

NORTH MAHARASHTRA UNIVERSITY, JALGAON
DEFENCE AND STRATEGIC STUDIES

F.Y.B.A./ F.Y.B.SC. (General) from : June 1993.

Title - Indian Art of warfare

PART - I

1. Military system in vidic period -
 - a) General
 - b) Arya Anarya conflict
 - c) Military system-Selection of King and its duties
 - d) Type of armed forces - Infantry & chariots
 - e) Military training
 - f) Weapons - Types - Mukta class, Amukta class and armours
 - g) Law of war
 - h) Causes of war
 - i) Forts
 - j) Selection of battle field
2. Military system in Epic period-
 - a) General
 - b) Type of forces - chariots, Elephantry cavalry and infantry
 - c) organisation (Akshauhini),
 - d) Type of war - open battle - law of open battle - Guerilla war (Kut)
 - e) Training
 - f) Recruitment, pay and allowances
 - g) Weapons
 - h) espionage and doots
 - i) tactics (vyuhas)
 - j) Use of aircraft and battleship
- Comparative studies of Indo Greek Art of warfare with special reference to battle of Zehlum (326 B.C.)
 - a) Indo Greek art of warfare - 1 - Background 2-Alexander-invasion - Aim of invasion- forces and its weapons 3-Pouras - forces and its weapons
 - b) Battle of Zehlum-background - war planning - battle action-causes of defeat of pours
4. Kautilyats Philosophy of war-
 - a) War philosophy
 - b) Remedies on soldiers demerits-war mobilisation
 - c) Military organisation- cavalry - type-role-training-base battle field of cavalry Elephantry-role training best battle field

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chariots-type role best battle field
Infantry - type-role training -battle
field Navy-role

- c) weapons- 1-mobile 2-demobile 3-sharp
4-offensive 5-defensive
- d) Forts - types
- e) pattern of war fare -type of war
- f) Espinge and Ambassador - types
- g) Decence and security
- h) Interstate relations-Theory of mandal

5. Rajput and Turk military system-

- a) Rajputs-General- organisation and
weapons - pay and promotions- Forts
Wartactics - reasons of downfall of
Rajputs- merits and demerits
- b) Turks -General -organisation-payments-
training and wartacoles
- c) battle of somnath -Mohmad Gaznavi -
warplanning- battle action -effects *
of Mohmad Gaznavi *of invantion-causes
- d) Battle of Tarzai -1st battle-General
of victory
military power of Turks and Rajputs-
Battle action
IInd battle -war strategy of mohmad :
Ghori-Battle action -causes of defeat
of Rajput

PART II

6. Military system of Sultant period-

- a) General
- b) Organisation- Type of soldiers-
temporary-permenant - cavalry -
Elephant Army- organisation
- c) Payments
- d) weapon
- e) wartactics
- f) military reforms of Bulban
- g) military reforms of Allah-uddin-
khilji
- h) causes of downfall of Sultans

7. Military system under Moghals-

- a) 1. General
- 2. military organisation-grades of
Mansabdar
- 3. Armed forces-a) Infantry and its
types
 - b) Cavelryand its types
 - c) Elephantry
 - d) Artillery-officers,
types and role of
artiley
 - e) Navy
- 4. Recruitment of soldiers and officers
- 5. Training 6)weepons 7)payments
- 8. Forts 9) wartactics
- 10. Merits and demerits of Mansabdari
- 11. causes of down fall of mughales
- b) First battle Panípat (1526)-General-
military strenght of Baer and
Ibrahimkha warplaning-battle
action -effects of battle-causes of
victory of babur

- c) Battle of Haldighat-general-military strenght of Rajput and Mughals -war. strategy-battle action

8. Maratha military system
- a) General
 - b) organisation-Army caval^{ry} Artillery Navy
 - c) Weapons
 - d) Forts
 - e) wartactics (Guerilla)
 - f) Third battle of Panipat-Background-Deployments of forces- pre war movements-*battle action causes of -defet in battle
- *military strenght of maratha and Afghans
9. Sikh military system
- 1) General
 - 2) Military organisation
 - 3) Armadforces and training
 - 4) weapons
 - 5) pay and pension
 - 6) Ranjitsing and Gurugovindsingh
10. Presidency army under east India company

