DEFENCE STUDIES

STANDARD ELEVEN

महाराष्ट्र राज्य पाठ्यपुस्तक निर्मिती व अभ्यासक्रम संशोधन मंडळ, पुणे

Indian Air Force Rescue Mission

INS Tabar

Wagha Border

The Coordination Committee formed by GR No. Abhyas - 2116/(Pra.Kra.43/16) SD - 4 Dated 25.4.2016 has given approval to prescribe this textbook in its meeting held on 20.6.2019 and it has been decided to implement it from academic year 2019-20.

DEFENCE STUDIES

STANDARD ELEVEN

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune 4.

C6H4V6

Download DIKSHA App on your smartphone. If you scan the Q.R. Code on this page of your textbook, you will be able to access full text. If you scan the Q.R. Code provided, you will be able to access audio-visual study material relevant to each lesson, provided as teaching and learning aids.

First Edition: 2019 ©
Reprint: 2020

Defence Studies Subject Committee

Dr. Shrikant Paranjpe, Chairman
Brig. S. G. Gokhale (Retd.), Member
Colonel Dr.Pramodan Marathe (Retd.), Member
Dr. Vijay Jadhav, Member
Dr. Shantaram Badgujar, Member
Dr. Ajaykumar Lolage (Member-Secretary)

Defence Studies Study Group

Shri. Nandkumar Borse
Shri. Vivekanand Kadam
Dr. Sanjay Dhake
Prof. Homsing Patil
Shri. Vaijnath Kale
Dr. Somnath Raut
Dr. Keshav Patil
Shri. Vikrant Kavale
Prof. Girish Gavit
Prof. Bhartbhushan Balbudhe

Chief Co-ordinator
Smt. Prachi Ravindra Sathe

Co-ordination
Dr. Ajaykumar Lolage
Special Officer, Work Experience and Incharge Special Officer, Health and Physical Education
Textbook Bureau, Pune

Cartographer
Shri. Ravikiran Jadhav
Textbook Bureau, Pune

Cover and Illustrations
Shri. Ramesh Ramchandra Malge

Translation
Dr. Dilip Jog
Smt. Shivani Limaye
Smt. Mugdha Mahabal

Scrutiny
Brig. R. R. Palsokar (Retd.)

Typesetting
Textbook Bureau, Pune

Paper : 70 GSM Creamwove

Print Order :

Printer :

Production
Shri Sachchitanand Aphale
Chief Production Officer

Shri Liladhar Atram
Production Officer

Publisher
Vivek Gosavi
Controller
Maharashtra State Textbook Bureau, Prabhadevi, Mumbai-400025

The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a 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 unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

Foreword

Dear Students,

Let me welcome you to the 11th Standard. I am happy to place the Defence Studies book in your hands.

What is meant by Defence Studies? What do you study in this subject? Traditionally, the term defence studies was used to study a country's efforts at remaining secure and independent. The main role played for this was that of the armed forces. They were responsible for the defence of the country. Today, the term used is national security. It has taken on a wider meaning. The term now includes political, economic, socio-cultural, environmental, and other aspects of security.

The teaching of defence studies in Indian universities and colleges began in the 1960s. The purpose of teaching this subject was to promote the understanding of national security amongst the youth.

The book for Std. XI will focus on the subject of national security as the central aspect of defence studies. It seeks to introduce the students to the various aspects that are studied to understand the subject of defence studies. These include the concepts of national interest and national security; geopolitics; defence economics; military history and role of science and technology.

The book also contains information about career opportunities in the defence sector that would be useful to you.

Please try to do the various activities mentioned in the book. You should take the help of your parents and teachers for these activities. Please use the Q.R. Code for your studies.

Please do inform us what part of this book you found useful or difficult to understand.

We wish you the best in your future academic life.

Pune

Date : 20 June 2019

Indian Solar Year : 30 Jyestha 1941

(Dr. Sunil Magar)

Maharashtra State Bureau of Texbook

Production and Curriculum Research, Pune

For Teachers

An Approach to Teaching of Defence Studies at Std XI

Defence studies is an interdisciplinary subject. Its focus is national security. This involves all aspects of security: military, political, economic, social, cultural, etc. Therefore, the study of this subject needs to be done keeping this aspect in mind. The XIth and the XIIth standards have to be looked at as a combined unit. The XIth standard syllabus tries to explain the various dimensions of the subject of Defence Studies. It includes the concept of national security, geopolitics, military history, defence economics, science and technology and defence organisation in India. The purpose is to build a base to understand the challenge facing India's national security which is the course for the XIIth standard.

Some important aspects :

i. **Activity :** Maps are an important part of the learning process. These are especially useful for the chapters on Geopolitics and Military History.

ii. **Understanding :** The subject of military history is not just a study of events. The focus must be on trends. It is also useful to link military history to geopolitics.

iii. **Analysis :** We cannot understand national security without understanding the costs involved. For this purpose, we have to study defence economics. We also have to understand the linkage between defence and development because all defence expenditure is not wasteful expenditure.

iv. **Classroom Discussion :** We are aware of the rapid changes in technology. Mobiles, internet, are common features today. What is the relevance of electronics, space science and nuclear technology to defence? How are these technologies common for both civilian use and defence use? These are some questions that need to be answered.

v. **Field Visit/Interviews/Dialogue :** Visit a Defence establishment or have a dialogue with retired Officers of the Indian Armed Forces or arrange their guest lectures on any topic of importance.

vi. **Some useful websites :**

a. Ministry of Defence (India) : https://mod.gov.in/

b. Ministry of Home (India) : https://mha.gov.in/

(Annual reports of the Ministry of Defence and Ministry of Home are available on these websites)

For Students

About the book…

The Departments of Military Science came to be established in Indian Universities in the 1960s. The first two were established at Pune and Allahabad. This was established as an academic discipline. It is an interdisciplinary subject. The University Grants Commission (UGC) appointed the Dr. D.C. Pawte Committee in 1968 to ensure that the departments of Military Science do not become centres for military training like the National Cadet Corps. Over the years, the UGC sought to broaden the understanding of the subject of security and place it in a global context. The Lt. Gen. K.P. Candeth Committee (1978) suggested the name 'Defence Studies' so as to provide it an academic perspective. Subsequently, the Dr. Mishra Committee considered the changes that were taking place at the global level and the recognition that this subject was getting as a discipline in its own right and recommended the name 'Defence and Strategic Studies'. Later the new UGC Committee under Air Commodore Jasjit Singh has recommended a focus on 'National Security'.

To achieve an understanding of national security in the contemporary world order it is necessary to understand the nature of the changing domestic and global scenario. While the role of the military is the key dimension, the discipline also needs to look at the following issues :

i. Role of Diplomacy.
ii. Security as a Human value.
iii. Military History.
iv. Domestic political, economic, and socio-cultural trends.
v. Economics of security.
vi. Developments in Science and Technology.
vii. Role of international law.

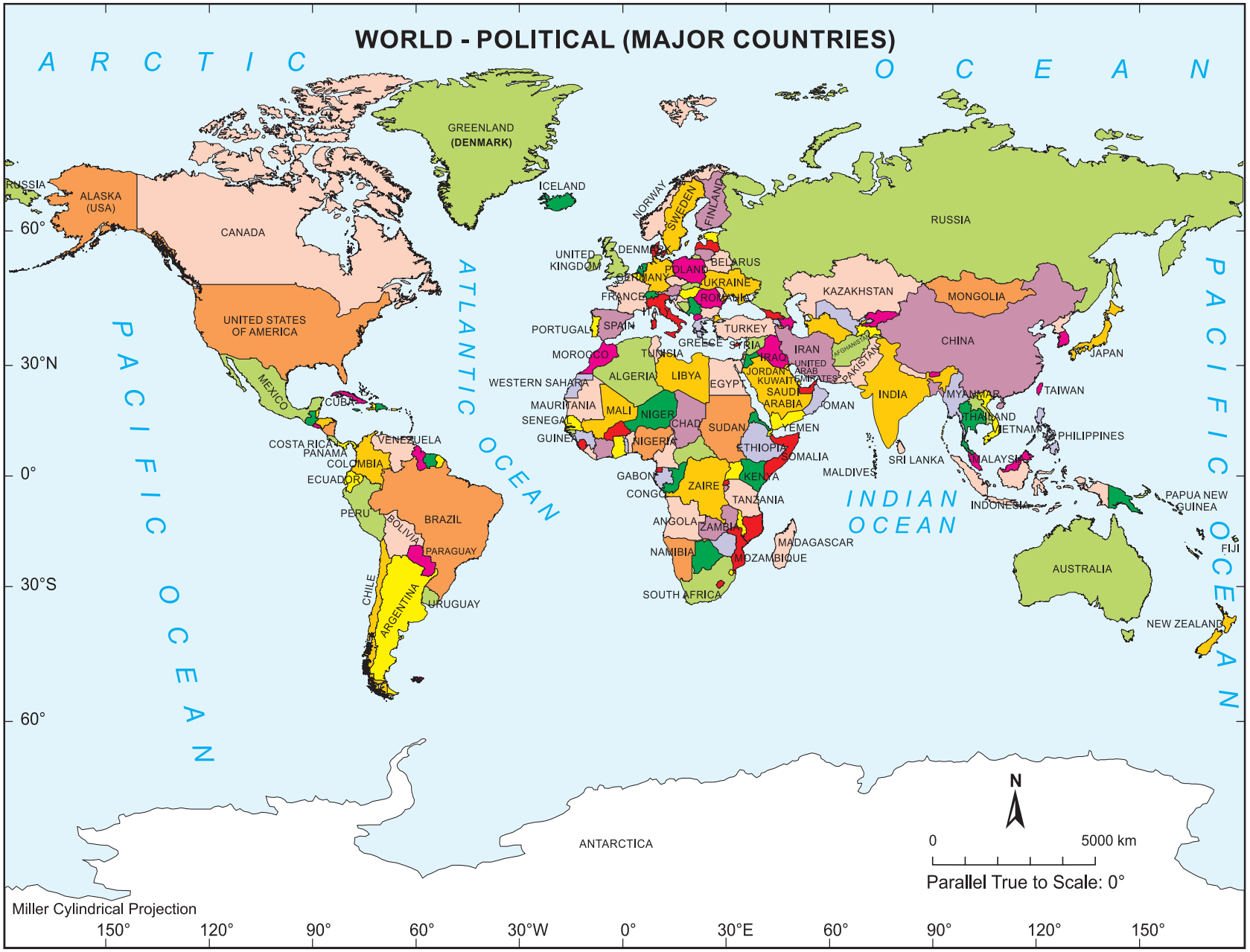
The book of the XIth Standard is designed to provide this broad perspective of Defence Studies with a strong focus on India. The XIth Standard book will provide you with a base to be able to understand, analyse and evaluate the issues that relate to India's national security.

The book will also help you to plan your future career in the Indian Armed Forces or in the Civil Services and in the Think Tanks that work in the areas of national security, risk analysis, etc.

Competency statements for Defence Studies : Standard 11 th

COMPETENCY
1) Key concepts create a base for understanding of various issues in defence studies.
2) Comprehend the linkage between national interest and national security
3) The linkage between geography and security is important. Geopolitics helps appreciate this linkage.
4) Analyse how geographic features have influenced India's security policy.
5) Study the Indian borders with the help of maps.
6) Understand that military history is not just a study of battles.
7) Understand the trends in Indian Military History in ancient, medieval and modern periods.
8) Analyse the link between military history and geopolitics.
9) Defence economics explains the cost that a country has to bear for national security. It introduces the student to defence industry in India.
10) Comprehend the linkage between defence and development.
11) Understand the relationship between science, technology and engineering.
12) Appreciate the technological developments in India. Study the developments in the areas of Nuclear, Space and Electronics in India.
13) Develop the ability to think of the futuristic technologies.
14) Introduce the organisation of India's Ministry of Defence. Study the Higher Defence Organisation of India.
15) Understand the role of the Army, Navy, Air Force and Paramilitary.

INDEX


WORLD - POLITICAL (MAJOR COUNTRIES)
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
PACIFIC OCEAN
GREENLAND (DENMARK)
ICELAND
RUSSIA
ALASKA (USA)
CANADA
UNITED STATES OF AMERICA
MEXICO
CUBA
COSTA RICA
PANAMA
COLOMBIA
VENEZUELA
ECUADOR
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
NORWAY
SWEDEN
FINLAND
UNITED KINGDOM
DENMARK
IRELAND
GERMANY
POLAND
BELARUS
UKRAINE
FRANCE
ROMANIA
PORTUGAL
SPAIN
ITALY
GREECE
TURKEY
MOROCCO
TUNISIA
ALGERIA
LIBYA
EGYPT
WESTERN SAHARA
MAURITANIA
MALI
NIGER
CHAD
SUDAN
SENEGAL
GUINEA
NIGERIA
ETHIOPIA
SOMALIA
GABON
CONGO
ZAIRE
KENYA
TANZANIA
ANGOLA
ZAMBIA
NAMIBIA
MADAGASCAR
MOZAMBIQUE
SOUTH AFRICA
KAZAKHSTAN
MONGOLIA
CHINA
IRAN
IRAQ
AFGHANISTAN
PAKISTAN
JORDAN
KUWAIT
UNITED ARAB EMIRATES
SAUDI ARABIA
YEMEN
OMAN
INDIA
SRI LANKA
MALDIVES
MYANMAR
THAILAND
VIETNAM
MALAYSIA
INDONESIA
PHILIPPINES
TAIWAN
JAPAN
PAPUA NEW GUINEA
FIJI
AUSTRALIA
NEW ZEALAND
ANTARCTICA
60°
30°N
0°
30°S
60°
150°
120°
90°
60°
30°W
0°
30°E
60°
90°
120°
150°
N
0
5000 km
Parallel True to Scale: 0°
Miller Cylindrical Projection

Chapter 1 Key Concepts in Defence Studies

The newspapers and television will give you a lot of information on relations between India and Pakistan or China or United States. Sometimes you may read about how there have been clashes on the border between India and Pakistan or India and China. You may read about clashes between police forces and militants in Kashmir. You may also have seen the Republic Day parade in Delhi. In that parade the Indian armed forces display various weapons. All this deals with issues relating to national security of India.

When we use the terms like national security or India as a nation we must understand the exact meaning of these terms. We use the term 'country' or 'nation' or 'state' to describe India, Pakistan, China, etc. While all the terms appear to convey the same meaning, technically there is a difference in each of these terms. Technically, the correct term is 'state'. This is the term used to describe independent sovereign countries. But in normal usage, all the terms tend to be used interchangeably.

The world consists of different states (or countries); we use the word 'state system' or 'international state system' to describe this. What do we mean by a state system? We are talking of the world consisting of sovereign states interacting with each other. They may sometimes have conflicts between them or they may cooperate with each other. To understand the state system it is necessary to understand the meaning of some of the concepts: nation, state, nationalism, self-determination, sovereignty, national power, national interest and national security.

Nation

The word 'nation' has been used in many different ways. How does one understand the term? A nation is a people who identify socially, culturally, politically in such a way that they want to establish a separate identity for themselves. There is a sense of oneness that is psychological and born out of commonness of culture, ethnicity, race, religion, language, history, etc.. They have a spirit of unity. They may or may not be located in a specific geographic territory.

Elements of a nation :

1. **Demographic and cultural similarities:** These similarities may be demographic characteristics such as language, race and religion or they may be common cultural or historical experiences.

2. **Feeling of community :** The similarities of demography and culture must translate into a psychological feeling of a community. This is a matter of perception held by the people of that community

3. **Desire to be politically separate :** The sense of community that is based on the demographic socio-cultural and historical experiences, needs to provide for a political identity of its own. This political identity comes from geography. People living in a particular geographic

area having common socio-cultural, religious or linguistic commonality can lead to a feeling of being a nation. Such a feeling is a product of the urge for self-determination. This can lead to a demand for self-governance at a political level.

Nationalism

Nationality is one of the main sources of nationalism. What is **nationality** ? It is the belief that people have about their role in the world. People who have a common cultural heritage aspire for sovereignty over a specific territory to decide their future. People feel that it is their right to decide their political future. They would want to form their own government that is sovereign. This is national self-determination.

What is sovereignty ? The Preamble of the Indian Constitution uses the words, 'Sovereign Democratic Republic'. Here the word sovereignty means the independent authority of the country. It signifies that the country is not dependent on any other country. It is independent to take its own decisions, formulate laws and govern. When people of a nation want to become a sovereign country it means they are demanding the right to self-determination. Freedom struggle is an expression of the right to self-determination.

