Representation of spectrum – the width of spectral line. Intensity of spectral lines. Selection rules for various transitions. The Beer-Lambert law, molar absorption coefficient and absorbance. Molecular motion and energy – degree of freedom. Moment of inertia.

Unit 7: Rotational Spectroscopy

Rotational spectra of diatomic molecules – rigid rotator concept – determination of bond length effect of isotopic substitution – spectra of non-rigid rotator.

Unit 8: Vibrational and Raman Spectroscopy

Vibrational spectra of diatomic molecules – harmonic and anharmonic oscillator model – Morse potential - calculation of force constants – effect of isotope - vibrations of polyatomic molecules, fundamental modes of vibration of H_2O & CO_2 molecules. Diatomic vibrating rotor vibration rotation spectrum of CO. Basic principles of IR

spectroscopy.

Principle of Raman spectroscopy – rotational and vibrational Raman spectra of linear molecules, stokes and anti-stokes lines, rule of mutual exclusion. Symmetry and IR/Raman activity of normal modes of vibration. Interpretation of IR and Raman spectra of simple inorganic and coordination compounds.

Unit 9: Electronic spectroscopy

Basic principles. Electronic transitions and selection rule - spectrum of atomic hydrogen – fine structure, spectra of H-like atoms. Electronic transitions in diatomic molecules – Selection rule

- Born Oppenheimer approximation – vibrational coarse structure - Frank Condon principle – electronic transitions in polyatomic molecules. chromophore, auxochrome – absorption due to ethylenic chromophore. Effect of solvents on electronic transition, quantitative estimation by spectrophotometry.

Unit 10. Spin resonance spectroscopy

Basic principle of NMR. Interaction between spin and magnetic field, equivalent and non- equivalent proton, ^{1}H NMR – presentation of the spectrum - chemical shift and its unit, factors affecting chemical shift – chemical shifts for simple organic molecules (alkane, alkene, alkyne, arenas, aldehydes, carboxylic acids and esters). Splitting patterns of signals, coupling constant and its distinction from chemical shift - use of coupling constant in structural elucidation Spin- spin coupling and high resolution ^{1}H NMR spectra of ethanol, ethyl benzoate, 2-iodopropane, cyanohydrin. Basic concept of electron spin resonance spectroscopy – presentation of the spectrum – hyperfine structure – ESR of H- atom, deuterium atom and methyl radical.

Unit 11. Basics of Mass spectroscopy

Mass spectroscopy, principle, idea of mass spectrometer, fragmentation pattern, base peak, molecular ion peak and metastable ion, nitrogen rule.

PG ENTRANCE SYLLABUS
DEPT. OF ECONOMICS
KOKRAJHAR UNIVERSITY, KOKRAJHAR

As per the decision of the members of the department of Economics, KU about the syllabus of PG Entrance Examination 2026, basic concepts of the following topics are included in the PG Entrance Examination 2026.

1. MICROECONOMICS
    a) Consumer Behaviour
    b) Production
    c) Cost
    d) Revenue
    e) Market:
        (i) Perfect Competition
        (ii) Monopoly
        (iii) Monopolistic Competition
2. MACRO ECONOMICS
    a) Introduction to Macroeconomics
    b) National Income Accounting
    c) Money
    d) Inflation
    e) Classical and Keynesian systems;
    f) Fiscal and monetary multipliers.
3. MATHEMATICAL ECONOMICS
    a) Matrix
    b) Differentiation
    c) Application of Differentiation
        - Derivation of Revenue function, Elasticity, Utility Function, Production Function
    d) Integration and Application of Integration
        - Derivations of total functions (total cost, total revenue, consumption and saving functions)
4. STATISTICS FOR ECONOMICS
    a) Measures of Central Tendency
    b) Measures of Dispersion
    c) Probability and Theoretical Distribution
    d) Correlation and Regression
5. DEVELOPMENT ECONOMICS
    a) Development and Underdevelopment
    b) Factors in Development Process
    c) Conceptions of Development
    d) Growth Models and Empirics
    e) Poverty and Inequality: Meaning, Measures and Mechanisms

6. INDIAN ECONOMY
    a) Basic features of Indian Economy
    b) Poverty and Unemployment
    c) Agriculture
    d) Industry
    e) Infrastructure

