

## Faculty of Science

### Interdisciplinary Department of Remote Sensing & GIS Applications

#### Master of Science in Remote Sensing & GIS Applications (M.Sc.)

This paper contains 100 Multiple Choice Questions from the following subjects:

##### Earth Sciences

Earth in the solar system : origin, size, shape, mass, density, rotational and revolution parameters. Formation of core, mantle, crust, hydrosphere, atmosphere, biosphere, and elemental abundance in each constituent. Seafloor spreading, plate tectonics, and continental drift. Volcanoes : Type and distribution. Atmospheric circulation. Earth's heat budget. Rock Weather : Type, Controlling factors and products of weathering. Soil formation, soil profile and soil types. Erosional and depositional landforms produced by running water, wind and glaciers. Physiographic subdivisions of the Indian subcontinent – their physical, structural and geological features. Stream patterns. Elementary Ideas about crystal structure. Silicate structure and their classification. Cycles in the earth system: carbon energy cycle, biogeochemical cycle, rock cycle, geochemical cycle. Landslides: slope stability, causes of landslides, prevention and mitigation. Physics of Remote Sensing, EMR, RS Data Acquisition, visual interpretation of aerial & Satellite images.

##### Computer & Reasoning

Fundamentals of Computers and Problem solving, Business Data Processing, Data Structure and Structured Programming, Systems Programming and Operating System.

Reasoning include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, spatial visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc.

##### Statistics

Data: Quantitative and qualitative, attributes, variables, scales of measurement- Bi-variate data, Correlation (simple, partial and multiple), rank correlation. Regression Analysis. Mean, median and mode of grouped data (bimodal situation to be avoided). Cumulative frequency graph. Classical definition of probability. Simple problems on finding the probability of an event.

## Physics

Black body radiation experiment and Planck's hypothesis, Photoelectric effect, Wave function and its simple properties. Distance and displacement, *Force and Newton's laws* : Force and Motion, Newton's Laws of Motion, Elementary idea of conservation of Momentum. *Gravitation*: Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall. *Floatation*: Thrust and Pressure. Archimedes' Principle; Buoyancy; Elementary idea of Relative Density. *Work, energy and power*: Kinetic and Potential energy; Law of conservation of energy. *Sound*: Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultrasound; reflection of sound; echo and SONAR. Structure of the Human Ear (Auditory aspect only).

## Mathematics

*Real numbers* : natural numbers, integers, rational numbers, terminating / non terminating recurring decimals, non recurring / non terminating decimals, non-rational numbers; *Algebra* : polynomials, pair of linear equations in two variables, quadratic equations, arithmetic progressions. *Geometry* : introduction to geometry, lines and angles, triangles, quadrilaterals, area, circles, constructions; *Trigonometry* : introduction to trigonometry, trigonometric identities, heights and distances. *Menstruation* : areas related to circles, surface area and volumes.