Nationalism is a sense of political identity. It is closely associated with two aspects: nationality and patriotism. It is a love for one's country. The people become sentimentally attached to the homeland. They gain a sense of identity and self-esteem by this identification and are motivated to help their homeland. The expression of such sentiments can be seen at different times: Cheering for a national cricket team, standing up during the National Anthem or support to the armed forces during a war. The emotions and feelings of the people about their country expressed in different forms can be described as 'nationalism'. Nationalism is an ideology which holds the people to a sense of political loyalty to the country.

In historical times, nationalism had been associated with a sense of loyalty to the rulers. The armies would fight for their King or Queen. The concept of popular sovereignty came in with the French Revolution. Thus, today wars would now be fought for the sake of the nation and not for the ruler. For example, the Indian army fights for India as a country and not for its President or Prime Minister.

Do you know ?

The United Kingdom comprises four geographic and historical parts- England, Scotland, Wales, and Northern Ireland. Geographically, England, Scotland, Wales are parts of the island of Great Britain. Northern Ireland and the Republic of Ireland are part of a separate island. While Northern Ireland is part of United Kingdom, the Republic of Ireland is a separate country. The name Britain is sometimes used to refer to the United Kingdom as a whole.

State

It is this urge for political self-determination that leads a nation in the direction of statehood. When does a nation become a state ? A State must have the following characteristics to qualify for statehood: sovereignty; independent government, territory and population.

1. Sovereignty is perhaps the single most important factor that determines the characteristic of a state. Sometimes this term is used interchangeably with the term independence. There is however a difference between the two. Sovereignty is a legal term while independence is a political term. It means that the country is legally sovereign with its own independent constitution. For example, India became politically independent in 1947. It became sovereign after the adoption of the constitution in 1950.
2. Every sovereign state must have a government. The government must be sovereign and independent. For example when India was a British colony, there was a government of India. But it was not a sovereign independent government. Therefore prior to independence India was not a state.
3. Territory refers to the geographic boundaries of a state. Every state must have a specific geographic territory.

What is meant by 'territory' ?
Territory has three aspects : (i) The actual land within the national boundaries. (ii) The territorial waters along the coastline. This is 12 nautical miles (22.2 km or 13.8 miles) along the coast line. (iii) The air space above its territory (there is no international law on the height of this airspace)

4. In the existence of a state population would be the final and most significant essential element. The population of a state can belong to various religious, ethnic, linguistic groups, etc. Thus there can be many 'nations' within a nation state. In India we talk of 'unity in diversity'. This diversity is made up of people belonging to different religions, ethnicity, race, language, etc.

Unity in Diversity in India

Do you know ?

Look at Palestine as a case study : The Palestine Liberation Organisation (PLO) has been granted recognition as the legitimate representative of the Palestinian people. The PLO has also identified Gaza and West Bank as the territory of the State of Palestine. However, Palestine is neither sovereign nor does it have geographic territory of its own, its territory is under the jurisdiction of Israel. This is why it cannot claim to be a state.

National Interest

What is national interest ? National interest is the protection of the core values of a nation. What are these core values? They are the country's goals and ambitions. These can be political, economic, military, or socio-cultural. Nationalism motivates people to protect what is theirs – values that they seek to cherish and protect as belonging to their state. It is the protection of these values that is the core of the concept of national interest.

Look at the Indian constitution. Its preamble will give you the core values of India. It talks of justice, liberty, equality and fraternity. These are the values that the state must protect. The state is expected to provide social, political, economic and political stability for its citizens. It has to look after the welfare of its citizens.

What are the threats to these core values? How does the state protect these core values? What then are the main elements of national interest?

1. The state protects its citizens from any external aggression or internal disturbance. National security is an important component of national interest. Unless a nation is secure it cannot provide various services to the people to enable them to live a peaceful and prosperous life. The threats to the core values can come from external aggression or internal disturbance. India has experienced wars with both, Pakistan and China. These are external threats to India's national interest. Similarly, there can be terrorist attacks. A terrorist attack against the Parliament of India (in 2001) or the attack in Mumbai (in 2008) are also threats that affect India's national interest. Internal disturbance is caused when people use violent means to express their demands. These violent means can come during demonstrations, riots, militant agitations or insurgencies. These threats harm the economic, political and social stability of the country.
2. The state must protect both personal freedom and national freedom or independence. Conflicts and wars can destroy freedom. Therefore, states try to promote peace, both at the domestic level and the international level.
3. States try to maintain international order to promote peace and stability. It is only through peace and stability that nations can promote development in their countries. One way of doing this is through regional and international organisations. These organisations provide for a forum for dialogue between countries.
4. Justice is another important value that the states try to protect. This is done with specific reference to protection of human rights. It is also achieved through international law. The International Court of Justice plays an important role in this matter.
5. Finally, the states try to promote the socio-economic welfare of its citizens. Providing food, shelter, clothing, education and health to the population are some of the key aspects of welfare.

National security is the most important component of national interest. National security is not just security from external aggression. It is closely related to the political, economic and socio-cultural stability of the country. Unless a nation is secure it cannot provide various services to the people to enable them to live a peaceful and prosperous life.

What is National Security ?

Walter Lippmann states : 'a nation has security when it does not have to sacrifice its legitimate national interests to avoid a war, and is able, if challenged to maintain them by war'.

National Security

What is national security? The origins of the concept of national security can be found in the concept of national interest.

The defence of the 'territory, sovereignty and freedom of the country' is the fundamental aspect of India's security policy. Traditionally, National Security meant protection of the state from external aggressions. The military dimension of security is an important, but not the sole, component of national security. To be truly secure, a nation needs other forms of security. Besides the traditional military aspect of security; the non-traditional aspects; ie. Diplomacy or politics, society, environment, energy as well as natural resources, economics and human resources are equally important.

The aim of national security is to achieve peace and harmony among people, socio- political and individual life stability and good governance, thus helping in nation- building. Another important element for our national survival is national unity. This unity is an outcome of the tradition, culture, history that makes people proud of their country. Therefore, the defence system created during peacetime for national defence is known as 'national security'. Thus while the traditional aspect of security is important, there are other dimensions that need to be studied.

National Security

National Power

We have seen the importance of the concept of sovereignty and nationalism. We have also seen the various elements of a state and what constitutes national interest. When we try to understand the state system, national power is another important element that we need to study. This is because it is the national power that protects the national interests of the country. It provides national security to the country.

Usually when we talk of national power we focus on the military strength of any country. This is only one aspect of national power. Let us understand the various elements of national power.

Elements of national power are classified in two groups: Tangible and intangible. Tangible elements are those that can be seen and measured. Intangible elements are those that cannot be seen but can be experienced.

Tangible elements -

1. **Geography :** In geography we study the size of the country, the weather and climate, its location in the world,

geographic features like mountains and rivers, etc. If you see the map of India you will notice that the Himalayas are a natural boundary in the north. You can also see the long coast line that India has. India can therefore play an important role in the Indian Ocean.

2. **Raw materials and natural resources:** This includes the following: (a) Agricultural products like food, cotton, rubber, jute, etc; (b) Animal products like milk, fish, poultry, meat, oil, etc. (c) Minerals like iron ore, coal, etc. India is one of the largest producers of milk in the world. It is self-sufficient in wheat and rice. India has large amount of coal and iron ore reserves.

3. **Population :** The most important aspect of population is not the total number. What is important is the working population that a country has. India is described as a 'young country'. India has more than 50% of its population below the age of 25 and more than 65% below the age of 35. This is an advantage as it is an excellent workforce.

4. **Technology :** Science is the systematic study of the structure and behaviour of the physical and natural world. Technology is the application of practical sciences for industry or commerce. Technology refers to methods, systems, and devices which are the result of scientific knowledge being used for practical purposes. Science and Technology are important elements of national power. Nuclear, space and electronics science are some of the areas where India has excelled.

Elements of National Power

Intangible Elements -

1. **Ideology :** Ideology is a world view of a society, people or a country. Indian ideology can be understood in the Preamble of the Indian Constitution.
2. **Morale :** Morale is the national character of the people. How do people react in times of a crisis? In times of floods, earthquakes, war, etc. people would come together to help and not panic. This is the morale of the country.
3. **Leadership :** Good, competent and capable leaders lead the country to peace and prosperity.

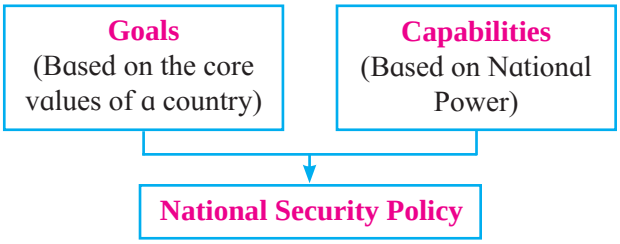
National Security Policy

We have argued that states will take decisions to protect their interests. They try to protect their core values. We have also tried to understand the various elements of national interest. We have seen that the main values are security, freedom, order, justice and welfare for the people of that state. These are all humanitarian goals. This means that a country like India, Pakistan, China, Russia, France, etc. would generally try to provide these values to their people.

What then is a national security policy ? National Security policy is based on the national interest of that country. It is a policy that aims to safeguard the country's national interest. The making of national security policy has two dimensions:

1. Security policy is based on certain basic principles and values that a country cherishes. These basic principles are the goals of the country.
2. Another important component that determines the formulation of security policy is national power. A security policy is not made in abstract. National power will provide the capability of the state.

The basic principles provide the goals. The goals would tell us what the country intends to do. We have to match the goals with the capabilities when we make policy. Thus a balance of intent and capability would give you policy.



For example, India's security policy is based on the basic principles of 'independent understanding of world affairs' and 'peace approach'. This means that India would not be dependent on any country for its security policy; it would make its policy independently. It also talks of peace as a core principle in the formulation of its policy. India would thus try to solve problems through dialogue and discussion and not through war and conflict.

Based on this one would have to understand India's policy towards different countries like Pakistan or China or France, etc. Similarly, one would have to understand India's policies about trade, arms control, environmental issues, etc. But India also has to look at its capabilities in terms of national power. If, for example, India has to fight cross border terrorism, it has to calculate its national power and then make a policy that would help it to fight terrorism.

We have seen the various elements of the state system. A country formulates its national security policy on the basis of the understanding of its national interest and the national power. A national security policy is one that seeks to protect the national security and thus take care of the national interest of the state.

Let us place this in a chart form as a summary.

Chart of Key Concepts

Nation

A sense of oneness that is psychological and born out of commonness of culture, ethnicity, race, religion, language, history, etc. with or without identified territory.

Nationalism

Defined as an expression of the concept of the nation.

State

Key ingredients include people, territory and sovereignty (government).

National Interest

Defined within the context of the core values of a nation as identified by the Constitution; as being a product of history (civilizational); the value systems of the polity, economy; the society and culture. The determining factors would be the geography, the geopolitics, the political, economic and socio-cultural aspects that go to determine the core values.

National Power

Protection of Core Values and therefore of national interest is dependent upon the national power of the nation state (Capability factor). National Power is dependent upon the material and non-material elements that contribute to power.

National Security Policy

Policy that seeks to protect the national security and thus take care of the national interest of the nation state.

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. The following is one of the intangible elements of national power _____

a. Technology **b.** Ideology

c. Mineral wealth

d. Industry

ii. National security policy takes care of _____

a. National morale

b. National interest

c. National resources

d. National leadership

(B) Complete the following sentence by using appropriate reason.

Palestine is not a State because----

(C) State the appropriate concept for the given statement.

There is a sense of oneness that is psychological and born out of commonness of culture, ethnicity, race, religion, language, history, etc..

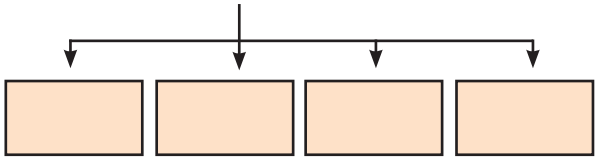
(D) Find the odd word from the given set.

Territory, Sovereignty,

Population, Morale

Q. 2 (A) Complete the following chart.

Elements of a state :



Q. 3 State whether the following statement is true or false with reasons.

A national security policy takes care of the political leadership state.

Q. 4 Explain the co-relation between the following.

Nation and State

Q. 5 What are the ways by which the morale of people can be boosted in times of a terrorist attack ?

Q. 6 Express your opinion on the following.

India is a State comprising of many nationalities.

Q. 7 Answer the following.

How is a national security policy formulated ?

Q. 8 Answer the following in detail with reference to the given points.

What are the elements of a nation?

(a) Demographic and cultural similarities

(b) Feeling of community

(c) Desire to be politically separate

Activity :

Discuss Jawaharlal Nehru's writing on the 'The Variety and Unity of India'Please refer to this website :

Jawaharlal Nehru The Discovery of India (Delhi : Oxford University Press, 1985)

Chapter : The Variety and Unity of India Page: 61

https://archive.org/stream/TheDiscoveryOfIndia-Eng-JawaharlalNehru/discovery-of-india_djvu.txt

Chapter 2 Geopolitics

In the study of defence studies you will come across three terms that are relevant to the understanding of national security issues: political geography, geopolitics and military geography. What do they mean? What is the relationship between them?

Let us see what is meant by political geography. Political geography is a branch of geography that deals with boundaries, geographic divisions, jurisdictions of countries. It concerns both, politics and geography.

Geopolitics is a branch of political geography. It studies the relationship between politics, geography and power and their interactions. The focus is on the impact of geography and politics on foreign and defence policies of a country.

Military geography is closely linked to geopolitics. Military operations are based on the understanding of geography. Military operations like peacekeeping, disaster relief, or combat require different types of geographic information. We can define military geography as the application of geographical tools and techniques to the solution of military problems.

Geopolitics

The word geopolitics was originally coined by the Swedish political scientist Rudolf Kjellen. He defined it as "the theory of the state as a geographic organism or phenomenon in space, i.e: as a land, territory, area or more specifically, as a country". He believed that state power could be analyzed with its geography, population, economic resources, social structure and government of the state.

In simple terms, Geopolitics is the effect caused by geography on internal and external policies of countries. The study of geography includes the following areas :

(1) Land (Physical) forms like mountains, plains, forests, deserts, snow covered peaks, rivers and lakes etc.

(2) Large water bodies like oceans and seas.

(3) The weather and climate.

(4) Economic factors like the agricultural produce, minerals and raw materials

Difference between Political Geography, Geopolitics and Military Geography-

Sr.No.	Political Geography	Geopolitics	Military Geography
1.	It is a discipline that is concerned with both, politics and geography.	Geopolitics analyses the geographic influences on power relationships in international relations	It is the application of geographic information, tools, and technologies to military problems.
2.	The study is 'static'. It studies events as they are. It analyses the interrelationship between territories and politics.	The study is 'dynamic'. It provides a framework for studying foreign and security policy. It tries to explain and predict the behaviour of countries based on geographical variables.	The study is 'dynamic'. It looks at the interaction between military organization, strategy, and technology, and shifts in the political relationships between military institutions and civil society.

found in the crust and the soil.

(5) Demography like population and its composition and their culture.

All these aspects are inter-related. All of them play a part in influencing the policies of countries. These factors determine the strategy and tactics adopted by countries for protecting their national interests. When we say that the policy of the government is guided by geopolitics we use the term in the context of something. For example we may say 'geopolitics of oil' or 'geopolitics of borders', etc.

There is a strong relationship between geography, ideology, sociology, politics, economics and application of military power. The role played by geographical factors in protecting national security has been discussed since ancient times. In India, Kautilya has written about it in his work 'Arthashastra'. His concept of 'Mandala' is the use of geography for national security.

Military Geography

There are four key dimensions to military geography :

(1) Spatiality : Military geography is interested in the operation of military activities across space. It seeks to understand the relationship between "terrain and tactics". This would help in understanding how specific military campaigns have been shaped by various environmental factors.

(2) Place : The relation between place and social relations is an important element. For example the location of a defence industry or a military base would have an impact on the social relations.

(3) Environment : Military activities have environmental impacts. The environmental effects of military activities are associated with instances of armed conflict; for example the physical destruction brought by the deployment of artillery, practices of aerial bombardment, etc. The study of environmental impact both, as short term and long term is a significant element of the study military geography.

(4) Landscape : Studies of military understandings of landscape include the specific ways in which ground is studied for military purposes. This includes understanding the landscape for infantry patrols for tactical purposes or for broader strategic purposes.

