SPECIALISED SUBJECTS

CHAPTER 1

ARMED FORCES

SECTION -1

BASIC ORGANIZATION OF ARMED FORCES

Ques 1 - What all major operations have been fought by Indian Army since Independence?

Ans - (a) Kashmir Operations against Pakistan 1947-48.

(b) Sino- Indian Operations in NEFA (Arunanchal) and Laddakh 1962.

(c) Indo-Pak war 1965.

(d) Indo – Pak war 1971.

(e) Kargil conflict 1999.

Ques 2 - What are names of Army commands?

Ans - (a) Northern Command
(b) Western, Command
(c) Central Command
(d) Southern Command
(e) South Western Command
(f) Eastern Command
(g) Training Command

Ques 3 - Name the fighting arms?

Ans - (a) Armour
(b) Infantry
(c) Mechanized infantry

Ques 4 - Name the Supporting arms?

Ans - (a) Artillery
(b) Engineers
(c) Army Air Defence
(d) Army Aviation corps
(e) Signals

Ques 5 – Name the supporting services of the Army?

Ans (a) Army Service Corps

(b) Army Medical Corps

(c) Army Ordnance Corps

(d) Corps of Electronics and Mechanical Engineers

(e) Remount and Veterinary Corps.

(f) Army Education Corps

(g) The Intelligence Corps

(h) The Corps of Military Police

(h) Judge Advocate General Branch

(k) Army Physical Training Corps

(l) The Pioneer Corps

(m) Defence Security Corps

Ques 6 – Name the various commands of the Navy?

Ans - (a) Western Naval Command with HQ at Mumbai.

(b) Eastern Naval Command with HQ at Vishakhapatnam.

(c) Southern Naval Command with HQ at Cochin.

Ques 7 – Name the various commands of Air Force?

Ans - (a) Western Air Command.

(b) Central Air Command

(c) Eastern Air Command.

(d) South Western Air Command.

(e) Southern Air Command.

(f) Training Command.

(g) Maintenance Command.

SECTION-2

BADGES AND RANKS

Ques 1 - Name officers' ranks of Army in ascending order?

Ans - (a) Lieutenant
(b) Capt
(c) Major
(d) Lieutenant Colonel
(e) Colonel
(f) Brigadier
(g) Major General
(h) Lieutenant General
(i) General
(j) Field Marshal

Ques 2 - Name officers' ranks of Air Force descending order?

Ans - (a) Marshal of the Air Force
(b) Air Chief Marshal
(c) Air Marshal
(d) Air Commodore
(e) Group Captain
(f) Wing Commander
(g) Squadron Leader
(h) Flight Lieutenant
(i) Flying Officer

Ques 3 - Name officers' ranks of Navy in ascending order?

Ans - (a) Sub Lieutenant
(b) Lieutenant
(c) Lieutenant Commander
(d) Commander
(e) Captain
(f) Commodore
(g) Rear Admiral
(h) Vice Admiral
(i) Admiral
(j) Admiral of the fleet

SECTION-3

HONOURS AND AWARDS

Ques 1 –Name the gallantry awards in the face of the enemy?

Ans - (a) Param Vir Chakra.

(b) Maha Vir Chakra.

(c) Vir Chakra.

(d) Sena, Nao Sena and Vayu Sena Medal.

(e) Mention in Dispatches.

(f) Chiefs of Staff Commendation Card.

Ques 2 –Name the gallantry awards other than in the face of the enemy?

Ans (a) Ashoka Chakra.

(b) Kirti Chakra.

(c) Shaurya Chakra

Ques 3 – Name the NCC awards for NCC personals?

Ans – NCC awards to WTLOs, ANOs,GCIs and NCC Cadets are as under: -

(a) Raksha Mantri's Padak.

(b) Raksha Mantri's Prashansa Patra.

(c) Raksha Sachiv's Prashansa Patra.

(d) Maha Nideshak's Prashansa Patra.