- Books -
- 1) J.N.Sarkar - Military history of India
 - 2) Chakrawarti -war in a Ancient India
 - 3) J.F.C. Fuller - Generalship of Alexander the Great
 - 4) K.P. Kangley - Kautilya Arthashastra
 - 5) Willam Eruin - Army of Indian Mughals
 - 6) S.N. Sen - Military system of Marathas
 - 7) F.S. Bajwa - The military system of Sikhs
 - 8) Ferterque-History of British Army.
 - 9) ब. रा. हिरगांवकर - कौटिल्यीय अर्थशास्त्र.
 - 10) नरेंद्र सिंह - भारतीय सैन्य इतिहास
 - 11) पांडे चौबे - भारतीय सैन्य इतिहास
 - 12) चौधरी गोंदरे - भारतीय सैन्य इतिहास

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NORTH MAHARASHTRA UNIVERSITY, JALGAON

Defence and Strategic studies

F.Y.B.A./B.Sc. Optional paper (From June, 1993)

Title - Western Military History.

PART - I

1. Military system of Greeks :- i) General -ii) Organisation - Flanks-merits & Demerits of flanks. Reforms of Alexander in flanks. Types - Hypaspits, Hetaria, sarisaphosi, light iii) Weapons iv) Art of warfare. v) Alexander the great.
2. Military system of Romans- i) General ii) Organisation - Roman leagion iii) Weapons -velight, Hastati, princip & Triari iv) merits & Demerits of Roman ligion. v) Julious ceasor and its Reforms.
3. Hanibal and Sipio contribution to the art of war of Battle of Zama and Battle of canne. (punic wars)
i) Hanibal- (Greek)-General,- Military organisation- strategy of Hanihal - Battle of canne. - war plan- Battle action -defeat of Romans. ii) Sipio - (Roman)- General- strategy-of Roman Generals Battle of zuma -warplan- Battle action defeat of karthegion (Hanibal)
4. The age of cavalzy -i) Background ii) Battle of Adrinople iii) Non Develop communities & its cavalzy- Goth, H.n, Arabs, Frank iv) Develop-ment of cavalzy under king Alfrade^(uk) v) War Tactis & weapons. vi) Battle of Hesting - (1066) vii) Battle of cresy- (1346) viii) causes of Downfall of cavalzy.
5. Revival of Infantry -
6. Gun powder and fire arms- i)General. ii)Effect of gun powder on naval & land warfare. iii)/^{Naval}Power of England & gun powder iv) changes of weapons- evolution of modern Gun. - Development of Rifle.
7. Assesment of Gustavas Adalphus, fredrick the great and nepolion
 - (1) Gustavus Adusphus - i) General. ii) Reforms in a)Administrative b) military organisation c)weapons d)cavalzy e)Artillery
 - (2) Fredrick the great - i) General. ii)Reforms - a)organisation of arm forces b) Artillery c) military Training and Discipline d) oblique order march d)principles of fredrick the great. iii) Demerits of arm forces. iv) evolution of fredrick the great
 - (3) Nepolion - i) General. ii) Important battles of Nepolion - Itali, Austria, Egipt, Spen, Austerlize, Russia waterloo iii) qualities of Nepolion's army - iv) War Tactics and reforms of Nepolion.- planning of war, leadership-, Mobility, Surprise, *
* offensive policy, c oncerntration of force, origine of citizen army, orga-nisation arm force, Administration, Artillery: cavalzy. v) causes of Downfall of Nepolion. vi) clauswitz and Jomini's view about nepolion's art of warfare.

