NATIONAL CADET CORPS

HEAD QUARTERS DG NCC

National Cadet Corps

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THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, Having Solemnly Resolved To Constitute India Into A [1][SOVEREIGN SOCIALIST

SECULAR DEMOCRATIC REPUBLIC] And To Secure To All Its Citizens :

JUSTICE, Social, Economic And Political;

LIBERTY Of Thought, Expression, Belief, Faith And Worship;

EQUALITY Of Status And Of Opportunity; And To Promote Among Them All

FRATERNITY Assuring The Dignity Of The Individual And The[2] [Unity And Integrity Of The Nation];

IN OUR CONSTITUENT ASSEMBLY This Twenty-Sixth Day OfNovember, 1949, Do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

[1]Subs, By The Constitution (Forty-Second Amendment) Act.1976, Sec.2, For "Sovereign Democratic Republic" (W.E.F. 3.1.1977)

[2]Subs, By The Constitution (Forty-Second Amendment) Act. 1976, Sec. 2, For "Unity Of The Nation" (W.E.F. 3.1.1977)

THE CONSTITUTION OF INDIA

Chapter IV A

FUNDAMENTAL DUTIES

ARTICLE 51A

Fundamental Duties - It Shall Be The Duty Of Every Citizen Of India-

To Abide By The Constitution And Respect Its Ideals And Institutions, The National Flag And The National Anthem;

To Cherish And Follow The Noble Ideals Which Inspired Our National Struggle For Freedom;

To Uphold And Protect The Sovereignty, Unity And Integrity Of India;

To Defend The Country And Render National Service When Called Upon To Do So;

To Promote Harmony And The Spirit Of Common Brotherhood Amongst All The People Of India Transcending Religious, Linguistic And Regional Or Sectional Diversities;

To Renounce Practices Derogatory To The Dignity Of Women;

To Value And Preserve The Rich Heritage Of Our Composite Culture;

To Protect And Improve The Natural Environment Including Forests, Lakes, Rivers, Wild Life And To Have Compassion For Living Creatures;

To Develop The Scientific Temper, Humanism And The Spirit Of Inquiry And Reform;

To Safeguard Public Property And To Abjure Violence;

To Strive Towards Excellence In All Spheres Of Individual And Collective Activity So That The Nation Constantly Rises To Higher Levels Of Endeavour And Achievement;

[1](K) Who Is A Parent Or Guardian To Provide Opportunities For Education To His/Her Child Or, As The Case May Be, Ward Between Age Of Six And Forteen Years.

[1]Ins. By The Constitution (Eighty - Sixth Amendment) Act, 2002 S.4 (W.E.F. 12.12.2002)

NATIONAL ANTHEM

Jana Gana Mana Adhinaayak Jaya Hey,

Bhaarat Bhaagya Vidhaataa

Panjaab Sindhu Gujrat Maraatha

Draavid Utkal Banga

Vindhya Himaachal

Yamuna Ganga,

Uchchhal Jaladhi Taranga

Tav Shubh Naamey Jaagey

Tav Shubh Aashish Mange

Gaayy Tav Jaya gaathaa

Jana Gana Mangal Daayak

Jaya Hey Bhaarat

Bhagya Vidhaataa

Jaya Hey, Jaya Hey,

Jaya Hey, Jaya Jaya Jaya, Jaya Hey.

Preface

1. National Cadet Corps (NCC) came into existence on 15 July 1948 under an Act of Parliament. Over the years, NCC has spread its activities and values across the length and breadth of the country; in schools and colleges in almost all the districts of India. It has attracted millions of young boys and girls to the very ethos espoused by its motto "unity and discipline" and molded them into disciplined and responsible citizens of the country. NCC has attained an enviable brand value for itself in the Young India's mind space.

2. National Cadet Corps (NCC) aims at character building and leadership in all walks of life and promotes the spirit of patriotism and National Integration among the youth of the country. Towards this end, it runs a multifaceted training; varied in content, style and processes with added emphasis on practical training, outdoor training and training as a community.

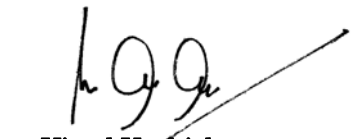
3. With the dawn of Third Millennia, there have been rapid strides in technology, information, social and economic fields bringing in a paradigm shift in learning field too; NCC being no exception. A need was felt to change with times. NCC has introduced its New Training Philosophy, catering to all the new changes and developments taking place in Indian Society. It has streamlined and completely overhauled its training objectives, syllabus, methodology etc thus making it in sync with times. Subjects like National Integration, Personality Development and Life skills, Social Awareness etc have alsobeen given prominent thrust.

4. The new syllabus has been in force for the last five years. The feedback, suggestions and various limitations have been brought out by different stake holders. This new edition being the outcome of these suggestions.

5. For the ease of both Trainers and Trainees alike, a summary and a list of various types of questions concerning the unit have been added at the end of each unit. The syllabus has been revised to make it cadet friendly, colourful with large number of photographs, charts, pictures etc and visually appealing. It is hoped that this will facilitate better assimilation and increased interest among the cadets.

6. The book has been the outcome of sincere devotion and relentless effort of the team Officers Training Academy, Kamptee duly steered by the Commandant. Our sincere gratitude and compliments to them. Any suggestions are welcome for its improvement in the future editions.

7. Contents of this hard work must form the basis of Institutional Training with explicit commitment.



Vinod Vashisht
Lieutenant General
Director General
National Cadet Corps

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- Mr. Niraj C Parate

SPECIAL SUBJECTS: JUNIOR DIVISION/WING

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UNIT 1: ARMED FORCES

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UNIT1 :ARMED FORCES

Knowledge	Understanding	Application Skill	Evaluation
Basic Organisation of Armed Forces	The cadetwill understand the basic structure of the three services of Armed Forces.	The cadet will be aware of the three services and develop sense of pride in Armed Forces.	Work sheets and Assignment
Basic Organisation of Army	The cadet will understand the basic outlineorganisation of Army.	The cadet will have an insight of various arms and services of Army and get motivated to join one of them.	Work sheets
Task and Role of Fighting Arms	The cadet will understand the task and role of Fighting Arms.	The cadet will be able to understand the capabilities of fighting Arms.	Work sheets
Task and Role of Supporting Arms and Services	The cadet will understand the task and role of Supporting Arms and Services.	The cadet will be able to understand the employment of Supporting Arms and Services.	Work sheets
Badges and Ranks	The cadet will understand the rank structure of the three services of Armed Forces.	The cadet will be able to compare the rank structure of the three services.	Work sheets and Assignment
Honours and Awards	The cadet will understand the Honours and Awards.	The cadet will be able to understand different Awards, Honours and decorations in the Armed Forces.	Assignments
Modes of entry to Armed Forces	The cadet will understand the Modes of Entry into Armed Forces.	The cadet will be able to equip him/herself for entry into Armed Forces.	Work sheets and Assignment

ARMED FORCES : AF-1

BASIC ORGANISATION OF ARMED FORCES

INTRODUCTION

1. As a NCC cadet it is important to understand the basic organisation of the Armed Forces. The armed forces comprise of the three services Army, Navy and Air force who are organised so as to meet all the security threats to our country

ARMY

2. The army Headquarters is located in New Delhi. The Chief of the Army Staff (COAS) is the head of the Indian Army. The COAS is assisted by the Vice Chief of the Army Staff (VCOAS) and other officers posted to Army HQ.

Command Headquarters

3. Command Headquarters is commanded by an officer of the rank of Lieutenant General who is called Army Commander or GOC – in - C. The whole country is divided into Seven Commands. These are:-

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

NAVY

4. Our country is covered almost from three sides with water with a coastline of approximately over 6000 Kms. The sea around India has an impact on India's freedom, trade, commerce, and culture.

Constituents of the Navy

5. The Indian Navy has several ships of different types and naval aircrafts. Seashore facilities have been provided at various places in the country to train personnel for the Navy, repair ships and aircrafts.

Organisation and Administration

6. Chief of Naval Staff commands Indian Navy. The Naval Headquarters is located in New Delhi. The Navy is divided into three commands, commanded by an officer of the Rank of Vice Admiral and is called the Fleet Commander or FOC-in-C :-

(a) Western Naval Command.

(b) Eastern Naval Command.

(c) Southern Naval Command.

AIR FORCE

7. Indian Air Force is the youngest of the three Services. It came into existence in the year 1932. Indian Air Force comprises of fighter aircrafts, transporter aircrafts, and helicopters.

Air Headquarters

8. Indian Air Force is commanded by Chief of the Air Staff and is located in New Delhi.

Commands

9. The Air Force comprise of seven commands commanded by an officer of rank of Air Marshall and is known as the Air Officer Commanding in Chief. The command are :-

(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.

CONCLUSION

10. The organisation of the armed forces is structured for ease of command and control both during war and peace.

ARMED FORCES : AF-2

ORGANISATION OF ARMY

INTRODUCTION

1. The Indian Army is one of the foremost fighting armies of the world with a vast Combat experience. The organisation draws its customs, traditions and basic character from the British India Army. The Army since independence has taken part in the following major operations

(a) Kashmir Operations against Pakistan 1947-48.

(b) Sino-Indian Operations in NEFA (Arunachal) and Ladakh 1962.

(c) Indo-Pak war 1965.

(d) Indo-Pak war 1971.

(e) Sri Lanka 1987-1990 (**Operation Pawan**).

(f) Kargil conflict 1999 (**Operation Vijay**).

COMMAND AND CONTROL

2. The army is divided into various sizes of groups for ease of command and control especially during war. These groups based on their sizes are called section, platoon, company, battalion (unit) upto a corps. The section is the smallest with 10 men while a corps may have more than 50,000 men The basic organisation/command is as follows:-

Group Name	Size/Comprise off	Commanded By	Remarks
Sections	10 men	NCO (Hav)	Equivalent to your PT Staff
Platoon	3 section (30-35 men)	JCO (Sub)	
Company	3 Platoons	Officer (Major)	
Battalion (Unit)	4 Companies	Col	Smallest Independent group
Brigade	3/4 Units	Brigadier	

Group Name	Size/Comprise off	Commanded By	Remarks
Division	3/4 Brigade	Maj Gen	Will have units/elements of other arms and services.
Corps	3/4 Division	Lt Gen	

FIGHTING ARMS

Armour

3. Armour means an object which provides protection during battle. Tanks have the best protection and units using them are called Armoured units. The tanks are mainly employed in the deserts of Rajasthan and plains of Punjab and use their mobility, firepower and protection to defeat the enemy.

Infantry

4. Foot based soldiers are called the infantry and is the major component of our army. In attack its role is to destroy the enemy forces and capture his ground. In defence, they protect our land from enemy attacks. In present day they are being employed in operations against militants / terrorists.

Mechanised Infantry

5. It is infantry with more mobility and fire power. Mechanized Infantry moves in armoured personnel carrier (APC) which has enough protection against small arms fire. They operate along with Armour in battle field. The equipment used are BMP- I and II.

SUPPORTING ARMS

6. The Supporting Arms which help the Fighting Arms. It consist of the following Arms. The Supporting Arms will be covered in detail in the next chapter :-

(a) Artillery.

(b) Engineers.

(c) Army Air Defence.

(d) Army Aviation Corps.

(e) Signals.

SUPPORTING SERVICES

7. The supporting services provide administrative cover to the fighting and supporting arms to carry out their task. The major services and their functions will be covered in detail in AF-7.

(a) Army Service Corps.

(b) Army Medical Corps.

(c) Army Ordnance Corps.

(d) Corps of Electrical and Mechanical Engineers.

(e) Remount and Veterinary Corps.

CONCLUSION

Since, independence the Indian Army has constantly been reorganized and modernized so as to meet the needs of the present day warfare.

ARMED FORCES : AF-3

TASK AND ROLE OF FIGHTING ARMS

INTRODUCTION

1. A well trained and motivated Army can defeat enemy when all its components i.e. various fighting arms, support arms and services function in complete harmony. The enemy is considered to be finally defeated only when its territory (land) is physically captured by own forces or its forces are destroyed / captured.

INFANTRY

2. Defeat of the enemy implies the destruction of his fighting forces and capturing his territory. It is infantry that captures and occupies the ground and destroys the enemies.

Role of Infantry

3. Infantry is essential arm of close combat. Its role in attack is to close with enemy and destroy or capture him; in defence it is to hold against all forms of attacks by the enemy.

Characteristics of Infantry

4. **Self-Reliance**. It means that infantry has basic elements of all arms and services within its organisation and can achieve certain basic tasks without support of other arms and services.

5. **Ability to Hold Ground**. It means to defend/guard a piece of land and infantry is best suited for it..

6. **Adaptability**. Infantry is highly adaptable and can operate over any type of ground, by day or by night and under almost any climatic conditions.

7. **Mobility**. Unlike other arms, it has a degree of mobility over almost any kind of terrain with or without transport.

8. **Vulnerability**. Infantry is vulnerable against:-

(a) **Ground Action –** Action taken by enemy forces on land.

(b) **Air Attack**

(c) **Anti-Personnel Mines**

Anti-Personnel Mines used against infantry

Employment and Tactics

9. **Employment**. Infantry can be employed in any operation of war. However the basic role remains same i.e close with the enemy to destroy or capture them and to hold the ground.

10. **Tactics.** Fire and movement is the basis of all infantry tactics.

11. **Infantry Weapons.** The basic infantry weapons are the rifle (INSAS/AK 47) and bayonet, the light machine gun and grenades. In addition certain personnel are armed with carbine, rocket launcher or 51 mm Mortar.

12. **Training.** The training of Infantry must cultivate skill at Arms, endurance, initiative, adaptability, and skillful use of ground.

ARMOUR

Main Battle Tank (MBT) ARJUN

Role of Armour

13. To destroy the enemy by heavy fire power and also due to its mobility and protection.

Principles of Employment

14. **Firepower**. Tanks have a main gun which can fire shell/missiles upto average of 3-4km. They also have machine guns in tanks, thus each tank has a lot of fire power.

15. **Protection**. Tanks have thick armour (metal) platting around them to protect them from rifle fire and small bombs.

16. **Mobility**. In deserts and plains tanks have very good mobility and do not need roads for movement.

17. **Speed**. In mobile warfare speed is of great importance. It involves the following: -

(a) Speed in decision.
(b) Speed in issue of orders.
(c) Speed in execution.

THE MECHANISED INFANTRY

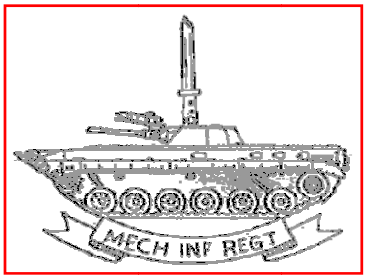
18. The concept of 11 echanized infantry is based on the need to provide protection, added mobility, radio communications and firepower to enable the infantry to operate effectively in mobile operations.

Role of the Mechanized Infantry

19. **Primary Role.** The primary role of the mechanised infantry is to attack the enemy in coordination with armour and destroy or capture the enemy.

20. **Secondary Role.**

(a) Destroy the enemy over run by armour.
(b) Hold ground temporarily.
(c) Reconnaissance (Search).
(d) Counter attack.



Characteristics of Mechanized Infantry

21 **Mobility**. It has the capability to move cross country and because of the amphibious capability (capable of operating on both land and water) help infantry to move across the water obstacle.

22. **Protection**. The light armour of the armoured personnel carrier provides protection against small arms fire and shell splinters.

23. **Fire Power**. Mechanized infantry is able to bring together considerable firepower due to its main gun and the machine guns mounted on the APC.

24. **Communication**. Radio is the primary means of communication in a mechanized infantry unit. Radio communication facilitates receiving and passing orders quickly while on the move.

ARMED FORCES : AF-4

TASK AND ROLE OF SUPPORTING ARMS AND SERVICES

INTRODUCTION

1. Artillery is an arm which handles big guns such as Bofors and provide fire power in the battle so that the enemy is defeated and own forces succeed. Guns are of different types, the biggest guns which can fire shells (bombs) 30-40km away are known as medium guns. Filed guns are lighter with lesser range.

SUPPORTING ARMS

2. Supporting Arms give support to fighting arms from behind to enable them to complete their task. Armour, Infantry and Mechanised Infantry are known as "Fighting Arms". The supporting arms which help the Fighting Arms to accomplish the task are :-

Artillery

3. The role of Artillery is to provide such fire power in the battle area that enemy neither interferes with our operations, nor develops his own effectively. It comprises of light, medium and field guns, mortars, multi barrel rocket launchers and missiles.

4. **Tasks.** The tasks of Arty are as follows:-

(a) To provide heavy volume of fire at long ranges.

(b) To provide fire power to advancing Infantry during attack and defensive fire on the attacking enemy.

Corps of Army Air Defence

5. Army Air Defence is equipped with air defence guns and Short and Medium range surface to air missile systems. Along with Air force it provides air defence to mobile forces and important military/civil installations.

6. **Tasks.** The tasks of Air Defence are :-

(a) To safeguard against hostile aircrafts, helicopters and drones attacking high values targets including Fighting Arms.

(b) To ensure early detection and destruction of enemy aircrafts.

Army Aviation Corps

7. The role of Army Aviation corps is to carry out recce and observation and also to provide commanders and staff, rapid means of communication for liaison visits (meetings) and reconnaissance (search). It is ideally suited for evacuation of battle casualties.

Corps of Engineers

8. It is one of the oldest supporting arms of the Indian army. The role of Engineers in War is to provide support for offensive and defensive operations in mine warfare, bridging, demolition, constructions of field fortifications and operational roads/tracks.

9. **Tasks**. The task of Engineers are as follows :-

(a) To provide mobility to own forces by constructing bridges, tracks and helipads; on the other hand the Corps denies the same to the enemy by creating obstacles such as laying mine-fields and demolition of bridges.

(b) To lay mine fields during War and also removing the mines and maintenance of records thereof.

(c) To create water sources during operations.

(d) To help in transportation of explosives and undertake bomb disposal activities during peace and war.

Corps of Signals

10. They are the communicators of Indian Army and provide Radio, Radio Relay, data and line communication and establish Signal Centres during war and peace. It also monitors enemy's communication systems.

SUPPORTING SERVICES

12. The following important services provide logistical support to fighting Arms:-

Corps of Electrical and Mechanical Engineering

13. The major role of EME is repair, recovery and maintenance of all vehicles, arms, electrical, electronic and mechanical equipment.

Army Service Corps

14. ASC is responsible for : -

(a) The supply and provision of ration to the Army during peace and war.

(b) To provide fuel oil and lubricants to the entire Army.

(c) To provide transport for conveyance of troops during movement.

(d) Transportation of heavy equipment and machineries including ammunition during war.

Army Ordnance Corps

15. It is responsible to provide weapons, vehicles and ammunition to all the fighting/support arm of the army. Ordnance maintains big ammunition depots even during peace time for storing all types of ammunition/(bombs, missiles) of the army.

Army Medical Corps

16. It provides medical facilities during war as well as in peace stations to troops and their families.

Army Dental Corps

17. This corps provides dental treatment to the soldiers.

(Photo insert)

Remount and Veterinary Corps

18. It deals with caring and training of animals.

CONCLUSION

19. Army is the organisation which is mainly divided into two categories the Arms & the Services. All the components of the Army fight together in war and support each other so that victory is achieved.

ARMED FORCES : AF-5

BADGES OF RANKS

INTRODUCTION

1. The Indian Armed Forces consists of three professional uniformed services: the Indian Army, Indian Navy, and Indian Air Force. All the three services have distinct Badges of ranks which help in identifying soldiers and their commanders. The ranks of Badges are given as per professional competence and length of service in Armed Forces.

Basic Rank Structure

2. The three services are broadly divided into four categories based on their ranks. They are commissioned officers, Junior Commissioned officers, Non Commissioned officers and Sepoy/Sailors/Airmen gen referred to as Jawans.

(a) **Commissioned Officers**. These are those who hold the president, Commission and are generally referred to as officers. The junior most rank is a Lieutenant (Lt) in Army or equivalent in the services and senior most is General / Admiral/ Air Chief Marshal.

(b) **Junior Commissioned Officer (JCO)**. These are those who on promotion from Sepoy/Sailor/Airmen though NCO rank, become JCOs. JCO is a non gazetted officer rank. These are like Subedar in Army, Chief Petty officer in Navy or Warrant officer in Air force.

(c) **Non Commissioned Officer (NCO)**. The men who are below JCO rank and senior to a Jawan or equivalent have ranks such as Havs, Sergeant, Petty officer.

PART I - BADGES OF RANK - ARMY

Army
Commissioned Officers
Ranks of the Indian Army- Officer ranks


Sepoy / Sowar

PART II- BADGES OF RANK- NAVY

(d) **Commissioned Officers**. Admiral of the Fleet is an honorary rank given to an Admiral for his invaluable service and will continue to serve the rest of his term with the honorary rank. This rank has not been used in the Indian Navy. The badges of rank worn by Naval Officers are:

(e) **Junior Commissioned Officers (Chief Petty Officer)**. The badges of rank worn by these officers are:-

(f) **Non Commissioned Officers (NCOs)**. The badges of rank worn by the NCOs are:-

PART III - BADGES OF RANK - AIR FORCE

Commissioned Officers

3. Marshall of the Air Force is an honorary rank given to an Air Chief Marshall for his invaluable service. In recognition of his services the Government of India gave the rank of Marshall of the Air Force to Arjan Singh in January 2002 making him the first and the only “Five Star” rank officer with the Indian Air Force. The badges of rank worn by officers are:-

Junior Commissioned Officers (Warrant Officer)

4. The badges of rank worn by these Officers are:-

Non Commissioned Officers (NCOs)

5. The badges of rank worn by these NCOs are:-

CONCLUSION

6. The Officers, Junior Commissioned Officers and Non Commissioned Officers of all the three services have different badges of rank. The badges of ranks facilitate easy recognition of rank of Officers, JCOs and NCOs.

ARMED FORCES : AF-6

HONOURS AND AWARDS

INTRODUCTION

1. The Armed Forces of India are awarded many military decorations, honours and awards. The awards and honours are awarded for extraordinary bravery and courage, as well as for distinguished service during times of war and peace. For the purpose of classification, Indian Armed Forces honours and awards can be divided into two categories:-

(a) Gallantry Awards.

(b) Non-Gallantry awards / Distinguished Service Awards.

GALLANTRY AWARDS

2. Gallantry awards are divided into two categories:

(a) Gallantry in the Face of Enemy. These awards are given for your actions in wars /battles.

S No	Name of the Award	Image
(i)	Param Vir Chakra	
(ii)	Maha Vir Chakra	
(iii)	Vir Chakra	

(iv)	Sena Medal	
(v)	Nao Sena Medal	
(vi)	Vayu Sena Medal	
(vii)	Mention in Despatches	
(viii)	Chief of Staff Commendation Card	

(b) **Gallantry Other than in the Face of Enemy**. These are given for bravery but not during war/battles example brave act during natural calamities such as floods, anti hijacking operations etc.

S No	Name of the Award	Image
(i)	Ashoka Chakra	
(ii)	Kirti Chakra	
(iii)	Shaurya Chakra	

CONCLUSION

3. Honours and Awards are ultimate recognition by the nation for unmatched act of bravery and selfless service, dedication and supreme sacrifice by soldiers/civilian /or any other professionals.

ARMED FORCES : AF-7

MODES OF ENTRY TO ARMED FORCES

INTRODUCTION

1. Armed forces are a brilliant career option for today's youth. Though we tend to forces only on the hardship, of service life we donot see the many advantages we get by joining the services. In addition to the job security, economic stability, social status and respect in the society the job gives you a chance to serve your nation and its people.

ENTRY IN THE ARMED FORCES

2. One can join the armed forces both as a jawan or equivalent or as a commissioned officer. The broad procedure is as follows :-

(a) **Commissioned Officer**. Can join the NDA/Navel Academy after class XII or can directly join the IMA for Army, Air force Academy and Navel Academy after graduation. There are other schemes also for engineers/ Law graduates etc which would be covered in the Sr Division. The entry process includes a written exam conducted by UPSC twice a year followed by an interview (SSB).

(b) **Jawan/Sailor/Airmen**. Minimum educational qualification of Class X/XII for recruitment. Recruitment is through recruitment rallies or through advertisements in employment News paper.

Permanent Commission

3. A permanent commission means a career in the Army till you retire. For a permanent commission you have to join the National Defence academy Khadakwasla or the Indian Military Academy Dehradun.

The National Defence Academy, Pune

(a) **National Defence Academy (NDA).** You can appear in NDA entrance exam right after class XII. After completion of three years in NDA, you will be awarded a degree and eligible to join IMA. For more details about NDA Khadakwasla visit website www.nda.nic.in.

(b) **Combined Defence Service Examination (CDSE)**.In final year of Graduation, you need to pass the Combined Defence Service Exams being conducted by UPSC, clear the SSB interview, be medically fit and join IMA as a Direct Entry if you are in merit list. For details of exam dates/notification visit UPSC website upsc.nic.in. The other entries are Non UPSC entries (There is no written exam. You are directly called for SSB interview).