(e) Maha Nideshak's Prashansa Patra To Civilian Personnel

SECTION-4

CONCEPT OF COMBINED DEFENCE SERVICES

Ques 1 – What is the concept of combined defence services?

Ans – (a) The concept of three dimensional warfare or combined operations wherein the three wings of the armed forces i.e. Army, Navy and Air Force, have to operate as a single cohesive force against the enemy, is the norm of the day.

(b) officers among the three services during various training course, sand model discussion and exercises at various levels is very useful in understanding the working ethos of other services

(c) Currently Integrated Command having all the three services under its wing is established at Port Blair to institutionalize the concept of three dimensional warfare

CHAPTER-II

MAP READING

SECTION-1

INTRODUCTION TO MAP AND CONVENTIONAL SIGNS

Ques 1 – What is map?

Ans - A map is representation of selected natural and man made features of the whole or part of the earth's surface on a flat sheet of paper on a definite scale and in their correct relative geographic positions and elevations.

Ques 2 – What is conventional sign?

Ans - Conventional signs are symbols used to represent certain artificial or natural features/objects on the map. They are seldom drawn to scale.

SECTION-2

SCALES

Ques 1 - What is scale?

Ans - By scale it means the proportion which the distance between two points on the map bears to the distance between the same two points on the ground

Ques 2 – What are the common scales used in survey of India maps?

Ans -

(a)	16 inches to 1 Mile	1/3960
(b)	4 inches to 1 mile	1/15840
(c)	2.53 inches to 1 mile	1/25000
(d)	1 inch to 1 mile	1/63360
(e)	½ inch to 1 mile	1/126720
(f)	¼ inch to 1 mile	1/253440
(g)	16 miles to 1 inch (Approx)	1/1000000
(h)	32 miles to 1 inch (Approx)	1/2000000

SECTION 3

TOPOGRAPHICAL FORMS AND TECHNICAL TERMS

Ques 1 – Define important technical terms used in map reading?

Ans (a) Bearing - The angle formed by a line joining two points and the North and South line. Bearings are always measured clockwise.

(b) Bench Mark - A permanent mark usually cut into a wall recording exact height for future reference, marked BM with the height on Ordnance Survey Maps.

(c) Contours - A line drawn on the map joining up all points of equal height above sea level.

(d) Gradient - The slope of a hill expressed as a fraction.

(e) Grid Lines - Lines running parallel to and at right angles to a North and South line through approximately the centre of the area covered by the grid system.

(f) Grid North - Except through the origin, grid lines do not lie true North and South or East and West, Grid North is the direction of the North South grid lines on a map.

(g) Magnetic Variation - The difference between true North & Magnetic North.

(h) Setting - Placing a map so that North on the map points toward the North so that the objects on the map are placed in relationship to the same objects on the ground.

(j) Trig Point - A point fixed during the triangulation at the beginning of a survey; marked on Ordance Survey Maps by a small triangle with the height.

(k) True North - The direction of the North Pole from the point.

Ques 2 – Define important Topographical terms used in map reading?

Ans (a) Basin - An area of fairly level ground surrounded by hills or the area drained by a river and its distributaries.

(b) Col or Saddle - A narrow ridge of high land joining up to higher hills.

(c) Crest - The highest part of a hill or mountain range. It is that line on a range of hills or mountains from which the ground slopes down in opposite directions.

(d) Dead Ground - Ground which by reason of undulations or hills is not visible to the observer.

(e) Defile - Any feature whether natural or artificial which could cause a body of troops to contract its front. An example of a natural defile is mountain pass while a bridge is an example of an artificial defile.

(f) Escarpment - The steep hill side formed by a sudden drop in the general ground level usually from a plateau.

(g) Knoll - A small isolated hill.

(h) Plateau - A table land, an elevated region of considerable extent generally fairly level.

(j) Ridge - The line along a hill or range of hills or mountains from which water flows in opposite directions, a divide, sometimes and the crest of a line of hills as it appears along the horizon.