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PART - II

8. (1) Causes of World War -I - i) Division of Europ in two groups. ii) military offensive policy. iii) Bismark's policy of france. iv) Development of science & Technology. v) Economic colonisam vi) lack of international organisation vii) Propaganda viii) Nature of Viliam II ix) Murder of Archduck fransis.
- (2) Kind of warfare - 1) Tank warfare 2) chemical warfare, 3) (U Boats) Naval warfare 4) Trench warfare. 5) Uuerilla warfare 6) Pschological.
- (3) Treaty of varsailas.
9. World War II - Background.
10. German Technique in IInd World War - Blitzkreig Technique: - used in Europe Russia- Africa - Battle of Al-Alamin - role of airforce (Strategic Bombing) Naval Blocked. - Rommel & Montgo- mery.
11. Japan as a Military power - military strength of Japan * Infantry, Airforce- Navy.- war in Malaya, invantion in Burma attack on pearl Harbour and naval battles in pacific ocean. submarine and aircraft carrier.
12. Air power in world war IInd - 1) Battle of Britan ii) Strate- gic bombing .
13. Development of Artillery during world-war II - use of field artillery
medium Artillery
Heavy Artillery
Mountain Artillery & its characteristics
Anty aircraft Artillery.
Costal Artillery.
14. Use of Atom in IInd World War -
- use of Atombomb on Japan
- End of IInd World War
- Origin/ ^{of} nuclear age-

- Books :1) Montgomery - History of warfare
2) Earle. En.- Makers of Modern strategy.
3) Falls cyril -Hundred years of war
4) Fuller JFC - conduct of war.
5) कुबलकर - दुसरे महायुद्ध.

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S.Y.B.A./ B.Sc. (From June, 1993)

Gen paper: Maratha Mil. History

Optional : Contemporary study of War & Peace.

Sp. 1 Modern warfare.

Optional. Logistic Management in Armed forces.

Sp. 2 Geopolitics & Military Geo-

Optional. ~~Role of Science & Technology in National~~
Security. Industrial Security.

Note : There will be practical of 20 marks of Spel -

NORTH MAHARASHTRA UNIVERSITY, JALGAON

paper-II

Defence and Strategic studies

S.Y.B.A./B.Sc., General Paper

Title - Maratha Military History

PART - I

- 1) Political, social, Economic, Religious and Geographical situation in Maharashtra before the emergence of Shivaji.
- 2) Role of Jijabai and Dadaji Kondadeo in making Shivaji.
- 3) Shivaji and Adil shah - a) General. b) Jawali incident -
 - i) Strategic importance of Jawali. ii) Shivaji and More conflict - causes. iii) consequences of Jawali Incident.
 - c) Battle of pratapgrats - i) Introduction - ii) Military Strength of Afzalkhan and Shivaji iii) Attack of Afzalkhan. iv) War Tactics of Shivaji v) Diplomacy of Krishnaji Bhasker and Gopinath Pandit. vi) causes of victory in Pratapgrah Battle.
- 4) Shivaji and Mughals - a) General. b) Raid on Shahistekhan -
 - i) introduction. ii) Military strength of shahistekhan and Shivaji iii) Battle action. iv) War Tactics of Shivaji
 - c) Campaign of Mirza Raja Jaising - i) Introduction ii) Strategy of Jaising. iii) Deployment of force. iv) Siege of purandar. v) Treaty of purandar.
- 5) Karnatak campaign of Shivaji - i) Introduction. ii) objectives of expedition. iii) Consequences of campaign (Military qualities of Shivaji in Karnatak campaign.)
- 6) Assessment of ^{a)} Shivaji as a Military leader - i) founder of National Army. ii) Superior commander qualities. iii) Guerilla war tactics. iv) discipline. v) Regular pay and pension and effective spies. vi) Simple living commander. vii) Comparison of Napoleon and Alexander.
(b) Guerilla war Tactics and shivaji - characteristics of Guerilla war tactics.
- 7) Organisation of Armed forces during shivaji - i) characteristics of Military Administration of shivaji ii) Remove of fudral system. iii) National Army - Bodiguards of king.

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iv) cavazy - Bargir and shiledar v) organisation, pay and Training vi) Infantry - Recruitment of soldiors - organisati on vii) Discipline viii) Navy - Importance of Navy - Naval system, - type of ships - size of ships - Total ships - orga- nisation - Naval Industries (Building) - commercial navy - Naval role for security.