(c) **10+2 Tech Entry**. You can apply after your12th Exams. Minimum aggregate of 70% is mandatory in Physics, Chemistry and Mathematics. Eligible candidates are detailed for SSB interview based on the cut off as decided by Recruiting Directorate. Total training is of five years.(one year at OTA Gaya and four years at Cadets Training Wings).

OTA, Gaya

(d) **University Entry Scheme (Pre Final Year Students Only)**.This entry is for those candidates who wish to apply for army in Pre-Final year of engineering.

(e) **Technical Graduate Course**.Those who are studying in final year/ have completed BE/B Tech in notified streams can also join IMA through Technical Graduate Course. The duration of training is 1 year through Technical Gradate Course.

Short Service Commission

4. You also have the option of joining the Army and serve as a Commissioned Officer for 10 years and extendable up to 14 years. At the end of this period you have two options. Either elect for a permanent Commission or opt out. Those not selected for Permanent Commission have the option of a 4 year extension. Those who want to opt out of Army, can resign at any time from the Army and have the opportunities to side step to an alternate career.

Officers Training Academy, Chennai

Officers Training Academy, Chennai

5. Once selected for Short Service Commission, you go to the officers Training Academy at Chennai. The selection process is written exam followed by the SSB interview and Medical Examination Board. For Technical (Engineering) graduates and law graduates it is direct SSB interview and Medical Examination Board. If you have obtained NCC “C” certificate with minimum “B” grade, you can apply through your NCC Branch HQ/ Zonal HQ to Recruiting Directorate for direct SSB interview. SSB qualified candidates undergo a medical examination. The duration of training is 49 weeks.

Lady Commissioned Officers

Short Service Commission for Women (Officers)

6. An important landmark in the history of Army was the induction of women into the officer cadre in 1992, and the difficult task of training them was undertaken by Officers Training Academy, Chennai. So far, more than 1200 Lady Cadets have already been commissioned into the various Arms and Services of the Indian Army.

CONCLUSION

7. Here it would be apt to reiterate, that all professions serve our motherland, but none of them is in the same league as the Army, for this is the only profession which offers you opportunity to live up to these stirring lines.

"To every man upon this earth,

Death comes sooner or later

And how can a man die better

Facing fearful odds

For the ashes of his father

And the temple of his Gods"

- Lord Macaulay

Summary

- The Army is divided into seven Commands i.e. Northern, Western, Central, Southern, South Western, Eastern and Training Command.

- The Navy is divided into three Commands i.e. Western Naval Command, Eastern Naval Command and Southern Naval Command.

- The Air Force is organized into seven commands i.e. Western Air Command, Central Air Command, Eastern Air Command, South Western Air Command, Southern Air Command, Training Command and Maintenance Command.

- The Combat Commands are grouped as Corps, Divisions and Brigades. These are commanded by an Officer of the rank of Lieutenant General, Major General and Brigadier respectively.

- There are three major components in army:-

    - Fighting arms – Armour, Infantry and Mechanised Infantry.

    - Support Arms – Artillery, Engineers, Army Air Defence, Army Aviation Corps and Signals.

    - Supporting Services – Army Service Corps, Army Medical Corps, Army Ordnance Corps, Corps of Electronic and Mechanical Engineers and others.

- Field Marshal is an honorary rank given to a General for his invaluable service and will continue to serve the rest of his term with the honorary rank.

- Admiral of the Fleet is an honorary rank given to an admiral for his invaluable service and will continue to serve the rest of his term with the honorary rank.

- Marshal of the Air Force is an honorary rank given to an Air Chief Marshal for his invaluable service.

- Indian Armed Forces honours and awards can be divided into two categories; Gallantry Awards & Non-Gallantry awards / Distinguished Service Awards.

- Permanent Commission (PC) is granted through the Indian Military Academy (IMA), Dehradun and OTA, Gaya. Short Service Commission (SSC) is granted through Officers Training Academy, (OTA) Chennai.

- Permanent Commission:

    - Combined Defence Service Examination (CDSE)
    - 10+2 Tech Entry
    - University Entry Scheme (Pre Final Year Students Only)
    - Technical Graduate Course.

Comprehension Questions

Q1. Answer the following in about 50 words:

(a) Write a short note on Chief of Army Staff.

(b) What are Static Formations in Army?

(c) What do you understand by Air Headquarter?

(d) Who are the two Field Marshals of Indian Army?

Q2. Answer the following in about 75 words:

(a) Write a short note on types of Command Headquarters in Army. (b) Write short note on Naval Headquarter and its Commands.

(c) Write a short note on Air Force Command Headquarters.

Q3. Answer the following in about 150 words:

(a) What do you understand by Field Formation?

(b) What are Fighting Arms?

Q4. Answer the following in about 250 words:

(a) Give the rank structure of Officers of Army, Navy and Air Force.

(b) Give the rank structure of Junior Commissioned Officers and Non Commissioned Officer of Army.

(c) What are Supporting Arms?

UNIT 2 : MAP READING

INDEX

UNIT 2: MAP READING

Knowledge	Understanding	Application Skill	Evaluation
Introduction to types of Maps and Conventional Signs	Maps and the Conventional signs to be used.	Ability to read the Map using Conventional signs.	Activities, work sheets, assignments, and mock exercises
Scales and Grid System	Use of Scale and the importance of Grid system in map marking.	Ability to read the map and relate it to ground.	Activities, work sheets, assignments, and mock exercises
Topographical Forms and Technical Terms	Definitions used for geographical features.	Ability to grasp Map Reading classes and lessons faster.	Activities, work sheets and assignments,
Relief, Contours and Gradients	Height, shape and slope of the ground.	The cadets can relate the ground to the Map.	Activities, work sheets, assignments, and mock exercises
Cardinal Points and Types of North	Directions, Degrees and the types of North.	The cadets can indicate places and objects using Direction and Degrees.	Activities, work sheets, assignments, and mock exercises
Types of Bearing and use of Service Protractor	Use of Bearing and Service Protractor to locate places on map.	Ability to locate places and objects on ground.	Activities, work sheets, assignments, and mock exercises
Prismatic Compass and its use and GPS	Use of Compass and GPS to locate places on ground.	Ability to navigate to the given location on ground using Compass and GPS.	Activities, work sheets, assignments, and mock exercises

LESSON PLAN: MR 1

INTRODUCTION TO MAPS AND CONVENTIONAL SIGNS

DEFINITION AND TYPES OF MAP

Definition of Map

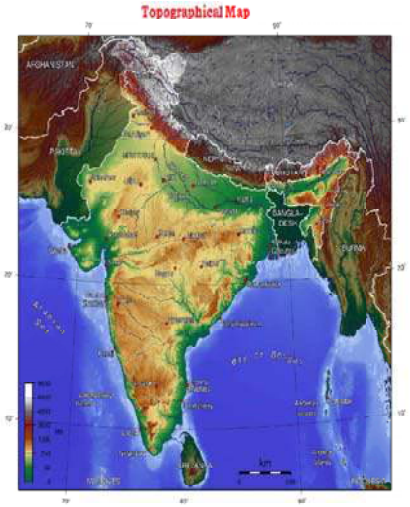
1. A map represents selected natural and manmade features of the whole or part of the earth's surface on a sheet of paper. It has a definite scale and correct relative geographical positions and elevations. Symbols, colour differences and contours on map help to show the physical features *i.e*. mountains, valleys and plains. A map, however, has the following limitations:-

(a) It is seldom, if ever, up to date.

(b) It cannot show everything that exists on the ground.

Types of Maps

2. There are different types of maps depending on their scale and their use. Important types of maps are as under:-

Serial No	Types Of Maps	Maps
(a)	**Atlas Maps:** These are small scale maps showing whole country's continents, oceans or even world on one sheet.	
(b)	**Topographical Maps:** These are maps with which we are concerned in map reading. Survey of India maps are all topographical maps.	

<table>
<tr>
<td>(c)</td>
<td>Other Maps:

(i) Geographical Maps showing the structure of the rock formation below the top soil.</td>
<td> 
</td>
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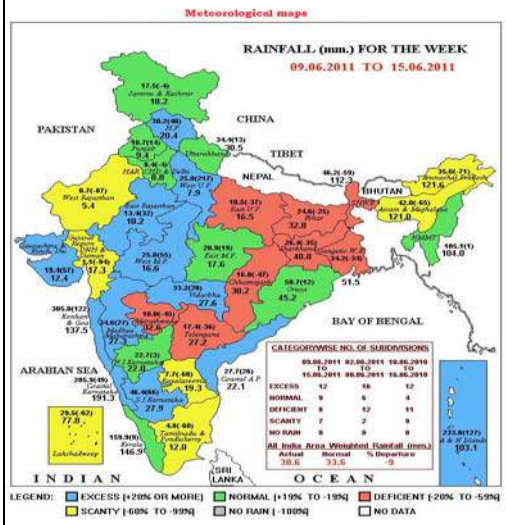
<tr>
<td></td>
<td>(ii) Meteorological Maps showing information regarding winds, atmospheric pressures and so on.</td>
<td> 
</td>
</tr>
</table>

CONVENTIONAL SIGNS

3. Conventional signs are symbols used to represent certain artificial or natural features/objects on the map. Some common types of conventional signs are listed at Figure-1.

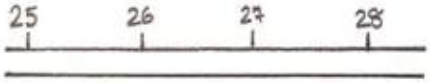
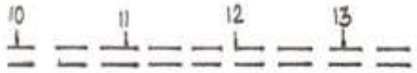
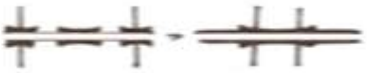
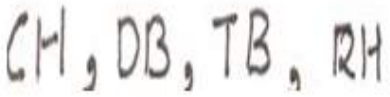
SR NO	OBJECT	CONVENTIONAL SIGN
1.	ROADS- METALLED WITH MILE-STONE	
2.	ROADS- UN-METALLED WITH MILE-STONE	
3.	CART TRACK, CAMEL TRACK, MULE PATH	
4.	BRIDGES WITH PIERS AND WITHOUT	
5.	RIVER BEDS – DRY, WITH STREAM	
6.	RAILWAY LINE	
7.	CIRCUIT HOUSE, DAK BUNGALOW, TRAVELERS BUNGALOW, REST HOUSE	
8.	CHURCH, MOSQUE, TEMPLE, PAGODA, IDGAH,	
9.	POST OFFICE	
10.	BOUNDARY; INTERNATIONAL AND STATE	
11.	BOUNDARY; DISTRICT	

Figure -1

CONCLUSION

4. A thorough knowledge of the map and conventional signs is very important to know about the area not seen before. Conventional symbols are used to maintain the clarity of the map. It is very important for all to know and identify these symbols on the map to make map reading easier.

LESSON PLAN: MR 2

SCALES AND GRID SYSTEMS

SCALES AND GRID SYSTEMS

Definition of Scale

1. The relation or ratio between the distance of two points/places on ground to that on a map is known as the scale of the map.

Example. In case two schools are located at a distance of one km on ground but on the map are shown at a distance of 1 cm then the scale of that map would be 1cm : 1km. On another map the schools may be shown at a distance of 10 cm, then the scale of that map would be 10cm : 1km or 1cm:100m.

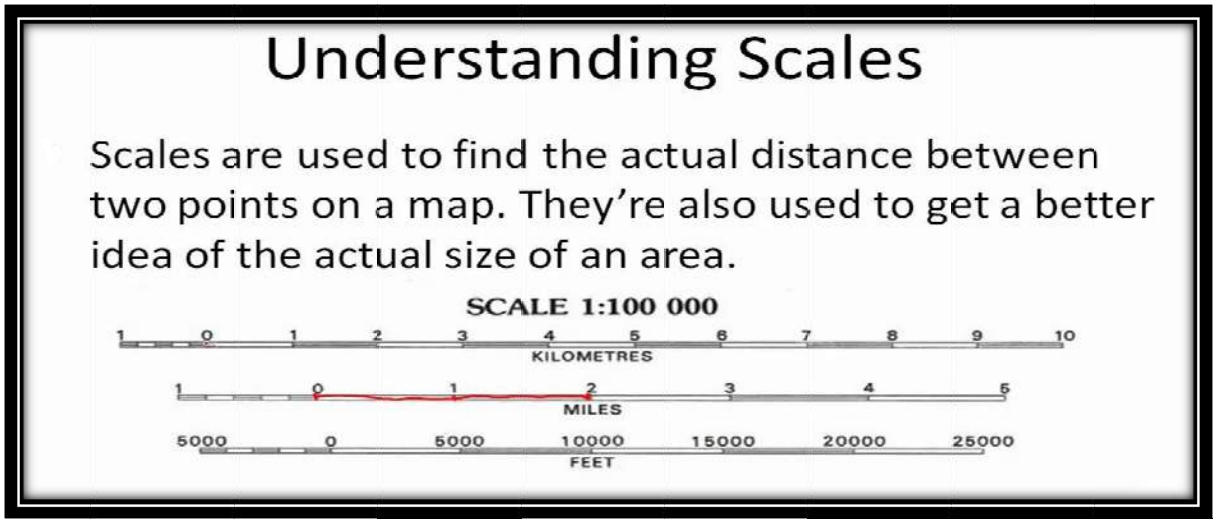


Figure 2

Methods of Expressing a Scale

2. There are two methods of expressing a scale:-

(a) **In Words**. 1 inch to 1 mile, it means that 1 inch on the map represents 1 mile on the ground.

(b) **As a Representative Fraction (RF)**. This is the scale expressed in the form of a fraction. If the scale of a map is given as 1/100000 this means that one unit of the map represents 100000 of the same unit on the ground. It could mean that one centimeter on the map represents 100000cm on the ground.

Scale Line

3. Below the scale is the scale line by means of which distance on the map can be measured. In this scale 2 cm on map is equal to 1 km on ground. An example of the scale line for a scale "2 cm to 1 km" is at Fig-3 below:-

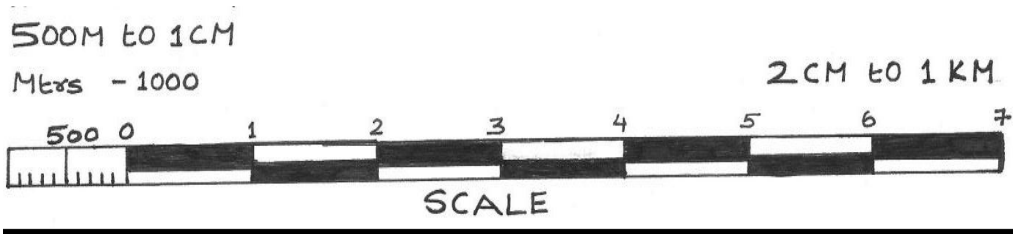
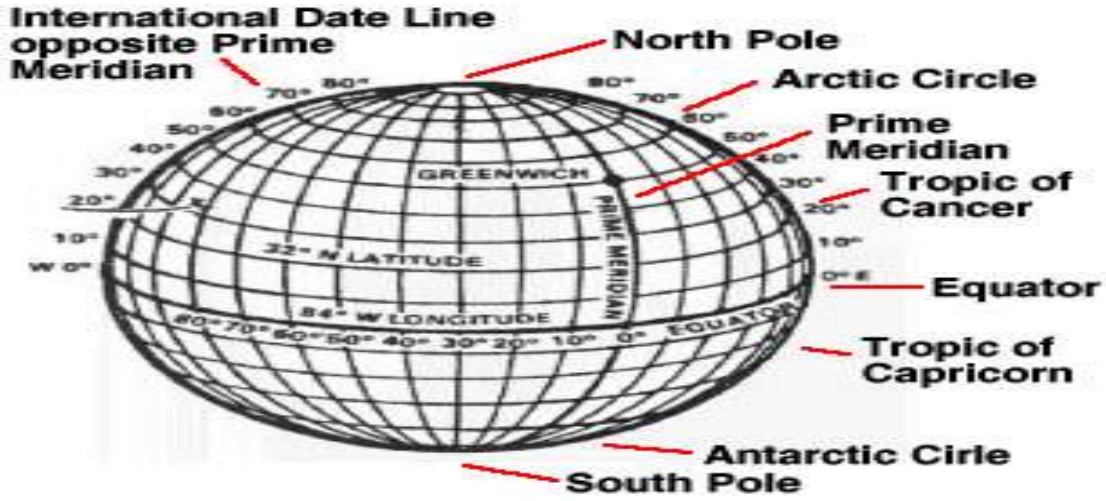


Figure 3

PART II : DEFINITION OF GRID AND GRID LINES

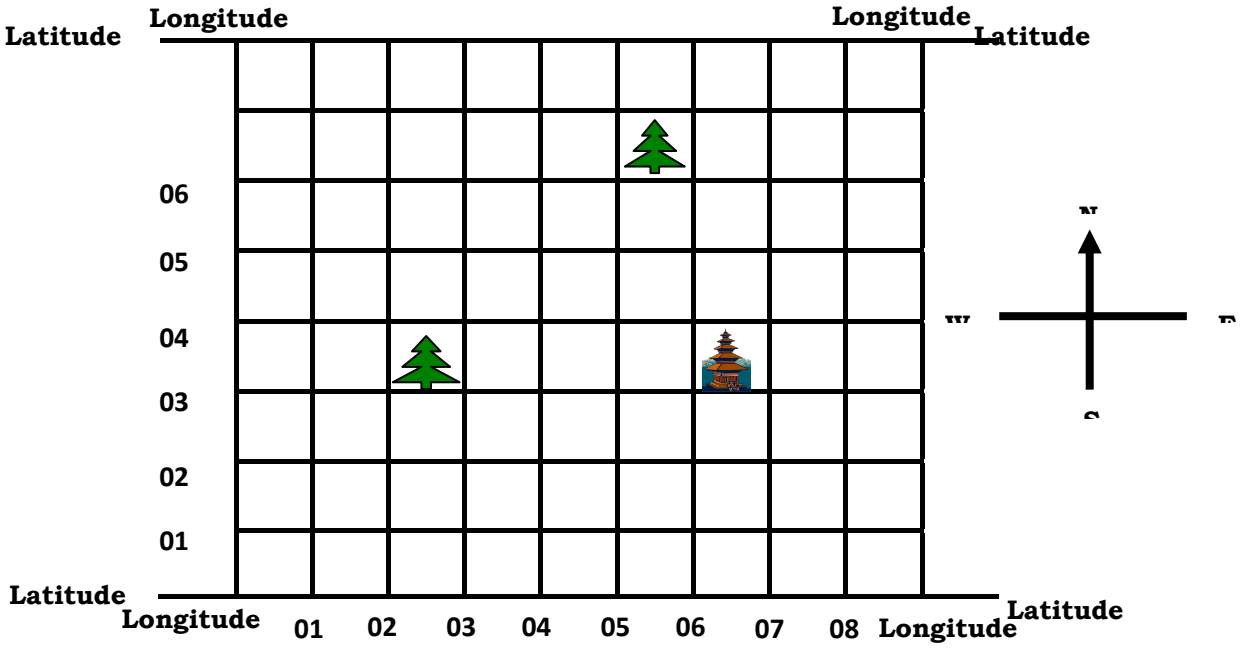
4. The Grid is a systematic pattern on Earth by laying a vertical and horizontal grid over the Earth's layout. The vertical lines are called the longitude and the horizontal lines are known as the latitude. The land mass within the latitude and longitude are further divided by lines covering smaller areas, these called **Grid Lines**.



5. Purpose. The purpose of Grid Lines is to make possible giving and reading Grid references and measurement of bearings.

METHOD OF GRID REFRENCE

6. As the whole earth is divided into 180 latitudes (90^0 N & 90^0 S) and 360 Longitudes (180^0 E & 180^0 W) the area between these is very large which is further subdivided by Grid lines, as shown in the map below



MAP

5. In the above map there are two trees and one temple marked. If we want to indicate only one tree then we can use the grid lines which have been marked. The grid lines marked 01-08 are numbered from West to East are known as Easting, while the one marked 01-06 and numbered northwards are called as Northings.

6. The tree which is marked below in the picture can then be indicated as “Tree in the Square 0203. Where 02 is the Easting line and 03 the Northing line of the Square where the tree is located. Similarly grid reference consisting of six numbers can also be found which would be an even more exact location.

Basic Rules for Findings

7. In giving a Grid Reference following rules should be remembered:-

(a) A reference must always contain an even number of figures, normally it contains six figures.

(b) Easting lines are the black colour vertical lines.

(c) Northing lines are the black colour horizontal lines.

(d) Always count along the Easting lines first from the West to East and then Northing from South to North.

(e) Grid References are of different types viz. Four Figure, Six Figure, Eight Figure and Ten Figure.

(f) Mostly Six Figure Grid Reference is used.

(g) For six figure Grid Reference the third and the Sixth figure represent the divisions of 1000 meters square to the nearest 10^{th} part (100m). Six figure grid reference is more accurate than a four fig GR.

(h) 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 its identity and four figure grid reference would suffice.

CONCLUSION

11. For effective and correct map reading, it is essential that cadets should be able to differentiate between maps of different scales and find out the correct Grid Reference of the object. The cadets should also be able to relate the scale on map to the actual distance of object on ground.

LESSON PLAN: MR 3

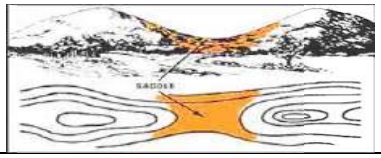
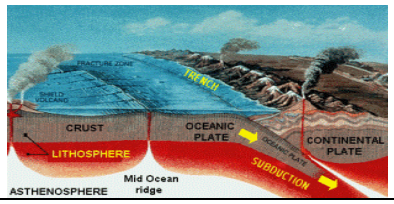
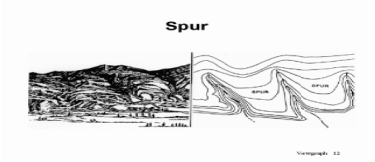
TOPOGRAPHICAL FORMS AND TECHNICAL TERMS

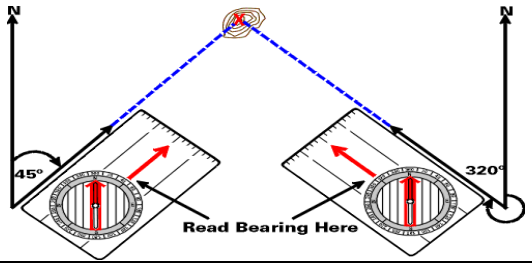
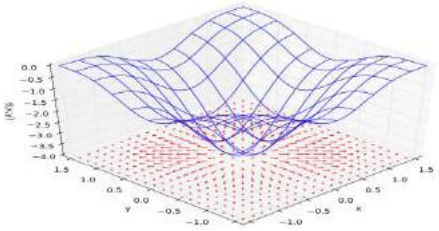
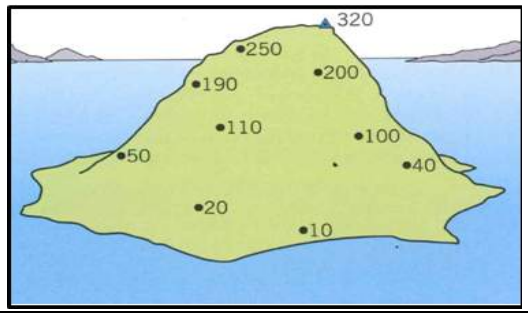
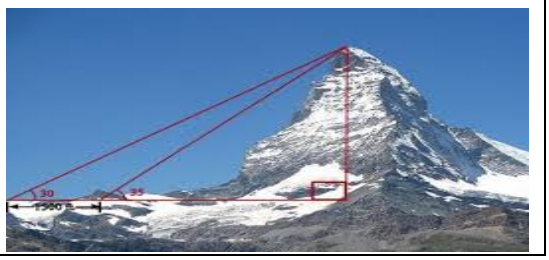
INTRODUCTION

1. Commonly used technical terms and topographical forms is a name used to describe geographical features which occur on the ground.

TOPOGRAPHICAL FORMS AND TECHNICAL TERMS

2. Topographical forms are names used to describe geographical features which occur on the ground. The following are more commonly used:-

Ser No	Topographical Forms	Samples
(a)	**Col or saddle:** A narrow ridge of high land joining up to higher hills.	
(b)	**Crest:** A highest part of hill or mountain range. It is that line on the range of hills or mountains from which the ground slopes down in opposite direction.	
(c)	**Dead Ground:** Ground which is because of undulations or hills is not visible to the observer.	
(d)	**Knoll:** A small isolated hill.	
(e)	**Ridge:** A line along a hill or range of hills or mountains from which water flows in opposite directions.	
(f)	**Spur:** A piece of high ground jutting out of range of hills into lower ground.	
	Technical Terms	**Sample**

(a)	**Bearing:** The angle formed by a line joining two points and the North and South line. Bearings are always measured clockwise.	
(b)	**Gradient:** The slope of a hill expressed as a fraction.	
(c)	**Spot Height:** A point on a map whose height has been determined by Survey methods. These are usually shown as block dot with a number giving exact height above sea level in meters.	
(d)	**Trigonometric Point:** A point fixed during the triangulation at the beginning of a survey, marked on Ordnance Survey Maps by a small triangle with the height.	