(k) Watershed - The line separating the water flowing into two different river systems, the edge of a river basin.

SECTION-4

THE GRID SYSTEM

Ques 1 - Define grid line?

Ans - A map is covered with a net work of purple lines, some running North and South and other West and East. These form a series of small squares all over the map. These lines are known as "Grid Lines".

Ques 2 - What are the basic rules for giving grid reference?

Ans - (a) A reference must always contain an even number of figures. In the normal method, it will contain six figures.

(b) Always count along the EASTING lines first from WEST to EAST and then from SOUTH to NORTH, along NORTHINGS.

(c) For the six figures reference, the third and the sixth figure represent the divisions of 1000 yards square to the nearest 10^{th} part, so they have to be estimated and for these figures a slight latitude is allowed.

(d) If a general grid reference is to be given or there is only one such object in one square e.g. bridge, temple, road, junction, then a four figure grid reference would suffice.

SECTION 5

RELIEF CONTOURS AND GRADIENTS

Ques 1 - Define Relief?

Ans - Relief is a name used to describe the rise and fall of the ground or in other words the hills and valleys.

Ques 2 - Define Vertical interval, Horizontal equivalent and gradient.

Ans - (a) **Vertical Interval(VI)** - The rise between successive contour lines is known as the vertical interval. On map scale 1 inch to 1 mile, the VI of each contour line is 50 feet while on the ¼ inch to a mile it is 250 feet.

(b) **Horizontal Equivalent** - The distance measured flat on the map between adjacent contour lines is horizontal equivalent (HE).

(c) **Gradient** - A gradient is a slope expressed as a fraction. If we say that a slope has a gradient of 1 inch to 7 we mean for every 7 feet of horizontal distance the slope rises or falls 1 foot vertically. Simple Formula is VI/HE = Gradient. The horizontal equivalent is obtained by measuring on the map and vertical interval by subtracting the contour heights.

SECTION 6

CARDINAL POINTS AND FINDING NORTH

Ques 1 - What are various types of North?

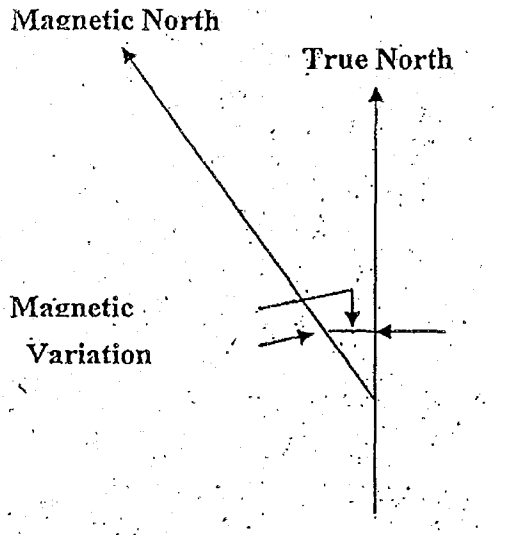
Ans - (a) **True North** - The direction of North pole from the observer.

(b) **Magnetic North** - It is the point to which an accurate compass needle points, when freely suspended.

(c) **Grid North** - It is the direction to which the North South grid lines on a map point.

Ques 2 - Explain magnetic variation with diagram?

Ans -



Magnetic variation

SECTION-7

TYPE OF BEARINGS AND USE OF SERVICE PROTRACTOR

Ques 1 - Define various types of bearings?

Ans - (a) Bearing - The clock wise angle formed by a straight line joining two points and direction of NORTH, is called the bearing between the two points. A bearing is always measured clockwise.

