Digital University Research Aptitude Test (DRAT) - 2023

Date: 7th October 2023, 10.00 AM

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. The candidate needs to write **all** the Section B test papers that correspond to the PhD programs he/she has applied for.

Total Marks for DRAT exam: 70 Time: 120 mins

Section A (35 marks, 60 mins)

Syllabus	Number of questions	Approximate Time	Marks
Quantitative Aptitude	10	15 mins	10
Analytical Aptitude	10	15 mins	10
Research aptitude	10	15 mins	10
English comprehension	5	15 mins	5

Section B (35 marks, 60 mins)

School of Computer Science & Engineering:

Section B Syllabus	No. of questions	Approximate Time	Marks
Basic Engineering Mathematics: Discrete Mathematics, Linear Algebra, Calculus, Probability and Basic 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, Flexible Electronics, Nanoelectronics, IoT):

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

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-based circuits, ADC and DAC	35	60 mins	35

School of Digital Sciences:

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: Computational Dynamical Systems, Nonlinear Dynamics and Chaos, Neurodynamics, Network of coupled oscillators and their dynamics, Discrete mappings and bifurcation theory)

Section B 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):

Section B 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

School of Informatics:

Section B Syllabus	No. of questions	Approximate Time	Marks
Fundamentals of Ecology, Terrestrial ecosystem, Biodiversity and conservation, Spatial Informatics, Ecological Data Analysis		60 mins	35