CONCLUSION

3. To be proficient in Map Reading and understand it better, it is very important for all to understand the various topographical forms and technical form in map and co-relate it with the ground.

LESSON PLAN : MR 4

CONTOURS AND GRADIENTS

CONTOURS AND GRADIENTS

1. **Contour.** It is imaginary line drawn on the map contenting all points on land with the same height. A contour is marked by a line and the line depicts a certain height, example 250m above sea level then from where all these lines pass on the map all those places would have the same height of 250m, If you walk along a contour line you neither gain nor lose elevation.

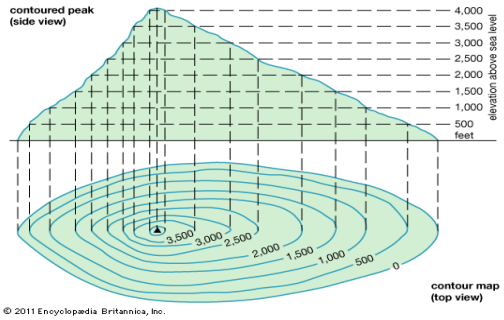


Figure 7

2. **Characteristics of Contours**.

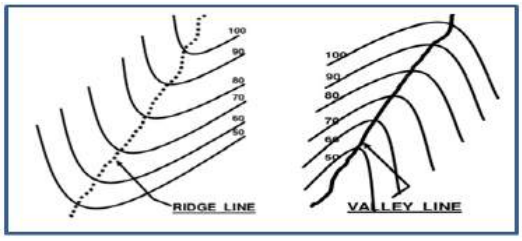
(a) Contours accurately show height, shape and slope of the ground.

(b) Contours are shown generally in brown.

(c) Height is marked on every fifth contour.

(d) Contour lines vary in appearance.

(e) These lines never touch or cross each other.



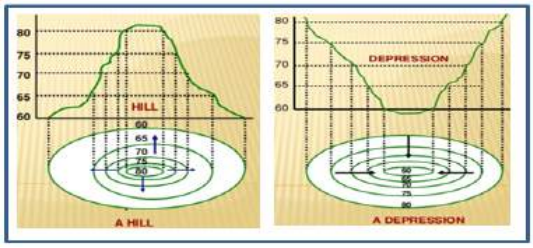


Figure 8

3. **Vertical Interval (VI)**. The rise between successive contour lines is known as the vertical interval (VI). On map scale 1 inch to 1 mile, the VI of each contour line is 50 feet while on the 1/4 inch to a mile it is 250 feet.

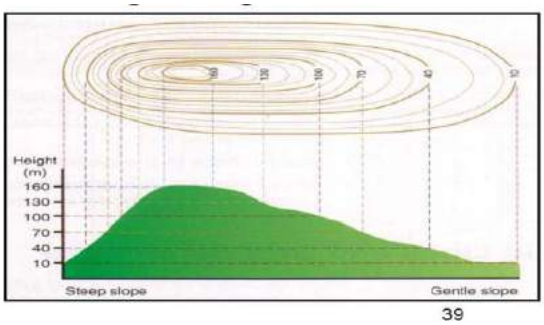


Figure 9

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

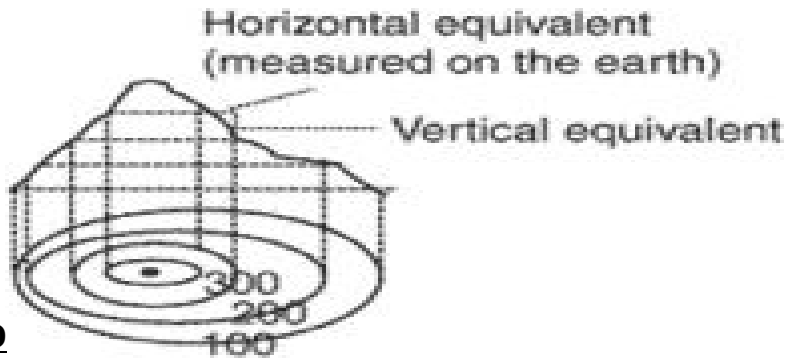


Figure 10

5. **Gradient.** The gradient is the steepness of a slope of the ground may be expressed as the angle the ground makes with the horizontal. In other words it is the ratio of the vertical interval to horizontal equivalent. It is independent of any unit of measurement. Simple Formula is VI/HE = Gradient.

6. **Measuring Gradient.** The rise or fall of a slope can be expressed in following two ways:-

(a) In an Angle or Degree of Slope.

(b) The tangent of the Angle or Gradient.

CONCLUSION

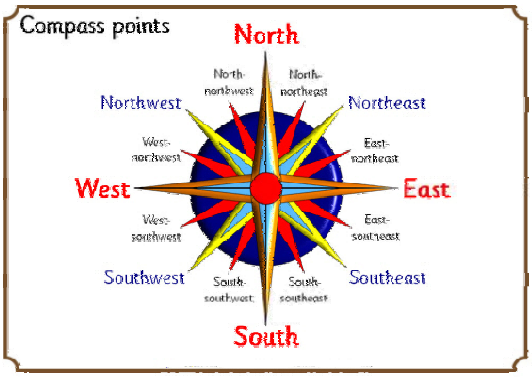
7. Contour reading is very important as it shows the height, shape and slope of the ground. For correct map reading, one should be able to read the contour lines and select the correct route for the navigation.

LESSON PLAN : MR 5

CARDINAL POINTS AND TYPES OF NORTH

CARDINAL POINTS AND TYPES OF NORTH

1. **Cardinal Points**. North, South, East and West are known as the cardinal points. If the North point is taken as zero degrees, East will be 90^0, South will be 180^0, and the West will be 270^0. In addition to four Cardinal Points there are four intermediate major directions. The names and degrees are as under:-



Cardinal Points

Figure 11

(a) North East - 45 Degrees

(b) South East - 135 Degrees

(c) South West - 225 Degrees

(d) North West - 315 Degrees

TYPES OF NORTH AND ANGLES BETWEEN NORTH POINTS

Types of North

2. There are three types of North :-

(a) **True North**. The direction of North Pole from the observer.

(b) **Grid North**. North as per the Grid on map.

(c) **Magnetic North**. It is the point to which a magnetic needle points, when freely suspended.

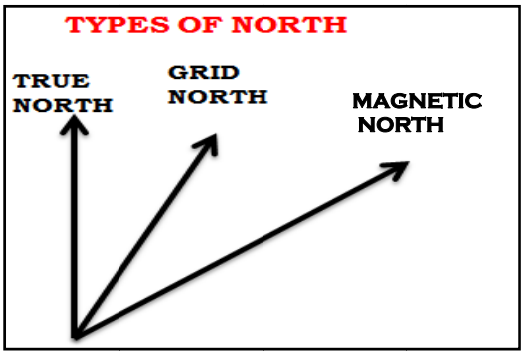


Figure 12

3. **Magnetic Variation**. Magnetic North is the point shown by compass needle points. The needle does not point directly to True North, but a little West or East of True North. The difference between True North and Magnetic North is called Magnetic Variation. The amount of the Magnetic Variation depends upon two factors, time and place.

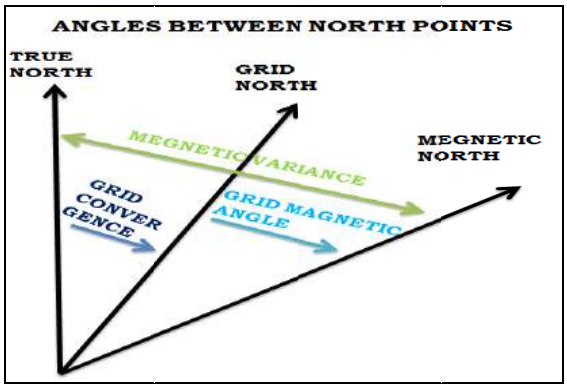


Figure 13

CONCLUSION

4. First step towards learning Map reading is finding North on ground. Knowledge of various major and minor directions assists in maintaining the correct direction during the navigation.

LESSON PLAN: MR 6

TYPES OF BEARING AND USE OF SERVICE PROTRACTOR

BEARING AND ITS CONVERSION AND SERVICE PROTRACTOR

1. **Types of 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. They are three types as given below:-

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

   (b) **Magnetic Bearing**. Measured from Magnetic North by the compass.

   (c) **True Bearing**. Calculated by finding out the relation of True NORTH and Grid NORTH or Magnetic NORTH.

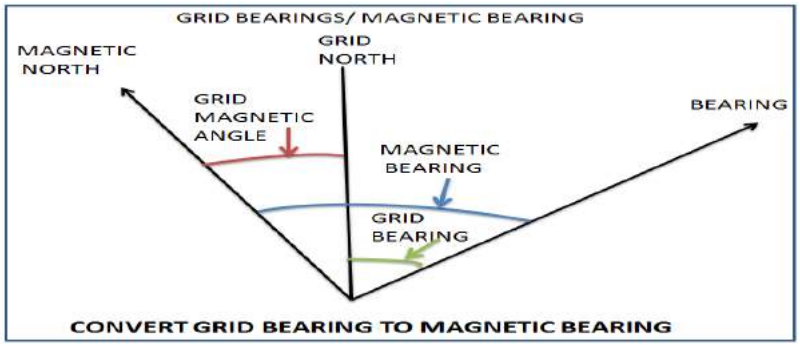


Figure 14

2. **To Convert a Magnetic Bearing to a Grid Bearing**. Suppose the bearing of a certain point P is measured with a compass and is found to be 160^0. To convert this Magnetic Bearing to a True Bearing, follow under mentioned steps:-

   (a) First find out the Magnetic Variation of the Area. Magnetic

   Variation is given on the Top Right corner of each Map.

   (b) Suppose 5^0 is the Magnetic Variation of the area. Now subtract this Magnetic Variation to the Magnetic Bearing.

   (c) The resultant is the Grid Bearing i.e. $155^{0.}$

3. **To Convert Grid Bearing to Magnetic Bearing**.

   (a) Measure the Grid Bearing of an object on the map with help of the service protractor from your own position.

   (b) Suppose the Grid Bearing of the object is 155^0.

   (c) Now, find out the Magnetic Variation of the area with the help of Map (Magnetic Variation is given on the Top right corner of the map). Suppose Magnetic Variation of the area is 5^0.

   (d) Now, add this Magnetic Variation to the Grid Bearing.

   (e) The resultant will be the Magnetic Bearing of the object i.e. 160^0.

4. **Back Bearing**. Is the bearing to your location as measured from an objector landmarks. It is needed when you have to find your own position by using objects on the ground (Explained in chapter MR-8).

(a) If forward bearing of an object is 70^0 then its back bearing will be $180^0 + 70^0 = 250^0$.

(b) If forward bearing of an object is 240 then it's back bearing will be $240^0 - 180^0 = 60^0$.

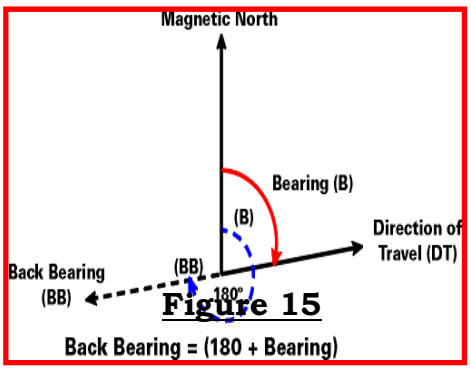


Figure 15

SERVICE PROTRACTOR

5. The service protractor "A" Mark IV is an instrument used for plotting and measuring bearing on the map. It is an essential link between the compass and the map. With the help of the protractor the magnetic bearings have been converted to grid bearing and transferred to the map. It is similar to the protractor you have in your geometry box used for measuring angles.

Description

6. The protractor is made of cardboard or ivories (flexible material) and it measures 6 inches long and 2 inches wide.

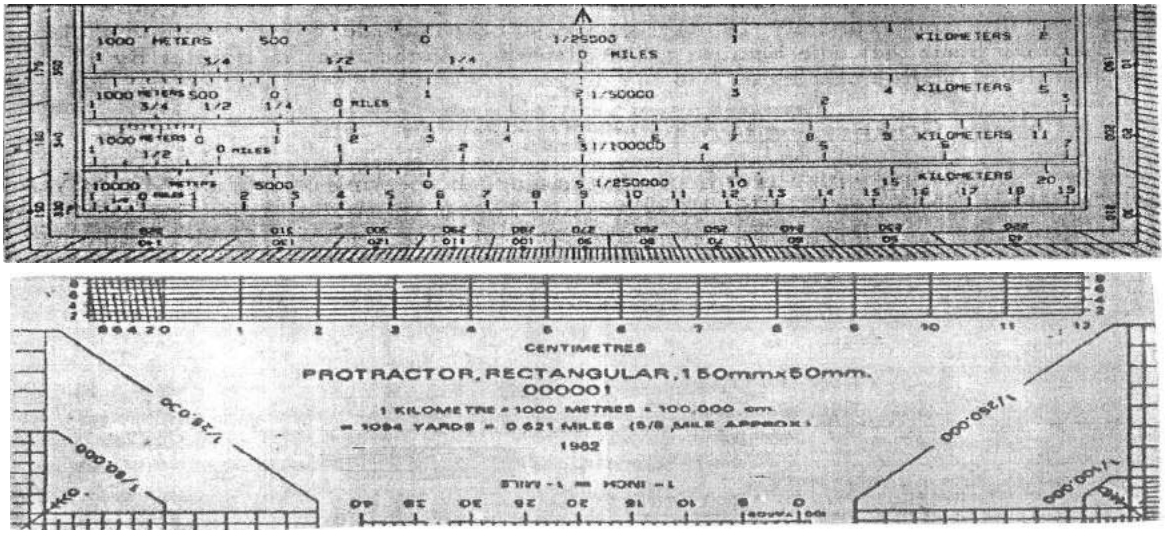


Figure 16

Scale of Protractors

7. The main purpose of the protractor is to measure angles and bearings as described in the preceding paragraphs. The protractor also shows on both its faces a number of the more common map scales. The respective scale lines are drawn out and divided into primary and secondary divisions in exactly the same

way as at the bottom of the map. These can be used to measure distances on the map.

CONCLUSION

8. Taking out correct magnetic bearing of an object is very important. Converting Magnetic bearing into Grid bearing and vice versa should be known to identify object on map and ground. Use service protractor to find out the distance and grid bearing of one object to another on the map should be known for accurate navigation.

LESSON PLAN: MR 7

PRISMATIC COMPASS & ITS USE AND GPS

INTRODUCTION

1. The magnetic compass an instrument containing a magnetized pointer which shows the direction of magnetic north and bearings from it. The magnetic compass is used extensively in ships, aircraft and the various branches of the army to find and maintain direction. With the prismatic compass one can measure magnetic bearing on the ground.

TYPES OF COMPASS AND TAKING BEARING

2. **Types of Compass and Taking Bearing**. There are two types of prismatic compass, the dry and liquid filled. Liquid type is easier to use though it is less sensitive.

3. **Description**. Various parts are shown below:-

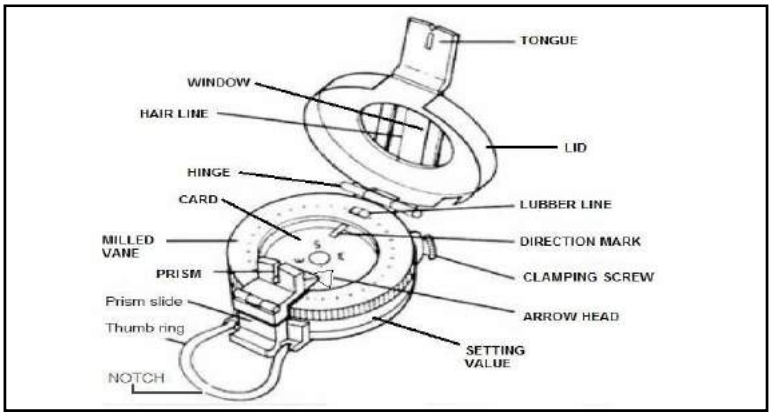


Figure 17

4. **How to Take a Bearing**

(a) Open the lid of compass.
(b) Turn the prism casing over.
(c) Put your thumb through the ring.
(d) Put your forefinger underneath the compass & hold it to horizontal level.
(e) Bring the prism up to the eye.
(f) See through the prism via hairline to object.
(g) Read the bearing.

COMPASS ERRORS AND GPS

5. **Compass Error**. Sometimes due to the presence of impurities in the material of which a compass is made or other reasons, the magnetic needle may not point toward the magnetic NORTH but a little to the EAST or WEST of it. This deviation of the magnetic needle in the compass from the magnetic NORTH is termed compass error.

6. **Global Positioning System**. Global Positioning System (GPS) refers to a system of satellites and receivers that allows people and devices to pin point their precise location on the earth. The first GPS satellite was launched in 1974. GPS is funded and controlled by the United States, Department of Defence. Present technology provides very handy and accurate navigation. GPS is used by:-

(a) Commonly used in day to day life by general public like for travelling purposes.

(b) Fishermen and hikers to navigate.

(c) Armed Forces, in its equipments and in battle fields.

(d) Today even your mobile phones have GPS to get your location but it is not very accurate.

CONCLUSION

7. It is very important for a soldier to understand the prismatic compass and be proficient in using the same. An individual should know how to take the bearing set the compass and then march on the bearing set on the compass. The compass should be checked for correctness and errors if any be noted on the inside of the lid. While using the compass ensure that there is no iron objects nearby.

LESSON PLAN: MR 8

SETTING OF A MAP, FINDING NORTH AND OWN POSITION

METHODS OF SETTING MAP

Setting of Map

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

Methods of Setting a Map

2. There are two methods of setting a map - by compass and by objects on the ground.

Setting by Compass

3. Draw a line showing magnetic North from a point on a grid line. Open the compass and lay it flat on the map over the above drawn line and the compass hairline aligns with the line drawn on the map. Then turn both the map and the compass till the needle points along the hair line and the compass hairline aligns with the line drawn on the map. The map is now set, since the magnetic North line on the map is pointing in the direction of magnetic North as indicated by the compass needle.

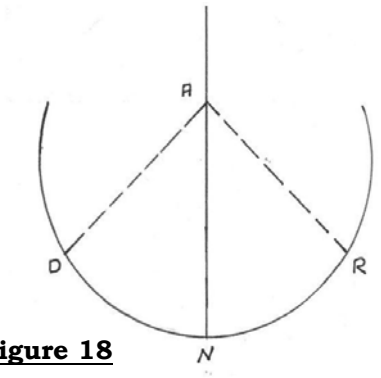
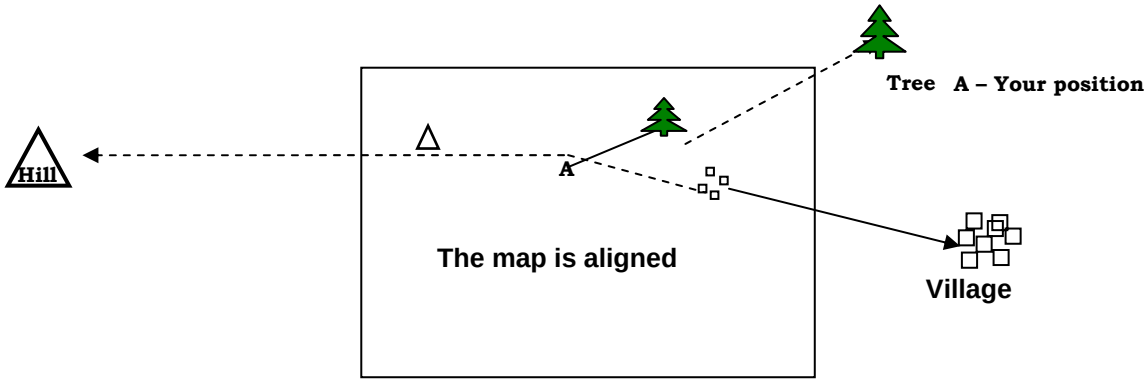


Figure 18

SETTING BY OBJECTS ON THE GROUND

4. The other method of setting the map is by using certain prominent landmarks on the ground. For this you need to identify atleast three objects both on the ground and the map which are visible from your location. Then place the map on the ground and move it so that the direction of the objects from your position on the map aligns with that on the ground.



FINDING NORTH AND OWN POSITION

Finding North

5. **Without Compass**. The position of North can be discovered by one of the following methods:-

(a) **Equal Altitude Method**.

(i) Take a fairly large piece of paper or card board and spread it flat on the ground. In the centre fix a pencil or piece of wood perpendicular to the ground. It can be done by directly pushing it in the ground.

(ii) Mark the shadow (AR) during the first half of the day and wait till mid day until the sun has moved around to throw another shadow as indicated by line AO, of the same

length. The line bisecting the Angle DAR will point to the North.

(b) **By Stars**. In the Northern hemisphere, the Pole star indicates the position of True North to within 2 degree. It is a bright star and it can be found by protruding a line from Great Bear. The pole star will be found slightly off this line on the side remote from the remaining stars of the Great Bear.

Finding Own Position on Map

6. **Methods of Finding Own Position on Map**

(a) By resection method or Compass method

(b) By Inspection method.

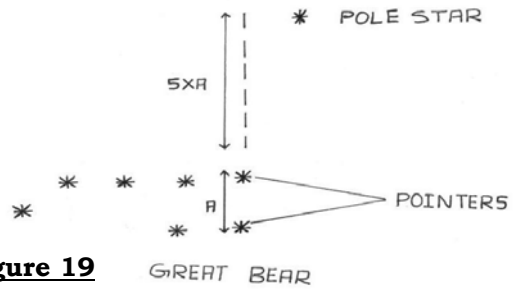


Figure 19

7. **Resection with Compass Method**.

(a) Recognise three prominent features (A, B, C) on map and on the ground as well. These three prominent features must not be more than 180 or less than 30 apart. They should be as far as possible and clearly visible. The bearing of these points be taken and converted into Grid bearings.

(b) Then, on the map the back bearings from these points must be plotted, and the point of intersection will be the required position.

(c) In order to do an accurate resection, three or more objects are necessary. But in that case if the three rays do not intersect at the same point, a triangle of error is obtained. The centre of triangle is the point of your own position.

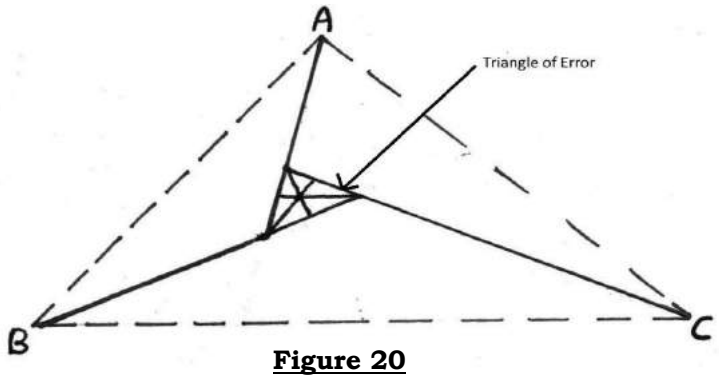


Figure 20

8. **By Inspection Method**. By inspections is meant a careful and detailed study of the ground and features both on the map and the ground and features on the map and on the ground. The method consists of:-

(a) Setting the map

(b) Recognition of general area of own position on the map

(c) A close study of the ground details

CONCLUSION

9. Setting of map and finding own position is the essence of the map reading training. One should be able to set the map with the help of compass and without it in minimum possible time. After setting of map, find out the two or three objects present on the ground and map be selected and resection method or compass method be used to find out the own position. Finding correct and accurate own position is very important for the navigation.

SUMMARY

- Map is the geographical representation of land on a paper.
- Scale is a proportion of two points on map and two points on the ground.
- Contour is an imaginary line following surface of the ground at a certain level.
- Gradient is the slope of the ground expressed as the angle the ground makes with the horizontal.
- Cardinal Points are the four major directions North, South, East and West.
- There are three types of North: True North is the direction of North pole, Magnetic North is the point which a magnetic needle points, Grid North is the direction of the North South grid lines on a map-point.
- Magnetic Variation the difference between True North and Magnetic North. It depends on time and place.
- Grid Convergence is the angular difference between Grid and True NORTH.
- Bearing: The clock wise angle formed by a straight line joining two points and direction of NORTH.
- The service protractor “A” Mark IV is an instrument used for plotting and measuring bearing on the map.
- Setting of Map: A map is said to be set or oriented when it is placed such that it corresponds directly with the ground. There are two methods of setting a map - by compass and by objects on the ground.
- Methods to find own position on map are:
- By resection or compass method
- By inspection method.

Comprehension Questions

Q1. **Answer the following in about 15 words:**

(a) What are Grid Lines and its purpose?

