BIOLOGY

The Medical Council of India (MCI) recommended the following syllabus for NATIONAL ELIGIBILITY CUM ENTRANCE TEST for admission to MBBS/BDS courses across the country after review of various State syllabi as well as those prepared by CBSE, NCERT and COBSE. This is to establish uniformity across the country keeping in view the relevance of different areas in Medical Education.

S. No.	CLASS XI	CLASS XII
1.	Diversity in Living World	Reproduction
2.	Structural Organisation in Animals and Plants	Genetics and Evolution
3.	Cell Structure and Function	Biology and Human Welfare
4.	Plant Physiology	Biotechnology and Its Applications
5.	Human physiology	Ecology and environment

CONTENTS OF CLASS XI SYLLABUS

Unit I : Diversity in Living World

- What is living? ; Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy – Museums, Zoos, Herbaria, Botanical gardens.
- Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids.
- Salient features and classification of plants into major groups-Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two examples of each category); Angiosperms- classification up to class, characteristic features and examples).
- Salient features and classification of animals-nonchordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

Unit II : Structural Organisation in Animals and Plants

- Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence- cymose and recemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus).
- Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only)

Unit III : Cell Structure and Function

- Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles-structure and function; Endomembrane system endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, micro bodies; Cytoskeleton, cilia, flagella, centrioles (ultra structure and function); Nucleus-nuclear membrane, chromatin, nucleolus.
- Chemical constituents of living cells: Biomolecules-structure and function of proteins, carbodydrates, lipids, nucleic acids; Enzymes-types, properties, enzyme action.
- B Cell division: Cell cycle, mitosis, meiosis and their significance.

Unit IV : Plant Physiology

- Transport in plants: Movement of water, gases and nutrients; Cell to cell transport-Diffusion, facilitated diffusion, active transport; Plant – water relations – Imbibition, water potential, osmosis, plasmolysis; Long distance transport of water – Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration-Opening and closing of stomata; Uptake and translocation of mineral nutrients-Transport of food, phloem transport, Mass flow hypothesis; Diffusion of gases (brief mention).

- Mineral nutrition: Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as a method to study mineral nutrition; Nitrogen metabolism Nitrogen cycle, biological nitrogen fixation.
- Photosynthesis: Photosynthesis as a means of Autotrophic nutrition; Site of photosynthesis take place; pigments involved in Photosynthesis (Elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non cyclic and photophosphorylation; Chemiosmotic hypothesis; Photorespiration C3 and C4 pathways; Factors affecting photosynthesis.
- Respiration: Exchange gases; Cellular respiration-glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); Energy relations-Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.
- Plant growth and development: Seed germination; Phases of Plant growth and plant growth rate; Conditions of growth; Differentiation, dedifferentiation and redifferentiation; Sequence of developmental process in a plant cell; Growth regulators auxin, gibberellin, cytokinin, ethylene, ABA; Seed dormancy; Vernalisation; Photoperiodism.

Unit V : Human Physiology

- Digestion and absorption; Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Caloric value of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders – PEM, indigestion, constipation, vomiting, jaundice, diarrhea.
- Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans-Exchange of gases, transport of gases and regulation of respiration, Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.
- Body fluids and circulation: Composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Human circulatory system- Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity; Disorders of circulatory system- Hypertension, Coronary artery disease, Angina pectoris, Heart failure.
- Excretory products and their elimination: Modes of excretion- Ammonotelism, ureotelism, uricotelism; Human excretory system-structure and fuction; Urine formation, Osmoregulation; Regulation of kidney function-Renin-angiotensin, Atrial Natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion; Disorders; Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney.
- Locomotion and Movement: Types of movement- ciliary, fiagellar, muscular; Skeletal muscle-contractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus); Joints; Disorders of muscular and skeletal system Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.
- Neural control and coordination: Neuron and nerves; Nervous system in humans- central nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sense organs; Elementary structure and function of eye and ear.
- Chemical coordination and regulation: Endocrine glands and hormones; Human endocrine system RHypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulators, Hypo-and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goiter, exopthalmic goiter, diabetes, Addison's disease).