Forts - Type of forts, officers in forts their duties - (Hawaldar, subnis and karkhanis)

8) Raje Sambhaji - as a Military leader.

PART - II

9) Struggle with Mughals -a) Rajaram - General.

- Strategy of Rajaram (Maratha)

- Battle action.

- role of santaji dhanaji

(b) Santaji & Dhanaji - Military role during Rajaram and shahu - Guerilla war tactics of santaji and dhanaji

(c) Tarabai -General - strategy of Tarabai, - counter attack on Mughals.

10) Bajirao - I - a) as a military leader b) Battle of palkhed -

Introduction, - causes of conflict between Nizam and Bajirao-I

- Importance of Battle of palkhed - c) Battle of Bhopal -

Introduction- Battle action, - sies of Bhopal - Treaty.

11) Nanasaheb peshwa - (1) Battle of panipat - General - causes of

inventions of Ahmedshah Abdali - War planning - War strategy

of Abdali and Maratha - Battle action - causes of deffet of

Maratha - consequences of Battle of panipat. (ii) Battle of

Kharda - Introduction. - Military importance of kharda. - War*
* War Movements of Nizam.

Movements of Maratha. - Deployment of force- Battle action

12) organisation of Armed forces during peshwa - General. - Army

Recruitment of other community. - cavalry - Type -paga-

shiledar - Bargir-pendhari - Weapons. - Artillery - Shinde -

Holkar's role in Artillery. - Transportation of artillery.

- Navy - contribution of kanhaji Angre.

13) Anglo Maratha Wars - (a) First war - i) Introduction -

ii) Treaty of purandar (Nana phadnis + British iii) Invant-

ion of Raghoba (Battle of khandala) iv) Treaty of vadgaon

(British & Maratha) v) Battle of sipra river - Treaty of sal-

bai vi) importance of treaty of salbai

(b) Second War - Introduction -

- War planning of British.

- Treaty with Bajirao - II

- Battle in south (shind + British)

- Treaty of Deogaon and Anjangao

(c) Third War - Battles with Holkar.

- 14). Decline of Maratha power - causes - i) fudral system, ii) lack of unity. iii) Economic condition. iv) ignorance of new war tactics & weapons. v) Neglegance of Navy. vi) lack of leadership. vii) inefficient spies & good knowdge of Geography, viii) lack of Nationality. ix) Defence between weapons and leadership x) Religion system of Maratha .

Books -

- 1) Sardesai G.S. - New History of Maratha's
- 2) Sarkar J.N. - Shivaji and his times.
- 3) Sen S.N. - Military system of the Marathas
- 4) Deopujari M.B. - Shivaji and the Maratha Art of war
- 5) Sarkar J.N. - House of shivaji
- 6) जयसिंगराव पवार - शिवाजी व शिवकाळ
- 7) जयसिंगराव पवार - मराठी साम्राज्याचा उदय आणि अस्त

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S.Y.B.A./ B.Sc.

Defence and Strategic studies

General (Optional paper)

Title - Contemporary study of war and peace

Section I

1. Nature of the International sovereign state system
 - a) Evolution of Post World war I International order
 - b) Nature of the international state system after the second world war (Sp.Ref. Pipolarity, nuclear age)
2. Concepts of security
 - a) Balance of power - meaning, types, characteristics, methods and evaluations.
 - b) Collective Security - meaning of foundation and evaluation
 - c) Defference, - meaning, Definition, Theory,
 - d) Neutrality, Relation between bell igerent and newtraks, Blockade, contraband,
3. Determinants of foreign/defence policies;
 - a) National power and National Interest,
 - b) Ideology,
 - c) Science, techonology and National security.
4. War as an instrument of foreign policy

Section II

5. Cold war and emergence of world order (1945 to 1985)
 - a) Evolution of cold war in Europe,
 - b) growth of alliance systems.
 - c) Detente, meaning, nature and scope.
 - d) Return of cold war.
6. Emergence of the Third World.
 - a) Growth of regionalism of in Afro-Asia (Special reference cont..4.