(b) How many types of Slopes are there?

(c) How many types of North are there?

Q2. **Answer the following in about 50 words:**

(a) What are Conventional Signs? Draw conventional signs for Temple, Railway line and Post office.

(b) Define Bearing?

Q3. **Answer the following in about 75 words:**

(a) What is magnetic variation?

(b) Differentiate between these:

(i) Contour and gradient.

(ii) Horizontal Equivalent and vertical Interval.

(c) When a map is said to be set. How can a map be set?

Q4. **Answer the following in about 150 words:**

(a) Define Map. Briefly explain all types of maps.

(b) What is the method or rules of calculating a Grid Reference?

(c) Write a note on Service Protractor.

Q5. **Answer the following in about 250 words:**

(a) Explain cardinal points?

(b) Define bearing and write the types of bearing?

(c) Explain back bearing and give out the method for the conversion of bearing?

(d) Explain the various methods of finding own position.

UNIT 3 : FIELD CRAFT /BATTLE CRAFT

INDEX

UNIT 3 : FIELD CRAFT/BATTLE CRAFT

Knowledge	Understanding	Application Skill	Evaluation
Introduction to Field Craft and Battle Craft	The cadet will understand the various ingredients of Field Craft and Battle Craft.	The cadet will understand the use of ground and the weapon available to him to the best of one's own advantage.	Activities, work sheets, assignments, and mock exercises.
Judging Distance	The cadet will understand the various methods to judge distance in different conditions.	The cadet will be able to engage a target by correct judging of distance.	Activities, work sheets, assignments, and mock exercises.
Description of Ground	The cadet will understand the various types of ground and the procedure to describe them.	The cadet will be able to grasp a quick, accurate and standard procedure to describe an area to his men to understand it correctly.	Activities, work sheets and assignments.
Recognition, description and indication of landmarks and targets	The cadet will understand the methods of indicating the targets.	The cadet will be able to identify, describe and indicate the target accurately.	Activities, work sheets, assignments, and mock exercises
Observation, Camouflage and Concealment	The cadets will understand the importance of observation, camouflage & concealment.	The cadets will be able to observe the surroundings in a better way.	Activities, work sheets, practical assignments.
Field Signals	The cadet will understand various signals to convey messages in the army.	The cadet will be able to apply these signals in their day to day functioning.	Activities, work sheets, assignments, and mock exercises.
Use of Ground and Movement	The Cadet will understand various basic infantry fire and movement tactics.	The cadet will be able to apply these tactics in their exercises.	Activities, work sheets, assignments, and mock exercises.
Section Formation	The cadet will understand the various section formations.	The cadet will be able to apply the section formations in their exercises and practice.	Activities, work sheets, assignments, and mock exercises.
Knots and lashings	To understand various knots and lashings used in soldiering.	To apply knowledge during survival techniques.	Activities, mock exercises, practice.

LESSON PLAN :FC & BC 1

INTRODUCTION TO FIELD CRAFT AND BATTLE CRAFT

INTRODUCTION

1. Field Craft is an important aspect of military training. It is the art of using the ground and the weapon to the best of one's own advantage.

FIELD CRAFT

2. Field Craft includes the following subjects:-

(a) Recognition and description of targets.

(b) Personal camouflage and concealment.

(c) Judging distance.

(d) Movement with and without arms.

BATTLE CRAFT

3. Battle craft is set of drills (pre-rehearsed procedure/actions) which are used for conduct of small tactical operations generally at section/platoon level. These drills save time avoid confusion and are carried out with minimum orders. Battle Craft includes the following subjects :-

(a) Field Signals.

(b) Fire and move.

(c) Section Formations.

(d) Section battle drills.

CONCLUSION

4. It is important for NCC cadets to know about the basics of battle craft. The art of using the ground and the weapon, not only is as essential skill for a trained soldier, it also helps an individual to perform better in various life situations.

LESSON PLAN :FC & BC 2

JUDGING DISTANCE

INTRODUCTION

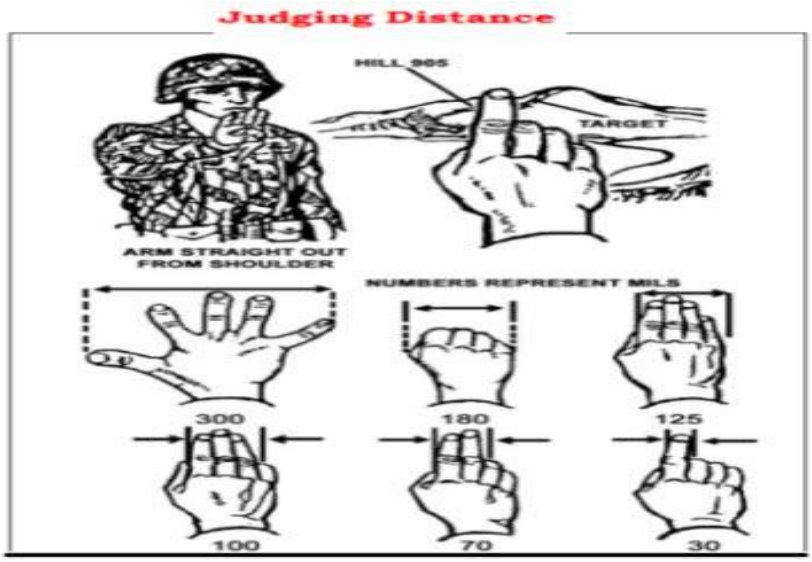
1. An individual should be able to judge distance accurately with his eyes so that the individual can decide on the following:-

(a) Know when to open fire.

(b) Know which weapon to be used.

(c) Can indicate targets to other men in his section

(d) Pass back correct information when acting as an observer.



METHODS OF JUDGING DISTANCE

2. **Methods of Judging Distance**. There are six methods of Judging Distance. These are as under:-

(a) Unit of measure.

(b) Appearance method.

(c) Section average.

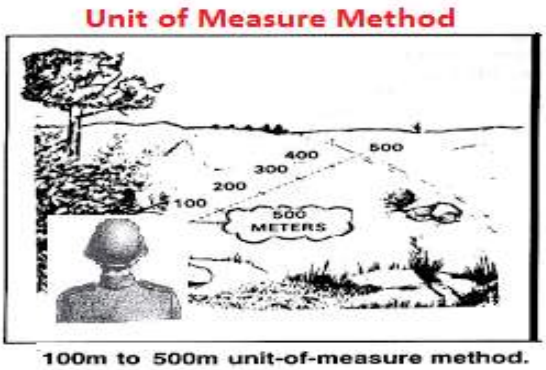
(d) Key range.

(e) Halving.

(f) Bracketing.

Unit of Measure

3. This method is also termed as the 100 metres method. The unit of measure chosen is normally 100 metres and therefore one should form a good idea of 100 metres distance on the ground. The length of a hockey field is the best yard stick for this purpose. The distance of a given object will be a multiple of the

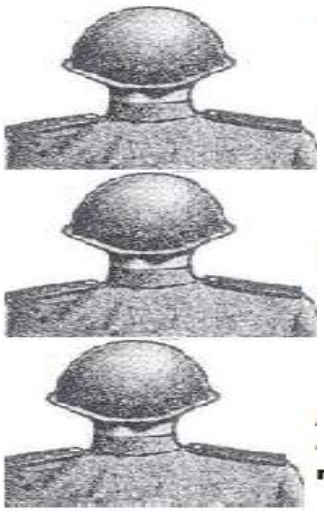


100m to 500m unit-of-measure method.

imaginary unit of 100 metres, as placed between the observer and the object.

Appearance Method

4. The distance can be judged by noting the detailed appearance of man at various ranges.



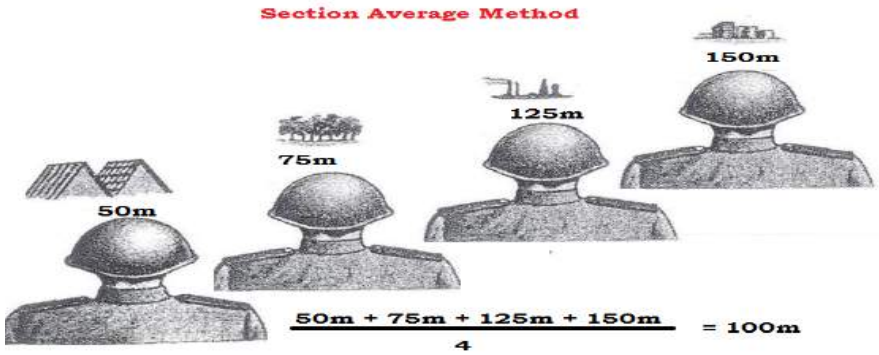
At 100m – clear in all details.

At 200m – clear in all details, colour of skin and equipment identifiable.

At 300m – clear body outline, face colour visible, remaining details remaining details blurred.

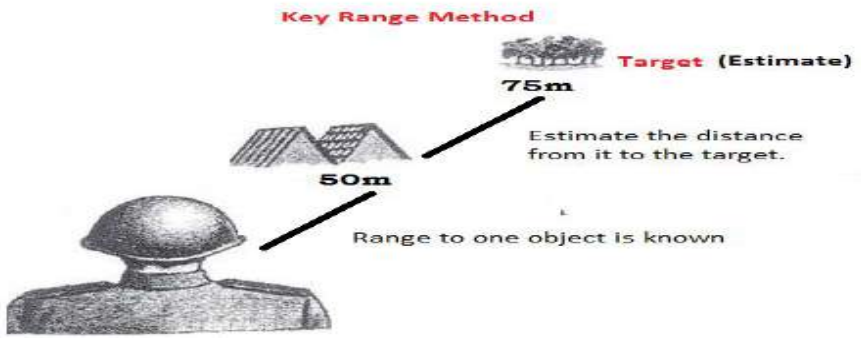
Section Average

5. Each man in the section is asked to judge the distance of a given object. The average of the answers given by the whole section is then accepted as the distance.



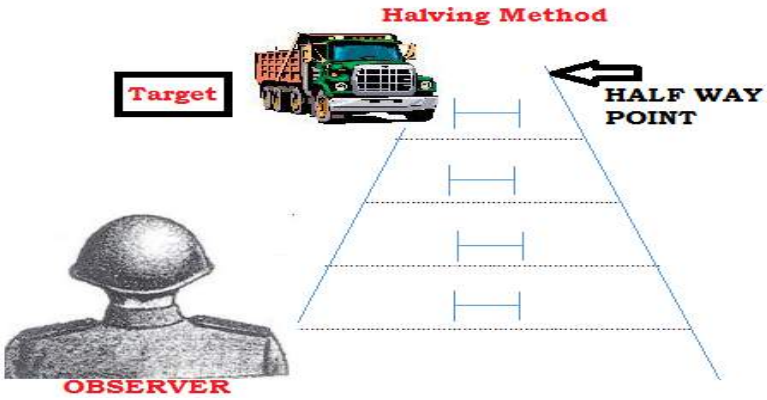
Key Range

6. If the range of the certain object is known, distance to other objects can be found in relation to the known range. This method is called “Key Range” method.



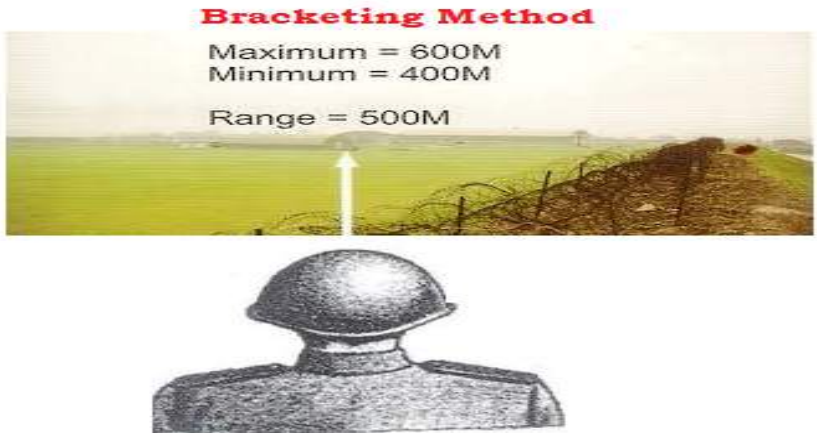
Halving

7. An object is selected half way between the observer and the target, the distance to the selected object is judged and doubled to get the distance to the target.



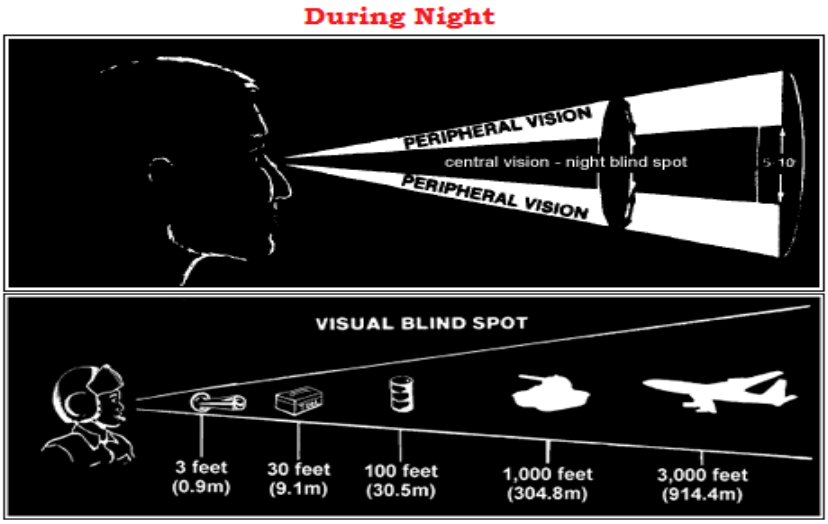
Bracketing

8. The observer works out the maximum and the minimum possible distances of the object and then accepts the mean as the distance.



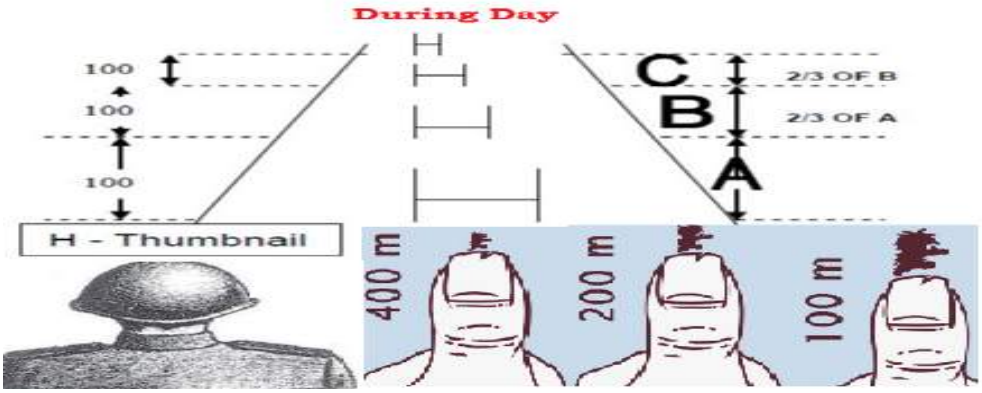
Practical Hints

9. **During Night**. Judging distance at night will depend upon the visibility. The only suitable method is the "Key Range". Therefore mark prominent objects and work out their distances while there is still day light.



During Day

10. Conditions which mislead the observer when judging distances are as follows:-



(a) Distances are overestimated when:-

(i) Light is bad.
(ii) The sun is in the observer's eye.
(iii) The object is small in relation to its surroundings.
(iv) Looking through a valley of narrow lane e.g. street.
(v) Lying down.

(b) Distances are underestimated when:-

(i) The light is bright or the sun is shining from behind the observer.
(ii) The object is large in relation to its surrounding.
(iii) There is some dead ground between observer and the object.
(iv) Looking uphill.

CONCLUSION

11. Judging distance is very important as it is essential to be able to estimate the correct distance to an object/target/enemy as the same would be required for indication or correct opening of fire.

LESSON PLAN : FC & BC 3

DESCRIPTION OF GROUND

INTRODUCTION

1. A quick, accurate and standard procedure is necessary to enable a commander to describe an area to his men and the men to understand it correctly.

TYPES OF GROUND

Ser. No	Types of Ground	Samples
(a)	**Broken Ground**. It is uneven mounds which has nullahs and small mouns. The ground provides cover for move of infantry.	
(b)	**Flat and Open Ground**. It is even ground with little cover. It is not suitable for move of Infantry by day.	
(c)	**High Ground**.Ground far above the general level of the area e.g. hill. It facilitates control of area around it by observation or fire.	
(d) Observer	**Dead Ground**. Ground that cannot be seen from a certain position either due to uneven slope/depression in the ground is called dead ground.	

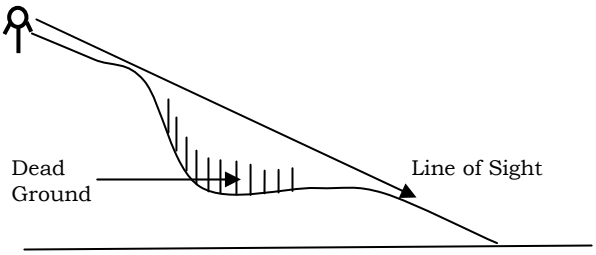
Note:

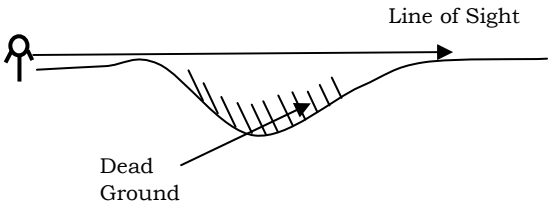
(a) Though an open ground is easy to travel, it is dangerous to do so when close to the enemy. Whether moving or taking fire position in an open area one is exposed to enemy from view and fire.

(b) Broken ground when correctly used affords protection from flat path weapons. It does not afford cover from air or protection from high path weapons.

(c) Dead ground does not afford cover from high path weapons.

PROCEDURE OF DESCRIPTION





2. The normal method of scanning and describing ground is by dividing it as follows:-

(a) Fore Ground up to 300 yards

(b) Middle Distance from 300 yards to 500 yards

(c) Distance beyond 500 yards

INDICATION OF LANDMARKS USING GENERAL LINE OF DIRECTION AND BOUNDARIES

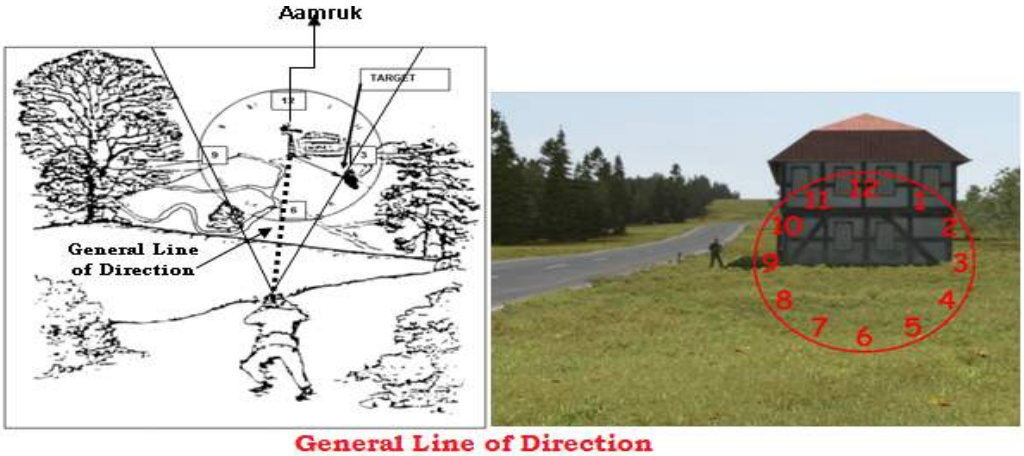
Need to indicate Landmarks

3. During war when troops are at a position the area in front of them is of interest to them. This is the area from where either the enemy will attack or they would move to attack the enemy. Thus commanders need to show various landmarks/targets to the men under him for conduct of operations. In army there is a set method for the same, so that everyone can understand the indication. The most important is the General line of Direction (GLD)

General Line of Direction (GLD)

4. In the approximate centre of the total area you want to indicate, one selects a prominent landmark which is visible and recognisable to all. Line joining your position and this landmark then becomes your GLD. The GLD also divides the area in two halves left and right which can be used to indicate other landmarks.

Example. No 1 section 500m, Red House. Line joining our position Red House and beyond is the General Line of Direction.



General Line of Direction

Boundaries

5. After giving general line of direction give LEFT and RIGHT boundaries of your area. Divide the ground into foreground, middle and distance. Having done so start from LEFT to RIGHT systematically in a clockwise direction and describe the ground.

Sequence of description

6. While describing the ground bounded by particular arc after giving the boundaries start from LEFT to RIGHT. If the ground all around is to be described, start after general line of direction to the right and finish at general line of direction by completing the indication all around.

CONCLUSION

7. Studying and appreciating the ground is an important factor for getting success in operations. A cadet should have an eye for the ground. He should keep on observing and judging the ground even while advancing and section commander should keep on explaining continuously while on move.

LESSON PLAN :FC& BC 4

RECOGNITION, DESCRIPTION & INDICATION OF LANDMARKS AND TARGETS

INTRODUCTION

1. Landmarks and other objects on the ground or a battle field may be either unclear due to climatic conditions or other reasons. Every effort should, therefore be made to indicate their location and size carefully and accurately. To ensure quick and accurate indication by commanders and recognition by individual soldiers a standard procedure has been laid down in the Army.

DEFINITIONS

Landmarks

2. An object, which is important on the ground and which is used in verbal orders to explain the ground in front.

Target

3. It is an object having a tactical significance which is indicated with a view to bring down fire on it.

Reference Point

4. An important and unmistakable object, with the help of which you can indicate other land marks or targets. A reference point should be specific.

METHODS OF INDICATION OF EASY TARGETS

Easy Targets

5. Can be indicated by the following methods:-

(a) **Indication by Description**.A noticeable target can often be described directly. For example "No. 1 Section BRIDGE". Here BRIDGE is so noticeable that nobody can make a mistake in recognizing it.

(b) **Indication by Direction or Range or Both**. In slightly less obvious cases other aids should be used e.g. direction or range or both.

An example of each is given below:-

(i)Indication by Direction : No 1 Section BAEN BAGHICHA.

(ii) Indication by Range : No 1 Section 600 BAGHICHA.

(iii) Direction and Range : When indicating a landmark, indicate direction first and then range e.g. BAEN-600, BAGHICHA.

METHODS OF INDICATION OF DIFFICULT TARGETS

6. The targets which cannot be indicated by the methods given above are termed difficult targets. The methods to indicate these are explained below:

The Direction Method

7. This is used to indicate the following:-

(a) The general line of direction

(b) A known reference point

(c) Another landmark

8. Unless otherwise stated all directions are taken to be with reference to the general line of direction. The following direction will be used:-

Direction	**Measuring**
Slight Left/Right	Approximately 10 degrees
Quarter Left/Right	Approximately 22 ½ degrees
Half Left/Right	Approximately 45 degrees
Three Quarter Left/Right	Approximately 67 ½degrees
Full Left/Right	Approximately 90 degrees

CONCLUSION

9. To achieve success in war it is very important that the target is understood and recognized by the troops. By using the methods of indicating the target the cadets can easily indicate and identify the target.

LESSON PLAN : FC & BC 5

OBSERVATION, CAMOUFLAGE ANDCONCEALMENT

INTRODUCTION

1. The term camouflage comes from the French Word, 'Camoufler' meaning to blind or veil. It means to disguise an object in plain sight in order to conceal it from something or someone. Camouflage is done to mislead the enemy about own location or strength. Concealment misinforms the enemy as to our intentions and troop strengths. Camouflage is more related to individual object/weapon (such as camouflage of tank) or small body of troops while concealment is at a bigger/higher level.

WHY THINGS ARE SEEN

2. Various factors responsible for things to be seen are as follows:-

(a) Shape
(b) Shine
(c) Shadow
(d) Surface
(e) Spacing
(f) Smoke
(g) Sound
(h) Movement

3. You have seen as to why things are visible during day or in clear moonlit night. Now let us see why things are visible at night. There are two factors which are given below:-

(a) Sound

(b) Light

PERSONAL CAMOUFLAGE

4. Camouflage means to disguise an object in plain sight in order to conceal it from something or someone.

5. We will now see how personal camouflage is done which includes camouflage of equipment worn or carried by a soldier.

(a) Use of Disruptive Pattern Clothing and Local Vegetation

(b) Camouflage of Face

(c) **Camouflage of Equipment**. Equipment can be camouflage firstly by making them with disruptive pattern clothing or by use of Hessian cloth, camouflage net, dull paints which match the local vegetation, use of garnish over shinning parts or by changing their shape.