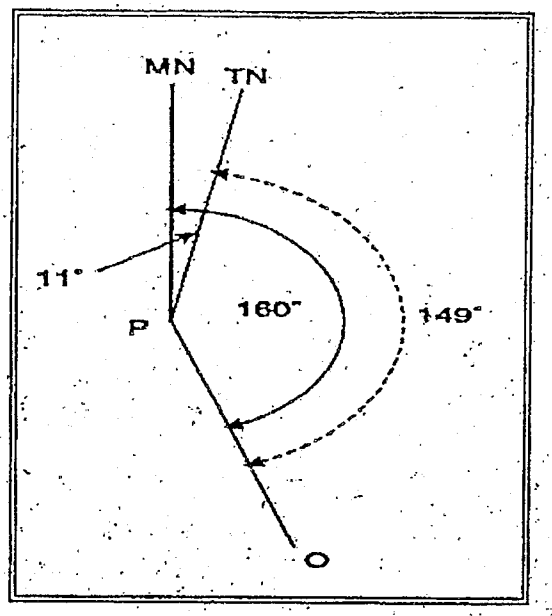
(b) Grid Bearing. Measured on the map from the Grid North by the help of a protractor.

(c) Magnetic Bearing. Measured from Magnetic North by the compass.

(d) True Bearing:- Calculated by finding out the relation of true NORTH and Grid NORTH or Magnetic NORTH.

Ques.2 – How too convert magnetic bearing to a True bearing? Explain with the help of a diagram.

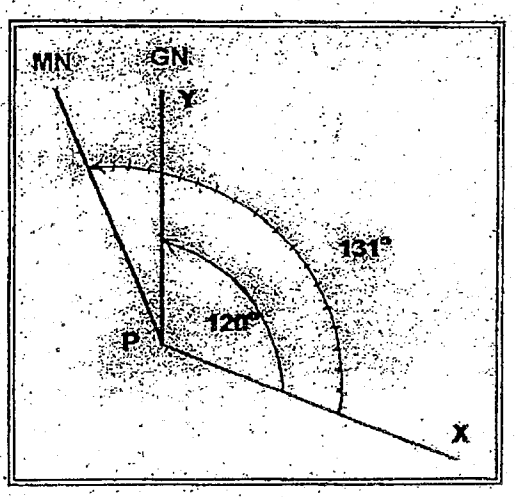
Ans - Suppose the bearing of a certain point P is measured with a compass and is found to be 160 Degrees. To convert this magnetic bearing to a true bearing, draw a diagram as given in Fig below.



First draw a vertical line to represent Magnetic North (because it is a magnetic bearing which is being considered). Next draw a line to P at an angle of 160 degrees. It is only a rough diagram, and the angle can be judged by eye. Thirdly, draw in the true North line approximately 11 degrees East of Magnetic North, with this diagram it becomes clear that true bearing (marked with a dotted line) is smaller by 11 degrees. Therefore, the true bearing of P is 149 degrees.

Ques 3 – How too convert magnetic bearing to a True bearing? Explain with the help of a diagram.

Ans - Measuring with a protractor on the map, the bearing of a Wind Mill at Y from a Church at X is found to be 120 degrees. To convert this grid bearing to a magnetic bearing, draw a diagram as under, this time starting with the Grid North line. Since the magnetic bearing is larger than the grid bearing by 11 degrees and it is therefore 131 degrees. See the diagram below: -



Ques 4 – What are the usage of service protector?

Ans - (a) Plot and measure bearing on paper or on a map. For bearing between 0 and 180 degrees their Zero edge must be on the LEFT and for 180 degrees -360 degrees it must be on the RIGHT.

(b) Measure distance in inches correct unto 1/100th.

(c) Measure distance in yards, meters or miles on a map by using the appropriate scale.

(d) For using the diagonal scale one must use an intermediate agent. Mark off the distance to be measured on the straight edge of a paper or by means of a divider and then put the paper or divider on the diagonal scale and measure.