Can you find out ?

These are some of the prominent Geopolitical Thinkers. Can you find out what their contribution was ?

(i) Alfred Thayer Mahan : Mahan focused on sea power as source of world domination.

(ii) Sir Halford Mackinder : Mackinder focused on land power.

(iii) Nicholas Spykman : Theory of Rim-land

(iv) Kautilya : Mandal Theory.

India

The geopolitics of India must be considered in the geographical context of the Indian subcontinent. This would include India, Pakistan, Bangladesh, Nepal and Bhutan. We would also include the Indian Ocean region in the context of India's geopolitical perspective. This would refer to India's Indian Ocean islands, Lakshadweep and Andaman and Nicobar. It would also include Sri Lanka and Maldives.

Geographically, India is divided into four distinct parts from North to the South :

(1) The mountains along the northern borders: The Himalayas in the North form a barrier against the Tibetan plateau. This mountain chain influences the country's rainfall, climate, availability of water,

etc. To the West of the Himalayas are the Hindu Kush and the Karakorum ranges. The traditional passes to enter the subcontinent were through the Hindu Kush along the Kabul valley into the northern part of the Indus valley or from central Afghanistan into western Punjab.

In the east, the southern Himalayas eventually branch off to become Naga Hills and Manipur plateau and various hill lines follow south demarcating the border with Myanmar. There have been very few invasions from the east.

(2) The great Indian plain comprising of

India Physical

Can you find out ?

On a map of South Asia mark the following different geographical features: Hindu Kush mountains, Karakoram range, Arakan mountains, Aravali ranges, Deccan Plateau, Chotanagpur plateau, Konkan coast and Satpura Ranges.

the Sind and the Ganga-Brahmaputra plains: The main approaches to the plains have been from the North-West. This was also the main trade route to enter India.

(3) The Central Indian Plateau: This is the region between the Aravali Range in the West and the Chotanagpur plateau and the Garhjat Hills of Orissa in the East.

(4) The Deccan Plateau and the Coastal Plains: This lies between the Eastern and Western Ghats. The Western coastal plain is a narrow coastal strip between the Ghats and the Arabian Sea. The Eastern coastal plain is broad and has several river deltas.

How does this geography influence India's military history ?

(1) Most of the invasions into India have been from the North West region, through the passes of the Hindu Kush mountain ranges. Once the invaders crossed the mountains and reached the plains there was nothing to stop them.

(2) The northern mountain ranges have isolated India from the Eurasian continent. The entry into India from the north has been difficult because of these ranges. Therefore the invaders who came in India from the North West had limited contact with their land of origin. The prosperity in the Indian plains also kept them in India. This gave rise to their assimilation into the Indian culture and society.

(3) The hills and mountains of the Indian

Can you find out ?

Chhatrapati Shivaji Maharaj was able to successfully use the geography of the Deccan region to develop and use the system of guerrilla warfare.

Can you find out some of the battles where he was able to successfully use the system of guerrilla warfare ?

Plateau and the Deccan made it difficult for the invaders from the North to reach southern India. The system of warfare in this region was different from the one used in the plains. In the Plains large armies could fight battles facing each other. In the Deccan the topography led to the development of guerrilla warfare.

(4) The long coast line provided opportunity for maritime trade. Indian records show that there had been trade with the Greek and Roman empires. There were close trade links with the Arab world. India had also carried out successful maritime expeditions to South East Asia during the Cholas rule. In the later years the Portuguese, Dutch, French and the British came into India through the sea routes.

The Geopolitics of Modern India

India holds a central position in Asia. India is a meeting ground between the East and the West. India's geographic location gives it the opportunity to play a significant role in Asia.

Let us now see how geopolitical features have influenced India's relations with its neighbours.

India and Pakistan :

Look at the features of the Indo-Pakistan border. In the north there are the mountain regions in the area of Kashmir. Further south in the area of Punjab we have the plains of the Indus river. Then as we move southwards along Rajasthan we have the

Do you know ?

Chabahar port's location on the south-eastern coast of Iran is expected to open up greater opportunities for promotion of trade and commerce, especially from the ports along India's western coast, with Iran, Afghanistan, Central Asia and beyond.

India's participation in the development of Chabahar Port will provide India an alternative and reliable access route into Afghanistan utilizing India's earlier investment in Zaranj-Delaram road built in Afghanistan, and also a reliable and more direct sea-road access route into Central Asian Region.

(Minister of State In The Ministry Of External Affairs, Lok Sabha 03.01.2018)

desert region with marshy land in the Gulf of Kutch area.

The main dispute between India and Pakistan is over Jammu and Kashmir. The first conflict between India and Pakistan took place in 1947-48 over the issue of Kashmir. A part of Jammu and Kashmir is under the control of Pakistan. This region is called Pakistan Occupied Kashmir (POK). India and Pakistan have experienced conflicts in the region of the Siachin Glacier and Kargil. There is also a boundary dispute in the area of Sir Creek in the Kutch region.

Can you find out ?

1. What is the nature of dispute between India and Pakistan over Jammu and Kashmir ?
2. Identify the region of the Siachin Glacier, Kargil and Sir Creek on themap.

India and Afghanistan :

India has a border with Afghanistan. However, this border region falls in the Pakistan Occupied Kashmir region. This is why India cannot have a direct road access to Afghanistan.

India and China :

The border between India and China is all along the Himalayan mountain ranges. Towards the West is the Aksai Chin region, in the central and Eastern region the border goes along the Himalayan ranges. The entire border is along the Tibet region of China.

Can you find out the importance of CPEC?

China-Pakistan Economic Corridor (CPEC): China-Pakistan Economic Corridor is a framework of regional connectivity. It includes the following :

(1) Development of an integrated transport & IT systems including Road, Rail, Port, Air and Data Communication Channels between China and Pakistan

(2) Energy cooperation

(3) Building of industries, etc. The CPEC will connect China's Xinjiang province to the Pakistani ports of Gwadar and Karachi.

The main conflict between India and China has been in two areas: Ladakh and the border between Tibet and Arunachal Pradesh called the McMahon Line. China claims that both Aksai Chin and Arunachal Pradesh (earlier called North East Frontier Agency, NEFA) belong to China. In 1962 a major conflict took place between the two countries. Both areas are in high altitudes and hence the armed forces have to make special preparations for defending this border.

Can you find out ?

Nathu La is a mountain pass in the Himalayas in East Sikkim that connects it with Tibet. Can you locate the pass on a map and find out about the 1967 border clash between India and China in that area ?

Did you know ?

- **Cease Fire Line :** It is the line where the war actually stops. The line can be a narrow strip of land or a broad strip of land depending where the war has halted.
- **Line of Control (LOC) :** A Cease Fire Line is converted into a Line of Control when the two sides draw the Cease Fine Line on a map. The local commanders of the two sides agree to the line shown on the map. There is a difference between a Line of Control and a Line of Actual Control (LAC). A line of Actual Control is like a Cease Fire Line. It is not drawn on the maps. The border between India and Pakistan in the Kashmir region is called LOC. The border between India and China in the Aksai Chin sector is called LAC.
- **International Border :** An International Border is a legal border recognised by the governments of both the countries.

India and Nepal and Bhutan :

Both Nepal and Bhutan lie in the Himalayan region. Both of these are landlocked States. To their North is the Tibetan plateau. The main river flows and trade routes have always been from these countries towards India. Both the countries depend on India for their trade and other services. India has security treaties with both the countries.

India and Bangladesh :

Bangladesh is surrounded by India from all sides except the South where its border is along the Bay of Bengal. The rivers Ganga and Brahmaputra flow from India into Bangladesh. Both countries are dependent on these rivers for their sustenance.

India and Myanmar :

The border between India and Myanmar runs along the Arakan Mountains. This is a hilly region with dense forests. This area is often used by insurgent groups to wage insurgency against the Indian state.

India and the Indian Ocean :

The unique geopolitical position of India in terms of its peninsular presence in the Indian Ocean presents an opportunity for India to emerge as a key player in the Indian Ocean region.

It is the sea routes that became the route to colonization of Asia. The Western powers entered India through the Indian Ocean region. Vasco da Gama landed at Calicut in 1498, and the Dutch British and French arrived. in the seventeenth century. Post World War II, the Americans and the Soviets started establishing their presence in this region. Today the Chinese are interested in creating their influence in the Indian Ocean region.

Indian Navy's Maritime Strategy today speaks of the need to project power as a means of supporting foreign policy objectives. The areas of primary interest that have been identified by the Indian Navy include :

(1) The Arabian Sea and the Bay of Bengal,;

(2) The choke points leading to and from the Indian Ocean, they being the Strait of Malacca, Strait of Hormuz, strait of Bab-el-Mandeb and the Cape of Good Hope;

Do you know ?

- **Territorial Sea** : Territorial sea is a belt of coastal waters extending at most 12 nautical miles (22.2 km; 13.8 mi) from the coast.
- An **Exclusive Economic Zone** (EEZ) is an area which is beyond the country's territorial seas and extends no more than 200 nautical miles (370 kilometers) from a country's own coastlines. Find out the importance of the above two areas and discuss them in the classroom

Indian Ocean Region

(3) The island countries like Sri Lanka, and Maldives;

(4) The Persian Gulf as a source of oil supply and

(5) Principal international sea lanes that cross the Indian Ocean Region.

(6) Protection of India's Exclusive Economic Zon

Like land frontiers, the coasts have to be guarded. This results into special security measures being adopted. Coasts are vulnerable to terrorist infiltration. In India, the terrorists who had struck in Mumbai in 2008 had infiltrated by sea.

When would the Indian Navy use military force ? It is likely to use its naval power in the following circumstances :

1. Conflict with a state in our immediate neighborhood
2. Assistance to a friendly nation
3. Anti-terrorist operations conducted multilaterally or unilaterally
4. Actions to fulfill international obligations.
5. Ensuring safety and security of International Sea Lanes through the Indian Ocean
6. Actions to assist the Indian Diaspora
7. Peace Keeping operations under the aegis of the United Nations.

Do you know ?

Indian Ocean Rim Association for Regional Co-operation (IOR-ARC):

The IOR-ARC is a regional cooperation initiative of the Indian Ocean Rim countries established in 1997. Its aim is to promote economic and technical cooperation. It aims to create a platform for trade, socio-economic and cultural cooperation in the Indian Ocean rim area.

Geopolitics is an analysis of the geographical factors underlying international relations and guiding political interactions. Most of the international military alliances, eaties, economic organizations or agreements, such as NATO (North Atlantic Treaty Organization), APEC (Asia-Pacific Economic Cooperation Forum), EU (European Union), etc. are based on geographical advantages and disadvantages. Most of the global issues today are concerned with geopolitics. They need an in-depth geopolitical analyses that could be useful in formulating the appropriate policies and strategies for common public good. These policies would be in areas like global financial stability, food security, human development, education, health, migration, environment, natural resources, arms proliferation, terrorism, etc.

Please see the following websites for further information :

1. Ministry of External Affairs, Government of India

   Border Disputes with Neighbouring Countries

   https://mea.gov.in/Images/attach/lu2722_new.pdf

2. Ministry of Law and Justice, Government of India

   The Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976

   http://legislative.gov.in/sites/default/files/A1976-80_0.pdf

3. Ensuring Secure Seas : Indian Maritime Security Strategy

   Prepared by the Directorate of Strategy, Concepts andTransformation, Integrated Headquarters, Ministry of Defence (Navy), New Delhi.

   https://www.indiannavy.nic.in/sites/default/files/Indian_Maritime_Security_Strategy_Document_25Jan16.pdf

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. The word geopolitics was originally coined by _____

a. Rudolf Kjellen.
b. Alfred Mahan
c. Halford Mackinder
d. Nicholas Spykman

ii. Chabahar port is located in _____

a. India **b.** Pakistan
c. Iran **d.** Bangladesh

(B) State the appropriate concept for the given statement

It is the application of geographic information, tools, and technologies to military problems.

(C) Find the odd word from the given set.

Myanmar, Tibet, Nepal, Bhutan

Q. 2 Observe the map and explain the following.

i. Strait of Malacca

ii. Karakoram ranges

Q. 3 State whether the following statements are true or false with reasons.

i. Cease fire line is an international border

ii. Guerilla warfare and geography are closely linked.

Q. 4 Explain the co-relation between the following.

Political Geography and Geopolitics

Q. 5 Observe the given image and write about it in brief :

Q. 6 Express your opinion on the following.

i. The Indian Ocean Region is an important security concern for India.

ii. How does this geography influence India's military history ?

Q. 7 Answer the following in detail with reference to the given points.

What is military geography ?

(a) Spatiality

(b) Place,

(c) Environment and

(d) Landscape

Chapter 3 Military History

The Mahabharata is a well-known historical story that Indians are familiar with. Did you know that the original Mahabharata was called Jaya? This was a poem of triumph told of the victory of one king over another. You may have read about Chhatrapati Shivaji Maharaj's battle against Afzal Khan at Jawali. You have also studied history of the battles of Panipat. In the First Battle of Panipat Babur used firearms. This was the first time that firearms were used in battle in India. Babur had used guns mounted on camels while Tipu Sultan used rockets against the British in 1780s.

In the history of Maharashtra you would have read about the method of warfare used by Chhatrapati Shivaji Maharaj. The form of warfare that he used was called guerrilla warfare. Chhatrapati Shivaji Maharaj understood the geography of the region. The Sahyadri range in the West with spurs going eastwards has cut the Deccan into many small isolated compartments. Invading armies from the North are slowed down by the terrain. This region was excellent for guerrilla warfare.

In the period of the British colonial rule the Indian army had participated in the First and the Second World Wars. After independence, the first war that India experienced took place in Kashmir between India and Pakistan. Later India experienced wars with China and again with Pakistan. The Indian Army, Air Force and Navy have benefitted from the experiences of these wars.

Wars are influenced by four important factors :

1. **Geography :** Wars may be fought in mountainous regions or plains. They can be fought on the seas. The geography of the region where wars are fought would influence the tactics used in war. (We have discussed the role of geography in detail in the Chapter on Geopolitics).
2. **The character or the morale of the people :** How does the population respond during war time? Does it support the armed forces or does it oppose or criticise them? The support of the local population is crucial to any war effort.
3. **The leadership :** The leadership is at two levels. One is the political leadership and the other the military leadership. The political leadership has to take decisions by looking at both domestic and international factors. The military leadership has to formulate strategies. The leaders of the country and the Generals who conduct the war play an important part in the success or failure of any battle.
4. **The equipment or weapons system that is used :** There has been a continuous evolution in the weapons systems. In the early historical period the weapons used were swords, shields, javelins etc. Today the technological changes have brought in new weapons like missiles, drones, etc. The mode of communication has also changed. From horses and mules used in ancient times we have railways, trucks, aircraft, etc.

The above mentioned factors influence the nature of war. But the study of military history is not just the study of war. What is the subject matter of military history ?

The study of military history involves the following :

1. **Elements :** One, it is the study of wars and all the elements that influence the nature of war. This includes geography, equipment, leadership, etc. as discussed above.
2. **Strategies :** We study the strategies used by the countries. From the point of view of the armed forces, we have to understand the tactics and the strategies used in war. Countries have their own military doctrines about how to face the enemy. Military history is studied at the various Armed Forces establishments. The purpose is to ensure that we do not repeat past mistakes, we improve upon its current performance by learning the lessons from the past.
3. **Diplomacy :** Some of the strategies are diplomatic. These are political strategies. This may include putting pressure on countries through threats or resolving problems through dialogue.
4. **Causes :** It is the study of the causes of war. There can be political, economic, cultural and other causes of war.
5. **Effects :** We study the effects of war. There is a huge loss of life and property. It has social and psychological effect on the people.

The discipline of military history is dynamic. It tries to understand the changes in society, economy and technology. Military history is an academic discipline. The core of the subject is the histories of war, both particular wars and the conduct of war. A historian can look at the history of war from various angles. It can be looked at from the perspective of how the battle was fought or from the perspective of political leadership, economic issues, and socio-cultural dimensions.

Can we broadly define what military history is ?

Military history encompasses history of wars. It includes the study of prominent military leaders, the manner in which wars were fought and the military institutions. It also includes the connection with politics, economics, society, nature and culture.