CONCEALMENT

6. If the enemy can see you, he can hit you with his fire. So you must be concealed from enemy observation and have cover from enemy fire. When the terrain does not provide natural cover and concealment, you must prepare your cover and use natural and man-made materials to camouflage/ conceal yourself, your equipment, and your position.

TYPES OF COVER AND CORRECT USE OF COVER

7. There are two types of cover. They are:-

(a) Cover from view.

(b) Cover from fire.

8. **Cover from View.** A person is concealed only from view and not from fire. Example a person behind a bush or moving in tall grass

9. **Cover from Fire.** This means that the concealed person is protected both from view and fire of weapon. Example person moving in a nullah or on the other side of a high ground.

10. **Correct use of Cover**. Whenever possible look through or around the cover but not over it

11. **Avoid Breaking a Straight Line.** Skyline/light coloured background is the worst background as the object against it will be found out because of contrasting background and shape.

12. **Isolated Cover is Dangerous**. Eye catches isolated cover easily especially if there is any movement near it.

CONCLUSION

13. To conclude, the importance of camouflage and concealment can be realized from the following:-

(a) In earlier days it was said "If it can be seen, it can be hit, if it can be hit it can be killed".

(b) But now in the modern warfare "If it can be seen it will be killed".

(c) Therefore, camouflage needs greater emphasis and the art of camouflage and concealment reduces the soldiers into two main categories viz, "The good and the dead."

LESSON PLAN : FC & BC 6

FIELD SIGNALS

INTRODUCTION

1. Whenever someone wants to convey his message one has to raise his voice. In olden days smoke, sound of drum was the mode to convey messages from one village to another. In Army different methods are used to convey messages. Today, you will learn one of these methods called Field Signals.

SIGNALS WITH HAND & WEAPONS

Signals with Hand

Ser No	Name Of Signal	Signals with Hand
(a)	Deploy	Right arm fully extended above head and waved from side to side, palm open.
(b)	Advance	Right arm swung from rear to front in “under arm blowing” fashion.
(c)	Halt	Right arm raised to full extent above head.
(d)	Turn About	Right arm raised and bent above head.
(e)	Change Direction	Right arm raised to front in line with shoulder. Body then turned in required direction.
(f)	Close	Right hand place on top of head, elbow to the right.
(g)	Follow me	Right arm swung from rear to front above the shoulder in “over arm bowling” fashion.

Signals with Whistle

Ser No	Name Of Signal	Signals With Hand
(a)	Cautionary Blast	A short blast to draw attention to a signal or order about to be given.
(b)	The Alarm Blast	A succession of alternate long and short whistle blasts.
(c)	Enemy Aircraft	A succession of short blasts.
(d)	Enemy Aircraft departed	Two long blasts repeated at interval of five seconds.

FIELD SIGNALS AS MEANS OF GIVING ORDERS

2. Field signals are alternate means of giving orders and to control troops when voice control is not possible. Control over troops deployed can be done better by field signals than by voice control. There are various occasions when voice control is not possible. They are:-

(a) Battle noises.
(b) Need for silence.
(c) Intervening distances are too large.

Battle Noises

3. In war, due to firing and vehicle movement very high noise will be produced, so it may not be possible for a Commander to give voice message.

Need for Silence

4. There are certain operations which, by design are carried out in utmost silence, e.g.:-

(a) Ambush
(b) Patrolling
(c) Raid
(d) Cordon

Intervening Distances are Too Large

5. When Infantry takes the battle field they come across many obstacles in ground such as the ditch, rivers, mountains. Under such circumstances we will have the only choice left with us is field signals for communication.

OTHER METHODS OF INTER COMMUNICATION

6. Besides field signals there are various other means of communication in the Army which are as follows:-

(a) Radio
(b) Dispatch Rider
(c) Runners

FIELD SIGNALS BY DAY

7. Some of the visual signals used during the day are flags and mercury coated mirrors. Flags are very effectively used by Navy on board a ship.

(a) Flags: (Red, Green and White flags)
(b) Mercury coated mirrors
(c) Smoke
(d) Miscellaneous: Various signals can be improvised and pre-arranged as under:-
(i) Clothes superficially hung out to dry.
(ii) Hurricane lamp, kept in the window.
(iii) Flashing of torch is used as Morse Code.
(iv) Applying various colours/signs on forehead and arms.

FIELD SIGNALS BY NIGHT

8. Some of the field signals that can be used at night are:-

(a) Pre decided signals on a walkie talkie.

(b) Clicks by fingers or by tounge.

(c) Whistle by the mouth.

(d) Use of colour light.

(e) Use of blacked out torch.

(f) Firing of weapon.

Remember to use the simplest method that will achieve your aim.

CONCLUSION

8. The fighting efficiency of a unit/sub unit depends on good communication system which helps commanders at all levels to exercise command and control effectively. Field signals become a part of movement of a good section/platoon commander. Victory in battle will come to that section/platoon whose men are familiar in the use of field signals.

LESSON PLAN :FC & BC7

USE OF GROUND AND MOVEMENT

INTRODUCTION

1. The primary task of infantry is to close in with the enemy and destroy him. The aim of getting close is achieved by making skilful use of ground. Once we are forced to move in open, a part of our force will have to fire on enemy position and force him to keep his head down. This process of keeping one element on the ground to give covering fire, while the other element is on move, is called fire and movement.

FIRE & MOVE

2. Fire and move is the basic tactics of a pair or a group of soldiers while they are closing in with the enemy. While one person or party gives covering fire, the other move forward. Then they switch their role till the group closes in with the enemy. Fire and move is also known as the tactics of one leg on the ground, which may be used in following situations:-

(a) The enemy has opened Small Arm fire which is effective.

(b) When own troops have seen the enemy first.

(c) When the enemy is known or suspected to be in a certain area.

(d) To cross obstacles.

Basic Consideration for Fire & Movement

3. There are five basic considerations for fire and movement. These are as under:-

(a) No movement on exposed ground without covering fire.

(b) Control by the commander.

(c) The angle of covering fire from direct firing weapons should be as wide as possible without loss of control or time.

(d) Full use of available cover.

(e) Optimum use of all available weapons.

GROUND AND COVER

Ground Appreciation

4. Skilful use of ground can help achieve surprise & save lives. It is therefore required to develop an eye for ground. Ground should be considered from the enemies' point of view and it should be appreciated for the following:-

(a) Fire positions.
(b) Observation positions.
(c) Cover from fire.
(d) Cover from view.
(e) Obstacles.

Types of Cover

5. Cover from view is often not cover from fire, especially if the movement to cover has been seen by the enemy. Camouflage from enemy air and ground observation is the chief means of gaining surprise. Some of the main types of cover are:-

(a) Undulating ground.
(b) Sunken roads, beds of stream, sand and ditches.
(c) Hedges and bushes.
(d) Standing crops.
(e) Buildings and walls.

Undulating Ground

Sunken Road

Dead Ground

6. Ground which a soldier cannot see from his position is called dead ground. Troops under cover or in dead ground are safe from enemy observed fire but not from indirect fire. Dead ground is also safe from detection by battle field surveillance radars.

Common mistakes

7. The wrong use of ground may lead to casualties and loss of surprise; some common mistakes are:-

(a) Carelessness by troops while making a survey.
(b) Unnecessary movement.
(c) Using clear landmarks.
(d) Halting troops near mapped features which are always registered as targets by the enemy.
(e) Bad track discipline.
(f) Failure to guard against enemy air observation.

Fire Position

8. The ideal fire position should:-

(a) Provide cover from fire.
(b) Provide cover from view.
(c) Afford a good view of the ground.
(d) Provide room in which to use the weapon freely.
(e) Have a covered approach.
(f) Be easy to advance from.

The selection of fire positions requires knowledge both of the characteristics of weapons and of the use of ground.

CONCLUSION

9. For making any operation successful the intelligent and tactical use of ground is of paramount importance. By making the correct appreciation of ground and using the type of cover available a soldier can move close to the target undetected and complete its mission. Therefore, it is important for the cadets to have detailed knowledge of the ground and how effectively it can be utilised using basic tactics of fire and move.

LESSON PLAN :FC & BC 8

SECTION FORMATIONS

INTRODUCTION

1. Various formations are used when troops come in contact with the enemy and the type of formation adopted is entirely dependent on the following four basic factors:-

(a) Degree of control required to be exercised by the Section Cdr.

(b) Type of ground.

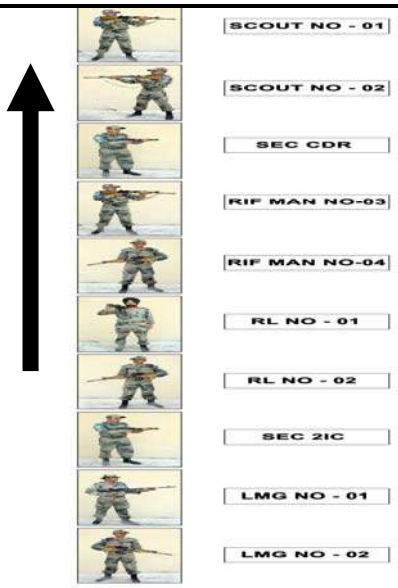
(c) Necessity of bringing down maximum fire with minimum delay.

(d) Task.

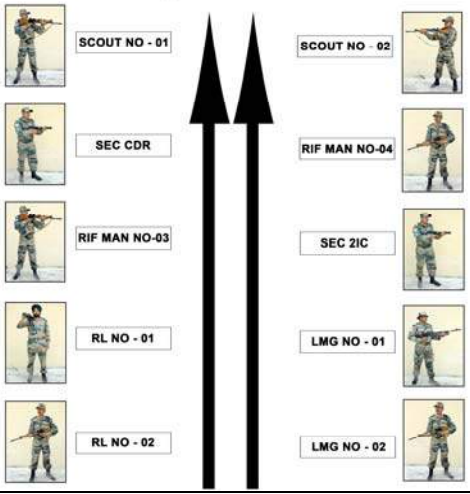
SECTION FORMATION

2. A Section is the smallest sub unit of an Infantry Battalion and is capable of undertaking independent task. It consists of ten persons who are organized in Rifle group and Support Group. Different types of formations adopted by a section are as under:

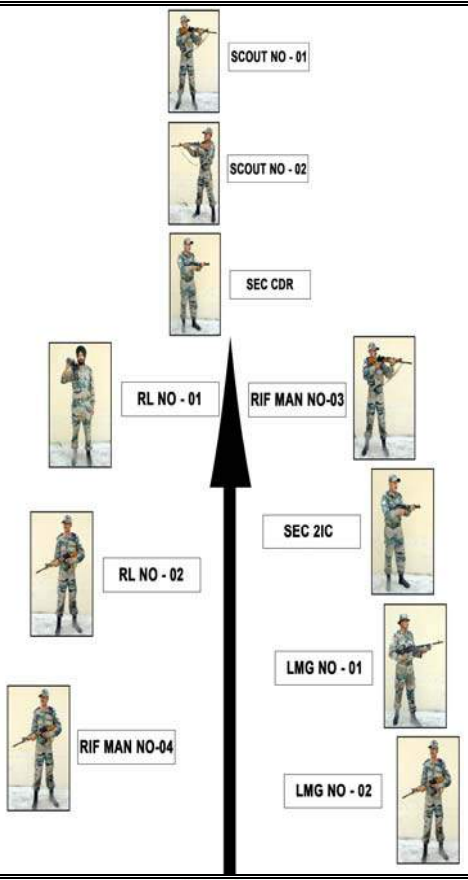
Single File Formation



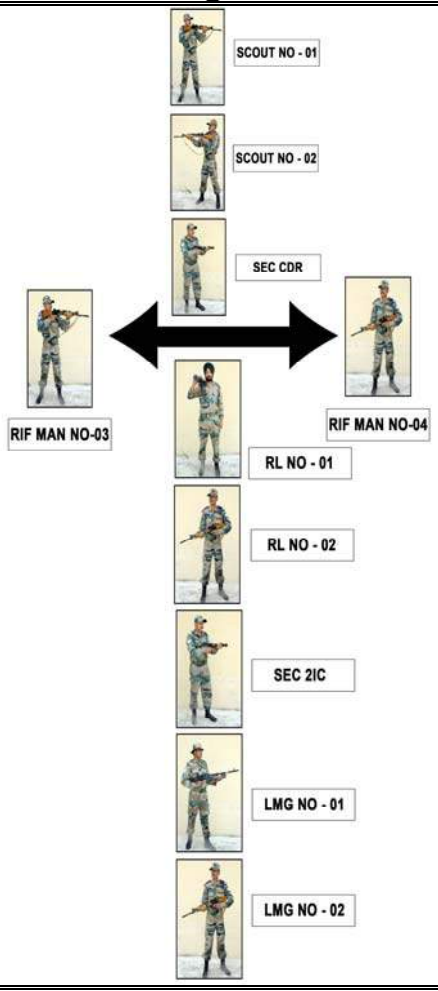
File Formation



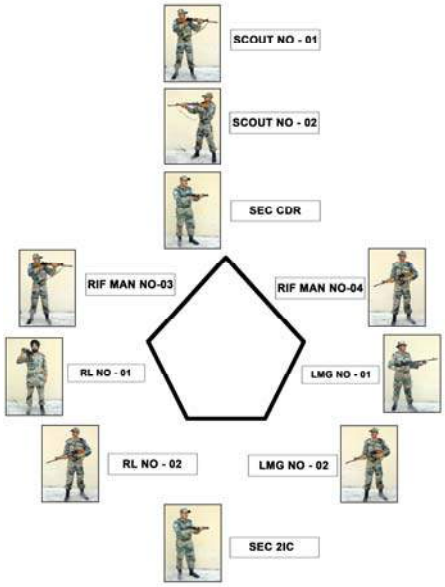
Arrow Head Formation



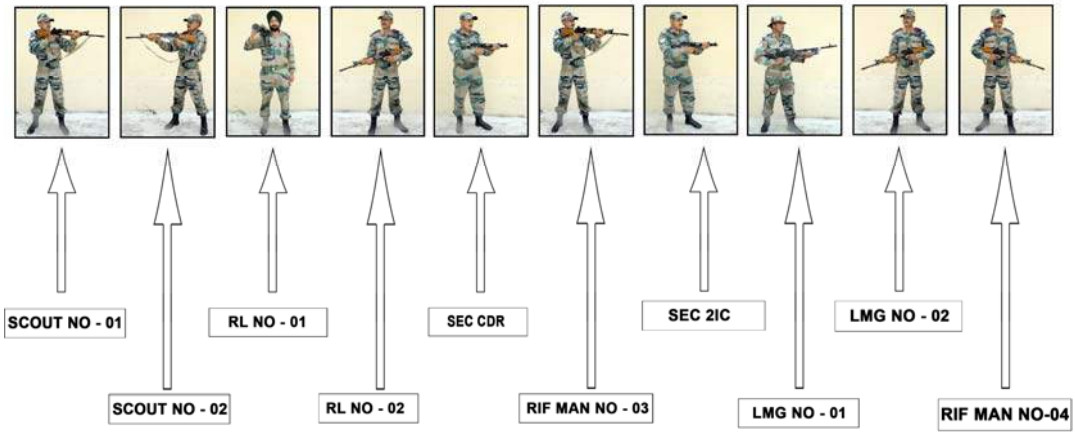
Spear Head Formation



Diamond Formation



Extended Line Formation



SCOUT

3. Now you have seen section formation, a word about the scouts. Scouts are the eyes and ears of the section. Scouts always work in pairs. They work ahead of the leading section and advance from bound to bound. As scouts, one must always be alert.

CONCLUSION

4. You have so far learnt the organisation of a section and the various formations adopted by a section in battle. Remember, a section is organised into the Rifle Group and Fire Support Group to facilitate fire and move, the basic of all tactics. As for the section formations, each formation has its peculiar advantages and disadvantages. Remember, need for command and control and the necessity of developing the maximum fire quickly, will determine the formation you as a section commander must adopt.

Summary

- Field Craft is an aspect of military training which relates to the conduct of a soldier in face of the enemy. It's an art of using the ground and the weapon available to the best of one's own advantages.

- Methods of Judging Distance
  - **Unit of Measure**
  - **Appearance Method**
  - **Section Average**
  - **Key Range**
  - **Halving**
  - **Bracketing**
- Types of Ground
  - **Broken Ground**
  - **Flat and Open Ground**
  - **High Ground**
  - **Dead Ground**

- **Landmarks**. An object, which is prominent on the ground and which is used in verbal orders to explain the ground in front.

- **Target**. It is an object having a tactical significance which is indicated with a view to bring down fire on it.

- **Reference Point**. A prominent and unmistakable object, with the help of which you can indicate other land marks or targets. A reference point should be specific.

- Things are seen due to
  - **Shape**
  - **Shine**
  - **Shadow**
  - **Spacing**
  - **Smoke**
  - **Sound**
  - **Movement**
- Camouflage measures include
  - **Use of disruptive pattern clothing and local vegetation.**
  - **Camouflage of Face.**
  - **Camouflage of Equipment.**
  - **Helmet.**
  - **Use of Hessian Cloth.**
  - **Use of Camouflage Net.**
  - **Camouflage of Packs.**
  - **Camouflage of LMG**
  - **Camouflage of Rifle.**

- There are two types of cover. They are :-

  - **Cover from Fire**. This implies that the concealed person is protected both from view and fire of weapon.

  - **Cover from View**. In this type of cover, a person is concealed
    Only from view or from being seen not from fire.

- Field Signals is one of the ways of passing of message with the help of Pre determined codes and signals.
  - **Signals with hand.**
  - **Signals with weapons.**
  - **Signals with whistle.**
- Field signals are alternate means of giving orders and control troops when voice control is not possible like.
  - **Battle noises.**
  - **Need for silence.**
  - **Intervening distances are too large.**
- The Field signals used during day are different form ones used at Night.
- Other Methods of Communication.
  - **Radio**
  - **Dispatch Rider**
  - **Runners**
- Basic Considerations for Fire and Movement
  - **No movement on exposed ground without covering fire.**
  - **Control by the commander.**
  - **The angle of covering fire from direct firing weapons should be as wide as possible w/o loss of control or time**
  - **Full use of available cover**
  - **Optimum use of all available weapons.**
- The ideal fire position should:-
  - **Provide cover from fire.**
  - **Provide cover from view.**
  - **Afford a good view of the ground to be watched or target to be engaged.**
  - **Provide room in which to use the weapon freely.**
  - **Have a covered approach.**
  - **Be easy to advance from.**
- The various section formations are :-
  - **Single file.**
  - **File.**
  - **Arrow Head.**
  - **Diamond.**
  - **Spear Head.**
  - **Extended Line**
- Knots: Ability to join two pieces of material/rope together. Important types of Knots are:-
  - **Thumb Knot.**
  - **Overhand Knot.**
  - **Figure Eight Knot.**
  - **Thief Knot**
- Lashing: The method employed to tie with ropes, poles, or any rope toa stationary object to securely hold it in place is known as lashing.
- **Square Lashing and Frapping Turns.**

Comprehension Questions

Q1. Answer the following in about 15 words:

(a) What are the methods of Judging distance?
(b) Name the different types of Ground.
(c) Write methods of indication of easy targets?
(d) Define camouflage.
(e) What are the two types of cover?
(f) Give out three methods of giving out field signals.
(g) What are the different methods of communication?
(h) Name the different types of Section Formation.
(j) Define Knots.
(k) Define Lashing.

Q.2. Answer the following in about 50 words:

(a) What is Key Range method of Judging distance?
(b) Explain the different types of Ground?
(c) What do you understand by Reference Point?
(d) Why are things seen?
(e) What are the field signals by Night?
(f) List the different types of Section Formations.
(g) What are the different kinds of knots to make a loop in Rope?

Q.3. Answer the following in about 100 words:

(a) Define Section Average method of Judging distance?
(b) What is the sequence of describing a Ground?
(c) What is the method for indicating difficult targets?
(d) Write various forms of personal camouflage.
(e) What do you mean by Square lashing?
(f) What is the need of Field Signals?
(g) Explain 3 Field Signals with the help of weapons.
(h) Compare Single file, File and Spear File Formations.
(j) What do you mean by crossover sheet bend?

Q.4. Answer the following in about 150 words:

(a) Define Appearance method of Judging distance?
(b) What is the method of indicating easy targets ?
(c) Explain 5 Field signals given out with the help of hands.
(d) What do you understand by Cover from View and Cover from Fire?
(e) Discuss guidelines for correct use to Cover.
(f) When do you use fire and movement tactics?
(g) Explain Diamond Formation.

Q.5. Answer the following in about 250 words:

(a) Define Unit of Measure method of Judging distance?
(b) What are the various factors responsible for things to be seen?
(c) Explain various field signals used by day and by night.
(d) Explain various section formations with an illustration.
(e) What do you mean by Knots and Lashing .Explain lashing in detail?

UNIT 4 : MILITARY HISTORY

INDEX

UNIT 4 : MILITARY HISTORY

Knowledge	Understanding	Application Skill	Evaluation
Biographies of Renowned Generals	The student will understand the life, history and leadership qualities of great Generals.	The student will be able to apply lessons learnt of past in future.	Activities, work sheets, assignments.
Indian Army war Heroes-PVCs	The student will know the accomplishments of leaders in various kinds of battle situations which led to great victories.	The student will be able to use these facts to get motivated and emulate them in future.	Activities, work sheets, assignments.
Study of Battles of Indo-Pak War1965, 1971 &Kargil	To make students understand how wars were fought and won by army.	The students will imbibe patriotism spirit and volunteer for armed forces.	Activities, work sheets and assignments, mock exercises.
War Movies	To make students understand how wars were fought and its intricacies.	The students will be motivated to join armed forces.	Multimedia Presentation, assignments.

LESSON PLAN : MH-1
BIOGRAPHIES OF RENOWNED GENERALS

INTRODUCTION

1. Military History is the study of the causes of war, the social and cultural effects, military doctrine of each side and the leadership, technology, logistics; strategy and tactics used by the two sides and how they have changed over the period of time.

PART I

History of the World is Largely a History of Warfare

2. Wars have been a very important part of our history. Most nations have come into existence either through or because of wars. Major battles have been the biggest causes for changes in the history

All Civilisations have Wars in their Culture

3. All civilizations have wars as part of their history. Internal/External wars have shaped the present of nearly all nations. The study of history, politics and culture would be impossible without the study of military history.

From War Arise Greatest Leaders in History

4. Maximum leaders in history have arisen from these conflicts / strives. To name a few – Abraham Lincoln of USA, Winston Churchill of Great Britain and Mrs. Indira Gandhi of India, are best remembered for their contribution in wars. The leadership these political leaders provided during times of war changed the destinies of their nations.

Study of Military History Affects the Future of Civilisations

5. The leaders we elect will determine if and how their countries will wage wars. These decisions will affect the future of civilizations. Military history fills in the gap where personal experience is sorely lacking. As warfare continues to influence our world today, we who study military history must continue to learn, the lessons demonstrated by wars in history.

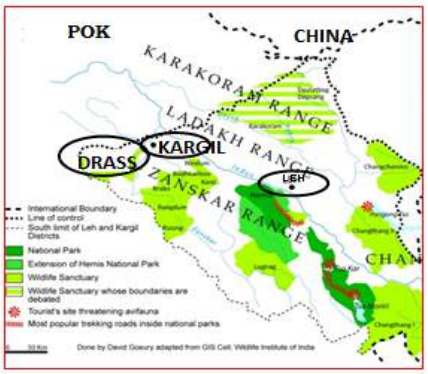
BIOGRAPHY OF FIELD MARSHAL KM CARIAPPA, OBE

6. Field Marshal Kodandera "Kipper" Madappa Cariappa, OBE (28 January 1899 – 15th May 1993) was the first Indian Chief of Army Staff of the Indian Army (Post independence)and led the Indian forces on the Western Front during the Indo-Pakistan War of 1947-48. He is among only two Indian Army officers to hold the highest rank of Field Marshal (the other being Field Marshal Sam Bahadur Manekshaw). His distinguished military career spanned almost three decades, at the highest point of which, he was appointed as the Commander-in-Chief of the Indian Army in 1949.

Early Life and Military Career

7. Cariappa was born at Shanivarsante in Kodagu (Coorg) which is currently in Karnataka. In 1919, he joined the first batch of KCIOs (King's Commissioned Indian Officers) at The Daly College at Indore and was commissioned into the Carnatic Infantry as a Temporary Second Lieutenant. In 1927, Cariappa was promoted to Captain. He saw active service in Mesopotamia (present-day Iraq) and was later posted to the 2nd Queen Victoria's Own Rajput Light Infantry, which became his permanent regiment.

10. Cariappa served in Iraq, Syria and Iran from 1941–1942 and then in Burma in 1943-1944. He was the first Indian Officer to be given command of a unit in 1942. After command, he volunteered to serve in 26 Division engaged in clearing the Japanese from Burma, where he was decorated with an “Officer of the Order of the British Empire.” In 1946, he was promoted as the Brigadier of the Frontier Brigade Group. Post-Independence, Cariappa was appointed as the Deputy Chief of the General Staff with the rank of Major General. On promotion as Lieutenant General, he became the Eastern Army Commander.