SECTION-8

PRISMATIC COMPASS, ITS USE AND INTRODUCTION TO GPS

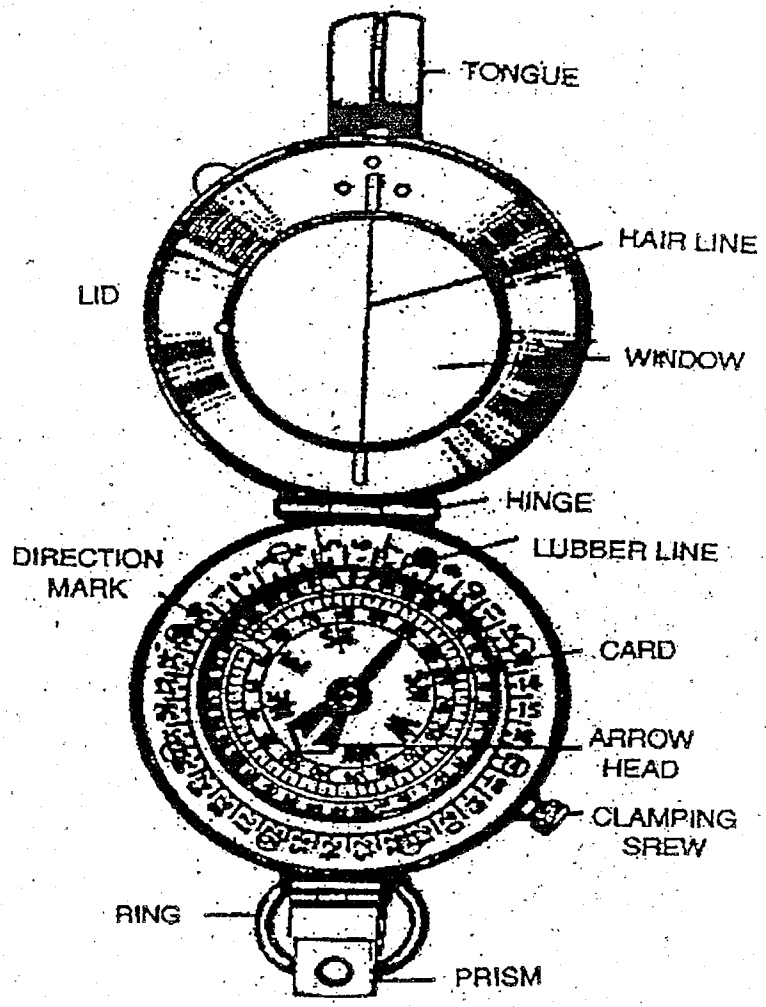
Ques 1 – What are the types of compass?

Ans - Compass is of two types as under : -

(a) Dry Type
(b) Liquid Type

Ques 2 – What are the various parts of a liquid compass?

Ans These are as under: -



Ques 3 – What is Global Positioning System (GPS)?

Ans GPS is a system of satellites and receivers that allows people and devices to pin point their precise location on the earth. The normal GPS operational constellation consists of 24 satellites that orbit the earth in 12 hours.

Ques 4 – What are the usage of GPS)?

Ans - (a) Used by fishermen and hikers.
(b) Used by civilian & para military vehicles to navigate their route.
(c) Used by defense aircrafts, ships and specialized vehicles.
(d) Used in defense in battle fields and insurgency-affected areas.
(e) It assists troops to navigate in thick jungles, mountains and deserts.
(f) GPS is also used to guide missiles to pre specified targets.

SECTION-9

SETTING A MAP, FINDING OWN POSITION AND NORTH

Ques 1 – When a map is considered to b e set?

Ans - A map is said to be set or oriented when it is placed such that it corresponds directly with the ground i.e. when true NORTH on the map points to true NORTH on the ground.

Ques 2 – What are the various methods to find North?

Ans - (a) Watch method.
(b) By stars
(c) From Idgah & Mosque
(d) From Sun
(e) Compass
(f) GPS

SECTION-10

MAP TO GROUND

Ques 1 – What are the methods used to identify objects from Map to ground?

