Aligarh Muslim University

Scheme of Exam for Direct Recruitment of Post Graduate Teacher in AMU Schools

The written test is of 120 marks (120 objective type multiple choice question) carrying 01 mark for each question. The duration of written test will be 120 minutes without ant time limit for each part individually.

Section Name – Nature of Questions

Part I – Proficiency in Languages **(12 marks)**

A. General English (06 questions)
B. General Hindi (06 questions)

Part II – General awareness, Reasoning & Proficiency in computers **(18 marks)**

a) General Awareness & Current Affairs and Aligarh Movement (10 questions)
b) Reasoning Ability (4 questions)
c) Computer Literacy (4 questions)

Part III – Perspectives on Education and leadership (25 questions) **(25 marks)**

(a) Understanding the learner (5 questions)

(b) Understanding teaching learning (5 questions)

(c) Creating Conducive learning (5 questions)

(d) School Organization and leadership (5 questions)

(e) Perspectives in Education (05 questions)

Part IV – subject – specific Syllabus **(65 marks)**

Professional Competency Test:

The Professional Competency Test is 70 marks (Demo Teaching 70 marks)

Note: The weightage of Written Test & Demo Teaching in drawing the Final Merit list will be 30:70 respectively.

Scheme & Syllabus of Exam for Direct Recruitment of PGTs:

Part I – Proficiency in Language **(12 marks)**

(a) General English (06 questions)
Reading comprehension, word power, Grammar & usage)

(b) General Hindi (6 questions)
पठन कौशल शब्द सामर्थ्य, व्याकरण एवं प्रयुक्ति

Part II – General Awareness, Reasoning & Proficiency in Computers **(18 marks)**

(a) General Awareness & Current Affairs and Aligarh Movement (18 questions)
(b) Reasoning Ability (5 questions)
(c) Computer literacy (5 questions)

Part III – Perspectives on Education and Leadership **(25 marks)**

(a) Understanding the Learner (10 questions)

- Concept of growth, maturation and development, principles and debates of development, development tasks and challenges.
- Domains of Development: Physical, Cognitive, Socio-emotional, Moral etc., deviations in development and its implications.
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- Understanding Adolescence: Needs, challenges and implications for designing institutional support.
- Role of Primary and Secondary Socialization agencies. Ensuring Home School continuity.

(b) Understanding Teaching Learning (15 questions)

- Theoretical perspectives on learning – Behaviorism, Cognitivism and Constructivism with special reference to their implications for:
  i. The role of teacher
  ii. The role of learner
  iii. Nature of teacher-student relationship
  iv. Choice of teaching methods
  v. Classroom environment
  vi. Understanding of discipline, power etc.
- Factors affecting learning and their implications for:
  i. Designing classroom instructions,
  ii. Planning student activities and,
  iii. Creating learning spaces in school.
- Planning and Organization of Teaching – Learning
  i. Concept of Syllabus and Curriculum, Over and Hidden Curriculum, Principles of curriculum organizations.

ii. Competency based Education, Experiential learning, etc.
iii. Instructional Plans :- Year Plan, unit Plan , Lesson Plan
iv. Instructional material and resources.
v. Information and Communication Technology (ICT) for teaching – learning
vi. Evaluation: Purpose, types and limitations. Continuous and Comprehensive Evaluation, Characteristics of a good tool.
vii. Assessment of learning, for learning and as learning: Meaning, purpose and consideration in planning each.

- Enhancing Teaching learning processes: Classroom Observation and Feedback, Reflections and Dialogues as a means of constructivist teaching.

(c) Creating Conducive Learning Environment (04 questions)

- The concepts of Diversity, disability and Inclusion, implications of disability as social construct, types of disabilities – their identification and interventions.
- Concept of School Mental Health, addressing the curative, preventive and promotive dimensions of mental health for all students and staff. Provisioning for guidance and counselling.

