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FREE SYLLABUS

GAT-B Syllabus

The complete official syllabus for the Graduate Aptitude Test-Biotechnology (GAT-B) in one clean list. Tick each topic as you finish it.

160
questions shown. You answer **120** in **3 hours**.

240
marks: **60** from Section A, **180** from Section B.

60 of 100
Section B questions you choose to answer.

-1
per wrong answer in **Section B**. −0.5 in Section A.

The GAT-B paper

Section	Questions	Answer	Correct	Wrong	Marks
A: Physics, Chemistry, Maths, Biology (10+2 level)	60	60	+1	−0.5	60
B: Biology, Life Sciences, Biotechnology (Bachelor's level)	**100**	**60**	**+3**	**−1**	**180**
Total	**160**	**120**			**240**

GAT-B 2027 is not announced yet. As of 31 October 2026, NTA has not released the GAT-B 2027 bulletin. This PDF follows the GAT-B 2026 bulletin and its official syllabus. GAT-B 2026 was held on 17 May 2026.

Section A has no chapter list. It covers Physics, Chemistry, Mathematics and Biology at the 10+2 level.

Official syllabus, word for word. The Section B topics are copied unchanged from the official GAT-B syllabus (RCB) linked in the NTA GAT-B 2026 information bulletin. The short headings above each topic (like "Immunology") are added by PsiGenei to make the list easy to scan. Checked on 31 October 2026. Official websites: exams.nta.nic.in/gat-bet and rcb.res.in

Practice any topic from this syllabus free on Test Manthan.
Build a GAT-B test on just the topic you finished, from past GAT-B questions.

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SCAN TO START

☐ Tick a box when you finish a topic. In Section B you answer only 60 of 100 questions, so build real strength in the topics you know best.

SECTION A

Physics, Chemistry, Mathematics and Biology

60 questions · all compulsory · 60 marks
10+2 level

- ☐ **A.1** Physics
- ☐ **A.2** Chemistry
- ☐ **A.3** Mathematics
- ☐ **A.4** Biology

SECTION B

Biology, Life Sciences and Biotechnology

100 questions · answer 60 · 180 marks
Bachelor's level

☐ B.1 Biomolecules and Metabolism

Biomolecules-structure and functions; Biological membranes, structure, action potential and transport processes; Enzymes- classification, kinetics and mechanism of action; Basic concepts and designs of metabolism (carbohydrates, lipids, amino acids and nucleic acids) photosynthesis, respiration and electron transport chain; Bioenergetics.

☐ B.2 Microbiology

Viruses- structure and classification; Microbial classification and diversity(bacterial, algal and fungal); Methods in microbiology; Microbial growth and nutrition; Aerobic and anaerobic respiration; Nitrogen fixation; Microbial diseases and host-pathogen interaction.

☐ B.3 Cell Biology

Prokaryotic and eukaryotic cell structure; Cell cycle and cell growth control; Cell-Cell communication, Cell signaling and signal transduction.

☐ B.4 Molecular Biology and Genetics

Molecular structure of genes and chromosomes; Mutations and mutagenesis; Nucleic acid replication, transcription, translation and their regulatory mechanisms in prokaryotes and eukaryotes; Mendelian inheritance; Gene interaction; Complementation; Linkage, recombination and chromosome mapping; Extra chromosomal inheritance; Microbial genetics (plasmids, transformation, transduction, conjugation); Horizontal gene transfer and Transposable elements; RNA interference; DNA damage and repair; Chromosomal variation; Molecular basis of genetic diseases.

B.5 Analytical Techniques

Principles of microscopy-light, electron, fluorescent and confocal; Centrifugation- high speed and ultra; Principles of spectroscopy-UV, visible, CD, IR, FTIR, Raman, MS,NMR; Principles of chromatography- ion exchange, gel filtration, hydrophobic interaction, affinity, GC,HPLC, FPLC; Electrophoresis; Microarray.

B.6 Immunology

History of Immunology; Innate, humoral and cell mediated immunity; Antigen; Antibody structure and function; Molecular basis of antibody diversity; Synthesis of antibody and secretion; Antigen-antibody reaction; Complement; Primary and secondary lymphoid organ; B and T cells and macrophages; Major histocompatibility complex (MHC); Antigen processing and presentation; Polyclonal and monoclonal antibody; Regulation of immune response; Immune tolerance; Hypersensitivity; Autoimmunity; Graft versus host reaction.