- to Asian, Relations Conference, 1947, conference on Indonesia, 1949, Colombo conference, 1954 and Bandung conference, 1955)
- b) Growth of Nonalignment (Special reference to Nonaligned summit conferences)
7. Arms control and Disarmament,
- a) Nature and meaning
 - b) Important arms control agreements.

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Books (References)

- i) Calvocovessi peter, World Politics Science 1945,
- ii) Halperin Morton : Contemporary military strategy.
- iii) Maurice Clark : Reading in the Economics of war.
- iv) Prodie. R : Strategy in the missile Age.

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Defence and Strategic Studies.

S.Y.B.A./B.Sc. Special paper - I S-1

Title - Modern Warfare.

PART - I

- 1. War - i) Concept and Meaning
 - ii) Scope of War
 - iii) Causes of War
 - iv) Principles and consequences of war.
- 2. Conventional warfare -
 - i) Aspects
 - ii) Limited war and Total war.
- 3. Nuclear warfare -
 - i) General
 - ii) Concept of nuclear warfare
 - iii) Origin and development of nuclear warfare.
 - iv) Nuclear strategy
 - v) Arms race and its effects.
- 4. Missiles - Type - a) Range based missiles
 - b) Target based missiles and their characteristics
- 5. Theory of Deterrence.
- 6. Detent and Decline of cold war.

PART - II

- 7. Guerilla warfare - i) Meaning, principles, characteristics etc
 - ii) Views of Mao, che-Guevara and Lenin
- 8. Chemical Warfare- i) Historical development
 - ii) Nature of chemical warfare
 - iii) Type of chemical warfare
 - iv) Methods of chemical warfare

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- v) effect and objectives of chemical warfare.
- 9. Biological warfare -i) Historical Development
 - ii) Nature of Biological warfare
 - iii) Type of Biological warfare
 - iv) Methods of Biological warfare
 - v) effect and objectives of warfare
- 10. Psychological Warfare :
 - i) Meaning of psychological warfare
 - ii) Nature " "
 - iii) Means of " "
 - iv) Objectives " "
- 11. Economical warfare - Meaning
 - concept
 - objectives.
- 12. Electronic Warfare, Definition, concept objectives and sources
- 13. Insurgency and counter-insurgency -
 - a) Insurgency -causes -i) Distictive feature ii) Pre-requa-sites for insurgency. iii) Elements of insurgency
 - iv) progression of insurgency v) conclusion.
 - b) counter insurgency -i) Retaliation - React in fit for taf way.
 - ii) follow up (continuous) action of action plan.
 - iii) To use various means to restrain insurgency.
 - iv) Accept external non Government bodies aid.
 - v) Measures to block internal & External aid to the insurgents.
 - vi) Destruction of power centers of insurgents.
 - vii) Isolation of insurgents from society.
 - viii) Assimilation of insurgents in national main current.
 - ix) Development plans to be activated.
 - x) continuous follow up action till the goal in reached.
- 14. Star war (SDI) concept of strategic defence Iniciative, objectives, methods.

Selected Readings -

- 1. World Politics since 1945 - calvocovessi peter
- 2. Contemporary Military Strategy - Halperin morton
- 3. Strategy in the missile Age- Bordie-B.
- 4. Makers of modern Strategy - Earle E.M.
- 5. Hundred years of war, - fulls cyrill
- 6. History of warfare - montgomery.

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Defence and Strategic Studies

S.Y.B.A./B.Sc. Special Paper I (Optional) S.1.

Title :- Logistic Management of National Defence.

PART - I

- 1) Logistic Management :- Definition-Military background-seope -
Political and Economical factors-
Influence of industrial revolution-
Need for study and research of logistic
management.
2. Logistics Principles and objectives of logistic
management.-Relation to the theory of
war.
3. The nature and Structure of War
 - i) Nature of war
 - ii) Spectrum of conflicts
 - iii) Tolls of conflicts
 - iv) Limitations of war.
4. Logistic planning and programming
 - i) War time and peace time
 - ii) Pattern of planning
 - iii) Levels of planning
 - iv) Requirements of planning
 - v) Capabilities of planning
 - vi) Operational planning
 - vii) Factors of planning
 - viii) Methods of planning
 - ix) Logistics objectives of planning.
5. Mobilization of War
 - i) Potential of War mobilization
 - ii) Integrating strategy logistics and
Tactics
 - iii) Fisibility and calculated risk.
 - iv) Logistic requirements of the Armed
Forces.

PART - II

6. Problems of Logistic in different terrain
 - i) Requirements of Logistics
 - ii) Transportation by-land,Air and Sea.
7. Flexibility and Momentum
 - i) Flexibility is rooted in command.
 - ii) Effect of command and control.
 - iii) Momentum and mobility.
 - iv) Logistic momentum.
 - v) Control of momentum.
 - vi) Relation to momentum control.
8. Logistics and Industries
 - i) Logistic channel and industrial
structure.
 - ii) Economic resources and industrial
base.
 - iii) Public Sector industries
 - iv) Private sector industries

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| Logistic channel for Armed Forces. |
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9. Command and control of Logistic Management
 - i) Factors
 - ii) Implication
 - iii) Board Command responsibilities.
 - iv) Logistics and functions of command
in an area.
 - v) Practical problems.
 - vi) Personal problems
 - vii) Exercise.

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10. Logistics in the Field board outline
- i) Army supply corps (ASC)
 - ii) Army ordnance corps (AOC)
 - iii) Army Medical Corps (AMC)
 - iv) Electrical & Mechanical Engineer (EME)

Books

- 1) Henry E. Eccles :- Logistics in the national Defence.
- 2) Rear Admiral R. Bureau :- The Organisation of Logistics support System.

Defence and Strategic Studies.

SYBA/B.Sc. Special paper-II

Title Geopolitics and Military Geography. S 2

PART - I

- 1) Military Geography - Introduction
Approach to Military Geography - Environmental Matrix, Operational matrix - section of operational matrix - Transport, & communication system, military organisation and logistics, civil co-operation.
3. Definitions -
4. Scope of the subject.
5. Principles of military Geography
6. Uses of military Geography.
7. Military Geography and Political Geography.
- (2) National power and Military Geography -
 - a) Concept of National power
 - b) Elements of National power - i) Geography, Natural Resources. ii) -Industrial Development, Military preparedness, population, science & Technology National moral, political and social system. etc.
- (3) Frontiers and Boundries - a) Introduction b) Meaning of frontiers c) Meaning of Boundries d) Type of Boundries - i) Natural ii) Artificial e) Elements of Boundries - natural obstacles, cultural dividation, Riligion, political Boundries. f) Role of Boundries -
- (4) Maritime Boundries - a) General b) Concept of territorial sea
- Rang - role of territorial water. c) concept of continental shelf & exclusive economic zone d) concept of open sea.
- (5) Buffer Zone - a) General
b) Land lock State - concept
- problems of land lock state -international revir, corridor, transit.
- (6) a) Planning of Logistics - War time and peace time planning - Requirments of planning - capabilities of planning - Methods and objectives of planning.
b) Transpartotion and communication.
- (7) India's land Boundries and their importance
 - a) Western Border i) Strategic importance
ii) sectors - Kashmir, punjab, Rajstan, Gujrath.
iii) Tactical problems
iv) Kashmir problem. (political problem)
 - b) Northern Border - i) Strategical importance.
ii) sectors - North West, - central, East.
iii) Mac Mohan line.

cont...B.

- c) Eastern Border - 1) Geostrategical importance
2) outer Border, internal Border.

PART - II

- 8) Geopolitics i) a) Meaning.
b) Importance of Geopolitics
c) Scope of Geopolitics.
d) Geopolitics and Military Geography.
ii) Historical evolution of Geopolitical thoughts
a) Machinder's Heartland theory - General Heart Land.
- theory
- objections on theory.
- effect of theory.
b) Mahan - General - Naval power theory.
- affecting factors on naval power-
i) Geographical situation of nation.
ii) Physical structure of nation
iii) Size of nation.
iv) population.
v) National Interest and Governments policy.
c) Haushofer - General.
- Basic principles of theory-
i) Economic self sufficiency
ii) Living Area.
iii) outer zon (बाह्य क्षेत्र)
iv) Land power Vs. Sea power.
v) Boundries.