(d) School Organization and Leadership (4 questions)

- Leader as reflective practitioner, team builder, initiator, coach and mentor.
- Perspectives on School Leadership: instructional, distributed and transformative
- Vision building, goal setting and creating a School Development plan
- Using School Processes and forums, for strengthening teaching learning – Annual Calendar, time – tabling, parent teacher forums, school assembly, teacher development forums, using achievement data for improving teaching – learning, School Self-Assessment and improvement
- Creating partnerships with community, industry and other neighbouring schools and Higher Education Institutes- forming learning communities

(e) Perspectives in Education (2 questions)

- NEP – 2020: Curriculum and Pedagogy in Schools: Holistic & Integrated Learning: Equitable and inclusive Education: Learning for All: Competency based learning and Education.
- Guiding Principles for Child Rights, Protecting and provisioning for rights of children to safe and secure school environment, Right of Children to free and Compulsory Education Act,2009,
- Historically studying the National Policies in education with special reference to school education;
- School Curriculum Principles: Perspective, Learning and Knowledge, Curricular Areas, School Stage, Pedagogy and Assessment

Part IV- Subject – specific Syllabus **(65 marks)**

Note: The weightage of Written Test & Demo Teaching in drawing the Final Merit list will be 30:70 respectively.

Syllabus for written examination for PGT (Biology)

It contains Class XI &XII Syllabus. However the questions will be testing the depth of understanding and application of these concepts at the level of Post-Graduation.

Unit I - Diversity of Living Organisms

Chapters
The Living World Three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature
Biological Classification Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.
Plant Kingdom Classification of plants into major groups; Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae (Topics excluded – Angiosperms, Plant Life Cycle and Alternation of Generations)
Animal Kingdom Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and at a few examples of each category).

Unit-II Structural Organization in Plants and Animals

Chapters
Morphology of Flowering Plants Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of family Solanaceae
Anatomy of Flowering Plants Anatomy and functions of tissue systems in dicots and monocots
Structural Organisation in Animals Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.

Unit-III Cell: Structure and Function

Chapters
Cell-The Unit of Life Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; 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,

microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.
Biomolecules Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, and nucleic acids; Enzyme - types, properties, enzyme action. (Topics excluded: Nature of Bond Linking Monomers in a Polymer, Dynamic State of Body Constituents – Concept of Metabolism, Metabolic Basis of Living, The Living State)
Cell Cycle and Cell Division Cell cycle, mitosis, meiosis and their significance

Unit-IV: Plant Physiology

Chapters
Photosynthesis in Higher Plants Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.
Respiration in Plants Exchange of 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 processes in a plant cell; plant growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

Unit-V: Human Physiology

Chapters
Breathing and Exchange of Gases 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 volume; 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 function; urine

formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.
Locomotion and Movement Types of movement - ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - 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
Chemical Coordination and Integration Endocrine glands and hormones; human endocrine system - hypothalamus, 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; dwarfism, acromegaly, cretinism, goiter, exophthalmic goitre, diabetes, Addison's disease. Note: Diseases related to all the human physiological systems to be taught in brief

Unit VI – Reproduction

Chapters
Sexual Reproduction in Flowering Plants Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; out breeding 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 dispersal and fruit formation.
Human Reproduction Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis -spermatogenesis and 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 (STDs); 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 VII - Genetics and Evolution

Chapters
Principles of Inheritance and Variation 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 and 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 8 expression and regulation - lac operon; Genome, Human and rice genome projects; DNA fingerprinting
Evolution Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); 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 VIII - Biology and Human Welfare

Chapters
Human Health and Diseases Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Unit IX - Biotechnology and its Applications

Chapters
Biotechnology - Principles and Processes Genetic Engineering (Recombinant DNA Technology).
Biotechnology and its Applications Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

Unit X - Ecology and Environment

Chapters
Organisms and Populations Population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution. (Topics excluded: Organism and its Environment, Major Aboitic Factors, Responses to Abioitic Factors, Adaptations)
Ecosystem Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy (Topics excluded: Ecological Succession and Nutrient Cycles).
Biodiversity and its Conservation Biodiversity-Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites