Faculty of Medicine

Aligarh Muslim University, Aligarh

Syllabus for Admission to Ph.D Programme 2020-21

Section-A

(Common to all Departments of the Faculty)

Research Aptitude/ Research Methodology

(i) Meaning, objective, types and significance of research. Selection and definition of a research problem. Types of research design. Evaluation of time and cost of scientific research.

(ii) Meaning and characteristics of research hypothesis. Testing of research hypothesis. Procedures of hypothesis testing. Errors in hypothesis testing. Study design options in medical and health research (observational/non-experimental/non interventional studies; experimental/interventional study designs; randomized controlled trials; elements to monitor clinical trials).

(iii) Meaning of population and sample. Sample size. Types of sampling. Sampling techniques, Sampling and non-sampling errors. Collection, analysis and interpretation of data. Merits and demerits of rating and ranking scales. Applications of biostatistics in research. Mean, mode, median, students't test, confidence interval, standard error, standard deviation, chi-square test, difference between parametric statistics, Data presentation, Measure of central tendency; Measure of disparity: Mean deviation, Coefficient of variation; Correlation and regression. Probability theory and distributions: Binomial, Poisson, and Normal distributions. Statistical inference – Hypothesis testing (t test, Z test, Chi square test), ANOVA for one way and two way classified data, Use of Statistics in Biosciences, Use of Computers in Quantitative analysis.

(iv) Meaning and sources of literature review. Significance of literature review in research. Cohort studies. Blind and double blind studies. Regress and index number.

(v) Ethics in research: Ethical practices for research on humans and animals. Publication ethics including plagiarism and knowledge of antiplagiarism tools.

(vi) History of computers, concept of computer hardware, concept of computer languages, concept of computer Softwares, computer applications in biology; spreadsheet tools; Introduction to spreadsheet applications, Data storing, Features for Statistical data analysis, Generating charts/ graph and other features.

(vii) Basics of bioinformatics; databases; structural databases; Protein Data bank (PDB), Nucleic Acid Data Bank (NDB), Molecular modeling Data Bank (MMDB).