(Imp: Diseases and disorders mentioned above to be dealt in brief.)

CONTENTS OF CLASS XII SYLLABUS

Unit I : Reproduction

- Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species; Modes of reproduction – Asexual and sexual; Asexual reproduction; Modes-Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.
- Sexual reproduction in flowering plants: Flower structure; Development of male and female gametophytes; Pollination-types, agencies and examples; Outbreeding devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events-Development of endosperm and embryo, Development of seed and formation of fruit; Special modes-apomixis, parthenocarpy, polyembryony;

Significance of seed and fruit formation.

- Human Reproduction: Male and female reproductive systems; Microscopic anatomy of testis and ovary; Gametogenesis-spermatogenesis & oogenesis; Menstrual cycle; Fertilisation, embryo development upto blastocyst formation, implantation; Pregnancy and placenta formation (Elementary idea); Parturition (Elementary idea); Lactation (Elementary idea).
- Reproductive health: Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control-Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies – IVF, ZIFT, GIFT (Elementary idea for general awareness).

Unit II : Genetics and Evolution

- Heredity and variation: Mendelian Inheritance; Deviations from Mendelism-Incomplete dominance, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes; Sex determination-In humans, birds, honey bee; Linkage and crossing over; Sex linked inheritance Haemophilia, Colour blindness; Mendelian disorders in humans-Thalassemia; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.
- Molecular basis of Inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, genetic code, translation; Gene expression and regulation-Lac Operon; Genome and human genome project; DNA finger printing.
- Evolution: Origin of life; Biological evolution and evidences for biological evolution from Paleontology, comparative anatomy, embryology and molecular evidence); Darwin's contribution, Modern Synthetic theory of Evolution; Mechanism of evolution-Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg's principle; Adaptive Radiation; Human evolution.

Unit III : Biology and Human Welfare

- Health and Disease; Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis. Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse.
- Improvement in food production; Plant breeding, tissue culture, single cell protein, Biofortification; Apiculture and Animal husbandry.
- Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

Unit IV : Biotechnology and Its Applications

- Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology).
- Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms-Bt crops; Transgenic Animals; Biosafety issues-Biopiracy and patents.

Unit V : Ecology and Environment

- Organisms and environment: Habitat and niche; Population and ecological adaptations; Population interactions-mutualism, competition, predation, parasitism; Population attributes-growth, birth rate and death rate, age distribution.
- Ecosystem: Patterns, components: productivity and decomposition; Energy flow; Pyramids of number, biomass, energy; Nutrient cycling (carbon and phosphorous); Ecological succession; Ecological Services-Carbon fixation, pollination, oxygen release.
- Biodiversity and its conservation: Concept of Biodiversity; Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity; Biodiversity conservation; Hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, National parks and sanctuaries.
- Environmental issues: Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warning; Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.

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Trend Analysis from (2022- 2010)