Why Study Military History

All nations, big or small, try to ensure that their national interest is maintained. National security is the most important component of national interest. They are willing to go to war to protect their national interests. This has been the core of military history since ancient times. Military history covers a wide range of subjects. It will help us to understand why this subject needs to be studied. Let us look at some of them :

1. First, there is the relationship between war and the development of states. Look at the history of India. The introduction of Buddhism in India during the Ashokan Empire was a result of the Kalinga war. He was the first ruler to create an all India empire. Chhatrapati Shivaji Maharaj fought against the Mughal rule to sow the seed of the Maratha Empire. Chhatrapati Shivaji Maharaj introduced the idea of creating an 'Indian' empire. It was this idea that was carried forward by the Maratha Empire in later years.

2. Second, it helps us to study the relationship between war and the international order. The First World War brought in the League of Nations while the Second World War led to the creation of the United Nations. These organisations were created to maintain peace and order in the world. They tried to create a new world order in the world.
3. Third aspect is the impact of war on the society and culture. War brings great changes in the society. India experienced a war during the Partition of India in 1947. It had a profound impact on the Indian society. The people who migrated from Pakistan to India brought in a new lifestyle and culture. Wars result in migrations and that impacts the lifestyle of the local people.
4. What value does the study of military history bring to the armed forces ? Would the study of the World Wars or wars that India fought help the military to plan for a future war? The study of wars does not mean that the military leadership will follow the old tactics and strategies in the future. The real value of the study is the knowledge it provides to think strategically, logically and rationally. Strategy is the use of military to achieve political goals. The military commander must be able to think in a logical and rational manner as to what strategy to use. The study of military history provides this ability.

Indian Military History

Historical events of any country have to be understood with reference to the environmental conditions that influence it. Permanent factors of the environment are the topography of the land, availability of water and climate and seasons.

Let us take a look at some of the key trends in Indian military history from ancient times. This section will focus on the ancient, medieval and modern period of Indian history. You have already studied this history in school. What we will do here is highlight some of the issues that relate to military history of these periods.

Military History of Ancient India :

The Indus Valley Civilization is one of the oldest known civilizations in the world. The archaeological sites of Lothal, Dholavira, Mohenjo-Daro and Harappa give some information of the weapons of that period. The cities of that period were well built. There appear to have been some fortifications. These were sturdy walls made with bricks. Evidence shows that archers were employed and knives have also been found. Their central military strategy was defensive in nature. It is believed that the Indus Valley civilization was defeated because of a defective military strategy.

India experienced the Persian invasions during 549 – 515 BCE and later Macedonian invasion by Alexander during 327 -325 BCE. The Macedonian form of warfare placed importance on cavalry and infantry with mounted archers. But it was characterised by brutality, massacre and enslavement of general population. The Mauryan army during the time of Ashoka placed importance on the infantry and archers. War elephants had played a significant role in the battle between Alexander and Paurava (Porus) (326 BCE). They continued to be important during the Maurayan period.

One of the most significant contributions on the system of warfare during that period was Kautilyas's Arthashastra. He talks of seven essential elements of the state: the King; Amatyas or Ministers and other officials; Janapada or geographical

territory; Durga or fort; Kosha or treasury; Danda or an army and Mitra or allies. He gives a detail analysis of battle strategies including battle formations, command and control, role of the commander, etc.

This phase also saw India's political and cultural expansion outside the traditional boundaries. The Cholas were able to spread their empire in the Bay of Bengal area in the areas of Ceylon (Sri Lanka), Burma (Myanmar) and South East Asia.

Dholavira Fortifications

Ashokan Fortifications

Some of the features of the military system of ancient India can be stated as follows :

1. The military orientation was mainly defensive. Massive forts were built to protect the populace.
2. The state maintained a regular defence force, but the budget provided was very small.
3. The Maurya period saw a shift from the use of cavalry to use of elephants.
4. A unique feature of the Indian system of warfare was that the rules of war were followed. This made warfare humane and civilised.
5. It was during the rule of Ashoka that for the first time there was an all India empire. It has been described as a 'unified state'. This is because for the first time there was an all India administrative network.
6. India's maritime capabilities were seen during the Chola rule that created an empire in South East Asia.

Great Generals of Ancient India :

- The first great military leader we know was **King Sudasa** who won many battles against other Aryan tribes as well as the Dasas, Dasuyas and the Rakshas. He is supposed to have fought a combination of ten kings in a battle called the Dasrajan war sometime during 1200/1300 BCE.
- The Magadha empire produced several military leaders. **Ajatasatru, Mahapadam Nanda** and **Emperor Chandragupta** are known names. This was followed by **Emperor Ashoka** who gave the unique message of Dhama (Dharma). This empire extended from the Iranian border in the west to Bengal in the east and from Hindukush mountains to Karnataka in the south.
- The **Paurava King** who fought a great defensive battle against Alexander has not been given due recognition in India.
- In the second half of the First century a great general of the house of Chedi-rajavansa of Kalinga, **King Karavela** defeated rulers of Bengal and came upto Vidarbha. He defeated the Magadha army and plundered Rajagriha.

- The Guptas had several great military leaders. **Samudragupta** (345-380) created an empire from Central Punjab in the west to Assam in the east and included Andhra Pradesh and large parts of Madhya Pradesh. His son **Chandragupta Vikramaditya** (380-414) He expanded the Gupta empire to the region of lower Sindhu and advanced into Kabul. His son **Skandagupta** (456-467) continued the offensive in Punjab.
- **Lalitditya** (742-760) of Kashmir defeated the Tibetans on the north-east and the Kambojas and Turks in the north-west. His territories included Kangra, Taxila, Hazara, Poonch and Rajouri.
- **Chalukya Pulakesin II** (610-642) conducted campaigns against the Pallavas. He extended his kingdom to the shores of the Arabian sea and ensured the security of Gujarat and Malwa region.
- The Rashtrakuta kings **Dhruva** (780-793) and **Govinda III** (793-814) and Indra III (914-927) defeated the Palas of Bengal and Gurjara Pratiharas. Krishna III (939-967) firmly held the whole of the South and Deccan during his reign.

Foreign Invasions during Ancient Indian period :

- The Indus people were defeated because they did not give much importance to defence and security. They placed a lot of faith on fortifications which could not withstand the offensive tactics of the outsiders.
- The Persians captured the north western regions in the 6th century BCE. But they were not able to make a significant impact.
- Alexander's invasion during the 4th century BCE was limited by the resistance put up by the Pauravas.
- The Bactrian Greeks succeeded in capturing the north-western and the western parts of the country from the middle of the 2nd century.
- The Sakas, the Pahlavas and the Kushans followed. The former two were deprived of their empire by the Guptas. In the middle of the 4th century.
- The next invasion was by the Arabs who were inspired by their religious zeal.

What do you think? Discuss in class :

- There is an impression created by western historians that India has always submitted to invasions. Actually, ancient India did not suffer an unusually large number of invasions. In most cases Indian rulers were able to defend their regions.

Military History of Medieval India :

The Turkish invasions of India from the time of Mahmud of Gazni followed a pattern. These attacks usually took place between October and February. This is because the monsoons were over by October and the summer heat would begin after February. These invaders did not capture territory. They invaded and took back the loot. They were mounted archers who used composite bows.

From the 12th century onwards until the foundation of the Mughal empire by Babur, India experienced attacks and then consolidation by the rulers who came from the North West. Until the First Battle of Panipat between Babur and Ibrahim Lodhi in 1526 firearms were unknown to India. From Akbar until Aurangzeb the Mughal empire grew into an all India empire. Akbar's important contribution was his policy called Suleh Kul (Peace to All). It tried to integrate the Hindu society in the system of governance.

This was also the period of Chhatrapati Shivaji Maharaj. His success is twofold: One, he laid the foundations of the concept of an 'Indian' empire. His struggle was against the 'outsiders' who were ruling India. Two, he was successful in using geographic features of the Deccan to formulate a system of warfare that is called guerrilla warfare. Chhatrapati Shivaji Maharaj was successful in lighting the flame in the minds of the Marathas that they were to fight to create an indigenous empire. The Third Battle of Panipat of 1761 proved that the Marathas were fighting for a principle that India was for Indians, governed by Indians. This is because they went all the way to the North West frontier to defend this country.

Can you find out ?

- Find out who fought the Third Battle of Panipat.
- On the map of India locate Panipat.

Another important development during the Maratha rule was the awareness of maritime security. The naval strength developed during Chatrapati Shivaji Maharaj's period and the role played by

Maratha Ships attacking British Ships

Sarkhel Kanhoji Angre

the Angres along the Konkan coastline was of critical importance. They were able to check the Portuguese, French and the British expansion in this region.

The study of the military history of medieval India teaches us some lessons :

1. The modern system of warfare adopted by the Turkish invaders, the mobility of the cavalry and the use of new technology (firearms) were decisive in battle. The Marathas were able to achieve the mobility by use of cavalry and that made them successful.
2. The inability of the Indian rulers to unite against foreign aggression resulted in the success of the Turkish and Mughal invasions in India.
3. This phase also saw growing awareness about maritime security.
4. Akbar's policy and the policy initiated by Chhatrapati Shivaji Maharaj that came to be followed during the Maratha rule later were of assimilation of cultures. It is this policy that is referred to as Sarva Dharma Samabhava (peaceful coexistence amongst all religions).

Great Military Leaders of Medieval India :

- **Rajaraja the Great** (985-1014) of the Cholas of Thanjavur expanded his small kingdom to include the whole of South India, the Maldives and Sri Lanka. His son Rajendra I Gangaikondachola (1012-1044) expanded the empire further to reach Ganga. He assumed the title 'Gangaikondachola' , the Chola who captured the Ganga. He was the first in the country to launch a successful naval expedition overseas into South-East Asia.
- **Lakshmikarana** (1034-1042) of the Kalachuris of Tripuri campaigned in the area of East Bengal, Orissa, Central India, Gujarat and parts of Rajasthan.
- **Krishnadevaraya** of Vijayanagara (1509-1529) remained undefeated and supreme in the Deccan.
- Amongst the Rajputs, **Rana Sangram Singh** (popularly known as Rana Sanga) and **Maharana Pratap** were both inspiring leaders.
- In case of the Mughals, **Akbar** qualifies as a great general. He established a secure empire from the Hindu Kush to the Deccan.
- In case of the Marathas, **Chatrapati Shivaji Maharaj** laid the foundation of an indigenous Indian empire. **Santaji** was a brilliant strategist in the area of unconventional warfare. **Sarkhel Kanhoji Angare** proved his military capabilities in terms of maritime security. **Peshwa Bajirao** was able to build on the earlier contribution and establish the Maratha power in the Deccan and the South.

Do you know ?

- **Maratha War Aims :** Chhatrapati Shivaji Maharaj's aim was to create a Hindvi Swaraj that was a Dharma Rajya. The aim was not merely to liberate Maharashtra but to conquer Delhi. The purpose was to create an indigenous empire. For the first 15 years his army was mainly infantry force that could operate in the hilly terrain and conduct guerrilla warfare. Later he realised that a mere defence of forts would not serve the purpose. He then shifted from a purely defensive strategy to an offensive defence with suitable mobile forces. Consequently, cavalry was created. What began with Chhatrapati Shivaji Maharaj was carried forward in the later period. The battle of Panipat is looked at as an attempt by the Peshwas to fight against an external force of Ahmad Shah Abdali to protect India.

Modern Warfare :

In Europe the last decade of the 15th century saw the change from medieval warfare to modern warfare. The army became more professional, more national and better equipped. Guns started to replace battle-axes, bows and arrows. Later, the artillery started to gain more importance and the infantry and cavalry was being integrated with the artillery.

In India, guns were introduced in the 14th century. But they did not bring any change in the method of conducting war. Cavalry continued to be the most important component of the army. It was the battle of the Adyar River (1746) that brought in change in India. The success of the French against the Nawab of Carnatic was because of the use of the use of muskets. Musket trained units of the army were better than a large cavalry. This battle brought modern warfare to India. The Indian powers, Marathas, Nizam and Haider Ali now began to look for Europeans to train their armies.

The main characteristic of modern warfare was the role, equipment, employment and the function of the infantry. Composition and employment of artillery, professionalism and improvement in weapons was crucial. Secondly, guns were standardised. The function of the artillery was to support the troops. The Sindhias were the first to raise the gardi battalions. These were infantry battalions equipped and trained along European lines. The Peshwas, Holkar and Tipu Sultan and later on the Sikhs followed this system.

Military History of Modern India :

The Portuguese were the first Europeans to come to India. Vasco da Gama landed in India in 1498. They were followed later by the British and the French. The Portuguese and the French power declined while the British were able to establish themselves.

The Battle of Plassey (1757) is considered the beginning of the establishment of the British rule in India. After having secured control over Bengal the British turned towards the other regional powers, the Marathas, Nizam and Mysore. After the fall of Tipu Sultan in 1799 and the Marathas in 1818 the English were able to annex Sindh in 1842 and defeat the Sikhs and take over Lahore in 1848. After the first Indian war of independence of 1857 the British government took over the control of India from the East India Company. By the late 19th century the British were able to finalise the Afghanistan boundary and in the early 20th century they finalised the boundary between India and China (including Tibet).

What lessons do we learn from the British period ?

1. **Frontiers and Boundaries :** Traditional Indian thinking had always used the term frontiers to describe the extent of their empire. For example, when we talk of Akbar's empire we say it extended upto Kabul and Kandahar. Or the Maratha Empire under the Peshwas extended up to Attock. Frontiers describe a general geographic area that lies between two countries. The British brought in the idea of boundaries. Boundary is a specific line that marks the territories of two countries. The McMahon Line, the Durand Line or the Radcliff Line are boundaries.

Durand Line

McMahon Line

Radcliffe Line

Do you know ?

- The **Durand Line** was boundary line between Afghanistan and British India. It was established in 1893 on the basis of an understanding between Foreign Secretary Mr. Mortimer Durand of British India and Afghan Amir Abdul Rahman Khan. Today the Durand Line is the border between Pakistan and Afghanistan.
- The **McMahon Line** is a border line between Tibet region of China and North East region of India (Arunachal Pradesh) finalised by British colonial administrator Henry McMahon at the 1914 Shimla Conference.
- The **Radcliffe Line** is the boundary line between the Indian and Pakistan portions of the Punjab and Bengal. It was named after its architect, Sir Cyril Radcliffe who was the joint chairman of the boundary commission.

These are examples of two boundaries :

Barbed wire fence

Border pillar

2. **Defensive Orientation :** The North Western region continued to remain the key source of threat during the British days. British concerns with China and hence Tibet were the other factor in security thinking that led to consider the Northern region as the clear source of threat. The former had been addressed through the Durand Line, the latter with a position on Tibet as an Autonomous Region that meant suzerainty and not sovereignty of China over Tibet.

3. **Marine Security :** The British held control over the Indian Ocean, both in terms of the littoral and the two crucial choke points, Suez and Straits of Malacca. Therefore, invasion from the sea was not considered a security threat.

Each country always tries to protect its national interest. National security is one of the most important components of national interest. In this survey of military history we have given the highlights of the three time periods. The purpose is to understand the manner in which approach to warfare changed over a period of time. There were several changes in the weapon systems, technologies, strategies, etc. In the earlier period we looked at small and big kingdoms and their policies. We also looked at the British Indian policies. Today after independence we look at India's national interest. The past history will help us to understand the military history of independent India.

Please see the following websites for further information :

1. Durand Line Written By : The Editors of Encyclopaedia Britannica.

https://www.britannica.com/event/Durand-Line

2. McMahon Line, international boundary, China-India Written By : The Editors of Encyclopaedia Britannica.

https ://www.britannica.com/event/McMahon-Line

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. Cholas were able to spread their empire in _____

a. South East Asia

b. West Asia

c. Afghanistan

d. North Asia

ii. The Battle of Plassey (1757) is considered the beginning of the establishment of the _____

a. Maratha rule in India

b. British rule in India.

c. Mughal rule in India

d. French rule in India

Q. 2 State whether the following statements are true or false with reasons.

i. The First battle of Panipat was fought between Humayun and Ibrahim Lodhi

ii. Chhatrapati Shivaji Maharaj laid the foundations of the concept of an 'Indian' empire

Q. 3 Explain the correlation between the following.

i. Nature of weapons systems and method of warfare

ii. Frontiers and Boundaries

Q. 4 Observe the given map and write about it in brief

Q. 5 Express your opinion on the following.

What is the importance of Akbar's policy of 'Suleh Kul' ?

Q.6. Answer the following.

Why should we study military history ?

Activity :

The McMahon Line was created at the Shimla Conference of 1914. Locate the Line on the map. Find out who participated at this conference and how the McMahon line came to be created.