Syllabus for PG Entrance Examination, 2026

Department: Education

1. Introduction to Education
2. Psychological Foundations of Education
3. Development of Education in India
4. Philosophical and Sociological Foundations of Education
5. Educational Measurement and Evaluation
6. Teacher Education
7. Educational Statistics
8. Contemporary Issues in Indian Education

KOKRAJHAR UNIVERSITY
Department of English

Syllabus for P.G. ENTRANCE EXAMINATION 2026
MCQs 80 Marks + Descriptive/Essay 20 Marks

1. 5 Marks from Old & Middle English literature, History and lit.
2. 5 Marks from the Age of Chaucer to University Wits.
3. 5 Marks from Shakespeare (plays & sonnets), Bacon, Milton, Sidney, etc.
4. 5 Marks from Rhetoric and Prosody.
5. 5 Marks from Metaphysical poets and Contemporary Prose writers.
6. 5 Marks from Restoration Comedy and Swift.
7. 5 Marks from Augustan Age.
8. 5 Marks from Romantic Age.
9. 5 Marks from Victorian Age (Fiction and Non-fiction).
10. 5 Marks from Victorian Women novelist.
11. 5 Marks from Modernist literature (Early 20th Century).
12. 5 Marks from Postmodern Literature (Fiction).
13. 5 Marks from Language and Linguistics.
14. 5 Marks from Literary Theory and Criticism.
15. 5 Marks from Indian Writings in English (20th century).
16. 5 Marks from American Literature (representative).
17. 20 Marks from Essay type/Analytical Questions

SYLLABUS FOR PG ENTRANCE EXAMINATION
DEPARTMENT OF GEOGRAPHY
KOKRAJHAR UNIVERSITY

Sl. No.	Core Paper	Sub Topic
1	Physical Geography	Geomorphology, Climatology, and Oceanography
2.	Human Geography	Population: Distribution and Density; Migration; Rural and Urban settlement; Economic Activities; race; ethnicity; social space; religion; nation; state; frontiers; geopolitics
3.	Regional Geography	World Regional Geography, Regional Geography of India, and North East India.
4.	Cartography	Concept of Scale, Projection System, and Surveying
5.	Research Methodology	Types of research; processes of research; hypothesis; research tools
6.	Quantitative Geography	Central Tendency, Dispersion, Co-relation, Regression; and Sampling

HoD, Geography
Kokrajhar University
Kokrajhar

Syllabus for PG Entrance Examination, 2026
Department of History, Kokrajhar University

Ancient India

- Sources of Ancient Indian History
- Indus Valley Civilization
- Vedic Age
- Buddhism and Jainism
- Mauryan Empire
- Gupta Empire

Medieval India

- Delhi Sultanate
- Mughal Empire

Modern India

- Revolt of 1857
- Socio-Religious Reform Movements
- Indian National Movement

World History

- Renaissance
- Reformation
- French Revolution
- Industrial Revolution
- World War I
- World War II

Assam & North-East India

- Freedom Movement in Assam
- History of Bodo and

PG Entrance Syllabus

Journalism, Mass Communication and Media Studies

Unit I: Introduction to Communication

- Meaning of communication
- Concept and characteristics of communication
- Importance of communication
- Basic elements of communication: Sender, Message, Receiver, Feedback
- Types of communication: Intrapersonal, Interpersonal, Group communication

Unit II: Communication in Daily Life

- Verbal communication
- Non-verbal communication
- Formal and informal communication
- Barriers to communication (Physical, Language, Cultural, Semantic, Psychological)
- Communication in everyday life

Unit III: Introduction to Mass Communication

- Meaning and concept of mass communication
- Characteristics of mass communication
- Functions of mass communication
- Types of mass media: Print, Broadcast and New media
- Role of mass media in society

Unit IV: Introduction to Journalism

- Meaning and concept of journalism
- Meaning of news
- Elements of news
- Types of news
- Role and responsibilities of journalists

Unit V: Media and Society

- Media and society

- Functions of media
- Media and public awareness
- Social media basics

Question Pattern:

- Total marks: 100
- Multiple Choice Questions (MCQs)---- 80 questions
- Simple descriptive questions ---------- 5 marks 4 questions

Note: The syllabus can be prepared through basic learning resources such as YouTube videos, PDF materials, articles and introductory study materials.

Kokrajhar University
Department of Mathematics
Syllabi for the PG Entrance Examinations

Ring Theory:
Rings, subrings, integral domains, fields, characteristics of a ring, ideals, prime and maximal ideals, ring homomorphisms and isomorphism, polynomial rings, factorisation of polynomials, reducibility and Irreducibility Tests of a polynomial, associate, irreducible and prime elements, Unique Factorisation Domain (UFD), Euclidean Domain (ED).