BIOLOGY															
Ch. No.	Chapter Name	Number of Question (s) in													
		2022	2021	2020	2019	2018	2017	2016 Neet-1	2016 Neet-2	2015	2014	2013	2012	2011	2010
1.	Living World	1	1	1	1	1	0	1	1	0	0	2	0	1	0
2.	Biological Classification	2	1	1	1	4	4	4	4	2	6	1	4	8	3
3.	Plant Kingdom	3	4	3	1	3	4	2	2	4	4	4	3	1	3
4.	Animal Kingdom	2	3	4	2	3	5	2	3	3	4	4	1	3	4
5.	Morphology of Flowering Plants	4	2	2	1	2	2	5	7	5	5	2	7	4	3
6.	Anatomy of Flowering Plants	3	4	3	3	4	4	3	0	4	2	3	5	4	3
7.	Structural Organisations in Animals	4	3	3	3	1	1	2	2	2	2	2	2	3	1
8.	Cell: The Unit of Life	1	3	2	3	4	1	3	3	4	4	3	5	4	4
9.	Biomolecules	3	4	6	2	1	2	3	5	1	2	4	3	2	1
10.	Cell Cycle and Cell Division	5	5	4	2	1	2	3	4	2	3	2	2	1	2
11.	Transport in Plants	3	1	1	0	2	2	0	1	1	0	1	0	0	0
12.	Mineral Nutrition	2	1	0	0	1	0	2	1	2	1	2	3	4	3
13.	Photosynthesis in Higher Plants	3	2	2	0	2	1	2	4	2	1	1	2	2	3
14.	Respiration in Plants	2	1	2	1	2	2	1	1	0	1	2	0	1	1
15.	Plant Growth and Development	4	3	4	1	0	1	1	1	2	4	2	0	0	2
16.	Digestion and Absorption	2	2	3	3	1	4	1	2	2	2	1	1	2	2
17.	Breathing and Exchange of Gases	2	2	2	2	1	1	2	2	2	1	2	1	1	2
18.	Body Fluids and Circulation	2	2	3	2	2	1	2	2	3	2	1	0	5	3
19.	Excretory Products and their Elimination	1	–	2	2	2	1	1	1	2	1	1	1	5	3
20.	Locomotion and Movement	3	4	1	2	2	2	1	1	2	1	3	1	1	1
21.	Neural Control and Coordination	2	1	1	2	2	3	1	2	2	3	2	3	2	1
22.	Chemical Coordination and Regulation	1	1	2	2	3	3	4	3	1	2	3	3	2	4
23.	Reproduction in Organisms	2	1	-	0	3	0	1	1	0	0	3	1	1	0
24.	Sexual Reproduction in Flowering Plants	2	3	3	6	3	6	4	2	4	3	6	3	5	4
25.	Human Reproduction	3	3	3	2	4	3	5	2	3	3	3	4	3	11
26.	Reproductive Health	2	3	1	2	1	2	2	2	1	3	3	2	2	1
27.	Principles of Inheritance and Variation	2	1	3	6	5	5	3	6	3	4	4	2	4	5
28.	Molecular basis of Inheritance	8	9	3	6	5	7	4	3	6	4	2	4	1	4
29.	Evolution	2	2	3	4	3	0	3	3	1	2	4	4	1	1
30.	Human Health and Disease	2	2	5	5	5	3	2	3	6	2	2	6	5	3
31.	Strategies for Enhancement in Food Production	2	4	1	3	1	2	3	1	2	1	1	2	3	2
32.	Microbes in Human Welfare	1	1	1	6	1	3	1	2	0	1	2	7	2	3
33.	Biotechnology: Principles and Processes	5	6	6	2	2	4	4	3	0	3	2	5	2	5
34.	Biotechnology and its Applications	2	6	2	1	2	1	1	0	3	2	1	1	3	3
35.	Organisms and Populations	3	5	3	2	4	3	4	3	2	4	2	0	4	2
36.	Ecosystem	3	3	1	2	1	1	2	2	6	1	3	6	2	2
37.	Biodiversity and its Conservation	3	–	1	1	2	3	3	2	2	4	1	2	3	1
38.	Environmental Issues	3	1	2	6	4	1	2	3	3	2	3	3	4	4
	Total Questions	100	100	90	90	90	90	90	90	90	90	90	100	100	100

