

**ALIGARH MUSLIM UNIVERSITY
ALIGARH**

Aligarh Muslim University, Aligarh has been granted funds by the Department of Biotechnology (DBT), Govt. of India under the BUILDER programme to initiate Inter-Departmental research. The participating Departments are Biochemistry, Zoology, Botany and Interdisciplinary Biotechnology Unit.

Applications are invited on plain paper (hard copy only, not by e-mail) for six posts of Junior Research Fellows in all above departments in the various sub-projects. Indicate, name, date of birth, address, area of interest/group leader to work with and other essential/technical/professional qualifications and experience and email ID. The appointments shall be initially for a period of one year, renewable every year depending on the performance of the fellows. Complete applications with all relevant documents should reach the Programme Coordinator **on or before 25 Feb., 2013** at the address given below. Superscribe the envelope with **DBT BUILDER JRF**

Candidates must have good communication skills and be willing to work in a team of biologists & biotechnologists under the following investigators:

1. Prof. Bilquis Bano, Research Group Leader, Department of Biochemistry, Faculty of Life Sciences, AMU, Aligarh One Post
2. Prof. S.M.A. Abidi, Research Group Leader, Department of Zoology, Faculty of Life Sciences, AMU, Aligarh. Two Posts
3. Prof. Nafees A. Khan, Research Group Leader, Department of Botany, Faculty of Life Sciences, AMU, Aligarh. Two Posts
4. Dr. Mohammad Owais, Research Group Leader, Interdisciplinary Biotechnology Unit, AMU, Aligarh. One Post

Candidates will be selected on the basis of a common test (multiple choice questions) of 70 marks and an interview of 30 marks. The interview date will be announced later and the candidates will be informed by e-mail.

Date of Test: Feb. 28, 2013
Time: 3:00 pm
Venue: Department of Zoology, AMU

Prof. Irfan Ahmad
Programme Coordinator
DBT-AMU BUILDER programme
Department of Zoology,
Aligarh Muslim University,
Aligarh – 202002

Syllabus for DBT BUILDER JRF Test

Structure, function, properties and significance of proteins, carbohydrates, lipids, nucleic acids and vitamins. pH, buffers, reaction kinetics, thermodynamics, colligative properties.

Cell membrane/wall, nucleus, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, centrioles, chloroplast, the cytoskeleton and its role in motility. Mitosis and meiosis and their regulation. Steps in cell cycle and control mechanism.

Dominance, segregation and independent assortment. Deviation from mendelian inheritance and genetic variation. Alleles, multiple alleles, pseudo alleles, cloning and transgenics.

Concepts of species and hierarchical taxa. Biological nomenclature. Classical and quantitative methods of taxonomy of plants, animals and microorganisms. Important criteria used for classification in each taxon. Classification of plants, animals and microorganisms. Evolutionary relationships among taxa.

Lamarckism and Darwinism. Concepts of variation, adaptations, struggle for existence and natural selection. Mendelism ; spontaneity of mutations and evolutionary synthesis. The geological time scale. Eras, periods and epochs. Major events in the evolutionary time scale. Origin of unicellular organisms; stages in primate evolution.

Common parasites and pathogens of humans, domestic animals and crops. Recognition and entry of pathogens like bacteria and viruses into animal and plant cells. Alteration of host cells and behaviour of pathogens. Virus induced cell transformation. Pathogen induced disease in animals and plants.

Current environment issues and their mitigation. Types of pollution: their sources, effects, prevention and control. Concept of biodiversity. Management and conservation issues and their solutions. Physical conditions of the environment: temperature, light and water. Biogeochemical cycles. Ecosystem: concept, structure and function. Food chain and food web. Energy flow and succession.

Measures of central tendency and dispersal. Probability distributions; sample distribution. Levels of significance. Regression and correlation. T-test, analysis of variance and Chi-square test.