Haushofer's role through Geopolitical theory.

9. Geostrategy - a) Meaning
b) Importance of Geostrategy.
c) Important factors of Geostrategy -
ie- physical Geography, Land & people, culture & Government of state, Boundries of the Nation, Climate, water and communication.
10. Geostrategical Minerals - i) Iron, ii) copper iii) Bauxite
iv) Mangnes, v) Coal, vi) Uranium etc.
- strategical importance of west Asia.
- Importance of oil during wartime and peace time.
11. Geostrategic position & importance of a) Die-go-Garcia
- General
- Geographical location
- Strategical importance
- India and Die-go-garcia
b) Andaman & Nicobar Islands - General
- Geographical location
- Strategical importance.
c) Lakshwadeep Islands - Geographical location
- Strategical importance
12. Grand Strategy - Strategy - Tactics
a) Grand Strategy - Meaning, Concept Characteristics
b) of grand strategy.
b) strategy - Meaning, concept
c) Tactics -
- 13) Geographical factors affecting war -
i) Boundries wall, stretch, Natural obstacles cultural division, religion.
ii) Topography
iii) Size & shape - Merits (Direct, indirect.)
iv) climate - examples.
v) Location - Mathematical, strategical.
14. Impact of Geography on - a) Sea warfare - main factors of
naval operation - i) open sea ii) Restricted water

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- iii) ports & Rout of communication.
- b) Air warfare - General
 - Meaning of Air power
 - Elements of Air power - i) physical
 - Element - a) Geographical - location, size & shape
Topography, wheather & climate.
 - b) Economical - Raw material, fuel, industrial potancial, circulatory system, electronic communication, socio- Economic development
 - ii) Political realities
 - iii) Human Elements.
 - iv) Aviation & Military Technology.

- 15) Characteristics of - a) Plain
- b) Desert
- c) High Altitude
- d) Jungle.

Logistics problems in these arca during war

Selected Reading - Books

- 1) Military Geography - peter louis and P.G.Elzel.
- 2) Geography and National power - Jefferies williams
- 3) Geographical studies in Dcfence strategy.
- S.T. Das.
- 4) राजकीय भूगोल - अ. वि. भागवत
- 5) Air power - Air commodore Jagjit sing.
- 6) systematic political Geography - Harm Jdi Blij
- 7) War potential of Nations - khaus knoor

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SYBA/ B.Sc. Spl - 2 (Optional)

Topic - Role of Science and Technology in National Security.

Section :-

- 1) Science during Ancient Times and middle Ages.
- 2) Rise of Modern Science and inventions -
 - a) Development from Arrows to Atom,
 - b) The era of Experiment,
- 3) Age of Newtonian philosophy and Scientific law.
- 4) Sceince in the Industrial development and as a factor in social change.
- 5) Energy.
 - a) Definitions,
 - b) Applications.
 - c) Principles of conservation of energy.
 - d) Different forms of energy.
 - e) Sources and theif distribution.

Section II

- 6) A changed outlook in science,
 - a) Discover of Electron,
 - b) Radiation
 - c) Theory of Relativity
- 7) Age of computers,
 - a) Utility and application
 - b) New Trends,

- 8) Space age
 - a) Introduction and current trend (SEI)
 - b) Utility and application,
 - c) India's achievement.
- 9) Science and Technology in India's Defence :
 - a) Resource base,
 - b) DRDO - throughout the country
 - c) Armment and Armoured fighting vehicles,
 - d) Electronics (chips and miniaturization)
 - e) Aeronautics,
 - f) Naval Science,
 - g) Engineering and material science etc. . .

selected Reading

- 1) Turner D.M. and Barffer - The book of scientific Discovery
- 2) Singer Charles - A Short History of scientific Ideas,
- 3) Singer C, Holmy and Es, Hall B.R. and Williams T.I. -
A History of Technology
- 4) Journal - Defence Science Journal.

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