B.7 Bioinformatics

Major bioinformatics resources and search tools; Sequence and structure databases; Sequence analysis (biomolecular sequence file formats, scoring matrices, sequence alignment, phylogeny); Data mining and analytical tools for genomic and proteomic studies; Molecular dynamics and simulations (basic concepts including force fields, protein-protein, protein-nucleic acid, protein- ligand interaction)

B.8 Recombinant DNA Technology

Restriction and modification enzymes; Vectors; plasmid, bacteriophage and other viral vectors, cosmids, Ti plasmid, yeast artificial chromosome; mammalian and plant expression vectors; cDNA and genomic DNA library; Gene isolation, cloning and expression ; Transposons and gene targeting; DNA labeling; DNA sequencing; Polymerase chain reactions; DNA fingerprinting; Southern and northern blotting; In- situ hybridization; RAPD, RFLP; Site-directed mutagenesis; Gene transfer technologies; Gene therapy.

B.9 Plant Biotechnology

Totipotency; Regeneration of plants; Plant growth regulators and elicitors; Tissue culture and Cell suspension culture system: methodology, kinetics of growth and, nutrient optimization; Production of secondary metabolites by plant suspension cultures; Hairy root culture; transgenic plants; Plant products of industrial importance.

B.10 Animal Biotechnology

Animal cell culture; media composition and growth conditions; Animal cell and tissue preservation; Anchorage and non-anchorage dependent cell culture; Kinetics of cell growth; Micro & macro-carrier culture; Hybridoma technology; Stem cell technology; Animal cloning; Transgenic animals.

B.11 Bioprocess Engineering

Chemical engineering principles applied to biological system, Principle of reactor design, ideal and non- ideal multiphase bioreactors, mass and heat transfer; Rheology of fermentation fluids, Aeration and agitation; Media formulation and optimization; Kinetics of microbial growth, substrate utilization and product formation; Sterilization of air and media; Batch, fed-batch and continuous processes; Various types of microbial and enzyme reactors; Instrumentation control and optimization; Unit operations in solid-liquid separation and liquid-liquid extraction; Process scale-up, economics and feasibility analysis.

B.12 Bioprocessing and Industrial Biotechnology

Engineering principle of bioprocessing - Upstream production and downstream; Bioprocess design and development from lab to industrial scale; Microbial, animal and plant cell culture platforms; Production of biomass and primary/secondary metabolites; Biofuels, Bioplastics, industrial enzymes, antibiotics; Large scale production and purification of recombinant proteins; Industrial application of chromatographic and membrane based bio-separation methods; Immobilization of biocatalysts (enzymes and cells) for bioconversion processes; Bioremediation-Aerobic and anaerobic processes for stabilization of solid / liquid wastes.

B.13 Plant Tissue Culture and Agricultural Biotechnology

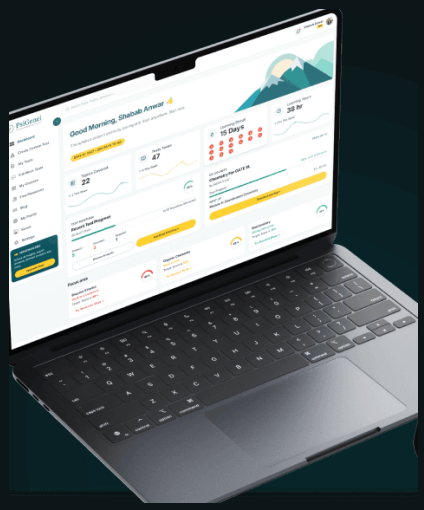
Tissue culture and its application, Micropropagation. Meristem culture and production of virus-free plants. Anther and microspore culture. Embryo and ovary culture. Protoplast isolation. Protoplast fusion-somatic hybrids, cybrids. Somaclones. Synthetic seeds. In vitro germplasm conservation. Cryopreservation. Organelle DNA, Satellite-and repetitive DNAs. DNA repair. Regulation of gene expression. Recombinant DNA technology-cloning vectors, restriction enzymes, gene cloning. Methods of gene transfer in plants. Achievements and recent developments of genetic engineering in agriculture. Development of transgenics for biotic & abiotic stress tolerance, bioethics, terminator technology, nanotechnology, DNA fingerprinting, gene silencing.

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FREE SYLLABUS

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psigenei.com/resources/downloads/gat-b-important-topics-weightage-pdf

Syllabus source: GAT-B syllabus, Regional Centre for Biotechnology (rcb.res.in), as linked in the NTA GAT-B 2026 information bulletin. Pattern: NTA GAT-B 2026 information bulletin. Checked 31 October 2026. Check the official websites for the GAT-B 2027 bulletin.