# Digital University Research Aptitude Test (DRAT) - 2024

**Date**: 8th June 2024

**Total Marks**: 70

**Time**: 120 mins

Section A (DRAT-Common or DRAT-C) is mandatory for all the candidates. The individual program specific test papers under Section B will follow after the completion of Section A.

## Section A (35 marks, 60 mins)

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Quantitative Aptitude: Data interpretation: Data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables. Numerical computation and estimation: Ratios, percentages, powers, exponents and logarithms, permutations and combinations, summations and series, Mensuration and Geometry | 10 | 15 mins | 10 |
| Analytical Aptitude: Logical methods, Deduction and induction, analogy, numerical relations, and reasoning | 10 | 15 mins | 10 |
| Research aptitude: Types and characteristics of research, methods of research, qualitative and quantitative methods, steps of research | 10 | 15 mins | 10 |
| English comprehension | 5 | 15 mins | 5 |

## Section B (35 marks, 60 mins)

**School of Computer Science & Engineering**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Basic Engineering Mathematics: Discrete Mathematics, Linear Algebra, Calculus, Probability andBasic Statistics Computer Science: Digital Logic, Computer Organization and Architecture, Programming and Data Structures, Algorithms, Theory of Computation, Operating System, Databases, Computer Networks and Security. | 35 | 60 mins | 35 |

**School of Electronic Systems & Automation**

*Note: The candidate can choose Test I or Test II after completing Section A depending on his/her research interests.*

**Test I** (For research areas: Energy Storage, and Conversion, Gas Sensors, Graphene and 2D Materials, Wearable Sensors, FlexibleElectronics, Nanoelectronics, IoT)**:**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Basics Electronics, Classification and properties of materials, material characterization techniques, Fundamental concepts of electrochemistry | 35 | 60 mins | 35 |

**Test II** (For research areas: Electronic Instrumentation, Applied Electronics, Interface Circuits)**:**

| Section B Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Sensors for temperature measurement, diode, zener diode, Op-amps and typical Op-amp-basedcircuits, ADC and DAC | 35 | 60 mins | 35 |

**School of Digital Sciences**

*Note: The candidate can choose Test I or Test II or Test III after completing Section A depending on his/her research interests.*

**Test I** (For research areas: Computational Dynamical Systems, Nonlinear Dynamics and Chaos, Neurodynamics, Network ofcoupled oscillators and their dynamics, Discrete mappings and bifurcation theory)

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Calculus, Linear Algebra, differential equations, numerical methods, programming language(MATLAB/ Python/C, C++) | 35 | 60 mins | 35 |

**Test II (For research area: Computational Chemical Biology):**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Bioinformatics-databases, omics data analysis, medicinal chemistry, molecular biology,retrosynthesis, computer-aided drug discovery, sensors and probes, machine learning | 35 | 60 mins | 35 |

**Test III (For research area: Computational Neuroscience):**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Mathematics fundamentals, Neuroscience basics, Computer basics & programming, Electronics basics, Chemistry basics. | 35 | 60 mins | 35 |

**School of Informatics**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Fundamentals of Ecology, Terrestrial ecosystem, Biodiversity and conservation, SpatialInformatics, Ecological Data Analysis | 35 | 60 mins | 35 |

**School of Digital Humanities & Liberal Arts**

| Syllabus | No. of questions | Approximate Time | Marks |
|---|---|---|---|
| Management Science- LPP, Sensitivity Analysis, Transportation Assignment problems, Queingtheory, PERT/CPM, Inventory models, Game theory, Decision Trees | 10 | 15 | 10 |
| Business Environment -  Liberalisation, privatisation, globalisation, industrial policy andindustrialisation trends | 10 | 15 | 10 |
| Business Statistics | 5 | 10 | 5 |
| Business Policy and Strategic management | 5 | 10 | 5 |
| Research Methodology | 5 | 10 | 5 |