Chapter 4 Defence Economics

In the Chapter on Key Concepts of Defence Studies, you have learnt that 'Economics' is an important dimension of 'National Security and National Power'. The need for a nation to be prepared for defence and its economic cost was well recognised from ancient times. In the Anushashan Parva of the Mahabharata, Bhishma instructs Yudhishtir about the duties of a King. He explains to him that a king should always protect his people. During the Mauryan rule, Kautilya considers war as a last option. But he also advises that when war is inevitable, preparation and maintenance of army is essential for the defence of the nation.

Adam Smith, the founder of economics as a discipline in the social sciences, was the first economist to theorise about the economics of war, in his major work, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776). He also accepted that the first duty of the sovereign is to protect the society and for that a military force is necessary. But how does the country meet the expenses of defence? He argued that since defence was common good for all the citizens the expenses must be met by everyone. He thus considered defence to be 'public good'. It meant that it is for the benefit of all the people of the country. But everyone cannot pay the same amount to the government. The poor would not be able to afford to pay the same as the rich. Therefore, he suggested the policy of 'payment according to ability'.

Today defence economics is an inescapable part of a nation's economic management, it is a useful way of looking at military problems, many of which can essentially be seen as economic problems in the efficient allocation and use of resources. We can consider the economic problems of defence at three levels: (i) the quantity of national resources available now and in the future; (ii) the proportion of these resources allocated to national security purposes; and (iii) the efficiency with which the resources so allocated are used.

What is Defence Economics ?

Defence Economics is a sub set in the field of national economic management, concerned with the economic effects of military expenditure and the management of military budgets during peace and war.

To further amplify the scope, defence economics extends over the overall economy involving defence-related issues, which includes the level of defence spending; the impact of defence expenditure on domestic economy; the defence industry sector; the relation of defence spending to technological changes and the implications of defence spending for international peace and stability.

Determinants of Defence Expenditure

National security is highly valued by most citizens, judging by the sacrifices that many nations make when territorial integrity, or fundamental interests, are threatened. Nations tend to swing between the extremes

in terms of expenditure. They spend more on defence when military pressure is actually exerted on the country, and less when peace prevails. Perceptions are important in determining the demands for expenditure. Some of the determinants for expenditure are :

1. **Security Scenario :** Security issues include confrontations with neighbours, due to territorial and sovereignty disputes, competition over natural resources, managing bordering ethnic peoples and instability of a neighbour. India has faced and continues to face such confrontations with China and Pakistan. After the 1962 war with China, there was a manifold jump in India's defence expenditure.
2. **International Obligations :** India is committed to treaty obligations, including cooperative efforts with the United Nations (UN) and other coalitions and countries, including peacekeeping operations, humanitarian assistance, and disaster relief. India has such obligations with the UN, Bhutan, Nepal, Myanmar and Maldives which requires considerable expenditure from time to time.
3. **New Threats :** Impact of trans-national issues such as terrorism, drug-trafficking, and environmental issues have an impact on defence spending. India faces such threats from across the border from most of her neighbours. This has led to increased deployment of border security resources, leading to rise in expenditure.
4. **Maritime Issues :** This includes protection of Exclusive Economic Zones (EEZs), marine resources, and fisheries. India raised the Coast Guard specifically for this task at considerable cost.
5. **Trade :** Protection of market access to trade, investment, energy, food, and other vital resources requires finance. India imports eighty percent of her energy needs from oil producing nations by sea, these routes need to be protected. This means that India needs a strong Navy to protect its sea routes.
6. **Domestic Concerns :** Internal security issues include maintaining domestic law and order, counter-insurgency, etc. India is faced with the Naxal problem as also Pakistan sponsored terrorism. The Central Reserve Police has been strengthened and expanded for this task.

Defence and Development

One of the issues in the discussion of defence economics, is in context to third world and developing nations. These nations face the challenges of economic development and poverty alleviation. The question is if such a nation spends on defence, will it be at the cost of development ? Or is there a case, for both defence and development going hand in hand keeping in mind the overall interests of the nation.

In the 1940s and 1950s, defence expenditure was not looked at positively. It was thought that it took money away from development. In the past development was understood simply as economic and industrial growth. Today things have changed. Today development is looked at in a holistic manner. It involves several aspects. We talk of social, political, economic development, modernisation,

and environmentally friendly approaches. The word used is sustainable growth and development.

The Complementary Nature of Defence and Development :

Today we see defence and development to be complementary. Some examples are given below :

1. Adequate expenditure on national security helps create a peaceful and secure atmosphere, this is conducive for industrial and economic growth. This creates more jobs and income which leads to increase of the Gross Domestic Product (GDP). A good rate of increase in GDP, attracts more investment in the nation's economy. Thailand consistently leads its neighbours Cambodia, Laos and Myanmar in development because of the peace and tranquillity it enjoys as compared to the neighbours, this in turn makes it the number one tourist destination of the region.
2. Defence spending includes creation of infrastructure such as roads, bridges, railway lines and airports. This helps development of backward areas. Ladakh and Sikkim are areas which saw rapid development due to construction of defence oriented strategic roads.
3. Development of defence industrial sector gives a boost to civilian industries, by bringing in new technology and setting up of ancillary industries. For example, requirement of Titanium alloys to manufacture fighter jet engines and artillery guns has resulted in a plant to convert indigenous ore to Titanium metal and alloys which are also used in civilian industry. This has resulted in import substitution and creation of more jobs.
4. As defence forces recruit large number of youths from rural areas and train them in various skills, it widens the mental and attitudinal horizons of the recruits, they pass on these skills and disciplined behavioural norms to their village.

Creating infrastructure in forward areas for defence and development

Do you know ?

The Third World is a collective name for the countries of Asia, Africa and South America. Most of these countries had been colonies in the past. They are also described as developing, less developed, or least developed countries. This is because they have a slow pace of industrialisation, low literacy rate and high level of population. Most of these countries have joined the nonaligned movement. During the cold war the Western capitalist economies aligned with the United States were described as the First World and the Eastern communist economies aligned with the Soviet Union were referred to as the Second World.

Increasing Commonality in Defence and Non-Defence Expenditure

Besides the complementary nature of Defence and Development there is also an increasing trend of commonality in the end use (also called dual use) of technical and economic resources for commerce as also security. For example; nations now build up strategic reserves of natural resources like petroleum, food grains, and metals at a great cost, to ensure against an adverse impact on their national economy in case of disruptions in their supply due to international/diplomatic pressures, internal disturbances or war. Similarly, nations spend large amounts on cyber security during peace time, mainly against espionage and economic crimes, this cyber security is also designed to ensure the protection and serviceability of vital national internet-based networks.

Dangers of Over spending for Defence

Defence spending is inescapable for a sovereign nation; a nation has to be judicious in balancing its security concerns with that of welfare and development needs of its citizens. Overplaying the security needs often leads to nations overspending beyond their economic abilities. Such a situation more often than not has led to the down fall of the nation. This occurs when a nation gets involved in an arms race with its rivals, or due to the whims and fancies of its rulers. A leading superpower like USSR also suffered a political and economic implosion in the 1980s. In trying to build the world's largest military force it could not economically afford in competing in an arms race with the USA.

India's Defence Budget

Every year in February, the Indian Finance Minister presents the Budget to the Parliament. The Budget gives an estimate of the nation's income and expenditure for the next financial year. In the budget speech, the Finance Minister gives out the amount that would be allocated in the ensuing financial year for expenditure to various armed services and entities under the Ministry of Defence (MOD), i.e. the Army, Navy, Air Force, Coast Guard, DRDO, Ordnance Factories Board and the Defence Pensions. The allotments are based on estimates projected by the various services and entities to the MOD.

Among all the nations of the world, India is ranked among the top five military powers. India is also among the top five nations ranked as per the annual budget expenditure. However, India's ranking in defence spending as per percentage share of GDP is not in the first five but much lower. This means India allots much lesser percentage of its national income on defence

The percentage share of Defence in GDP is considered as a common measure of a country's Defence expenditure and gives a fair idea about its affordability. In case of India, the percentage has been as follows :

Year	% of GDP
2014-15	2.06%
2015-16	1.96%
2016-17	1.50%
2017-18	1.56% (Budget Estimates)

Source : Committee on Estimates, 2018-19, 29th Report, 16th Lok Sabha, Lok Sabha Secretariat, New Delhi.

Comparative Military Expenditure

Sr. No	Countries	Military Expenditure as percentage of government spending for 2016	Military Expenditure as percentage of government spending for 2017
1.	India	9.0%	9.1%
2.	Pakistan	18.0%	16.7%
3.	China	6.0%	6.1%
4.	USA	9.0%	8.8%
5.	Russia	14.8%	12.0%

Source : SIPRI Military Expenditure Database
https : //www.sipri.org/databases/milex , (28 November 2018)

than other nations who are top five military powers. In fact, China and Pakistan rank much above India in defence spending measured as a percentage of GDP.

The defence budget can be broadly classified under two heads of expenditure:

1) **Capital Expenditure :** Allotments under this head are meant to meet expenditure on account of procurement of weapons and equipment for the armed forces, these include aircraft, ships, guns etc. It also includes creation of permanent infrastructure and assets such as air bases, defence-oriented roads, setting up factories and workshops etc for manufacturing defence weapons and equipment.

2) **Revenue Expenditure :** Allotments under this head are meant to meet expenditure on account of maintenance of weapons, equipment, infrastructural assets like military bases and housing, training activities, pay and allowances, expenditureon consumable and expendable items such as fuel, rations, clothing, spares etc and logistic and administrative activities like transport, medicine and health care etc.

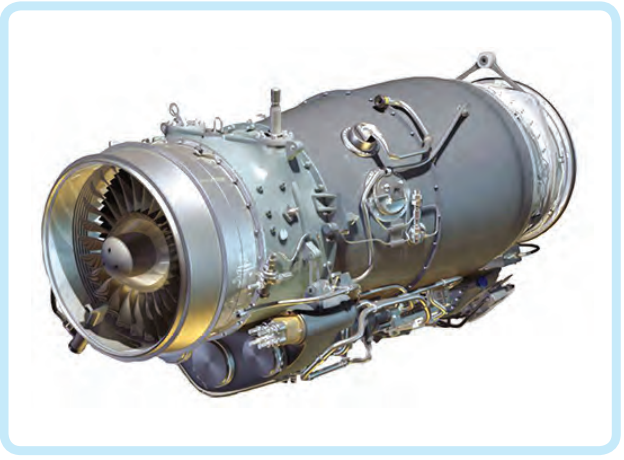
India's Defence Production and Procurement

When India became an independent nation in 1947, the general level of industrialisation in the nation as a whole was very low. There was hardly any capability for the research, design, development and manufacture of weapon systems. India was fortunate to inherit 18 Ordnance Factories (OFs) established by the British rulers in the 18th & 19th century, as also two Ship Repair Yards established in the 1930s, however these were basic in nature, manufacturing low technology items such as uniforms, tents, rifles, small arms ammunition, gun carriages and repairing small ships. Besides the state owned OFs and shipyards, the Tata and the Walchand Group of Industries were the only pioneers in the private sector, with some experience in manufacturing weapons grade steel and the repair and overhaul of aircraft and ships in their factories. Post-independence, the government nationalised and took over the Hindustan Shipyard and Hindustan Aeronautics from the Walchand Group.

Defence Public Sector Undertakings (DPSUs)

From the above-mentioned meagre defence manufacturing resources in 1947, the industry grew significantly but mostly in the government sector. The government established nine (DPSUs) under the Department of Defence Production MOD, they are :

1. **Hindustan Aeronautics Ltd (HAL) :** The main manufacturing hubs are at Nashik and Bengaluru. Its main activity is production of military aircraft and aero-engines. It also builds transport aircraft and helicopters for civil use.



HAL Products

2. **Bharat Electronics Ltd (BEL) :** Plants are located at Bengaluru, Gaziabad and Pune. Its main activities are in the area of radar, electronics and electro-optics and missile command posts for the armed forces. It also makes electronic voting machines for the civilian market.

BEL Products

3. **Bharat Dynamics Ltd (BDL) :** Located mainly at Hyderabad, it manufactures Anti-Tank Guided Missiles (ATGM), Surface-to-air weapon systems, strategic weapons, launchers, underwater weapons, decoys and test equipment.

4. **Bharat Earth Movers Ltd (BEML) :** Its main locations are Bengaluru and Kolar Gold Fields. It is engaged in design, development, and manufacturing of Earth Moving Equipment, Metro rail systems, Heavy High Mobility Vehicles, Mining & Construction Equipment and Heavy recovery vehicles. Some of these products are for use of defence forces.

5. **Mishra Dhatu Nigam Limited (MIDHANI) :** It is situated in Hyderabad, it manufactures a wide spectrum of critical and complex alloys like super alloys, titanium alloys, special steels & stainless steels, soft magnetic alloys etc.

6. **Mazagon Dock Shipbuilders Limited (MDL) :** This is located in Mumbai. It is a leading Shipyard engaged in construction of Warships and Submarines.

7. **Garden Reach Shipbuilders and Engineers Limited (GRSE) :** This is a shipyard located at Kolkata. Besides repair and maintenance of naval vessels. It also constructs warships of all types.

8. **Goa Shipyard Limited (GSL) :** This shipyard is located at Goa and it also does construction, repair and maintenance of light naval vessels.

9. **Hindustan Shipyard Limited (HSL):** Hindustan Shipyard Ltd. is located in the port city of Visakhapatnam on the East coast of India. It does the work of construction and repair of Naval ships and Strategic / Conventional submarines.

Ordnance Factories (OF)

Besides the nine DPSUs, the 18 OFs have also expanded, now there are 41 OFs under the Ordnance Factories Board of the Ministry of Defence engaged in the production of a comprehensive product range in the area of land, sea and air systems. The various products that these factories produce include Ammunition, Explosives, Propellants & Chemicals, Military Vehicles, Armoured

Mazagon Docks Products

Destroyer

Submarine

Vehicle Factory Jabalpur

Vehicles, Optical Devices, Parachutes, etc. Manufacturing of a defence product is seldom done under one roof. The parts and sub-assemblies are manufactured by several small and medium scale industries mostly in the private sector, as per designs given by the designer (DRDO). These are then integrated by the OFs and DPSUs to make the final product.

Participation of Private Sector and Foreign Companies in Defence Manufacturing.

The DPSUs and OFs are not able to meet all the demands of making modern weapon systems in the required quantity and time. India tops the list of weapons importing nations Seventy percent of India's weapon systems are imported from abroad, with Russia, France, USA and the UK being the major suppliers. The Air Force followed by the Army are more dependent on imported weapons, the Navy is in a happy position as most of its warships are made in India.

In a bid to make India self-reliant in manufacturing the necessary weapons, the government, since 2001 has progressively increased the scope of participation of Indian Private Sector companies to manufacture weapon systems for the armed forces. Besides this the government has also permitted foreign companies to invest in setting up defence manufacturing plants in India, as also form joint ventures with Indian companies. Hopefully India will become self- reliant in the not too distant future.

Please see the following website for further information :

Comparative Military Expenditure

SIPRI Military Expenditure Database

https://www.sipri.org/databases/milex ,(28 November 2018)

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. Adam Smith considered defence to be _____

a. Public good.

b. Wasteful expenditure

c. An unnecessary activity of the State.

d. An individual choice

ii. Expenditure done to meet expenditure on account of procurement of weapons and equipment for the armed forces is _____

a. Revenue expenditure

b. Capital expenditure

c. Contingent expenditure

d. Private expenditure

(B) Find the odd word from the given set.

i. Bharat Electronics Ltd (BEL).

ii. Ordnance Factories (OFs)

iii. Bharat Earth Movers Ltd (BEML)

iv. Hindustan Shipyard Limited (HSL).

Q. 2 State whether the following statements are true or false with reasons.

i. India's defence expenditure reduced after the 1962 war with China.

ii. Development of defence industrial sector gives a boost to civilian industries.

Q.3 Answer the following questions briefly.

What is the role of Ordnance Factories ?

Q.4 Express your opinion on the following.

What are the dangers of overspending for defence ?

Q.5 Answer the following.

What is the difference between capital expenditure for defence and revenue expenditure for defence ?

Q.6. Answer the following in detail with reference to the given points.

What are the determinants of defence expenditure ?

(a) Security scenario,

(b) International obligations

(c) New threats

(d) Domestic concerns.