Metric Spaces:
Definitions and examples of metric spaces, sequences and their convergence, Cauchy sequences, completeness of a metric space, open and closed sets, neighbourhoods, continuous mappings, connectedness, compactness, and continuous functions.

Multivariate Calculus:
Functions of several variables, Level curves and surfaces, Limits and continuity, Partial differentiation, Higher order partial derivatives, Tangent planes, Total differential and differentiability, Chain rule, Directional derivatives, First and second partial derivative tests for relative extrema of functions of two variables, and absolute extrema of continuous functions, Method of Lagrange multipliers, Constrained optimisation problems.

Linear Algebra:
Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, bases and dimension, linear transformations, null space, range, rank and nullity of a linear transformation, dimension theorem, matrix representation of a linear transformation, invertibility and isomorphisms and their related theorems, eigenvalues and eigenvectors, eigenspace, Cayley-Hamilton Theorem.

Complex Analysis:
Functions of complex variable, mappings, limits, theorems on limits, continuity, derivatives, differentiation formulas, Cauchy−Riemann equations, analytic functions, harmonic functions, contours, contour integrals, upper bounds for moduli of contour integrals, Cauchy−Goursat theorem, Cauchy integral formula, Liouville's theorem and the fundamental theorem of algebra, maximum modulus principle, Convergence of sequences and series, Taylor series, Laurent series, absolute and uniform convergence of power series, continuity of sums of power series, integration and differentiation of power series, residues and poles, singular points, Cauchy's residue theorem.

PG Entrance Test/2026

Department of Philosophy

Kokrajhar University

Syllabus for PG Entrance Test/2026:

1. **Western Philosophy:**

   Pre-Socratic Philosophers (Thales, Anaximander, Anaximenes etc.)

   Socrates, Plato

   Descartes, Spinoza, Leibnitz

   Locke, Berkeley, Hume

   Hegel, Kant etc.

2. **Indian Philosophy (Nine Philosophical Schools of Thought):**

   Carvaka, Bauddha, Jaina, Samkhya, Yoga, Nyaya, Vedanta etc.

3. **Basic concepts of Logic:**

   Term, sentence, Copula, truth-functions, basic truth-tables, Vyapti, Hetu etc.

4. **Basic concepts of Philosophy of Religion:**

   Theology, arguments for God's existence, supporters of arguments etc.

DEPARTMENT OF PHYSICS
KOKRAJHAR UNIVERSITY
KOKRAJHAR, BTC, ASSAM, INDIA

PG ENTRANCE SYLLABUS - 2026

Mathematical Methods: Calculus of single and multiple variables, partial derivatives, Fourier series. Vector algebra, Vector Calculus, Multiple integrals, Divergence theorem, Green's theorem, Stokes' theorem. First order equations and linear second order differential equations with constant coefficients. Matrices and determinants.

Mechanics and General Properties of Matter: Newton's Laws of motion and applications, uniformly rotating frame, centrifugal and Coriolis forces, Motion under a central force, Kepler's laws, Gravitational Law and field, Conservative and non-conservative forces. Elastic and inelastic collisions. Rigid body motion, fixed axis rotations, rotation and translation, moments of Inertia and parallel and perpendicular axes theorem.

Oscillations, Waves and Optics: Differential equation for simple harmonic oscillator and its general solution. Superposition of two or more simple harmonic oscillators. Lissajous figures. Damped and forced oscillators, resonance. Wave equation, traveling and standing waves in one- dimension. Group velocity and phase velocity. Sound waves in media. Doppler Effect. Interference of light, Fraunhofer diffraction. Diffraction gratings. Polarization: linear, circular and elliptic polarization.

Electricity and Magnetism: Coulomb's law, Gauss's law. Electric field and potential. Biot-Savart law, Ampere's law, Faraday's law of electromagnetic induction, self and mutual inductance. Alternating currents. Simple DC and AC circuits with R, L and C components. Displacement current, Maxwell's equations, Poynting's theorem. Lorentz Force and motion of charged particles in electric and magnetic fields.

Kinetic theory, Thermodynamics: Elements of Kinetic theory of gases. Velocity distribution and equipartition of energy. Laws of thermodynamics. Zeroth law and concept of thermal equilibrium. First law and its consequences. Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law and entropy. Carnot cycle. Maxwell's thermodynamic relations and simple applications. Maxwell-Boltzmann, Fermi- Dirac and Bose Einstein distributions.