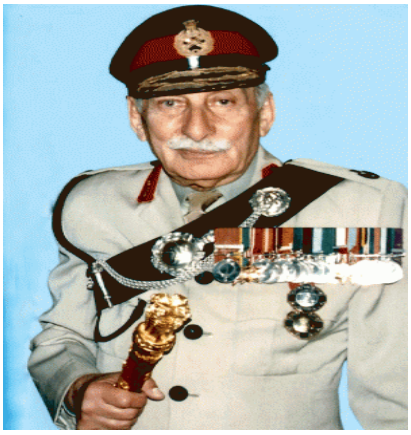


11. On outbreak of war with Pakistan in 1947, he was moved as General Officer Commanding-in-Chief, Western Command and directed operations for the recapture of Zojila, Drass and Kargil and re-established a linkup with Leh. In all this, he showed tremendous energy in moving troops, against considerable odds and finally ensuring success. On 15 January 1 949 Cariappa was appointed as the first Indian Commander-in-Chief of the Indian Army. Cariappa was then instrumental in turning an Imperial Army into a National Army.

Higher Commands and Offices

12. After his retirement from Indian Army in 1953, he served as the high commissioner to Australia and New Zealand till 1956. He was conferred with 'order of the chief commander of the legion of merit' by US President, Harry S. Truman. As a token of gratitude of the nation for the exemplary service rendered by him, the Government Of India conferred Cariappa with the rank of Field Marshal on 14th January 1986 at the age of 87.

BIOGRAPHY OF FIELD MARSHAL SAM MANEKSHAW, MC



13. Field Marshal Sam Hormusji Framji Jamshedji Manekshaw, MC (3 April 1914 – 27 June 2008), popularly known as Sam Bahadur ("Sam the Brave"), was an Indian military leader. He was the first Indian Army officer to be promoted to the five-star rank of Field Marshal.

14. Though Manekshaw initially thought of pursuing his career as a doctor, he later joined the first batch at IMA when it was established in 1932. His distinguished military career spanned four decades and five wars, beginning with service in the British Indian Army in World War II, where he was awarded the Military Cross for gallantry.

15. Manekshaw rose to become the 8th Chief of Army Staff of the Indian Army in 1969 and under his command, Indian forces conducted victorious campaign against Pakistan in the Indo-Pakistani War of 1971 that led to the liberation of Bangladesh in December 1971. Later, he was awarded the Padma Bhushan and the Padma Vibhushan for his services to the Indian nation.

Early Life and Education

16. Manekshaw was born to Parsi parents on 3 April 1914 in Amritsar. Hormusji Manekshaw, a doctor, and his wife Hilla, who moved to Punjab from the city of Valsad on the coastal Gujarat. Sam's father served in the British Indian Army as a Captain in the medical services and also participated in World War I. Hormusji and Hilla had six children of which Sam was the fifth one. After completing his schooling in Punjab and Sherwood College, Neonatal, he asked his father to send him to London to become a doctor. But his father refused to send him to London stating that he was not old enough.

The cadets of the first course of the Indian Military Academy (IMA) with Muhammad Musa (number 2) who was the General of the Pakistan Army during the 1965 war.

16. In an act of rebellion against his father's refusal, Manekshaw took the entrance examination for enrollment into the Indian Military Academy and was one of the fifteen cadets to be selected through open competition. He stood sixth in the order of merit.

Military Career

17. Manekshaw's military career spanned four decades, from the British era and World War II, to the three wars against Pakistan and China after India's independence in 1947. Manekshaw went on to become the 8th chief of the army staff, led the Indian Army successfully in a war with Pakistan and became India's first field marshal after independence. On commissioning, as per the practices of that time, Manekshaw was first attached to the 2nd Battalion, The Royal Scots, a British battalion, and was later posted to the 3rd Battalion, 5th

Gorkha Rifles, which he commanded.

World War II

18. During World War II, the then-Captain Manekshaw saw action in Burma in the 1942 campaign on the Sittang River and had the rare distinction of being honoured for his bravery on the battlefield. During the fighting around Pagoda Hill, he led his company in a counter-attack against the invading Japanese Army and despite suffering 50% casualties the company managed to achieve its objective. After capturing the hill, Manekshaw was hit by a burst of Light Machine Gun fire and was severely wounded in the stomach. Observing the battle, Major General David Cowan, the then commander of

the 17th Infantry Division, spotted Manekshaw holding on to life and, having witnessed his valour in the face of stiff resistance, rushed over to him. Fearing that Manekshaw would die, the general pinned his own Military Cross ribbon to Manekshaw saying, "A dead person cannot be awarded a Military Cross." The official recommendation for the MC states that the success of the attack was largely due to the excellent leadership and bearing of Captain Manekshaw.

Chief of the Army Staff

19. Then Chief of the Army Staff (COAS) General P P Kumaramangalam was due to retire in June 1969. Manekshaw was
appointed as the 8th Chief of the Army Staff on 8 June 1969. As the Chief of the Army Staff, he developed the Indian Army into an efficient instrument of war. During his tenure as COAS, he was instrumental in stopping the implementation of reservations for scheduled castes and scheduled tribes in the army.

Indo Pakistan War of 1971

20. In Apr 1971, Smt Indira Gandhi, the Prime Minister of India, during a cabinet meeting asked Manekshaw if he was prepared to go to war. Manekshaw replied that neither were his forces prepared nor were adequate trains available for movement of troops due to movement of food grains and also in two months time monsoon would start in East, thereby causing heavy flooding. Accepting his advice the PM allowed him to prepare for the war and decide the date for it.

21. Under Manekshaw's direction the Indian Army trained the Mukti Bahini (Group of Local freedom fighter). These forces were used to harass the Pakistani army stationed in East Pakistan.

22. The war started on 03 Dec 1971, when Pakistan aircraft bombed Indian Air force bases on the Indian Pakistan border in the west. Next day the Indian Army launched its offensive in East Pakistan leading to the surrender of 93,000 Pakistani troops and creation of the new nation of Bangladesh. The instrument of surrender was signed by Lt Gen Niazi of Pakistan Army and Lt Gen JS Arora, Eastern Army Commander.

The Instrument of Surrender being signed on 16 December 1971

Promotion to Field Marshal

22. After the end of the war, Indira Gandhi decided to promote Manekshaw to the rank of Field Marshal. Though Manekshaw was to retire in June 1972, his term was extended by a period of six months. On 3 December 1973, Manekshaw was conferred with the rank of Field Marshal at a ceremony held at Rashtrapati Bhavan.

CONCLUSION

23. Today the Indian Military is the third largest in the world. As India is planning to emerge as a regional super power, it is mandatory for its civilian and military leaders to learn from military history to be ready to meet future challenges. Therefore, it is important for all cadets to study the biographies of Field Marshal Cariappa and Field Marshal Sam Manekshaw.

LESSON PLAN : MH-2

INDIAN ARMY WAR HEROES PVC

INTRODUCTION

1. Our Army has been involved in five major wars with our neighbouring countries. We have fought four wars with Pakistan and one with China. Apart from above mentioned wars, the army has also been an active participant in United Nations peacekeeping missions. The Indian Army has shown thorough professionalism, dedication and devotion while participating in all these wars and operations. And for the same many gallantry awards have been awarded to Indian Army for displaying courage, bravery and selfless dedication beyond the call of duty.

PARAM VIR CHAKRA AND WAR HEROES DECORATED WITH PVCs

ParamVir Chakra

2. The **Param Vir Chakra (PVC)** is India's highest Military decoration awarded for highest degree of valour or self-sacrifice in the presence of enemy. The medal has been awarded 21 times 14 of which were posthumous (after death) awards. Literally meaning "Wheels (or cross) of the ultimate brave'' it is similar to Medal of Honor in the United States and the Victoria Cross in the United Kingdom. The PVC was established on 26 January 1950 by the President of India, with effect from 15 August 1947. It can be awarded to Officers or enlisted personnel from all branches of the Indian military. It is the highest gallantry award of the Government of India.

Recipients of the Param Vir Chakras.

3.

Major Somnath Sharma (Posthumous), 4 KUMAON (1947)

Lance Naik Karam Singh, 1 SIKH (1948)

2nd Lt Rama Raghoba Rane, BOMBAY ENGINEER (1948)

Naik Jadunath Singh (Posthumous), 1 RAJPUT (1948)

CHM Piru Singh (Posthumous), 6 RAJ RIF (1948)

Capt Gurbachan Singh Salaria (Posthumous), 3/1 GR (1961)

Major Dhan Singh Thapa, 1/8 GR (1962)

Subedar Joginder Singh (Posthumous), 1 SIKH (1962)

Major Shaitan Singh (Posthumous) 13 KUMAON (1962)

CQMH Abdul Hamid (Posthumous), 4GRENADIERS (1965)

Lt Col AB Tarapore (Posthumous), 17 HORSE (1965)

Lance Naik Albert Ekka (Posthumous) 14 GUARDS (1971)

Grenadier Yogender Singh Yadav, 18 GRENADIERS (1999)

Rifleman Sanjay Kumar, 13 JAK RIF (1999)

Capt Vikram Batra (Posthumous), 13 JAK RIF (1999)

Flying Officer
Nirmal Jit Sing Sekhon
18 Squadron, Indian Air Force
(1971)

2nd Lt Arun Khetrapal
(Posthumous) 17 HORSE
(1971)

Major Hoshiar Singh,
3 GRENADIERS (1971)

Naib Subedar Bana Singh,
8 JAK LI (1987)

Major R Parameswaran
(Posthumous), 8 MAHAR
(1987)

Lt Manoj Kumar Pandey
(Posthumous), 1/11 GR
(1999)

HEROICS OF MAJOR SOMNATH SHARMA, PVC

MajorSomnath Sharma, PVC	
	
Born	January 31,1923Dadh, Kangra, Himachal Pradesh
Died	November 3, 1947 (aged 24) KIA at Badgam, India
Allegiance	British Indian Empire Republic of India
Service/branch	British Indian Army Indian Army
Years of service	1942-1947
Rank	Major
Unit	4 KUMAON
Battles/wars	World War II Indo-Pakistani War of 1947
Awards	ParamVir Chakra

4. Major Somnath Sharma, PVC (1923–1947) was the first recipient of the Param Vir Chakra the highest Indian gallantry award. He was awarded the medal posthumously for his bravery in the Kashmir operations in November 1947. He died while evicting Pakistani infiltrators and raiders from Srinagar Airport during the Indo-Pak war of 1947-48 in Kashmir. He belonged to the 4th Kumaon Regiment.

Early life

5. Major Somnath Sharma was born on 31 January 1923 in a Brahmin family at Dadh, Kangra, then in the Punjab Province of British India, present day state of Himachal Pradesh. He came from a well-known military family, his father, Major General Amar Nath Sharma, was also a military officer (retired as Director, Medical Services (Army)) as were his brothers Lt. General Surindar Nath Sharma (retired as Engineer-in-chief) and General Vishwa Nath Sharma (retired as Chief of Army Staff, 1988–1990), and his sister Major Kamla Tewari (Medical Doctor). He did his schooling at Sherwood College, Nainital, before enrolling at the Prince of Wales Royal Military College in Dehra Dun and later joined the Royal Military College,

Sandhurst. He was commissioned into the 8th Battalion, 19th Hyderabad Regiment (later 4th Battalion, Kumaon Regiment) of the Indian Army (then British Indian Army) on 22 February 1942. He also saw combat during the second World War in the Arakan Operations. Incidentally, he is the eldest brother of the son-in-law (Lt. Gen. Surindra Nath Sharma, P.V.S.M, A.V.S.M) of Savitri Khanolkar, who designed the medal.

Battle of Badgam

6. Somnath's company was airlifted to Srinagar on 31 October 1947. His left hand was in a plaster cast as a result of injuries sustained in the hockey field previously but he insisted on being with his company in combat and was given permission to go. On 3 November 1947, Major Somnath Sharma's company (D Company of 4 Kumaon) was ordered to go to Badgam Village in the Kashmir Valley. A tribal "Lashkar" of 700 raiders approached Badgam from the direction of Gulmarg. The company was soon surrounded by the enemy from three sides and sustained heavy casualties from the ensuing mortar bombardment. Somnath realized the importance of holding onto his position as both the city of Srinagar and the airport would be vulnerable if it were lost. Under heavy fire and outnumbered seven to one, he urged his company to fight bravely, often exposing himself to danger as he ran from post to post.

7. When heavy casualties adversely affected the firing power of his company, Major Sharma, with his left hand in plaster, took upon himself the task of filling the magazines and issuing them to men, operating light machine guns. While he was busy fighting the enemy, a mortar shell exploded on the ammunition near him. His last message to Brigade HQ received a few moments before he was killed was: "The enemies are only 50 yards from us. We are heavily outnumbered. We are under devastating fire. I shall not withdraw an inch but will fight to our last man and our last round."

8. By the time the relief company of 1st Battalion Kumaon Regiment reached Badgam, the position had been overrun. However, the 200 casualties suffered by the raiders made them lose their impetus to advance buying time for Indian troops to fly in to Srinagar airfield and block all routes of ingress to Srinagar. In this manner, Somnath Sharma prevented the fall of Srinagar and arguably the Kashmir Valley to Pakistan.

2ND LT ARUN KHETARPAL,PVC

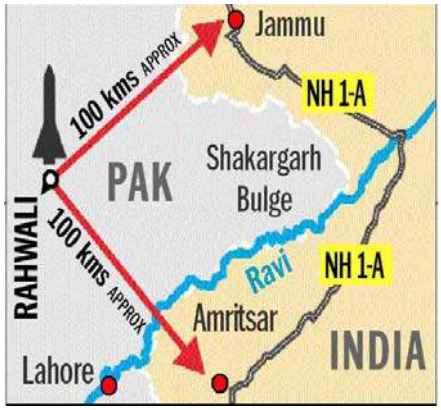
2nd Lt Arun Khetarpal, PVC	
	
Born	14 October 1950 Pune, Bombay State, India
Died	16 December 1971(aged 21) Barapind Shakargarh Sector
Allegiance	Republic of India
Service/branch	Indian Army

Years of service	1971 (6 months)
Rank	 Second Lieutenant
Unit	 17 POONA HORSE
Battles/wars	Indo-Pakistan War of 1971 Battle of Basantar
Awards	Param Vir Chakra

9. Second Lieutenant Arun Khetarpal, PVC (14 October 1950 – 16 December 1971) born in Pune, Maharashtra, was an officer of the Indian Army and a posthumous recipient of the Param Vir Chakra, India's highest military decoration for valour in face of the enemy. He died in the Battle of Basantar during the Indo-Pakistan War of 1971 where his actions earned him his honour.

Early life

10. Arun Khetarpal was born in Pune, Maharashtra on 14 October 1950. His father Lt Col (later Brigadier) M. L. Khetarpal was a Corps of Engineers officer serving in the Indian Army and his family traced a long history of military service. Attending The Lawrence School, Sanawar, he distinguished himself both as an able student and sportsman and was the school prefect. Khetarpal joined the National Defence Academy in June 1967. He subsequently went on to join the Indian Military Academy. In June 1971, Khetarpal was commissioned into the 17 Poona Horse (Armoured Regiment).



1971 War, Battle of Basantar

11. During the Indo-Pakistan War of 1971, the 17 Poona Horse was assigned to the command of the 47th Infantry Brigade of the Indian Army. Through the duration of the conflict, the 47th Brigade saw action in the Shakargarh sector in the Battle of Basantar. Among the tasks set for the 47th Brigade was to establish a bridgehead across the River Basantar. By 2100hr of 15 December, the brigade had captured its objectives. However, the place was extensively mined, which prevented the deployment of the tanks of the Poona horse, and the engineers clearing the mines were halfway through their tasks when Indian troops at the bridge-head reported alarming activity of the enemy armour, asking for immediate armour support. It was at this critical juncture that the 17 Poona Horse decided to push through the mine-field. The regiment was able to establish a link-up between the armour and the infantry at the bridge-head by first light the next day.

12. At 0800hr on 16 December, Pakistani armour launched the first of their counter-attacks under the cover of a smokescreen at the pivot of the 17th Poona Horse at Jarpal. At 0800 hours on 16 December, Pakistani 13th Lancers equipped with the then state-of-the-art US-made 50 ton Patton tanks launched the first of their counter-attacks under the cover of a smokescreen at ‘B’ Squadron, The Poona Horse, at Jarpal. Its squadron commander urgently called for reinforcements. Arun Khetarpal, who was in ‘A’ squadron and was stationed close by with his Centurion tank troop, responded with alacrity, as did the rest of his

regiment. The first counterattack was decimated by accurate gunnery, coolness by Indian tank troop and individual tank commanders from the iconic CO, Lt Col Hanut Singh, MVC downwards to its troop leader, Arun Khetarpal. 13th Lancers desperately launched two more squadron level counterattacks and managed to achieve a breakthrough.

13. Khetarpal rushed to meet the Pakistani armour and launched right into the Pakistani attack. With his troop he was able to run over the enemy advance with his tanks. However, the commander of the second tank was killed in this attack. Alone in charge, Khetarpal continued his attack on the enemy strong holds, The enemy fought very bravely and did not retreat even after losses. Disappointed by his failure so far, he desperately attacked the incoming Pakistani troops and tanks gunning down a Pakistani tank in the process. However Pakistani forces regrouped and counterattacked. In the ensuing tank battle, Lt. Arun Khetarpal with his 2 remaining tanks fought off and gunned down 10 tanks before he was killed in action.

14. Second Lieutenant Arun Khetarpal was dead but he had, by his intrepid valour saved the day; the enemy was denied the breakthrough he was so desperately seeking. Not one enemy tank got through. Second Lieutenant Arun Khetarpal had shown the best qualities of leadership, tenacity of purpose and the will to close in with the enemy. This was an act of courage and self-sacrifice far beyond the call of duty.

CAPTAIN VIKRAM BATRA, PVC

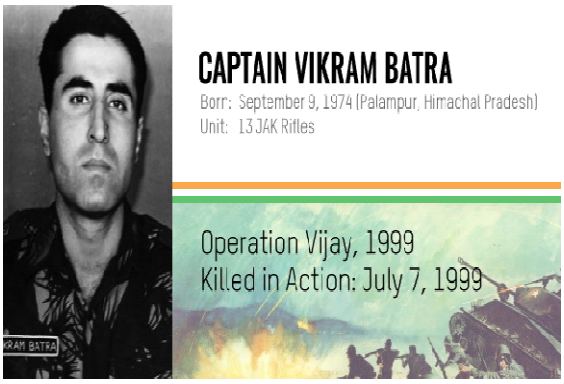
15. Captain Vikram Batra, PVC (9 September 1974 – 7 July 1999) was an officer of the Indian Army, posthumously awarded with the Param Vir Chakra, India's highest and prestigious award for valour, for his actions during the 1999 Kargil War in Kashmir between India and Pakistan. He led one of the toughest operations in mountain warfare in Indian history. He was often called as ''Sher Shah'' in the intercepted messages of the Pakistan army.

Early Life and Career

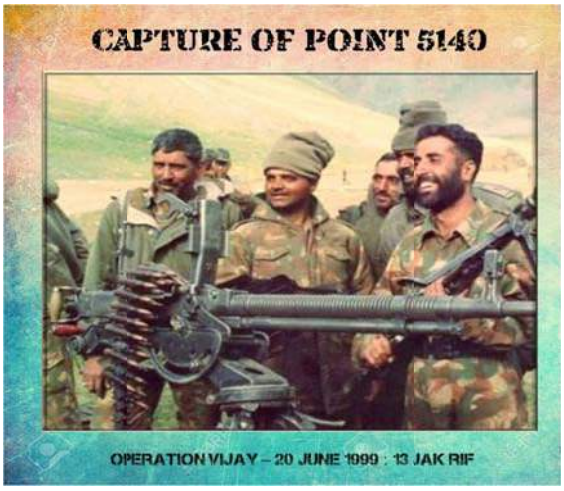
16. Vikram Batra was born on 9 September 1974 in Ghuggar village near Palampur, Himachal Pradesh, to G.L. Batra and Jai Kamal Batra. He got his primary education from his mother, who herself was a teacher. He received his education up to Middle Standard at the D.A.V. Public School in Palampur and up to senior secondary stage in Central School, Palampur. After passing his 10+2 in 1992 from Central School

Palampur, he got admitted in D.A.V. College, Chandigarh in B.Sc where he was adjudged the best N.C.C. Cadet (Air Wing) in two zones. Later, he was selected to join the Indian Military Academy in Dehradun in 1996 in Jessore company of Manekshaw Battalion, and was commissioned in the Indian Army as a Lieutenant of the 13 Jammu & Kashmir Rifles at Sopore, in Jammu and Kashmir. He rose to the rank of Captain.

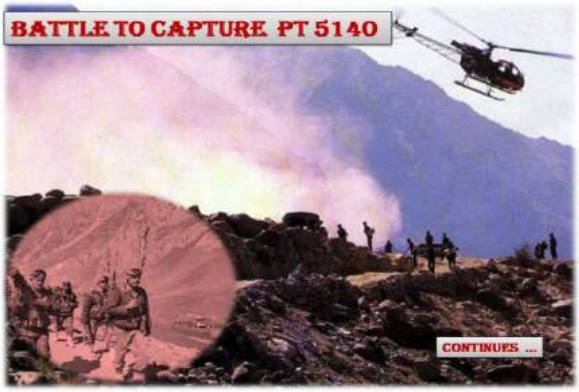
Kargil War



17. During the Kargil invasion of 1999 by Pakistan, Lt. Batra (at time), 13 JAK Rifles, and his Delta Company were ordered to recapture peak 5140 on June 19, 1999 five weeks after the war began. Nicknamed *Sher Shah* ('Lion King') in Urdu for his courage which also doubled as his call sign,[1] he decided to approach the hill from the rear, aiming to surprise the Pakistani defenders. He and his men ascended the sheer rock-cliff, but as the group neared the top, the enemy pinned them on the face of the bare cliff with machine gun fire. Captain Batra, along with five of his men, climbed up regardless and after reaching the top, hurled two grenades at the machine gun post. He single-handedly killed three enemy soldiers in close combat. He was seriously injured in the process, but insisted on regrouping his men to continue with the mission. Inspired by the courage displayed by Captain Batra, the soldiers of 13 JAK Rifles charged the enemy position and captured Point 5140 at 3:30 a.m. on 20 June 1999. His company is credited with killing at least eight Pakistani intruders and recovering a heavy machine gun.



18. The capture of Point 5140 set in motion a string of successes, such as Point 5100, Point 4700, Junction Peak and Three Pimples. Along with fellow Captain Anuj Nayyar, Batra led his men to victory with the recapture of Point 4750 and Point 4875. This led to the fall of Tiger Hill and India's eventual hold on the valley was strengthened.



19. Nine days later, Vikram Batra was assigned to an urgent mission to recapture peak 4875. This was one of the most difficult peaks to capture as the Pakistani troops sat above the peak at 16,000 feet and the climb gradient was 80 degrees. The fog made matters worse for Batra and his team. In the early morning hours of 7 July 1999, he commanded a mission to rescue an injured officer during a Pakistani counterattack against Point 4875. During the rescue attempt, he pushed aside his Subedar, saying ***"Tubaal-bacchedarhai, hat japeeche****."(You have children, step aside)* and was killed in action while clearing enemy positions. His last words were, "*Jai Mata Di.*", which is a Punjabi creed referring to Durga devi, the Hindu Goddess of Victory.

CONCLUSION

20. Soldiers face the dangers and vagaries of war and sacrifice their lives for their motherland. The Indian Nation also honours its bravest of the brave soldiers by conferring on them the highest gallantry award "Param Vir Chakra" as recognition of their bravery and sacrifice.

LESSON PLAN : MH-3

STUDY OF BATTLES OF INDO-PAK WAR 1965, 1971 & KARGIL

INTRODUCTION

1. The partition of the subcontinent came into effect on 15 August 1947, when India gained independence. Pakistan declared independence a day earlier. At the time of independence the old Indian Army stood divided between Pakistan and India. Instead of large scale celebrations, riots and mass killing between Hindus and Muslims in Punjab and Bengal intensified. It also led to acute suffering and misery of the displaced people, apart from colossal loss of precious human lives and destruction of property due to communal riots and retribution.

2. Taking advantage of communal strife, in Oct1947 Pakistani troops soon crossed over into Kashmir to precipitate nun declared war with India. The tribal 'volunteers' along with Pakistani regular shad by then over run large tracts of Jammu province and the Valley, which shared a porous border with Pakistan. It was when they had reached Badgaon, on the suburbs of Srinagar that the Maharaja of J&K signed the Instrument of Accession and put in a bid for India's military assistance. Indian Army then swung into action to save J&K.

3. Despite the accession of the state, a part of Kashmir, known as Pakistan Occupied Kashmir, remains under the illegal occupation of Pakistan, and this has remained a contentious issue between both nations. Since1947-1948 war India and Pakistan have fought the following wars:-

(a) 1965 War.
(b) 1971 War.
(c) 1999 Kargil War.
(d) Proxy war in J & K state since 1988 till date.