Ans - (a) **Bearing and Distance Method.** With the help of bearing and distance, find out own position. Find out the distance of the object to be identified on ground with the help of a scale on the map. Using service protractor, find out the bearing of the object and convert it into magnetic bearing. Set the magnetic bearing on compass and look for the object in the given bearing. Estimating the distance on ground, the object will be identified.

(b) **Direction and Distance Method.** Draw a line on the map between own position and object to be identified. Calculate its distance and using any of the following methods find the direction of the object:-

(i) With the help of a sight rule find the ground direction of the object.

(ii) With the help of two points on the map estimate the ground direction.

(iii) Place a foot ruler /pencil at own position and align it with line of the map.

(iv) Place a pin each at own position and at the object on the map. Align both pins and find general direction.

(c) **By Estimation Method.** In this method measuring bearing, distance and direction, object is identified with the help of other details in the proximity of the object.

SECTION-11

GROUND TO MAP

Ques 1 – What is the intersection method of identifying objects from ground to map?

Ans - **Intersection Method.** To find out the objects which are at a larger distance or in hilly terrain, intersection method is used. In this method help of minimum two prominent objects are taken which can be easily identified on the ground. Lines are drawn from the prominent objects to the object to be identified on map. This method is used when we cannot estimate exact distance. Intersection is done in two ways:-

(a) **By Compass Bearing.** Take the bearing of the object from two known prominent objects. Draw the lines on the map. The object will be in the proximity of the intersection of the two lines. Magnetic bearing is found by two methods:-

(i) **By Compass.** Take the forward bearing from known object.

(ii) **By Back Bearing.** In war, in case we intercept the enemy's transmission, with the help of the fall of the shot we can find out the location by working out back bearing.

SECTION-12

POINT TO POINT MARCH

Ques 1 – What is night march?

Ans - When a navigation party moves at night with the help of compass and night march chart, this is called night march.

Ques 2 – What all items are required by navigation party?

Ans - (a) Set compass as per bounds.

(b) Luminous stick.

(c) White cloth.

(d) Marching chart.

(e) White lime/ chalk.

(f) Stone pebbles for measuring steps.

(g) Frosted torch.

Ques 3– What is the composition of navigation party?

Ans - (a) **Guide**. He carries a luminous stick and a compass set to a given bearing.

(b) **Assistant Guide**. He has a white piece of cloth at his back for identification and a stick to measure depth of nala / pits.

(c) **Recorder**. He carries additional compass already set on given bearing, night march chart and stone pebbles. He measures the distance.

(d) **Scouts**. Number of scouts could be from 2 to 4 depending upon the route and tasks.

Ques 4 - What points should be kept in mind by all members of navigation party?

Ans - (a) While marching do not cough, talk or make any noise.

(b) While marching keep inter person distance in mind.

(c) Party must ensure safety and security.

(d) Smoking / using any kind of light is strictly prohibited.

(e) To read night march chart use frosted torch.

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CHAPTER-III

FIELD ENGINEERING

SECTION-1

INTRODUCTION TO FIELD ENGINEERING

Ques 1- Define Field engineering?

Ans - Field engineering is the study of field fortification, obstacle planning including minefields, mine warfare, and stores and equipment relating to the same.

Ques 2 – What are the various tasks performed by Field Engineers?

Ans - (a) Laying of mine fields.
(b) Breaching of mine fields.
(c) Construction of field defences.
(d) Construction of tracks in mountains.
(e) Construction / maintenance of border roads.
(f) Water supply to troops in the field, especially in deserts.
(g) Construction of Helipads where-ever required.
(h) In Counter Insurgency Operation:-
(i) Detection, neutralisation and removal of IEDs and explosives.
(ii) Road opening etc for all type of traffic.
(j) Maintenance of essential services.

SECTION-2

KNOTS AND LASHINGS

Ques 1 - What is the purpose of Knots?