Modern Physics: Inertial frames and Galilean invariance. Postulates of special relativity. Lorentz transformations. Length contraction, time dilation. Relativistic velocity addition theorem, mass energy equivalence. Blackbody radiation, photoelectric effect, Compton Effect, Bohr's atomic model, X-rays. Wave-particle duality, Uncertainty principle, Schrödinger equation and its solution for one-dimensional box. Structure of atomic nucleus, mass and binding energy. Radioactivity and its applications. Laws of radioactive decay.

Solid State Physics, Devices and Electronics: Crystal structure, Bravais lattices and basis. Miller indices. X-ray diffraction and Bragg's law Intrinsic and extrinsic semiconductors, variation of resistivity with temperature. Fermi level. p-n junction diode, I-V characteristics, Zener diode and its applications, BJT: characteristics in CB, CE, CC modes. Single stage amplifier, two stage R-C coupled amplifiers. Simple Oscillators: Barkhausen condition, sinusoidal oscillators. OPAMP and applications: Inverting and non-inverting amplifier. Boolean algebra: Binary number systems; conversion from one system to another system; binary addition and subtraction. Logic Gates AND, OR, NOT, NAND, NOR exclusive OR; Truth tables; combination of gates; de Morgan's theorem.

Kokrajhar University
Syllabus for M.A Political Science Entrance Examination-2026

Papers and Marks Distribution

Unit	Paper	Marks
1	Political Theory	20
2	Indian Political System	20
3	Public Administration	20
4	International Relations	20
5	Western and Indian Political Thinkers	20
Total		**100**

Important Areas

1. Political Theory (20 Marks)

- Meaning, Nature and Scope, State, Power, Sovereignty, Liberty, Equality, Justice, Rights and Duties, Democracy, Citizenship, Political Ideologies (Liberalism, Marxism, Socialism, Feminism, Gandhism)

2. Indian Political System (20 Marks)

- Constitution, Legislative, Executive and Judiciary, Federalism, Political Parties, Local Self-Government and Contemporary Issues of Political Relevance

3. Public Administration (20 Marks)

- Meaning and Scope, Classical Theories: (Woodrow Wilson, Max Weber, Henri Fayol), Bureaucracy, New Public Administration, New Public Management, Good Governance, E-Governance, Accountability and Transparency, Civil Services in India

4. International Relations (20 Marks)

- Meaning and Scope, Realism and Idealism, World Wars, Cold War, Globalisation, India's Foreign Policy: (China, US & Russia), United Nations, South Asia, BRICS, G20 and Contemporary Global Issues

5. Western and Indian Political Thinkers (20 Marks)

Western Thinkers

- Plato, Aristotle, Niccolò Machiavelli, Thomas Hobbes, John Locke, Jean-Jacques Rousseau, Karl Marx, J. S. Mill, John Rawls

Indian Thinkers

- Kautilya, Mahatma Gandhi, B. R. Ambedkar, Jawaharlal Nehru, Vinayak Damodar Savarkar, Abul Kalam Azad

NB: Pattern of Questions and Marks Distribution

Total = 100 marks / Time: 2 hours

- **MCQ:** 80 questions × 1 mark = **80 marks**
- **Descriptive:** 4 questions × 5 marks = **20 marks**

PG ENTRANCE SYLLABUS

Department: ZOOLOGY

Animal Diversity: Non chordates and Chordates, all phyla characteristics.

Cell and Molecular Biology and Biochemistry : Cell division-Mitosis and Meiosis. Cell cycle.

Structure of DNA and RNA. Repliication, Transcription, Translation. Regulation of gene expression in prokaryote and Eukaryotes.

Poteins, lipids, fats structure, classification, functions.

Ecology and ecosystem: Definitions, functions and components.

Biodiversity: National parks of Assam, Wildlife sanctuaries. Wild life protection.

Biostatistics: definition, uses, data, sampling, significance level.

Endocrinology and developmental science:

Endocrine system, structure and functions of endocrine glands.

Developmental:. Gametogenesis: spermatogenesis and oogenesis; types of animal eggs; egg membranes and vitellogenesis. Fertilization: external and internal fertilization; sperm-egg interaction; biochemical and post-fertilization events.
Basics of Bioinformatics
Basics of Immunology.