Laxmi Narain Dubey College, Motihari
(a constituent unit of B.R.A. Bihar University, Muz.)
NAAC Accredited 'B+'
National Cadet Corps (NCC)

Topic: Geographic Information System (GIS)

NCC – Special Topic
B/C Certificate Examination

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Geographic Information System (GIS)

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1. Definition :- A GIS is a computer-based system for capturing, storing, querying, analyzing and displaying geographically referenced data.
2. Geographically referenced data are data that describe both the location and characteristics of spatial features such as roads, rivers, land and vegetation layout on the earth's surface. It is also called as 'Geo-spatial data'.
3. Characteristics of GIS :- The following characteristics can be described as facet of GIS:
   (a) Geographic : The system is concerned with data relating to geographic scales of measurement.
   (b) Information : Any queries related to the question of the geographic database are stored in several layers.
   (c) System : GIS is an integrated set of procedures for the input, storage, manipulation and output of geographic information.
4. Need for GIS : (i) One of the requirements of GIS in armed forces is to display data about the enemy, terrain, weather and climate which assists the commanders in making decisions and guiding the subordinates in executing them.
   (ii) The GIS has been an effective tool for implementation and monitoring of infrastructure.
   (iii) The use of GIS has been complimented due to the following :
   (a) Planning of project : GIS helps in creation of detailed planning of project having a large 3-dimensional

Coherent, where analysis of the problem is a pre-requisite at the start of the project. In GIS we can generate Thematic maps.

(b) Decision making: GIS assists in tasks such as presenting information at planning enquiries, thus contributing to effective decision making.

(c) Visual Analysis: Using Digital Terrain modelling (DTM)/3D modelling in GIS, landscape can be better visualised, leading to a better understanding of certain relations in the landscape.

(d) Fostering organisational integration. GIS has the ability to link data sets together by geography, it facilitates inter departmental information sharing and communication.

5. Components of GIS: GIS requires following four components to manipulate geographically referenced data:-

(a) Hardware.
(b) Software
(c) Brain ware.
(d) Infrastructure

6. Applications of GIS. Following are the important field where we can apply GIS-

(a) Land use planning.
(b) Hydrology

(c) Geology.-
(d) Ecology and forestry.
(e) Agriculture
(f) Drinking water/sewerage management.
(g) Risk management - natural or man-made disasters.
(h) Coastal zone management.
(i) military applications.

7. Military Applications.

(i) GIS helps in planning of military operations by evaluation of terrain through GIS which is an intelligence product that presents an analysis and interpretation of the natural and manmade characteristics of an area and their effects on military operations.

(ii) In conducting any operations, the commander must determine how his forces can use the terrain most effectively, how it may affect the enemy's capabilities and how it may be exploited to interfere with the enemy.

(iii) GIS provides capability to observe the area of interest by terrain evaluation. This may help the army to identify field of fire during operations/war. Based on that the Army can identify and use suitable weapons including flat trajectory weapons, high trajectory weapons, rockets and guided missile.

(iv) Analysis of terrain using GIS can helps Army in concealment

and cover military installations or activities from enemy observation.

(v) using GIS & Army analyse terrain which helps in identify obstacles of operations area and thus they plan accordingly by finding alternate routes.

(vi) Weather information is very imbortant during operations. GIS helps army by providing timely information on weather which helps them to plan accordingly for the operations.

(vii) GIS can provide aids to counter terrorism by providing detailed 3D models.

(viii) GIS can help also in naval operations.

(ix) GIS can help in Air operations also.

(x) GIS can also help in nuclear and biological warfare by providing adequate data on relevant assets.