Top 50 Medical Institutes
National Institutional Ranking Framework (NIRF) 2022

S. No.	Name	City	State	Score	Rank
1.	All India Institute of Medical Sciences	New Delhi	Delhi	92.07	1
2.	Post Graduate Institute of Medical Education and Research	Chandigarh	Chandigarh	82.62	2
3.	Christian Medical College	Vellore	Tamil Nadu	75.33	3
4.	National Institute of Mental Health & Neuro Sciences, Bangalore	Bangalore	Karnataka	73.62	4
5.	Sanjay Gandhi Postgraduate Institute of Medical Sciences	Lucknow	Uttar Pradesh	72.45	5
6.	Amrita Vishwa Vidyapeetham	Coimbatore	Tamil Nadu	69.25	6
7.	Banaras Hindu University	Varanasi	Uttar Pradesh	67.62	7
8.	Jawaharlal Institute of Post Graduate Medical Education & Research	Puducherry	Pondicherry	67.42	8
9.	King George`s Medical University	Lucknow	Uttar Pradesh	64.67	9
10.	Kasturba Medical College, Manipal	Manipal	Karnataka	63.60	10
11.	Sree Chitra Tirunal Institute for Medical Sciences and Technology	Thiruvananthapuram	Kerala	63.04	11
12.	Institute of Liver and Biliary Sciences	New Delhi	Delhi	61.29	12
13.	St. John's Medical College	Bengaluru	Karnataka	60.83	13
14.	Sri Ramachandra Institute of Higher Education and Research	Chennai	Tamil Nadu	58.92	14
15.	Aligarh Muslim University	Aligarh	Uttar Pradesh	58.10	15
16.	Madras Medical College & Government General Hospital, Chennai	Chennai	Tamil Nadu	57.88	16
17.	Maulana Azad Medical College	Delhi	Delhi	56.35	17
18.	Vardhman Mahavir Medical College & Safdarjung Hospital	New Delhi	Delhi	56.20	18
19.	Dr. D. Y. Patil Vidyapeeth	Pune	Maharashtra	55.96	19
20.	S.R.M. Institute of Science and Technology	Chennai	Tamil Nadu	55.74	20
21.	Siksha `O` Anusandhan	Bhubaneswar	Odisha	54.13	21
22.	Lady Hardinge Medical College	New Delhi	Delhi	54.07	22
23.	Kasturba Medical College, Mangalore	Mangaluru	Karnataka	53.75	23
24.	JSS Medical College, Mysore	Mysore	Karnataka	53.63	24
25.	Jamia Hamdard	New Delhi	Delhi	53.18	25
26.	Dayanand Medical College	Ludhiana	Punjab	53.13	26
27.	Saveetha Institute of Medical and Technical Sciences	Chennai	Tamil Nadu	52.91	27

S. No.	Name	City	State	Score	Rank
28.	All India Institute of Medical Sciences Jodhpur	Jodhpur	Rajasthan	52.87	28
29.	Government Medical College & Hospital	Chandigarh	Chandigarh	51.90	29
30.	University College of Medical Sciences	Delhi	Delhi	51.89	30
31.	All India Institute of Medical Sciences Bhubaneswar	Khordha	Odisha	51.87	31
32.	Medical College	Kolkata	West Bengal	51.69	32
33.	PSG Institute of Medical Sciences & Research	Coimbatore	Tamil Nadu	51.62	33
34.	Datta Meghe Institute of Medical Sciences	Wardha	Maharashtra	51.52	34
35.	Maharishi Markandeshwar	Ambala	Haryana	50.96	35
36.	Kalinga Institute of Industrial Technology	Bhubaneswar	Odisha	50.36	36
37.	M. S. Ramaiah Medical College	Bengaluru	Karnataka	50.05	37
38.	Sawai Man Singh Medical College	Jaipur	Rajasthan	49.65	38
39.	SCB Medical College and Hospital	Cuttack	Odisha	49.42	39
40.	Annamalai University	Annamalainagar	Tamil Nadu	49.13	40
41.	Padmashree Dr. D. Y. Patil Vidyapeeth, Mumbai	Mumbai	Maharashtra	48.07	41
42.	Krishna Institute of Medical Sciences Deemed University	Karad	Maharashtra	47.11	42
43.	Narayana Medical College	Sri Potti Sriramu-lu Nellore	Andhra Pradesh	46.50	43
44.	Regional Institute of Medical Sciences	Imphal West	Manipur	46.50	43
45.	K. S. Hegde Medical Academy	Mangaluru	Karnataka	46.49	45
46.	Mahatma Gandhi Medical College and Research Institute	Puducherry	Pondicherry	46.08	46
47.	Jawaharlal Nehru Medical College	Belagavi	Karnataka	46.04	47
48.	Tirunelveli Medical College, Tirunelveli	Tirunelveli	Tamil Nadu	46.03	48
49.	Chettinad Hospital and Research Institute	Kelambakkam, Chengalpattu District	Tamil Nadu	45.32	49
50.	Shri B.M.Patil Medical College, Hospital & Research Centre	Vijayapura	Karnataka	45.11	50