Activity :

Write a note on any one Defence Public Sector Undertaking. Discuss its importance in the classroom.

Chapter 5 Science, Technology and India's National Security

In Chapter I of this Book you have learnt, that to protect national security, a nation requires to develop National Power. You had also learnt about the various elements of national power. One of these elements is science and technology. Let us see the role of science and technology in national security.

Relationship between Science, Technology and Engineering

Technology is often developed from the basic knowledge of science combined with engineering. For example, science might study the flow of electrons in electrical conductors by using already-existing tools and knowledge. This new-found knowledge may then be used by engineers to manufacture new tools and machines such as semiconductors, computers, and other forms of advanced technology. In this sense, scientists and engineers may both be considered as technologists. Therefore the three fields i.e. Science, technology and engineering are often considered as one for the purposes of research and development. The definition of each given below will enable better understanding of the relationship of three terminologies :-

1. **Science :** Science is an intellectual and practical activity. It does a systematic study of the structure and behaviour of the physical and natural world, through observation and experiment. The purpose of this study is to gain knowledge.
2. **Technology :** It is the application of practical sciences to industry or commerce. Technology refers to methods, systems, and devices which are the result of scientific knowledge being used for practical purposes. A modern example is the rise of Information Technology (IT) which is the combined application of computer science and electronics.
3. **Dual-Use Technology :** It is that technology which can satisfy more than one goal at any given time. Thus, expensive technologies which would otherwise serve military purposes are also used to benefit civilian interests. Examples: Global Positioning System; Technology for Satellite launch rockets can also be used for manufacturing long range missiles; Nuclear reactors produce electricity, as also produce plutonium for making nuclear bombs.
4. **Engineering :** It is the application of various kinds of knowledge to invent, innovate, design, manufacture, various components.
5. **Manufacturing :** It is the process of converting raw materials, components, or parts into finished goods. Technology is an essential component of manufacturing.
6. **Industry :** It is a group of manufacturers or businesses that produce goods or services. In the modern world, industries form the backbone of a nation's economy.

Did you know ?

The Industrial Revolution led to the development of factories for large-scale production with consequent changes in society. Originally the factories were steam-powered, but later transitioned to electricity. The mechanized assembly line was introduced, with individual workers performing specific steps during the process. This led to significant increases in efficiency, lowering the cost of the end product. Later automation was increasingly used to replace human operators. This process has accelerated with the development of the computer and the robot.

Scientific, Technological and Industrial Development in India

India was the cradle of knowledge in many fields such as medicine, mathematics and astronomy since ancient times. Textiles and Ship building industry was well advanced in medieval India. HMS Trincomalee was a 38 gun frigate built at Bombay (Mumbai) for the British navy. The designer was Jamsetjee Bomanjee. The ship's keel was laid down in 1816 and launched in October 1817.

Thus until the 17th century India was technologically, economically and militarily at par with the European nations. In 1780 Tipu Sultan surprised the British forces by using rockets against them; the British copied these rockets and used them against Napoleon in Europe in 1812. The Industrial revolution commenced in England around 1760 and spread to Europe. Unfortunately, the Indian subcontinent fell behind the Europeans in various fields such as textiles, metallurgy, explosives, machinery for mass production and transport systems. The subjugation of India by the British in the 18th century, led to the dismantlement of India's indigenous industries such as textiles and shipbuilding.

Under British rule, the education system also suffered; there was very little encouragement in establishing institutions of learning, research and for development of science and technology. After independence in 1947, the government encouraged scientific-technical research through the establishment of several national research laboratories and institutions for higher education and research in pure and applied sciences and technologies. These efforts resulted in rapid strides in science and technology with achievements in many fields. These include agriculture, textiles, health-care, pharmaceuticals, info-tech, space, nuclear and defence technology.

All of these scientific and technological achievements, including those in a purely non military field, also have tremendous significance from the strategic and national security angle. For example, the green and white revolution in agriculture and dairy farming ushered in through efforts of Dr. Swaminathan and Dr. Verghese Kurien respectively, has resulted in India becoming self sufficient in production of food grains for its population. Unfortunately, the spread and speed of industrial development in the field of manufacturing did not match up to that required for rapid development of the nation.

In 1991 major economic reforms took place in India. Private participation in the industrial sector increased. However, India is yet to become self-sufficient in some high technology manufacturing sectors including weapons technology. Indian scientists and engineers like Dr. Homi Bhabha Dr. Vikram Sarabhai, Dr. Abdul Kalam, Dr. Vijay Bhatkar, Dr. Swaminathan, Dr. Verghese Kurien, and others have helped India achieve notable success in a number of fields of military, non-military and dual use technologies. For example :

1. **Military Technology :** In the field of Military Technology Dr. Abdul Kalam was instrumental in making India capable of building all types of missiles required for its armed forces.

2. **Nuclear Technology :** Dr. Homi Bhabha pioneered India's nuclear development program, both for peaceful and military purposes. Besides being a nuclear weapon state, India has built its own nuclear reactors to generate electricity.

3. **Space Technology :** Dr. Vikram Sarabhai, Dr. Kasturirangan and many others scientists of the Indian Space Research Organisation (ISRO), have made the nation self-sufficient in building and launching rockets, spacecraft and satellites. Satellites are invaluable in providing the nation with communication, navigation and surveillance facilities for military as well as civilian purposes.

4. **Agriculture :** Dr. M.S. Swaminathan an agricultural scientist and Dr. Kurien Verghese an engineer by education, made a success of the green and white revolution respectively. Consequently India is now a leading producer in the world for food grains, fruits, vegetables, milk and poultry. Even this purely non-military development has a tremendous significance from the strategic and national security point of view.

5. **Information Technology :**

   Dr. Vijay Bhatkar, led a group of young engineers to build India's first super computer. A number of young Indian engineers and entrepreneurs like Dr. Narayan Murthy made India a leading power in Information Technology.

Science, Technology, Manufacturing and National Security

India needs to develop science and technology to rapidly develop the economy, achieve prosperity and ensure the economic and social welfare of the citizens. India's size, geopolitical status, security threats and need to protect national interests makes it necessary for India to become capable of developing and making the necessary weapons and allied systems for its armed forces.

The Government of India has spelt out various policies and plans to tackle the challenges that cover practically all possible fields to include economic, social, scientific and technological aspects concerning the nation. However in this chapter, we shall restrict ourselves to the brief study of the following fields of science and

technology which have a major impact on national security.

i) Space.

ii) Nuclear.

iii) Electronics.

iv) Military.

Indian Space Program

Dr. Vikram Ambalal Sarabhai (1919-1971)

Dr. Sarabhai is considered as the Father of the Indian space program. The establishment of the Indian Space Research Organization (ISRO) was one of his greatest achievements.

The Indian National Committee for Space Research (INCOSPAR) was set up under the leadership of Dr. Vikram Sarabhai and Dr. Ramanathan in 1962. Later, INCOSPAR was transformed into the Indian Space Research Organisation (ISRO) on August 15, 1969

ISRO's Vision Statement :

'Harness space technology for national development, while pursuing space science research and planetary exploration'.

Today, India is among the top five space powers in the world. India is self-sufficient in building and launching rockets, spacecraft and satellites. It has started space exploration, through the success of the Chandrayaan 1 mission to the Moon and the Mangalyaan mission to Mars.

The Indian space programme has the following three distinct elements :

(1) Launchers : ISRO made a humble beginning by launching indigenously made sounding rockets from 1965. There after it has built a series of satellite launch vehicles.

(2) Spacecraft : ISRO has developed and launched a large number of satellites for sensing, interplanetary exploration and navigation.

(3) Application Programmes : These are satellite-based programs ranging from education, health, remote sensing, mapping, navigation and military purposes.

Space has always been considered to be an important aspect of scientific research and development. Technological inventions in areas of metallurgy, super conductivity, Nano technology and cryogenics are dual use technologies. ISRO developed Lithium Ion Batteries to power its satellites; they also have several military applications, one of them being their use in submarines.

Did you know ?

Sounding rockets are one or two stage solid propellant rockets used for probing the upper atmospheric regions and for space research. They also serve as easily affordable platforms to test or prove prototypes of new components or subsystems intended for use in launch vehicles and satellites.

ISRO SATELLITE LAUNCH VEHICLES

SLV-3

Height : 22.7m
Lift-off weight : 17t
Propulsion : All Solid
Payload mass : 40 kg
Orbit : Low Earth Orbit

ASLV

Height : 23.5m
Lift-off weight :39t
Propulsion : All Solid
Payload mass : 150 kg
Orbit : Low Earth Orbit

PSLV-XL

Height : 44m
Lift-off weight : 320t
Propulsion : Solid & Liquid
Payload mass : 1860 kg
Orbit : 475 km Sun Synchronous Polar Orbit (1300 kg in Geosynchronous Transfer Orbit) Payload mass

GSLV Mk II

Height : 49m
Lift-off weight : 414t
Propulsion : Solid, Liquid & Cryogenic
Payload mass : 2200 kg
Orbit : Geosynchronous Transfer Orbit

GSLV Mk III

Height : 43.43m
Lift-off weight : 640t
Propulsion : Solid, Liquid & Cryogenic
Payload mass : 4000 kg
Orbit : Geosynchronous Transfer Orbit

For details see : https://www.isro.gov.in/applications

Nuclear Programme

India began its nuclear programme soon after independence. The Atomic Energy Commission (AEC) was established to advise the government on nuclear issues. The main purpose of the nuclear programme had been to use nuclear energy for civilian power reactors to produce electricity. Dr. Homi Bhabha and Meghanand Saha played an extraordinary role in the nuclear field. In 1954 the Department of Atomic Energy was created under the leadership of Dr. Homi Bhabha.

Nuclear energy is going to play an increasingly important role in India's energy security and sustainable development plans. India has the largest Thorium ore resources in the world and therefore, Thorium can be used as the basic fuel for nuclear power reactors. Though Thorium itself is not a fissile material, and thus cannot undergo fission, yet it can be transmuted to uranium-233 in a reactor fuelled by natural uranium or plutonium. This would reduce India's dependence on fossil fuels. To achieve this, Dr. Homi Bhabha had in the 1950s, conceived of the three-stage nuclear programme, as a way to develop indigenous nuclear energy to overcome the problem of India's limited source of Uranium through Thorium.

Dr. Homi Jehangir Bhabha (1909-1966)

Dr. Bhabha was a scientist, visionary and institution builder. He was instrumental for the formation of Atomic Energy Commission in 1948 and the Department of Atomic Energy in 1954. He was such a visionary that he had realized the importance of nuclear power programme way back in 1950s and enunciated a three stage nuclear programme so as to meet the energy security of the nation.

Do you know ?

Strategy for Nuclear Energy : India's nuclear programme aims at tapping nuclear energy for power generation. This is based on the use of Uranium and Thorium as nuclear fuel.

The estimated deposits of these are as follows :

Natural Uranium deposits: 70,000 tonnes.

Natural Thorium deposits: 3,60 000 tonnes.

India's Three Stage Nuclear programme is as follows :

Stage 1: Building Pressurised Heavy Water Nuclear Reactors using Uranium Oxide (UO2) and Heavy Water. This phase also includes building Reprocessing Plants for reprocessing spent fuel.

Stage 2: Building Fast Breeder Reactors that would use Plutonium 239 generated from the First Stage to transmute thorium to Uranium 223 as also generate electricity.

Stage 3 : Using Fast Breeder Reactors using Uranium 233. to primarily generate electricity.

(For details see : Bhabha Atomic Research Centre, http://www.barc.gov.in/about anushakti_sne.html).

The government has taken considerable diplomatic measures to accelerate the nuclear program, these include signing nuclear cooperation agreements with the USA, France and Russia, to seek technology and build nuclear reactors as also to become a member of the exclusive Nuclear Suppliers Group (NSG).

Nuclear Suppliers Group(NSG) -

NSG is a multilateral export control regime of a group of nuclear supplier countries that seek to prevent nuclear proliferation by controlling the export of materials, equipment and technology that can be used to manufacture nuclear weapons.

India's Nuclear policy

India's Nuclear policy, revolved around two principles: promotion of research and development for harnessing nuclear energy for peaceful purpose, and attainment of self-sufficiency in the nuclear programme. Pandit Jawaharlal Nehru had publicly opposed the development of nuclear weapons. He maintained that atomic energy for peaceful purposes was more useful for India.

The first change in India's nuclear programme came after the Chinese nuclear tests of 1964. India, under the leadership of Prime Minister Lal Bahadur Shastri announced that India would be willing to consider the use of nuclear blasts for peaceful purposes. This was for the first time that India considered developing nuclear explosives.

India conducted its first nuclear test in 1974 at Pokhran. Following the test Prime Minister Mrs. Indira Gandhi stated that the nuclear test was an experiment conducted as part of research and development for using nuclear energy for peaceful purposes. India had demonstrated to the world that India was capable of developing nuclear weapons, but did not have the intention of doing so.

In 1998 India carried out several nuclear tests again at Pokhran. India declared that it was now a nuclear weapon state. Prime Minister Atal Behari Vajpayee's statement after the nuclear test gives us the main aspects of India's nuclear policy :

1. The security situation deteriorated in the 1980s and 1990s because of the spread of nuclear weapons and missiles in India's neighbourhood.
2. India has been the victim of externally aided and abetted terrorism, militancy and clandestine war.
3. At a global level, we see no evidence on the part of the nuclear-weapon States to take steps in moving towards a nuclear-weapon-free-world.
4. The Nuclear Non-proliferation Treaty was extended indefinitely perpetuating the existence of nuclear weapons in the hands of the five countries.
5. India does not intend to use these weapons for aggression; these are weapons of self-defence.

Nuclear Non-proliferation Treaty (NPT) :

The NPT is an international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy and to further the goal of achieving nuclear disarmament and general and complete disarmament. This treaty was signed in 1968. India did not join this treaty. The treaty prohibits those countries that do not have nuclear weapons to produce nuclear weapons. But it does not place any restrictions on those countries that have nuclear weapons. This is discriminatory. Therefore India refused to join the agreement.

Pokharan Test Site

Countries having nuclear weapons

According to the Stockholm International Peace Research Institute (SIPRI) the following countries have nuclear weapons: the United States, Russia, the United Kingdom, France, China, India, Pakistan, Israel and North Korea. (SIPRI information of January 2016)

Find Out :

Which countries are members of the Nuclear Suppliers Group.

Electronics

सी डैक
CDAC
CENTER FOR DEVELOPMENT OF ADVANCED COMPUTING

PARAM SUPER COMPUTER

The Government of India's National Policy on Electronics (NPE) 2011 seeks to promote Electronics System Design & Manufacturing (ESDM) in the country. One of the important objectives of this policy is to develop a partnership between ESDM

and the core sectors of the economy like Defence, Atomic Energy and Space. It also plans to create a complete secure cyber eco-system in the country to secure Information and communication technology (ICT) infrastructure and cyber space of the country.

Electronics is an important part of India's defence preparedness. It is used in communications by satellite phones; radars; guided missiles, electronic circuits in various equipment etc. India started a program to develop indigenous supercomputers and supercomputing technologies. These supercomputers are also capable of assisting in the development of Nuclear Weapons. PARAM 800 was the first super computer developed by the Centre for Development of Advanced Computing (C-DAC).

The coming together of multiple technologies with the internet and the growth of social networking has added a new dimension to discussions on cyber security. The use of internet is enormous. People use the web and social networking sites every day. It is impossible to carry out surveillance of all that happens in cyberspace. The rapid advancement in technologies has led to new forms of threats which need to be understood and tackled. Cyber security threats today have become increasingly sophisticated and complex. There can be attacks on such basic social necessities as power supplies, banking, railways, air traffic control, etc. Hackers can target government ministries, banks, utilities, other key infrastructure, and companies nationwide, demanding ransom. These acts are not a traditional law and order problem. Therefore it would be difficult to deal with them. To tackle this problem the Indian government has introduced the National Cyber Security Policy in 2013 to provide an umbrella framework for defining and guiding actions related to cyber security.

For details see :

National Cyber Security Policy-2013 (NCSP-2013)

Ministry of Electronics and Information Technology of the Indian Government

http://meity.gov.in/writereaddata/files/National_cyber_security_policy-2013_0.pdf

Military Technology Including Research, Development and Manufacturing

Defence Research and Development Organisation :

Military technology is the application of technology for use in warfare. It draws on the knowledge of several traditional engineering disciplines, including mechanical engineering, electrical engineering, mechatronics, electro-optics, aerospace engineering, materials engineering, and chemical engineering.