Ans - Knots, bends and hitches are used to join two lashings together, to form a loop in a lashing, to make a stop on a lashing or to secure a lashing to a spar, or to make a hook.

Ques 2 – What is the characteristics of Knots?

Ans - (a) Knot should be strong so that it does not open due to pull and pressure.
(b) Knot should be in conformity to work and simple to use.

(c) Knots should be opened easily.

Ques 3 – What are the various types of lashes?

Ans - (a) Square Lashes

(b) Diagonal lashes

(c) Parallel lashes

SECTION-3

TYPES OF MINES

Ques 1 – What is mine?

Ans - A mine is a weapon to be used with cunning and with the constant aim of catching the enemy unawares.

Ques 2- What are the various types of mines?

Ans (a) **Anti Tank Mines.** Mines designed primarily against tanks are called anti tank mines.

(b) **Anti Personnel Mines.** Mines designed primarily against personnel are called anti personnel mines. They are further classified as follows:-

(aa) Blast type.

(ab) Fragmentation type.

(iii) **Toxic Chemical Mines.** Mines used to contaminate areas. The toxic agent of each mine is dispersed by burster charges.

SECTION-4

TYPES OF OBSTACLES

Ques 1 – What is the purpose of obstacle?

Ans - (a) Delaying and disorganizing him under fire.

(b) Restricting his power of manoeuvre thereby canalizing him into a pre-selected killing ground.

(c) Disorganizing his plan of attack.

(d) Making him waste time, labour and equipment in forcing a passage.

(e) Denying him the opportunity of achieving surprise.

(f) Lowering his morale

Ques 2 – What are essential characteristics of obstacles?

Ans - (a) Must be strong and of sufficient depth to impose maximum delay to enemy.

(b) Sited to fit in with coordinated plan; covered by fire and concealed to achieve surprise.

(c) Constructed outside the hand grenade range.

(d) It must not;

(i) Obscure the fire or observation of the defender,

(ii) Afford cover to enemy ,

(iii) Reveal the exact position of the defence,

(iv) Hinder the mobility of the defender

(v) Permit the enemy reconnaissance without interference by the defender.

Ques 3 – What are the various types of infantry obstacles?

Ans - (a) **Artificial Obstacles.**

(i) Wire obstacles.

(ii) Anti-personnel minefields.

(iii) Thorn fences.

(iv) Panji fields.

(v) Walls.

(vi) Ditches with or without water.

(b) **Natural Obstacles.**

(i) Marshes.

(ii) Rivers, nullahs and canals.

(iii) Unscalabe cliffs, escarpments and steep slopes.

(iv) Dense growth like tea or rhodendrous bushes.

Ques 4 – What are the various types of vehicles and anti tank obstacles?

Ans - (a) **Anti-tank Minefields.** These are dealt with in details in section dealing with 'Types and Laying of Minefields'.

(b) **Physical Obstacles.**

(i) **Steep Slopes.** Slopes of 50 degrees can stop tanks under normal conditions. If the slopes are of loose slippery surface, even lesser angel is sufficient. However the slops must be of sufficient length.

(ii) **Vertical Steps.** A vertical step of 6 feet can be an effective obstacle against all types of tanks.

(iii) **Ditches.** A ditch, which is sufficiently wide and deep to make the nose of the tank tilt down so much that it loses hold on the ground, is an effective obstacle.

(iv) **Water.** For a river or canal to be an obstacle against tanks it must have depth more than tanks heights and length more than ¾ of tanks length.

SECTION-5

METHOD OF WATER CROSSING

Ques 1 – What are the various kinds of improvised water crossing equipment?

Ans -(a) Groundsheet Water Belt.

(b) Tin Float.

(c) Two Men's Equipment and Groundsheet.

(d) Bamboo Pole

(e) Chattis Water Wings

(f) Water Bottle Belt

(g) Drum Rafts.

(h) Bundle of Logs

(j) Bamboo Mat Raft

(k) Hay Bundle Raft