INDO-PAKISTANI WAR OF 1965

4. The Indo-Pakistan war of 1965 was a culmination of skirmishes that took place between April 1965 and September 1965 between Pakistan and India. The conflict began following Pakistan's Operation Gibraltar, which was designed to infiltrate forces into Jammu and Kashmir to participate in insurgency against Indian rule.

Indo-Pakistani War of 1965

Strength

India	Pakistan
700,000 Infantry	260,000 Infantry
700+ aircraft	280 aircraft
720 Tanks	756 Tanks
• 186 Centurions	• 352 Pattons
• 346 Shermans	• 308 Shermans
• 90 AMX	• 96 Chaffees
• 90 PT-76	552 Artillery
628 Artillery	• 72x105mm How
• 66x 3.7"How	• 234X25pdr
• 450x 25pdr	• 126x155mm How
• 96x 5.5"	• 48x8" How
• 16x 7.2"	• 72x3.7" How
	• POK Lt Btys

Casualties and losses

India	Pakistan
Neutral claims	Neutral claims
• 3,000 men	• 3,800 men
• 150[7]–190 tanks	• 200-300 Tanks
• 60–75 aircraft	• 20 aircraf
• 540 km² (210mi²) of territory lost (primarily in Rann of Kutch)	• Over 1,840 km² (710 mi²) of territory lost (primarily in Sialkot, Lahore, and Kashmir sectors)
Indian claims	Pakistani claims
• 35-59 aircraft lost	• 19 aircraft lost
In addition, Indian sources claim that there were 13 IAF aircraft lost in accidents, and 3 Indian civilian aircraft shot down.	
• 322 km² territory lost	

5. In retaliation, India reacted swiftly and launched a counter attack and a second confrontation with Pakistan took place in 1965, largely over Kashmir. Pakistani President Ayub Khan launched Operation Gibraltarin August1965, during which several Pakistani para military troops infiltrated into Indian-

administered Kashmir and attempted to ignite an anti-India agitation in Jammu and Kashmir. Pakistani leaders believed that India, which was still recovering from the disastrous Sino-Indian War, would be unable to deal with a military thrust and a Kashmiri rebellion. Pakistan launched Operation Grand Slam on 1 September, invading India's Chamb- Jaurian sector.

Offensive on Pakistan

6. Initially, the Indian Army met with considerable resistance in the northern sector. After launching prolonged artillery barrages against Pakistan, India was able to capture three important mountain positions in Kashmir. By 9 September, the Indian Army had made considerable in-roads into Pakistan. India had its largest haul of Pakistani tanks when the offensive of Pakistan's 1st Armoured Division was blunted at the Battle of Asal Uttar, which took place on10 September near Khemkaran in Punjab. Another tank battle of the war came in the form of the Battle of Chawinda, the largest tank battle in history after World War II. Pakistan's defeat at the Battle of Asal Uttar and Dograi hastened the end of the conflict.

Battle of Dograi

7. To relieve pressure at Chamb – Jaurian Sector in J&K,15 Infantry Division launched offensive in Lahore sector.3 JAT of 54 Infantry Brigade crossed Ichogil canal and captured the town ship of Dograi and was just 13 miles from Lahore on 23 September 1965. On 23 September 1965 ceasefire was announced. A decision to return back to pre-war positions was taken following the Tashkent Declaration.

Destroyed or abandoned Pakistani Patton and Sherman tanks on display near Khem Karan. About 97 Pakistani tanks were either destroyed or captured by India during the Battle of Asal Uttar.

Tanks of 18th Cavalry (Indian Army) on the move during the 1965 Indo-Pak War.

Lt. Col. Hari Singh of the India's 18th Cavalry posing outside a captured Pakistani police station (Barkee) in Lahore District.

INDO-PAKISTANI WAR OF 1971

8. An independence movement broke out in East Pakistan which was brutally crushed by Pakistani forces. Due to large-scale atrocities against them, thousands of Bengalis took refuge in neighboring India causing a major refugee crisis there. Inearly1971, India declared its full-support for the Bengali rebels, known as Mukti Bahini, and Indian agents were extensively involved in covert operations to aid them. Wary of India's growing involvement in the Bengali rebellion, the Pakistan Air Force (PAF) launched a preemptive strike on 10 Indian air basesat Srinagar, Jammu, Pathankot, Amritsar, Agra, Adampur, Jodhpur, Jaisalmer, Uttarlai and Sirsa at 1745 hours on 3 December.

9. This aerial offensive, however, failed to accomplish its stated objectives and gave India its excuse to declare a full-scale war against Pakistan the same day. By midnight, the Indian Army, accompanied by Indian Air Force, launched a major three-

pronged assault into East Pakistan. The Indian Army won several battles on the eastern front including the decisive of Battle of Hilly, which was the only front where the Pakistani Army was able to build up

considerable resistance. India's massive early gains was largely attributed to the speed and flexibility with which Indian armoured divisions moved across East Pakistan.

Battle of Longewala

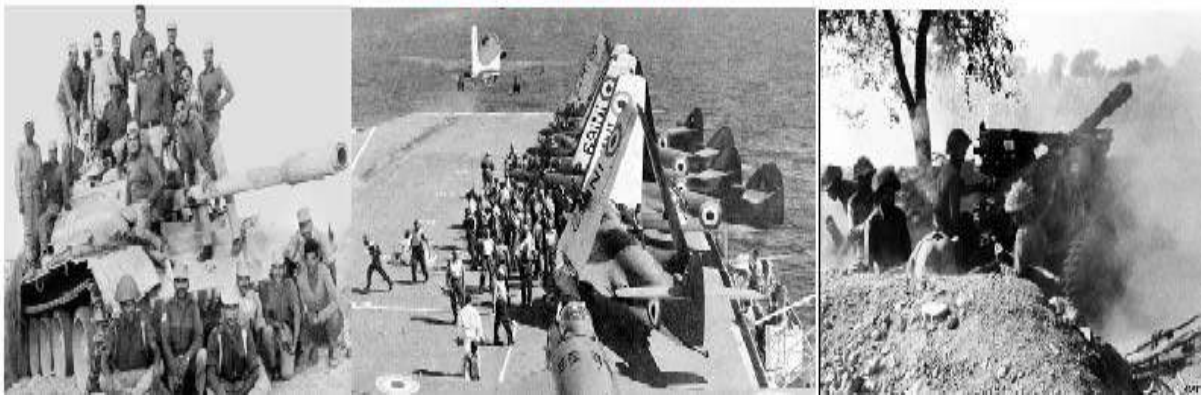
10. Pakistan launched a counter-attack against India on the western front. On 4 December 1971, the A company of the 23rd Battalion of India's Punjab Regiment detected and intercepted the movement of the 51st Infantry Brigade of the Pakistani Army near Ramgarh, Rajasthan. The battle of Longewala ensured during which the A company, though being out numbered, thwarted the Pakistani advance until the Indian Air Force directed its fighters to engage the Pakistani tanks. By the time the battle had ended, 38 Pakistani tanks and 100 armoured vehicles were either destroyed or abandoned.

11. About 200 Pakistani troops were killed in action during the battle while only 2 Indian soldiers lost their lives. Pakistan suffered another major defeat on the western front during the Battle of Basantar which was fought from 4 December to 16 December. By the end of the battle, about 66 Pakistani tanks were destroyed and 40 more were captured. In return, Pakistani forces were able to destroy only 11 Indian tanks. By 16 December, Pakistan had lost sizeable territory on both eastern and western fronts.

Surrender of Pakistan Army in Dhaka

12. Under the command of Lt. General J. S. Arora, the three corps of the Indian Army, which had invaded East Pakistan, entered Dhakaand forced Pakistani forces to surrender on 16 Dec 1971, one day after the Battle of Basantar. After Pakistan's Lt General A.A.K.Niazi signed the Instrument of Surrender, India took more than 90,000 Pakistani prisoners of war.

Indo-Pakistani War of 1971



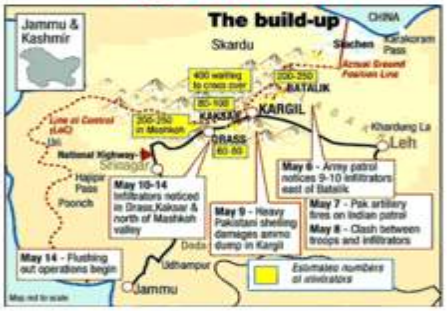
Indo-Pak War Of 1971

PART III – KARGILCONFLICT-1999

13. In 1998, India carried out nuclear tests and a few days later, Pakistan responded by more nuclear tests giving both countries nuclear deterrence capability, although India had exploded three hydrogen bombs which Pakistan lacks. Diplomatic tension ceased after the Lahore Summit was held in 1999. The sense of optimism was short-lived, however, sincemid-1999 Pakistani paramilitary forces and Kashmiri insurgents captured deserted, but strategic, Himalayan heights in the Kargil district of India. These had been vacated by the Indian army during the onset of the in hospitable winter and were supposed to reoccupy in spring. Once the scale of the Pakistani incursion was realised, the Indian Army quickly mobilized about 200,000 troops and Operation **Vijay** was launched.

14. However, since the heights were under Pakistani control, India was in a clear strategic disadvantage. From their observation posts, the Pakistani forces had a clear line-of-sight to bring down indirect artillery fire on NH 1A, inflicting heavy casualties on the Indians. Thus, the Indian Army's first priority was to recapture peaks that were in the immediate vicinity of NH 1A. This resulted in Indian troops first targeting the Tiger Hill and Tololing complex in Dras.

Kargil War - 1999



The town of Kargil is strategically located.

Kargil War	
Part of the Indo-Pakistani Wars	
 Location of the conflict	
Date	May–July 1999
Location	Kargil district, Jammu and Kashmir
Result	India regains possession of Kargil
Territorial changes	None

Belligerents	
India	Pakistan
Commanders and leaders	
Ved Prakash Malik	Pervez Musharraf
Strength	
30,000	5,000
Casualties and losses	
Indian official figures • 527 killed • 1,363 wounded • 1 POW • 1 fighter jet shot down • 1 fighter jet crashed • 1 helicopter shot down **Pakistani claims** • 1,600	**Pakistani official figures** • 357–453 killed • 665+ wounded • 8 POWs **Other Pakistani claims** • 1,000 to 4,000 killed **Indian claims** • 700+ killed

View Of Tololing

15. The Battle of Tololing, was one of the pivotal battles in the kargil war between Indian Armed forces and troops from Northern Light Infantry who were aided by other Pakistan irregulars in 1999. The Tololing is a dominate feature over looking Srinagar-Leh (NH-1D) and was vital link. The terrain was such that frontal attacks had to be launched which resulted in heavy causalities. The three week assault finally culminated with India taking control of the peak and changing the course of the war. 23 Indian soldiers were killed in the final assault, resulting in one of the costliest battle of the entire war. Other assaults, slowly tilted the combat in India's favour. Nevertheless, some of the posts put up stiff resistance, including Tiger Hill (Point5140) that fell only later in the war.

16. The Indian Army mounted some direct frontal ground assaults which were slow and took a heavy toll given the steep ascent that had to be made on peaks as high as 18,000 feet (5,500m). Two months into the conflict, Indian troops had slowly retaken most of the ridges they had lost; according to official count, an estimated 75%–80% of the intruded area and nearly all high ground was back under Indian control. On 4 July 1999, Pakistan's Prime Minister Sharif agreed to with draw Pakistani troops under US pressure and the fighting came to a gradual halt, but some Pakistani forces remained in positions on the Indian side of the LOC.

17. The Indian Army launched its final attacks in the last week of July; as soon as the Drass sub sector had been cleared of Pakistani forces, the fighting ceased on 26 July. 26 July has since been marked as 'Kargil Vijay Diwas' (Kargil Victory Day) in India. By the end of the war, India had resumed control of all territory south and least of the Line of Control, as was established in July 1972 as per the Shimla Accord.

Kargil conflict 26th July 1999

Memorial of Operation Vijay

The main entrance of Kargil War Memorial by the Indian Army at Dras, India

Kargil War Memorial, Patna

CONCLUSION

18. Wars with Pakistan has been a regular affair in the long history of both countries. This is a compulsive and existential necessity for the Pakistani State controlled by their military. The sacrifices made by the Indian Army to safeguard the sovereignty and integrity of the nation are great, for which the whole nation is proud of its achievements.

LESSON PLAN : MH-4

WAR MOVIES

INTRODUCTION

1. Battles are fought in the wilderness and away from limelight. However ferocious and destructive they may be. Historians have always tried to piece together those little but significant actions by individuals and groups bringing out their valour and courage for the consumption of future generations. Here we will see three visual documentaries on Indo – Pak wars of 1965, 1971 and 1999 to gain further insight on the subject.

DOCUMENTARY ON INDO – PAK WAR 1965

2. Screening of documentary on Indo – Pak war 1965.

DOCUMENTARY ON INDO – PAK WAR 1971

3. Screening of documentary on Indo – Pak war 1971.

DOCUMENTARY ON KARGIL CONFLICT 1999

4. Screening of documentary on Indo – Pak Kargil Conflict, 1999.

CONCLUSION

5. The study of the Indo-Pak War brings out the sacrifices made by the Armed Forces of India. It is heartening to see the role of Armed Forces in maintaining the sovereignty and integrity of our nation. One must salute the war heroes and all those who have laid down their lives for the motherland.

Summary

- **Field Marshal KM Cariappa, OBE was** the first native Indian **Chief of Army Staff of the Indian Army**. He is among only two Indian Army officers to hold the highest rank of Field Marshal. He was appointed as the Commander-in-Chief of the Indian Military in 1949, received the rank of Field Marshal On 14th January 1986 at the age of 87.

- **The Param Vir Chakra (PVC)**is India's highest military decoration award for highest degree of valour or self-sacrifice in the presence of enemy. The PVC was established on 26 January 1950 by the President of India. The medal was designed by Mrs Savitri Khanolkar.

- **Major Somnath Sharma, PVC** was the first recipient of the Param Vir Chakra the highest Indian gallantry award. He was awarded the medal posthumously for his bravery in the Kashmir operations in November 1947. He died while evicting Pakistani infiltrators and raiders from Srinagar Airport during the Indo-Pak war of 1947-48 in Kashmir. He belonged to the 4th Kumaon Regiment.

- **Second Lieutenant Arun Khetarpal, PVC** born in Pune, Maharashtra, was an officer of the Indian Army and a posthumous recipient of the Param Vir Chakra. He died in the Battle of Basantar during the Indo-Pakistan War of 1971 where his actions earned him his honour.

- **Captain Vikram Batra, PVC** was posthumously awarded with the Param Vir Chakra for his actions during the 1999 Kargil Conflict. He led one of the toughest operations in mountain warfare in Indian history.

India has fought four wars with Pakistan so far, 1947-48 War, 1965 War, 1971 War, Kargil Conflict

- **War of 1965**
  - Pakistan launched Operation Gibraltar to support insurgency in J&K against Indian rule.
  - In retaliation India launched Operation Grand Slam in western sector against Pakistan.
  - The famous battles of 1965 war include Battle of Asal-Uttar, Battle of Dograi etc.
  - Battle of Chawinda was the largest tank battle in the history after World War II.
- **War of 1971**
  - In early 1971, India declared its full-support for the Bengali rebels, known as Mukti Bahini.
  - Battle of Longewala was fought on 4 December 1971.
  - On16 December 1971, more than 90000 Pakistani soldiers surrendered at Dhaka.

- **Kargil Conflict– 1999** was fought on the heights of Kargil and Dras in 1999. In mid-1999 Pakistani paramilitary forces and Kashmiri insurgents captured deserted, but strategic, Himalayan heights in the Kargil district of India. Indian forces painstakingly recaptured all posts one after another in a bloody conflict. Operation Vijay was declared success on 26 July1999.

Comprehension Questions

Q1. Answer the following in about 50 words:

(a) Write a short note on Param Vir Chakra.

(b) Write a note on Maj Somnath Sharma, PVC.

(c) Write a note on Battle of Longewala.

(d) Write a note on Battle of Dograi.

(e) Write short note on the surrender of Pakistan Army in Dhaka.

Q2. Answer the following in about 75 words:

(a) Write a short note on 2 Lieutenant Arun Khetarpal, PVC.

(b) Write short note on Recipients of the Param Vir Chakras.

(c) What is the importance of studying military history?

Q3. Answer the following in about 150 words:

(a) Discuss in detail about Indo – Pakistan War 1965.

(b) Discuss in detail about Indo – Pakistan War 1971.

(c) Discuss in detail about the Operation Vijay.

(d) Write a brief note on Captain Vikram Batra, PVC.

Q4. Answer the following in about 250 words:

(a) Give the biography of Field Marshal KM Cariappa, OBE.

(b) Give the biography of Field Marshal Sam Manekshaw, MC.

UNIT 5: COMMUNICATION
INDEX

UNIT 5 : COMMUNICATION

Knowledge	Understanding	Application Skills	Evaluation
Types of Communications	The cadet will understand the various types of communication available to them and their use in different circumstances.	The cadet will be able to effectively and economically utilize the resources of communication available to them.	Activities, work sheets, assignments.
Characteristics of Wireless	The cadet will understand the characteristics of Wi-Fi system and their functioning in day to day life.	The cadet will be able to use these as and when required without compromising the security.	Activities and assignments.
Characteristics of Walkie /Talkie	To understand the basic functioning of Radio sets.	To learn and apply basic knowledge of Radio sets and Radio Telephony.	Activities.
Basic Radio Telephony Procedure	To understand the basics of Radio Telephony and how to communicate using RT procedures.	To learn and apply knowledge of Radio Telephony during activities.	Activities, exercises, work sheets, outdoor exercises.
Latest Trends and Developments (Multimedia, video conferencing, IT)	To understand the basic knowledge in recent trends and developments in Communication.	To learn and apply knowledge of Multimedia, video conferencing, IT etc. in day to day functioning.	Activities, exercises, work sheets, outdoor exercises.

LESSON PLAN: C-1

TYPES OF COMMUNICATION

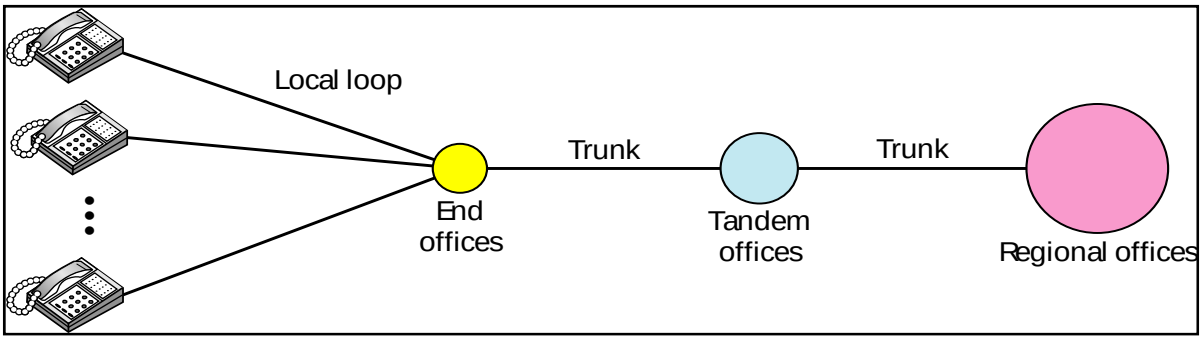
INTRODUCTION

1. Communication means the passage of orders or instructions from one person to another person through voice, in writing, using radio waves or digital means. In modern waves communication between various commanders and troops is very important for a ensuring correct actions by our forces

LINE COMMUNICATION

Line (Wire/Cable) Communication

2. The invention of telephone by Graham Bell revolutionized the world of communications as individuals were able to speak directly to each other. This is the basic means of signal communications for a force which is static. A telephone is by far the best means of signal communication between individual officers, and telegraph circuit is the best means of clearing messages.



3. **Advantages**.

(a) Reliable and practically free from electrical interference.

(b) Relatively secure.

(c) Number of circuits and message carrying capacity is more but limited only by availability of material and manpower.

4. **Disadvantages**.

(a) Vulnerable to physical interference and enemy interception along the entire length of the route

(b) Takes time to construct.

(c) Inflexible once it is laid.

(d) Expensive in men and material.

RADIO COMMUNICATION

Radio Communication

5. We all would have heard radio especially FM radio. The songs we hear on our radios travel from the Radio stations located for away from us using radio waves. These are electromagnetic waves which change due to the sound energy and when they reach a receiver (radio) they convert back into original from i.e. sound.

6. Using the same technology we in the armed forces also have radio communication wherein we donot use them to hear to our favourite programmes but use them to pass important messages / orders. We have radio sets which convert our voice (sound) into radio waves and transmit them into space and only our radio sets with matching setting receive those waves and convert them back to human voice. This way we can transit our orders / messages to multiple users over long distances.

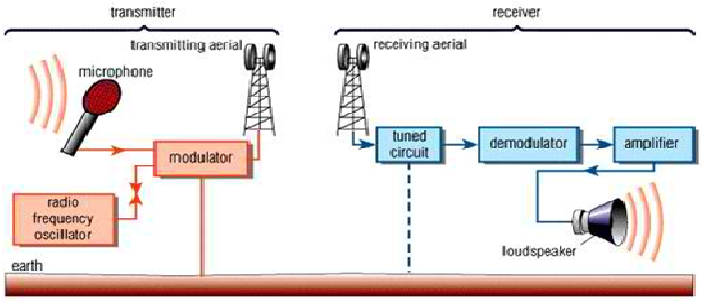
7. **Wave.** A wave can be described as a disturbance that travels through a medium from one location to another location. Types of waves are :-

(a) **Mechanical Waves**. A mechanical wave is a wave that is an oscillation of matter, and therefore transfers energy through a medium.

(b) **Electromagnetic Waves.** Electromagnetic waves are waves which can travel through the vacuum of outer space.

Net Radio

8. Radio set is the basic means of signal communication for any mobile force. Efficiency of radio communication is affected by factors such as weather, terrain, power output of the set, state of training of operators and equipment maintenance. It provides facilities for the following:-



(a) Radio Telephony – Voice communications.

(b) Radio telegraphy for transmission of messages.

9. **Advantages**.

(a) Vulnerable only at terminal and is therefore reasonably protected from enemy action except by a direct hit.

(b) Flexible as it involves no laying & wires/cables. Any radio set can speak to any troops/commander by putting his frequency.

(c) Fast in establishing communication.

(d) Works on the move although range will be less than when stationary.

10. **Disadvantages**.

(a) Basically insecure and easy for to enemy interception. Thus use of codes/ciphers is required.

(b) Since it is insecure it demands considerable degree of security consciousness on the part of the users.

Radio Relay

11. Radio relay implies that a series of radio transmitters and receivers normally spaced between 20-35 Kms apart and are used to provide signal communication for longer distances.

12. **Advantages**.

(a) Replace line with considerable economy of manpower and stores.

(b) It can be used where for reasons of ground or enemy use of line may not be possible.

(c) Provides greater flexibility than line.

(d) Quick to set up and move except in mountainous country.

13. **Disadvantages**.

(a) Liable to interception and hence insecure. Has relatively greater security than net radio.

(b) Liable to interference from enemy jamming although not as much as in the case of net radio.

(c) Terrain between stations must permit line of sight.

(d) It cannot work on the move.

(e) Slightly more expensive in men and material than in the case of net radio.

CONCLUSION

14. Communication has made a remarkable impact in our life and changed it many folds. Both the line and the radio communication have provided us with several advantages to both during times of war and peace.

LESSON PLAN : C-2

CHARACTERISTICS OF WIRELESS TECHNOLOGY (MOBILE, WI-FI ETC.)

INTRODUCTION

1. The development on Wi-Fi technology began in 1997 when the Institute of Electrical and Electronic Engineers (IEEE) introduced the 802.11 technologies that carried higher capacities of data across.

2. Wi-Fi provides its users with the liberty of connecting to the internet from any place such as their home, office or a public place without hassles of plugging in the wires. Wi-Fi use radio network to transmit data between its nodes. Such networks are made up of cells that provide coverage across the network. The more the number of cells, greater and stronger is the coverage on the radio network.

FEATURES OF Wi-Fi TECHNOLOGY

Features of Wi-Fi

3. Wireless operations permit services, such as a long-range communications, that are impossible or impractical to implement with the use of wires. Information is transferred in this manner over both short and long distances.

4. The following list summarizes some of the benefits of a Wi-Fi network:

(a) **Extended Access**. The absence of wires and cables extends access to places where wires and cables cannot go or where it is too expensive for them to go.

(b) **Cost Reduction**. As mentioned above, the absence of wires and cables brings down cost.

(c) **Mobility**. Wires tie you down to one location. Going wireless means you have the freedom to change your location without losing your connection.

(d) **Flexibility**. Extended access, cost reductions, and mobility create opportunities for new applications or solutions.