The Defence Research and Development Organisation (DRDO) was created in 1958 to provide scientific and technological advice to the Ministry of Defence. Its mission is to establish a world class science and technology base and provide the Defence Services the most advanced systems and solutions. It also evaluates defence equipment and provides technological knowledge to defence industries. Today, DRDO has more than 50 laboratories which are engaged in developing defence technologies covering various disciplines. These include aeronautics, armaments, electronics, combat vehicles,

engineering systems, instrumentation, missiles, advanced computing and simulation, special materials, naval systems, life sciences, training, information systems and agriculture.

The DRDO has been successful in developing many weapon systems these include, Tejas Light Combat Aircraft, Arjun Main Battle Tank, the INDRA Radar and Pinaka Multi Barrel Rocket System. The most successful program of the DRDO has been the Integrated Guided Missile Development Program (IGMDP) headed by Dr. Abdul Kalam, which commenced in 1983. It comprised development of five different missiles, they are : Agni, an Intermediate Range Ballistic Missile, Trishul, a low-level quick reaction surface to air missile (SAM); Akash, a medium to high altitude SAM; Prithvi, a tactical surface to surface missile (SSM); and Nag, a third generation anti-tank missile.

The Integrated Guided Missile Development Program laid down the foundation of missile technology in India. Development of a number of types of missiles with improved technology and capability followed. These included the Prithvi II & III Short Range Surface to Surface Ballistic Missiles, Agni III and Agni IV Surface to Surface Intermediate Range Ballistic Missiles, Agni V Surface to Surface Intercontinental Ballistic Missiles, the Brahmos Supersonic Cruise Missile, the Nirbhay Subsonic Cruise Missile, Submarine launched K4 and K15 Ballistic Missiles, the Pradyuman and Prithvi Air Defence Surface to Air Missiles and the Astra Air to Air Missile.

Dr. APJ Abdul Kalam (1931 – 2015)

Dr. Kalam was responsible for the evolution of ISRO's launch vehicle programme. He took up the responsibility of developing Indigenous Guided Missiles at Defence Research and Development Organisation as the Chief Executive of Integrated Guided Missile Programme. He is popularly known as India's Missile Man. Dr. Kalam became the 11th President of India on 25th July 2002.

Classification of Missiles

A combination of factors is generally used to classify a missile. Range is one of the important factor in classification.

- Tactical Missile : Approximate range : 150 kms to 300 kms (For example Prithvi I)
- Short Range Ballistic Missile : Approximate range : 300 kms to 1000 kms (For example Agni 1).
- Medium Range Ballistic Missile : Approximate range : 1000 kms. to 3500 kms (For example Agni 2 and K4 Sagarika)
- Intermediate Range Ballistic Missile : Approximate range : 3550 kms to 5500 kms (For example Agni 3 and Agni 4)
- Intercontinental Ballistic Missile : Approximate range : More than 5500 kms (For example Agni 5.)

Prithvi Missile

Agni Missile

Akash Missile

Trishul Missile

Nag Missile

Brahmos Missile

DRDO Products

Futuristic Game Changer Technologies in the Field of Defence

While India is still to play catch up with the weapons of the advanced nations such as USA, Russia, Japan and France, India must look into jumping ahead in frontier technologies such as

- Artificial Intelligence and Robotics.
- Particle beam or laser beam weapons.
- Electromagnetic propulsion.
- Light weight Super alloys and composites having high strength and heat resistance.
- Miniaturisation of systems.
- Stealth technology which can defeat detection by radars.

Do you know ?

On 27 March 2019 India a successfully launched an anti-satellite missile. India was only the fourth country to test an anti-satellite weapon that is used to attack enemy satellites or intercept ballistic missiles. Besides India only United States, China and Russia have tested such a weapon.

Promotion of Science and Technology through Education

Various scientific educational and research facilities have been established and are functioning to meet the needs of the nation. Some of these are under the control of various ministries of the government, some others are autonomous, details regarding a few which are important for students interested to become scientists and technologists are given below. Detailed information on these can be accessed on the links to various ministries in the website of the government of India at https://india.gov.in/. A consolidated list is also availabe on the internet at https://en.wikipedia.org/wiki/List_of_institutes_funded_by_the_Central_Government_of_India.

Prominent Educational Institutions for Students

- The Indian Institutes of Science Education and Research (IISERs
- The Indian Institutes of Technology (IITs)

Prominent Research Organisations

- The Department of Atomic Energy (DAE).
- Indian Space Research Organisation (ISRO).
- Council of Scientific and Industrial Research (CSIR)
- Centre for Development of Advanced Computing (C-DAC).
- Indian Institute of Science (IISc).
- Tata Institute of Fundamental Research (TIFR)

Defence Oriented Research and Development Establishments

- Defence Research and Development Organisation (DRDO).

(https://www.drdo.gov.in/)Those students who are interested in making a career as a scientist with DRDO can log on to https://rac.gov.in/ for further details.

Please see the following websites for further information :

1. Bhabha Atomic Research Centre : Strategy for Nuclear Energy
   http://www.barc.gov.in/about/anushakti_sne.html
2. Cyber Security : Dr VK Saraswat, Member NITI Aayog
   http://www.niti.gov.in/writereaddata/files/document_publication/CyberSecurityConclaveAtVigyanBhavanDelhi_1.pdf
3. Ministry of Home Affairs, Government of India. Cyber and Information Security (C&IS) Division (Division deals with matters relating to Cyber Security, Cyber Crime, National Information Security Policy & Guidelines (NISPG) and implementation of NISPG, NATGRID etc.)
   https://mha.gov.in/division_of_mha/cyber-and-information-security-cis-division
4. Shri Atal Bihari Vajpayee laid a paper entitled "Evolution of India's Nuclear Policy". PAPERS LAID ON THE TABLE XII Lok Sabha Debates, Session II, (Budget) Wednesday, May 27, 1998 / Jyaistha 6, 1920 (Saka)
   https://parliamentofindia.nic.in/ls/lsdeb/ls12/ses2/0527059801.htm

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. India declared itself to be a nuclear weapon power in _____

a. 1974 b. 1978

c. 1998 d. 2000

ii. GPS is an example of ____

a. Dual use technology

b. Internet revolution

c. Nuclear research

d. Electronics revolution

(B) Complete the following sentence by using appropriate reason.

India did not join the Nuclear Non-proliferation Treaty

(C) Identify the incorrect pair in every set, correct it and rewrite it.

i. Dr. Homi Bhabha : Nuclear Science

ii. Dr. Vikram Sarabhai : Space Science

iii. Dr. Abdul Kalam : Information Technology

(D) Find the odd word from the given set.

Tejas, Agni, Trishul, Prithvi,

Q. 2 Observe the map and answer the following questions.

On a map of India point out the location of the following :

Pokhran

Q.3 State whether the following statements are true or false with reasons.

i. The Integrated Guided Missile Development Program laid down the foundation of missile technology in India.

ii. India's nuclear energy programme is Uranium based.

Q.4 Explain the correlation between the following.

Science and Technology

Q.5 Observe the given image and write about it in brief :

Q.6. Express your opinion on the following

Should India develop nuclear weapons?

Q.7. Answer the following.

i. What is the role of the Defence Research and Development Organisation (DRDO) ?

ii. What are the Futuristic Game Changer Technologies in the Field of Defence.

Activity :

Give examples of Cyber Crime. What is cyber security? Why is it important? Discuss in the classroom.

Chapter 6 Higher Defence Organisation of India

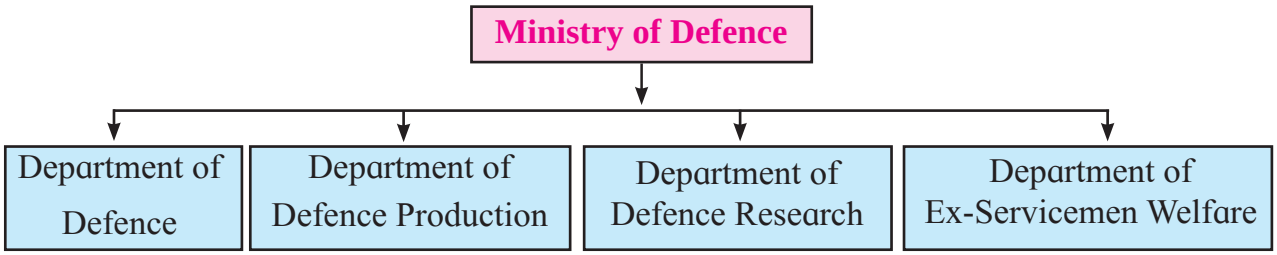
India is a democracy. In a democratic system of government the final authority in any decision making rests with the people or their representatives. This is civilian authority. Therefore the supreme command of the Armed Forces vests in the President. The responsibility for national defence rests with the Cabinet. The principal task of the Defence Ministry is to obtain policy directions of the Government on all defence and security related matters. These are then communicated to the Services Headquarters, Inter-Services Organisations, Production Establishments and Research and Development Organisations for implementation.

The geographical features of India are unique. It shares a 15000 kms. (approx..) border with seven neighbouring countries and a 7500 kms. (approx.) coastline. Defending the land and coastal borders is a tremendous task that is performed by the Indian armed forces.

The Ministry of Defence comprises of four Departments :

1. **Department of Defence :** The Department of Defence deals with the three Services i.e Army, Air Force, Navy and Coast Guard. It also deals with Inter-Services Organization. It is also responsible for the Defence Budget, establishment matters, defence policy, matters relating to Parliament, defence cooperation with foreign countries, and coordination of all defence related activities

2. **Department of Defence Production :** The Department of Defence Production (DDP) was set up in November 1962 with the objective of developing a comprehensive production infrastructure to produce the weapons, systems, platforms, equipment required for defence. The Department has established wide ranging production facilities through the Ordnance Factories and Defence Public Sector Undertakings (DPSUs). The products manufactured include arms and ammunition, tanks, armoured vehicles, heavy vehicles, fighter aircrafts and helicopters, warships, submarines, missiles, ammunition, electronic equipment, earth moving equipment, special alloys and special purpose steels. The Ordnance Factories



and DPSUs have been continuously modernizing and upgrading their capabilities to achieve self-reliance in defence production.

3. **Defence Research and Development Organisation:** The Defence Research and Development Organisation (DRDO) was created in 1958 to provide scientific and technological advice to the Ministry of Defence. It works towards enhancing self-reliance in Defence Systems. It undertakes design and development of weapon systems and equipment in accordance with the requirements by the three services. DRDO is working in various areas of military technology which include aeronautics, armaments, combat vehicles, electronics, instrumentation engineering systems, missiles, materials, naval systems, advanced computing, simulation and life sciences.

4. **Department of Ex-Servicemen Welfare :** The Department of Ex-Servicemen Welfare was created in the Ministry of Defence in 2004 in order to pay focused attention to the welfare and resettlement of ex-service men. Its role is to formulate and implement various policies and programmes for the welfare and resettlement of Ex-Servicemen in the country The Department consists of two Divisions i.e. (i) Resettlement Division; and (ii) Pension Division.

Higher Defence Organisation

India's Higher Defence Organisation is based on two principles :

1. One, there should be an interaction between the political executive and the Defence Services.
2. Two, the political executive would be the final authority in all matters dealing with security.

Thus, while the Armed Forces contribute to the decision making in matters of war and peace, the final decision is taken by the Prime Minister and the concerned committee.

Independent India had a three tier Higher Defence Organisation. The three levels were as follows :

1) The Defence Committee of the Cabinet (DCC) chaired by the Prime Minister.
2) The Defence Minister's Committee (DMC) chaired by the Defence Minister.
3) The Chiefs of Staff Committee (COSC) as part of the Military Wing of the Cabinet Secretariat.

After the 1962 India-China war, the DCC was first changed to Emergency Committee of the Cabinet and then to Cabinet Committee of Political Affairs (CCPA). This was later renamed as Cabinet Committee on Security (CCS). There were other committees too

Higher Defence Orgnisation

President

↓

Prime Minister ← National Security Advisor, National Security Council, Strategic Policy Group, Joint Intelligence Committee, National Security Advisory Board

↓

Cabinet Committee on Security

Cabinet Committee on Security :

The composition of this committee is as follows : Prime Minister, Minister of Defence, Minister of Home Affairs, Minister of External Affairs and Minister of Finance. (Composition as on 10.03.2018)

like the Joint Planning Committee, Joint Intelligence Committee, Joint Training Committee, Inter-Service Equipment Policy Committee etc.

National Security Council (NSC)

The National Security Council was established in 1998. It advises the Prime Minister's office on matters of national security and strategic interest. The National Security Council consists of the following members: National Security Advisor; the Deputy National Security Advisor; Ministers of Defence, External Affairs and Finance; and Deputy Chairperson of the NITI Ayog. This is the apex body.

The Strategic Policy Group is the first level of the NSC structure. It prepares the Strategic Defence Review of short and long term security threats, as well as possible policy options on a priority basis. It is headed by the Cabinet Secretary and includes the chiefs of staff from the Army, Navy and Air Force, the governor of Reserve Bank of India, Secretaries of various the ministries and the Director of the Intelligence Bureau.

The Joint Intelligence Committee is the second level of the organisational structure of the NSC. Its role is to analyse intelligence data for the NSC.

The National Security Advisory Board is the NSC's 'think tank'. It consists experts in external security, strategic analysis, foreign affairs, defence, the armed forces, internal security, science and technology and economics.

Integrated Defence Staff (IDS)

In 2001 the Government of India set up the Integrated Defence Staff. The aim was to create a Point organisation for jointmanship in the Ministry of Defence. This would help to integrate security policy, doctrine, war fighting, and procurement under a single organisation.

The tasks performed by the Integrated Defence Staff are as follows:

1) **Higher Defence Planning :** This is a combined activity of various organisations. It provides for plans and strategies for ensuring national security. (See Chart for Higher Defence Planning)
2) **Exercises :** Indian Armed Forces regularly participate in various bilateral and multilateral exercises with the Defence Forces of other nations. These exercises may be for a specific service or Joint Tri-Services Exercises.
3) **Humanitarian Assistance and Disaster Relief :**
   The Integrated Defence Staff have been carrying out disaster relief operations within the country as well as outside the country. This includes evacuation, setting up of relief infrastructure, restoring communication & providing medical facilities, distributing ration supplies, clothing etc.
4) **Acquisition :** Based on Long, Medium and Short Term Plans procurement of required weapon systems/equipment/ platforms is done by this organisation.
5) **Budget :** The IDS looks at various financial planning issues of Defence Services It is responsible for forecasting, projecting, allocation and monitoring expenditure.
6) **Training :** The IDS looks into training requirements of the armed forces.
7) **International Cooperation :** IDS handles all issues relating to International Defence Cooperation and is responsible for implementation of Defence Cooperation as mandated by Foreign Policy of the Government of India.

(8) **Medical :** The IDS looks into all matters pertaining to medical planning, health of troops, all medical aspects of Nuclear, Biological and Chemical Warfare techniques and disaster relief.

Jointmanship :

Jointmanship in the armed forces means the following: Integrated planning and application of military power at the Strategic, Operational and Tactical levels, with proper sequencing of combat power of the three Services in time and space. This is done as per requirement and in relation to the enemy's centres of gravity. The culmination point is to win a war. Cooperation is a time-tested principle of war and would need to be exhibited in full measure by the services to prosecute our combined military strategy. Good jointmanship will result from proper joint training, understanding of each other's capabilities and limitations and mutual trust, confidence and respect for each other.

Joint Operation :

Joint Operation in the armed forces means: Operations planned and executed by two or more services, operating under a single designated Joint Task Force Commander. Joint Operations are normally mission oriented and have specific objectives.

Higher Defence Planning

↓

Cabinet Committee on Security

↓

Ministry of Defence ← **Defence Minister**

↓

Defence Planning Committee

(National Security Advisor, Service Chiefs, Chiefs of Staff Committee, Defence Secretary, Foreign Secretary)

↓

Chiefs of Staff Committee

(Service Chiefs and Chiefs of Staff Committee)

↓

Vice Chiefs Committee (Chiefs of Staff Committee and Service Vice Chiefs)

↓

Headquarters IDS

Integrated Headquarters of Ministry of Defence (Army, Navy and Air Force)

The Armed Forces

The armed forces comprise the three armed services under the Ministry of Defence, they are :

- Army
- Navy
- Air Force

The primary role of the armed services is to protect the sovereignty of the nation from external aggression, however when called upon they can also be called upon by the government to assist it to face any natural disaster or internal security threat, strife or unrest.

Indian Army :

The role of the Indian Army is to safeguard National Interests from External Aggression and Internal Subversion, towards this it has to be ready to perform the following tasks :

- Go to war to defeat an External Aggression.
- Internal Security Management to defeat internal threats.
- Project force wherever and whenever called upon to safeguard the nation's interests.
- Peace Keeping Operations or Military Assistance to friendly foreign countries.
- Render Humanitarian Assistance, Disaster Relief and Aid to Civil Authorities.

Command & Control of the Army

The Indian army is spread over six Operational Commands based on geography and the perceived security threats. The Commands are further divided into two to three Corps. The Corps are further divided into two to four Divisions. The Divisions are made up of four to five brigades. Each Brigade has three to four Battalions or Regiments under it. A battalion comprises of Four Companies, each Company comprises of Three Platoons, Each Platoon comprises of Three Sections, each section comprises of Ten soldiers being the smallest entity.

Besides the six operational Commands there is also one Training Command which is tasked for training of the Army. There are also entities called Area Headquarters and Sub Area Headquarters under the Operational Commands which are dedicated to provide logistic sustenance to the Army in their Geographical area.

Regional Commands

The six regional operational commands are as follows :

1) Northern Command is Headquartered in Udhampur. It is responsible for operations in Jammu and Kashmir against China in the East and Pakistan in the West.
2) Western Command is Headquartered in Chandigarh. It is responsible for operations in Punjab, and Himachal Pradesh against China in the East and Pakistan in the West.
3) SouthWestern Command is Headquartered in Jaipur. It is responsible for operations in North and Central Rajasthan, against Pakistan in the West.
4) Southern Command is Headquartered in Pune. It is responsible for operations

in South Rajasthan and Gujarat against Pakistan in the West.

5) Central Command is Headquartered in Lucknow. It is responsible for operations in Uttarakhand against China in the North, as also security along the Indo - Nepal Border with UP and Bihar.

6) Eastern Command is Headquartered in Kolkata. It is responsible for operations in Sikkim, Bhutan, and Arunachal against China and security of Indo – Nepal, Myanmar and Bangladesh borders

Indian Navy

The Indian Navy grew rapidly after independence as of now it is undergoing modernization with new ships being added to the fleet.

1) **Military Role :** The application of maritime power both in offensive operations against enemy forces territory and trade, and defensive operations to protect own forces, territory and trade.

2) **Diplomatic Role :** The larger purpose of the navy's diplomatic role is to favorably shape the maritime environment to promote India's national interest and national security objectives.

(3) **Constabulary Role :** In the constabulary role, forces are employed to enforce law of the land. Force is only employed for self-defence or as a last resort in execution of this role. The protection and promotion of India's maritime security is one of the prime responsibilities of the Indian Navy. After the terrorist attacks on Mumbai on 26 November 2008, the overall responsibility for coastal security has been mandated to the Indian Navy, in close coordination with the Indian Coast Guard, State marine police and other central/state government and port authorities.

Command & Control

The Navy is headed by the Chief of the Naval Staff (CNS), he is located at the Integrated Headquarters of the Ministry of Defence (Navy) (also known as the Naval Headquarters) in New Delhi.

Naval Commands

Three Naval Commands based on geographic areas of responsibility function under the Naval Headquarters.

1) **Western Naval Command :** Headquarters located in Mumbai, with ships of the fleet based in various Naval Stations at ports in Gujarat, Maharashtra, Goa and Karnataka.

2) **Eastern Naval Command :** Headquarters located in Vishakhapatnam, with ships of the fleet based in various Naval Stations at ports in Bengal, Orissa Andhra Pradesh and Tamil Nadu.

3) **Southern Naval Command:** Headquarters located in Kochi, with ships of the fleet based in various Naval Stations at ports in Kerala and Lakshadweep.

Indian Air Force

In context of modern technology, the Air Force has a premier role in future warfare. Its mission is to defend the nation through the control and exploitation of air and space. Indian Air Force (IAF) bears the responsibility of safeguarding Indian airspace and thus furthering national interests in cooperation with the other branches of the armed forces. The IAF provides close air support to the Indian Army on the battlefield as well as strategic and tactical airlift capabilities.,

Air Force Commands

The Indian Air Force has seven commands, of which five are operational and two functional, namely :

Operational Commands	
HQ Central Air Command	Allahabad
HQ Eastern Air Command	Shillong
HQ Western Air Command	New Delhi.
HQ Southern Air Command	Thiruvananthapuram
HQ South-Western Air Command	Gandhinagar
Functional Commands	
HQ Maintenance Command	Nagpur and
HQ Training Command	Bangalore

Tri Service Commands

Andaman and Nicobar Command :

This is the first Tri Service Command based at Port Blair. It is commanded in rotation between Army, Navy and Air Force. The Command has under it the Army, Navy, Air Force and Coast Guard. This command protects India's interests in the region of South East Asia and the Straits of Malacca.

Andaman and Nicobar Command

Coast Guard

The Coast Guard was established as an independent organisation in 1978. The organisation has four Regional Headquarters located at Gandhinagar, Mumbai, Chennai and Port Blair.

The main duties and functions of the Coast Guard are as follows :

1. Ensure safety and protection of artificial islands, offshore terminals and other installations.
2. Provide protection and assistance to fishermen when at sea.
3. Protect maritime environment
4. Assist authorities in anti-smuggling activity

The terrorists who attacked Mumbai (2008) had used the sea route. After this attack the Coast Guard has also been given the responsibility of coastal security.

Central Armed Police Forces/ Paramilitary Forces

Central Armed Police Forces/ Paramilitary Forces :

These are various armed police forces under the Government of India Ministry of Home Affairs. They are deployed on a wide range of roles as per the internal security requirements of the nation, they are also employed outside India in UN peace keeping tasks, as also in some areas to protect India's national interests.

Assam Rifles : It is a region specific force with its operational role in the North East. It comprises 46 Battalions. Its role is to conduct counter insurgency operations in the disturbed areas of the Northeastern states and other such areas where deemed necessary under control of the army. During peace and 'proxy war', ensure security of the Indo-China and Indo-Myanmar borders and war, rear area security immediately behind the battle front.

Border Security Force (BSF) : It is the nation's largest largest border guarding and management force. It is deployed on the Indo-Pak international border extending from Sir Creek in Gujarat to Jammu region and thereafter along the line of control upto North Kashmir. It also deployed to guard the entire Indo- Bangladesh border. Its tasks during peace time are :

- Promote a sense of security among the people living in the border areas.
- Prevent trans border crimes, unauthorized entry into or exit from the territory of India.
- Prevent smuggling and any other illegal activity.
- During war it can be called upon to perform a large variety of tasks in

support of the army. These could be holding defences, rear area security, guarding vital logistic and line of communication facilities among the many more tasks.

Central Industrial Security Force (CISF) : It is a premier multi-skilled security agency of the country, mandated to provide security to major critical infrastructure installations of the country in diverse areas. CISF is currently providing security cover to nuclear installations, space establishments, airports, seaports, power plants, sensitive Government buildings and even heritage monuments. Among the important responsibilities recently entrusted to the CISF are the Delhi Metro Rail Corporation.

Central Reserve Police Force (CRPF) : It is the largest Central Armed Police Force of India. It has a very wide range of tasks, these range from counter insurgency in J&K and Naxal infested areas in Central and South Indian States, security of vital installations and VIPs as also election duties, riot control and assisting state police in maintaining law and order.

Indo Tibetan Border Police (ITBP) : Its primary role is border guarding duties from Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh covering 3488 km of Indo-China Border and manning Border Outposts on altitudes ranging from 9000' to 18700' in the Western, Middle and Eastern sectors of the Indo-China Border. It is also deployed in counter insurgency role in Chhatisgarh. Its other tasks are :

- Check illegal immigration, trans-border smuggling and crimes.
- Security to sensitive installations, banks and protected persons.
- Provide aid in disaster relief.

Shasastra Seema Bal (SSB) : Its primary role is border guarding duties, which includes prevention of smuggling, illegal immigration as also intelligence gathering, along India's borders with Nepal and Bhutan in the Indian states of Uttarakhand, Uttar Pradesh Bihar, West Bengal, Sikkim and Assam.

Do you know ?

Deployment of forces along the borders is based on the principle of one border, one border-guarding force'.

Accordingly, each border has been entrusted to a particular force as follows :

- Bangladesh and Pakistan borders : Border Security Force
- China border : Indo Tibetan Border Police
- Nepal and Bhutan Borders : Sashastra Seema Bal
- Myanmar Border : Assam Rifles.

Please see the following website for further information :

1. Indian Armed Forces.

http://knowindia.gov.in/my-india-my-pride/indian-armed-forces.php

2. Ministry of Defence, Government of India, Annual Reports
https://mod.gov.in/documents/annual-report

EXERCISE

Q. 1 (A) Choose the correct alternative and complete the following statements.

i. Security cover to nuclear installations, space stablishments, airports, seaports, power plants, is provided by ____

a. Indo-Tibetan Border Force

b. Sashastra Seema Bal

c. Central Industrial Security Force

d. Indian Army

ii. The Headquarters of the Eastern Naval Command is at _____

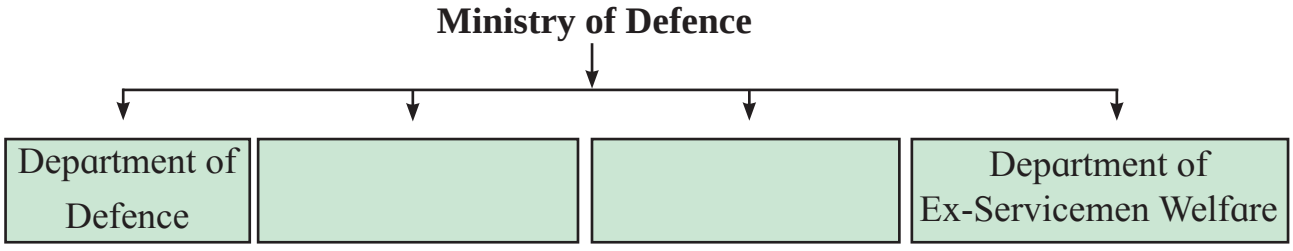
a. Vishakhapatnam

b. Chennai

c. Kolkata

d. Andaman

Q. 2 (A) Complete the following concept maps



(B) Observer the given map and answer the following questions.

Locate the following places on the map of India :

(a) Udhampur.

(b) Kochi

(c) Shillong

Q. 3 State whether the following statements are true or false with reasons.

i. The President is a member of the Cabinet Committee on Security.

ii. The Coast Guard is responsible for the security of Sri Lanka.

Q.4. Explain the correlation between the following.

Jointmanship and Joint Operations

Q.5. Express your opinion on the following.

Why do you think the Coast Guard is important for India's national security?

Q.6 . Answer the following.

i. What are the tasks performed by the Integrated Defence Staff ?

ii. What is the structure of the Higher Defence Organisation.

Activity :

Read any news item that deals with India's security issues. For example: India-Pakistan border problems, import of defence equipment by India, etc. Discuss it in classroom.

Career Opportunities in the Armed Forces

Dear Students,

In case you are planning for a career in the Armed Forces or any other similar services here are some suggestions for you:

1. Start your preparations for the career in the XIth standard. Do not postpone your decision.

2. Talk to your teachers and other experts who can guide you about a career in the Armed Forces. Retired Officers of the Army, Navy or the Air Force and any similar organisations would be able to guide you.

3. You must start your academic preparations as soon as possible. The syllabus for any competitive examinations contains several subjects. The XIth and XIIth standard books usually cover these topics. When studying any subject try to understand it properly. Simply memorizing the topics does not help. Unless you understand the topic you will not be able to write answers. Also start reading any one standard newspaper every day. This will help you to grasp current events.

4. The information given below is a general guide line for opportunities in the Armed Forces and related services.

Please Note the following :

1. The information provided is to be treated as a guideline. This textbook will not be taken as an authority under any circumstances and Balbharati or the board of authors/ compilers and the publisher bear no legal or moral responsibility of any kind.

2. Changes in all parameters may take place and may get published from time to time on websites and Employment News.

3. There are entries for Coast Guard, BSF, CRPF, ITBP and Industrial Security Force for officers' cadre. These are announced separately from time to time.

4. Read Employment News for advertisements relating to recruitment.

Entries after X + II (to be attempted while in X + II) as Officers in Armed Forces

[Please refer to the UPSC and Armed Services websites and Employment News for schedules and latest parameters. This textbook will not be quoted as an authority and will be used only as a guideline for awareness]

1. National Defence Academy (NDA), Pune: For male candidates of the age 16.5 to 19 years at the time of entry into the Academy.
2. Technical Entry for the Army and the Navy: For male candidates only after passing XII board examination with PCM subjects. Age limit 16.5 to 19 years of age at the time of entry.
3. Armed Forces Medical College (AFMC) entry for medical officers stream: Male and Female candidates appearing or passed XII board examination with Physics, Chemistry and Biology as their subjects. Age limit 16.5 to 21 years (changes are likely).
4. Armed Forces Medical College entry for Nursing Stream: For Female candidates appearing or passed XII board examination with Physics, Chemistry and Biology as their subjects at the board examination. Age limit 16.5 to 21 years (changes are likely)

Entries after Graduation (Can be attempted while in the final year of graduation) as Officers in the Armed Forces

1. Through Combined Defence Services entrance examination. Age limits – 19 to 25 years for male and female candidates, through Permanent Commission stream or Short Service Commission stream. This is in all three services. (changes are likely and there are different streams). Entrance Test is followed by a detailed interview (Service Selection Board interview). (Some entries are without the entrance test).
2. Entry for Engineers in all three services – without entrance test or AFCAT test for the Air Force. Age limits are variable for the three services, from 19 to 24/ 27 years).
3. Legal cadre and Education Cadre – These entries are announced from time to time.

Note : All entries (except the AFMC and Nursing) have SSB interview procedure, whether entrance test is applicable or not. The selection through interviews is followed up by medical examination with stringent requirements of height, weight, ECG, EEG, eyesight, hearing ability. Partial or full colour blindness, Knocked Knees and Flat feet are very common grounds for medical rejection.

Entries in Non-Officer Cadre

These are announced by the Directorate of Recruitment for entry as Jawans, Airmen and Naviks. Min qualifications are X + II. Some craftsmen are also recruited after X std. There are technical entries for diploma holders as direct recruitment at Non-Commissioned Officer levels (Naiks and Havildars or equivalent ranks in the Navy and the Air Force).

Websites for Recruitment in the Armed Forces

For Army : at www.joinindianarmy.nic.in

For Navy : https://www.joinindiannavy.gov.in/

For Air Force : http://indianairforce.nic.in/

Websites for Recruitment in Indian Paramilitary Forces

1. **Border Security Force (BSF) :** Get information related to recruitment in Border Security Force.

   http://bsf.nic.in/en/career.html

2. **Central Industrial Security Force (CISF) :** is a premier multi-skilled security agency which provides security cover to nuclear installations, space establishments, airports, seaports, power plants, sensitive Government buildings and ever heritage monuments. Detailed information related to recruitment of Central Industrial Security Force.

   http://www.cisf.nic.in/RECRUITMENT_files/RECRUITMENT.htm

3. **Central Reserve Police Force (CRPF) :** is an armed Force of the Union of India, with the basic role of assisting the State/Union Territories in Police operations to maintain law and order and contain insurgency. You can find information about recruitment of Central Reserve Police Force.

   https://www.india.gov.in/recruitment-central-reserve-police-force

4. **Indo Tibetan Border Police (ITBP) :** is a specialized mountain Force and most of the officers & men are professionally trained mountaineers and skiers. Know more about career opportunities in Indo Tibetan Border Police.

   http://itbpolice.nic.in/itbpwebsite/index.html

5. **Sashastra Seema Bal (SSB) :** is a Border Guarding Force (BGF) . You can find detailed information pertaining to recruitment and career opportunities in the SSB.

   http://www.ssbrectt.gov.in/

Border Roads in Himalayan region

United Nations Military Observation Group Headquarters, Srinagar

Ibadat-e-Shahadat Army Museum, Srinagar

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune 4.

संरक्षणशास्त्र इयत्ता अकरावी (इंग्रजी माध्यम)

₹ 84.00

संरक्षणशास्त्र इयत्ता अकरावी (इंग्रजी माध्यम)