TERMINAL EQUIPMENT AND LIMITATIONS OF WI-FI

Mobile Telephones

5. One of the best-known examples of wireless technology is the mobile phone, also known as a cellular phone, with more than 4.77 billion mobile cellular subscriptions worldwide as of 2017. These wireless phones use radio waves from signal-transmission towers to enable their users to make phone calls from many locations worldwide.

6. Wi-Fi technology is not perfect and has many flaws that limit its use as follows:

(a) **Security**. Because wireless transmissions can pass through walls, security is an issue.

(b) **Wireless Reception**. Varies from area to area, even within your own house. It's not always guaranteed that you'll have a connection to the Internet.

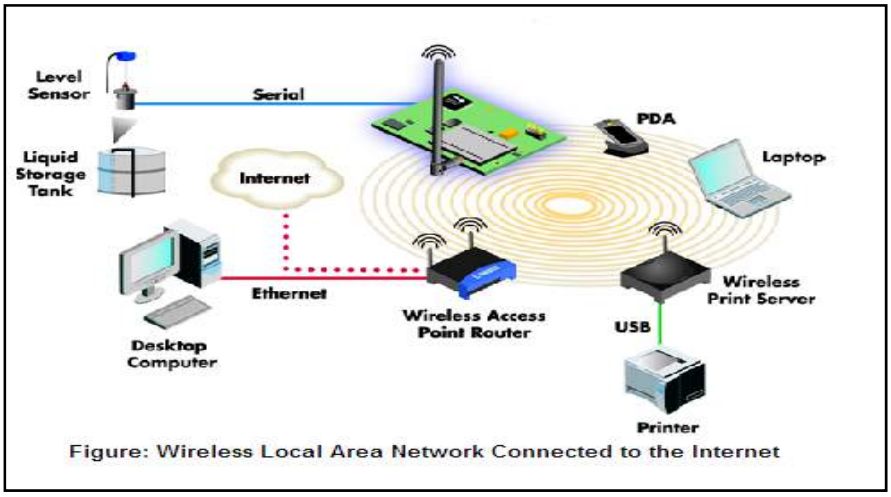


Figure: Wireless Local Area Network Connected to the Internet

(c) **Interference**. Call quality is greatly influenced by the environment, is particularly sensitive to electromagnetic radiation generated by other household appliances.

(d) **Compatibility Issue**. Despite the global standardization, many devices from different manufacturers are not fully compatible, which in turn affects the speed of communication

CONCLUSION

7. The environment is flooded with various Wi-Fi software tools. Each of these tools is specifically designed for different types of networks, operating systems and usage type. Through the Wi-Fi hotspot, the users can even enhance their home business, as accessing information through Wi-Fi is simple.

LESSON PLAN : C-3

CHARACTERISTICS OF WALKIE /TALKIE

INTRODUCTION

1. A walkie/talkie is a hand-held, portable, two-way radio transceiver. Its development during the Second World War is credited to the engineering team at Motorola. Hand-held transceivers may be used to communicate between each other, or to vehicle-mounted or base station.

2. **Radio set GP338 Motorola:** Defence organisations use hand held radios for a variety of purposes. Radio Set Gp338 Motorola can communicate on a variety of bands and modulation schemes.

FACILITIES/ FEATURES

3. **Facilities**.

   (a) It is portable and light in weight.

   (b) Can be operated easily.

   (c) It can be operated in VHF/UHF and 2 way simplex mode.

   (d) 128 channel of this radio set can be preset into 8 zone.

   (e) Option of selective call facilities available.

   (f) Call alert can be given to receivers station.

4. **Weight**.Weight with Ni MH high capacity battery-420gm.

5. **Communication Range**. Communication range of this radio set is 4 to 5Km sand 20 to 40 Kms with repeater.

6. **Power Supply**. Power supply can be provided to this radio set by the high capacity 7.2 volt batteries.

7. **Battery Charging Time**. 1 hour for high capacity 7.2 volt batteries.

HANDLING OF WALKIE/TALKIE

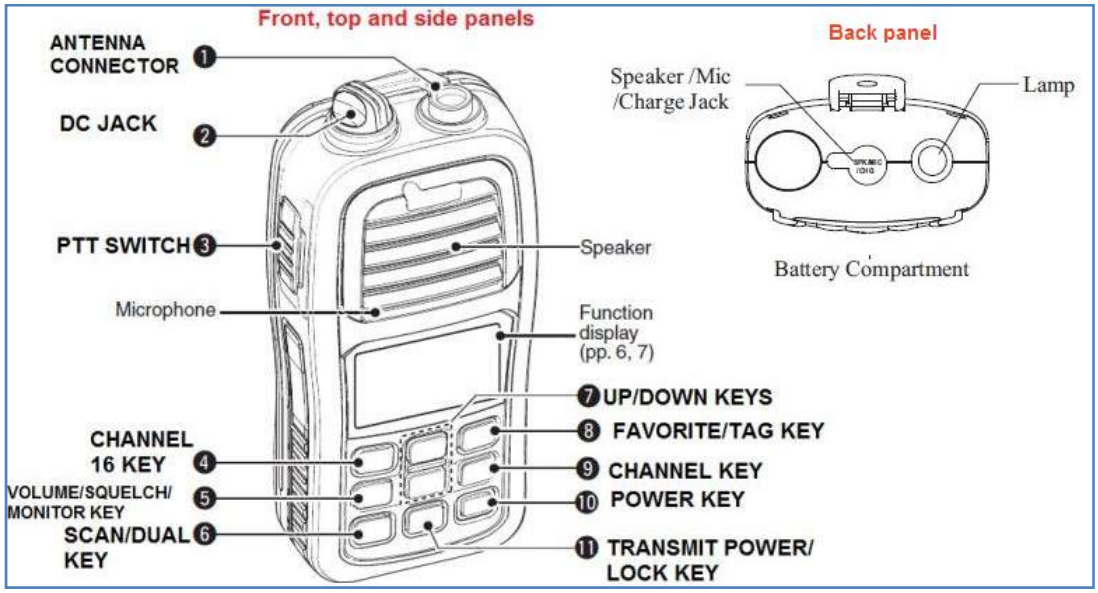
8. **Model (Shape)**.This radio set has been divided in to four portions.

(a) Top Panel.

(b) Side Panel.

(c) Front Panel.

(d) Back Panel.



9. **Top Panel**. Contains On/Off Volume Knob, Channel Selector Knob, Top Button and Antenna

10. **Side Button**. Name and functions of the large control on side panel is Press to Talk Switch and Right Side Accessory Mount.

11. **Front Panel**. There are a total of six buttons i.e. Exit Key, Up Key, and Menu Select Key. Front Panel Key Pad. This is an alpha numeric keypad. There are10 keys on this pad from 0 to 9. One keys tar and one extract key. LCD Display. This is a14-character LCD display window and14 types of indicators are displayed.

12. **Back Panel**. The battery is fixed on this back panel of radio.

CONCLUSION

13. Walkie-Talkies were created for armed forces to operate in field areas and also for internal security during peace time. However, seeing their effectiveness, utilization, user friendly features, walkie-talkies have been spread to public and private sectors for public safety and also for commercial and jobsite work. Therefore, it is very important for cadets to understand the essential features, functioning and importance of this technology.

LESSON PLAN : C-4

BASIC RADIO TELEPHONY (RT) PROCEDURE

INTRODUCTION

1. The procedure laid out to communicate on the Radio so as to make the conversation secure and successful, which is referred to as “Radio Telephony”. This procedure is very important to avoid utter confusion over radio and is generally used by defence forces, air traffic controllers, maritime operators and amateur radio operators. Various advantages/disadvantages of RT procedure and radio communications are as under:-

(a) **Advantages**.

(i) Easy to establish

(ii) Flexible.

(iii) Transmissions to more than one station.

(b) **Disadvantages**.

(i) Easier to intercept.

(ii) Liable to atmospheric interference and interference from other stations.

(iii) Liable to be jammed.

(iv) Skilled operators required.

2. **Need for Standard Procedure**. Standard procedure in RT needed to attain speed, uniformity, security and prevents misunderstanding & confusion by use of code words etc, which hide identity of an operator and that of a unit.

3. **Principles of Radio Telephony Procedure**. BASS defines the Principles of RT procedure.

(a) B – Brevity

(b) A – Accuracy

(c) S – Security

(d) S - Speed

DEFINITIONS

4. **Radio Net**. Stations working on same frequency in order to communicate with each other comprise a Radio Net.

5. **Control Station**. Station serving as the senior HQ in the Radio Net. It is responsible for establishment of communications and maintains radio discipline on the net.

6. **Link Sign**. It is secret group of letters or combination of letters and figures, allotted to a station on radio net, for concealing the identity of the communicating station. Link signs are changed daily or even earlier if required.

7. **Code Sign**. It is three-letter group allotted to HQ/formation or unit to conceal their identity. These are changed daily.

8. **Phonetic Alphabet**. Alpha, Bravo, Charlie…

9. **Code Word**. A code word is a single word used to provide security cover for reference to a classified matter.

RT PROCEDURE

10. **Standard Phrases**. Standard phrases used in RT procedure are as under:-

(a) **Over**. My transmission has ended and I expect to hear a further transmission from you on this subject. Other stations will not transmit. Equal to a comma in English, which means only a pause in conversation from your end.

(b) **Out**. My transmission has ended and I do not expect you to make a further transmission on the subject. Other stations may transmit. Means the end of conversation equal to a full stop.

(c) **Roger**. Message received and understood.

(d) **Wilco**. Message received, understood and will be complied with.

11. **Types of Calls** Calls can be categorised as under:-

(a) **Single Call**. A call when only one station on a net is addressed by anyone station of the net.

(b) **Multiple Call**. A call when two or more but no tall stations on the net are addressed. The pro word “and” will be inserted between the last two call signs e.g. A1 for A2 and A3'.

(c) **Net Call**. A call used to address all stations on a net e.g. “All stations Alpha”.

12. **Establishment of Communication**. Initial instructions are issued by the control (Higher HQ) regarding the net, generally not on radio. When all stations are in position or based on orders all stations will switch on their radio sets and establish communication with each other and also check the voice quality which is called signal strength. This is known as establishment of communication/net and is always followed under following situations :-

(a) After change of frequency.

(b) Bad weather.

(c) After move.

(d) After lifting of radio silence.

(e) After change of link sign.

13. **Documentation**. Documentation forms a very important aspect of RT procedure. All events need to be documented for future reference in case of a query.

14. **Rules on Security**. Security over radio is an important issue in defence forces hence there is a need to adopt these procedures and follow certain golden rules.

(a) Think before you speak.

(b) Use correct procedure.

(c) Use official codes only.

(d) Substitute clear names by code signs.

(e) Be brief.

PRACTICE

15. The cadets will be given adequate practice on RT procedure.

CONCLUSION

16. Proper Radio Telephony procedure is essential to establish communication both during war and peace time. There are certain advantages and disadvantages of RT procedure. The messages can be intercepted by enemy and the complete information can be retrieved especially during field conditions. Considering the same one must follow all the rules of security while communicating.

LESSON PLAN: C-5

LATEST TRENDS AND DEVELOPMENT INCOMMUNICATION

INTRODUCTION

1. Control of the battle has always been the concern of the commanders down the ages and whoever can have better control over his own forces will win the war. When the armies were small and the distances relatively small, messengers on foot or on horseback were used. However as the battlefields stretched out and the size of armies increased, such means could no longer used. Necessity being the mother of invention, such changes in the battlefield drove the evolution and adoption of modern technologies. The field of communication has seen rapid growth during the last century. Various forms of communication media have been discovered.

PART I - MODEM, FAX & TELEX

MODEM (Modular-Demodulator)

2. This device is used to convert computer generated output (Digital signals) that can be transmitted on a telephone line. Modems are required at both the sending and receiving computers.

FAX

3. This is common short form of FACSIMILE which is one of the memory type electronic mail and message systems with the following advantages:-

(a) Can transmit graphics as well as alphanumeric information (letters and numbers).

(b) Reduce time and eliminates transmission error.

(c) Use any transmission medium eg. Telephone, line, micro radio wave.

TELEX

4. This is the abbreviated form of TELEPRINTER EXCHANGE. As cable is used in this type of communication devices to connect two such instruments it restricts its range of operation.

(a) **Advantage**.

(i) Re-generative repeaters in a network can increase range; however voice signal cannot be re-generated.

(ii) Can be used over a telephone network.

(iii) Can receive messages when unattended.

(iv) Message is recorded in a printer form.

(b) **Disadvantages**.

(i) The Equipment is costlier than a telephone set.

(ii) Key in error due to the need for a human operator to send-receive message.

(iii) Lack of privacy since any one can read the printed output.

PART II – SATELLITE

5. An object which revolves around another larger object whose motion is primarily and permanently determined by the force of attraction of the body is known as satellites. Before the space age, planets and moons were the only known satellites. On 4th October 1957 the first man made satellite called the SPUTNIK was launched by the erstwhile USSR. Since then more complex and versatile satellites have brought about a revolution in the field of communications. India launched its first Satellite **Aryabhatta** on 19th April 1975 from Kapustin Yar with the help of Soviet Union.

6. **Types of Satellite**.

(a) Weather Satellite.

(b) Scientific Satellite.

(c) Communication Satellite.

(d) Navigational Satellite

(e) Military Satellite.

PART III – FIBRE OPTICAL COMMUNICATION COMPUTER SYSTEM

7. Hollow tubes made of corning glass with an outer protective coating of rubber/plastic etc. are what constitute optical fibers. These fibers are very delicate and small in diameter.

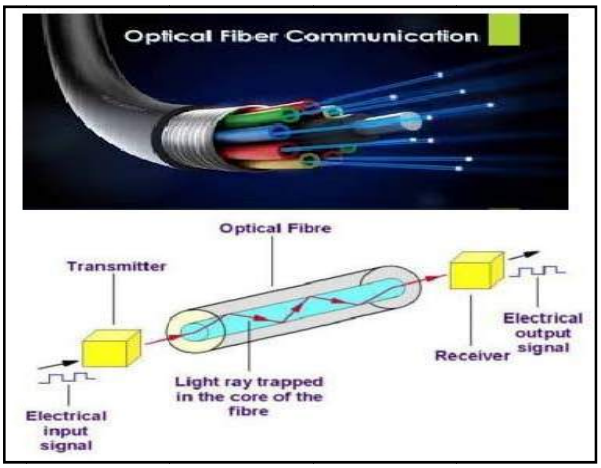
(a) **Advantages**.

(i) It has wide band width carrying different types of information from low speed voice signal to high speed computer data.

(ii) Less power requirement.

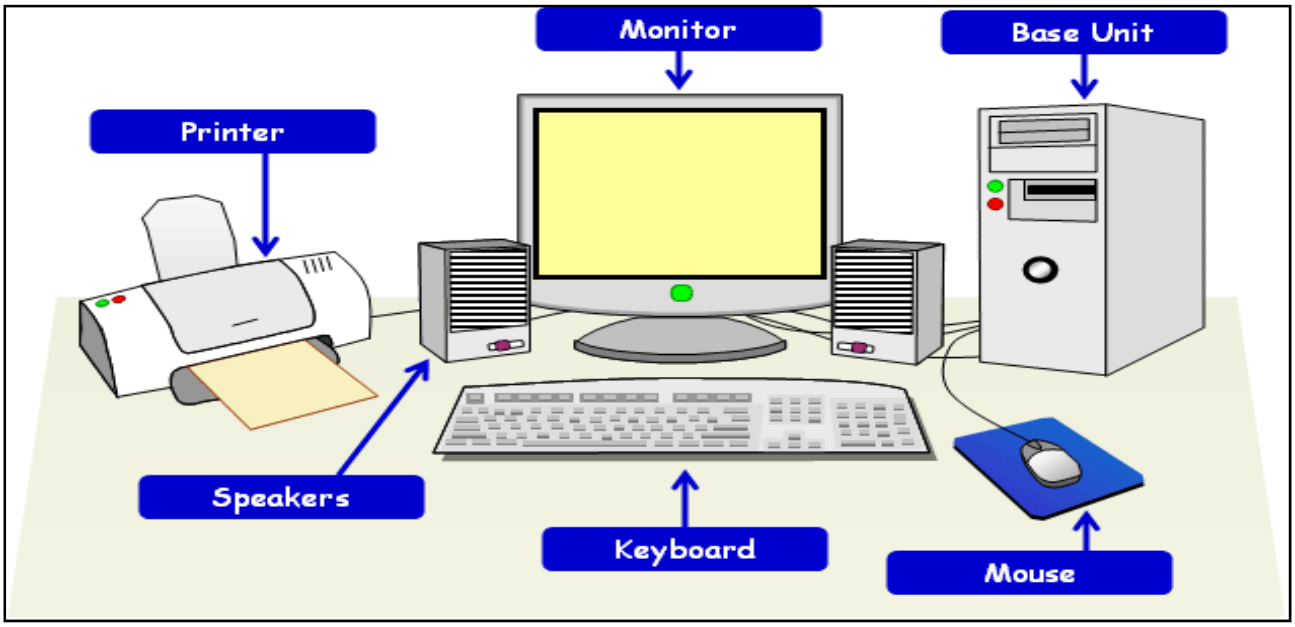
(iii) Small cable size.

(iv) No electromagnetic interference.



Computer System

8. Strictly speaking a computer is any calculating device. The name is derived from a Latin word "Computer" meaning to reckon or compute. However, the term computer has come to mean a special type of calculating machine having certain characteristics.



(a) **Advantages**.

(i) Speed of process and calculations.

(ii) Accuracy of process and calculation once the programme is proved.

(iii) Persistence - It will continue on the same job until the end, always working in the same way, each and every day.

(iv) Mass storage of data.

(v) The ability to handle large volume of data.

(b) **Disadvantages**.

(i) Data loss if machine malfunctions.

(ii) Back up hard data still required to be maintained.

(iii) Constant power source is required.

Internet

9. Millions of computers all over the world are interlinked through telephone lines, satellites, submarine cable and optical fiber network. This World Wide Web (www) is what is called the "Internet". It provides an instant, trouble free and cheap means of communications. Internet is therefore a collection of individual data networks connected together in such a way that data can be exchanged back and forth between networks widely separated.. Electronic Mail, Web- Browsing and Voice Mail are the main facilities of internet.

Cell Phone

10. Cellular radio network was first introduced in 1980. It provides a mobile subscriber access to the global telephone network. It is a rapidly expanding technology with high rates of obsolescence.

(a) **Advantages**.

(i) More subscriber and traffic capability.

(ii) No perceptible difference between mobile and fixed subscribers.

(iii) Better quality of service.

(iv) Higher speed of data exchange.

(v) Can be used in an integrated mode with computer network.

(b) **Disadvantages**.

(i) Open source. It can be jammed if required.

(ii) Repeated charging of battery.

(iii) Security related issues.

(iv) Works on the capability and commercial interests of service provider.

(v) Health hazards due to excessive radiations.

Indian Navy Summit conducted by Video Conferencing system

Multimedia

11. It is a computer technology that displays information using a combination of full motion video animation, sound graphics and text with high degree of user interaction.

Video-Conferencing Systems

12. These provide the full benefits of face to face communication with sound, graphics and simultaneous transmission of data. The system enables people widely separated geographically to inter- act without having to meet at one place.

Videophone

13. It is a system that enables us to transmit an image via digital tele network, making visual contact possible over great distances, apart from transferring speech. Facilities provided by videophone are:

(a) Can transmit speech as well as colour video.

(b) Conduct of video conferences.

(c) Called subscriber is seen on the monitor.

(d) High quality of voice.

(e) Speed of sending/ receiving can be adjusted by the user.

(f) Map over-lays can be transmitted.

PART IV – INFORMATION TECHNOLOGY

14. Information Technology or IT for short, refers to the creation, gathering, processing, storage, presentation and dissemination of information, and also the processes and devices that enable all this to be done. IT stands firmly on the hardware and software of a computer and the telecommunications infrastructure. Computers, as we all know, have been in existence for over 50 years. For many of these years, they had been primarily used for information processing. It is well known that year-by-year, computers are becoming more and more powerful both in terms of their computational speeds and also their capacities for storing of data. What has made the big difference in recent years is not the fact that individual computers have dramatically improved in their capabilities, but that all those information islands are being connected by digital highways made possible through the use of the telecommunications infrastructure by the computers, which, largely explains why the internet and the WWW have begun to play such a significant role in our use of computers.

CONCLUSION

15. Today the technology has advanced in all spheres of life. Even the defence forces are well poised to exploit the state-of-art modern communication techniques for meeting the requirements of the Indian Army in the 21st century. Some of the areas where the army is already in the process of exploiting are the Cellular Radio (both GSM & CDMA), WLL, mobile trunked radio, mobile satellite systems, OFC and so on. Therefore, it is very important to be well versed with the latest trends in information technology to gain maximum advantage from the same.

Summary

- **Line.** This is the basic means of signal communications for a force which is static.

- **Radio Communication.** Radio communication involves Net Radio and Radio Relay. Net radio is the basic means of signal communication for any mobile force.

- **Radio Relay.** Radio relay implies that a series of radio transmitters and receivers normally spaced between 20-35 Kms apart and are used to provide point signal.

- **Wireless.**Wireless operations permit services, such as a long-range communications, that are impossible or impractical to implement with the use of wires.

- **Mobile Telephones.**These wireless phones use radio waves from signal-transmission towers to enable their users to make phone calls from many locations worldwide.

- **Wireless Data Communications.**Wireless data communications are an essential component of mobile computing. The various available technologies differ in local availability, coverage range and performance.

- **Wi-Fi.**Wi-Fi is a wireless local area network that enables portable computing devices to connect easily to the Internet. Wi-Fi has become the de facto standard for access in private homes, within offices, and at public hotspots. Cellular data service offers coverage within a range of 10-15 miles from the nearest cell site.

- A walkie-talkie is a hand-held, portable, two-way radio transceiver.

- **Radio Telephony.**The procedure laid out to communicate on the Radio so as to make the conversation secure and successful, which is referred to as “Radio Telephony”.

- Principles of Radio Telephony Procedure.
  - B – Brevity
  - A – Accuracy
  - S – Security
  - S – Speed
- Types of communication
  - RT conversation
  - Unregistered (UR) Message
  - Formal Message
- Types of Calls.
  - Single Call.
  - Multiple Call
  - Net Call.
  - Net Call with Exceptions
- Troposcatter is a system in which micro waves are transmitted in the UHF and SHF band to achieve radio communication over the horizon covering a range between 70 Kms to 1000 Kms.

- Modem (modulator-demodulator) is a network hardware device that modulates one or more

carrier wave signals to encode digital information for transmission and demodulates signals to decode the transmitted information.

- A satellite is an artificial object which has been intentionally placed into orbit. Such objects are sometimes called artificial satellites to distinguish them from natural satellites such as Earth's Moon.

- Satellites are used for a large number of purposes. Common types include military and civilian earth observation satellites, communications satellites, navigation satellites, weather satellites, and research satellites.

- Multimedia is content that uses a combination of different content forms such as text, audio, images, animation, video and interactive content. Multimedia contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material.

- Video conferencing (VC) is the conduct of a video conference (also known as a video conference or video teleconference) by a set of telecommunication technologies which allow two or more locations to communicate by simultaneous two-way video and audio transmissions.

- Information technology (IT) is the application of computers and internet to store, retrieve, transmit, and manipulate data or information often in the context of a business or other enterprise.

COMPREHENSIVE QUESTIONS

Q1. Answer the following in about 15 words:

(a) What is Radio Telephony?

(b) What is a Single Call?

(c) What is a Code Sign?

(d) What is a Radio Net?

(e) What is a Walkie Talkie?

(f) What is the use of Videophone?

Q2. Answer the following in about 50 words:

(a) What do you mean by Line communication?

(b) What do you mean by Radio Relay?

(c) What do you mean by Net Call with Exception?

(d) What is a Multiple Call?

(e) What do you understand by Information Technology?

Q3. Answer the following in about 75 words:

(a) What are the characteristics of wireless technology?

(b) What are the wireless data communications used in army?

(c) Discuss about Wi-Fi technology in modern communication system.

(d) What are the principles of Radio Telephony?

(e) What are the Rules on Security in Radio Telephony?

Q4. Answer the following in about 150 words:

(a) What are the advantages and disadvantages of Line Communication?

(b) What are the advantages and disadvantages of Net Radio?

(c) What are the advantages and disadvantages of Radio Relay?

(d) What are aids to Security in Radio Telephony?

(e) What are the different kinds of calls?

(f) Name the number of buttons/keys on front panel programming button with functions in RS GP338 MOTOROLA.

(g) Explain the concepts, latest trends and development in communication. List and brief about any 4 communication devices.

Q5. Answer the following in about 250 words:

(a) Draw a diagram of wireless technology and explain the parts with example.

(b) Draw diagram the Wi-Fi technologies and explain with examples.

(c) What do you mean by Radio Telephony procedure? What are the advantages and disadvantages of Radio Telephony?