Appendix to F.Y. B.Sc.
Changes from June 1989

University of Poona

Circular No. 136 of 1989

Subject :—**F.Y., S.Y., T.Y.B.Sc. Geography.**

In pursuance of the decision taken by the University authorities, it is hereby notified for the information of all concerned that the syllabus of F.Y., S.Y , T Y.B.Sc. Geography is as enclosed in Appendix 'A'.

The said Syllabus will be implemented from June 1989.

Ganeshkhind, Pune-411007
Ref. No. CBS/Geography/857
Date : 25-4-1989

J. G. Bapat
for Registrar.

Gg. 110 F.Y.B.Sc. (85 Pattern)
(Elements of Physical Geography)

Section I

1. The Earth (i) Pibinteriot (ii) Composition and structure.
2. Rocks : their types with Indian examples. 6
   (*a*) Defination.
   (*b*) Classification of Rocks according to the mode of origin.
   (i) Igneous, (ii) Sedementary, (iii) Metamorphic.
   (*c*) Their characteratues, types, properties and uses (with Indian Example).
   Theories of distribution of continents and ocean :
   (i) Weagener's Theory of Contenential drift. 4
   (ii) Plate tectonique theory with Criticism.
3. Earth Movements. 4
   (A) Diastrophism.
   (i) Types of Folding.
   (ii) Faulting and associated lond ferms (with Indian examples) :
   (*a*) Block mountain, (*b*) Rift Valley.
   (B) Earthquakes :—Definition (ii) Causes of Earthquake, Earthquake waves (three wares) effect and distribution with reference to India.
   (C) Volcanism : Definition (ii) Causes of Origin. 3
   (iii) Types of Volconos, (iv) Active, (v) Dorment, (vi) Extinct.
4. Weathering :—(i) Defination. 2
   (ii) Types :—Mechanical Chemical Biological.
5. Work of Rivet :—(1) Three fold works. 8
   (ii) Erosioual, (iii) Transpertation. (iv) Depositional work.
   (2) Land forms associated with its work with Indian Example.
   (3) Study of cycle of Erosion by W. M. Davis. 5
6. Work of Wind :—Three fold Work.
   (i) Erosional, (ii) Transpertation, (iii) Deposition.
   Land forms associated with its work.
7. Work of sea :—(i) Erosion (ii) Deposition (iii) Transportation. 5
   The land forms associated with its three fold work.

40

Section II : ATMOSPHERE

1. Weather and climate. 8
   (i) Defenition and difference.
   (ii) Elements of weather and climate.
2. *Atmosphere*
   (i) Definition, (ii) Structure, (iii) Composition.
3. (i) (*a*) Temperature :—
   (*b*) Horizontal distribution of Temp :—factors effecting the distribution of temperature.
   (*c*) Vertical distributers of Temp.
   (*d*) Normal Lapse Rate and Inversion of Temperature. factor affecting the inversion tresure belts. 4

   (ii) Pressure affecting :
   (i) Formation of Pressure belts/Migration of Pressure belts. 4
   (ii) Vertical and Horizontal distributions of pressure and pressure Gradients.
   (iii) Planatary Winds. 4
   Periodic winds—Monsoon winds Land and see Breezes.

   (iii) Humidity and precipitation :— 6
   Defination and brief account of Absolute and Relative Humidity.
   Evaporation, dew-point, Staturation.
   Condeasation precipitation and Sublimation.
   Types of condensation and

   (iv) Types of Rainfall :—
   Study of Cyclones—with special reference to (*a*) temperate and (*b*) Tropical cyclone; on the basis of their origin size, shape, wind velocity, weather conditions, and associated regions, Anticyclones—

Hydrosphere :—

(i) Submarine Relief.
   (*a*) General structure of ocean floor.
   (*b*) Submarine Relief of Indian Ocean.

(ii) Salinity of ocean water :—(i) Salinity of
   (*a*) Seas, Inland lakes.
   (*b*) Causes and distrubution of Salinity. 3

(iii) Ocean Currents :—
   (i) Types : Warm and Cold.
   (ii) Causes of origin and general Circulation of ocean currants.
   (iii) Currents of Atlantic ocean. 3

Total No. of Periods ..40

List of Books :

(1) Physical Geography—A. N. Strahler.
(2) Physical Geography—P. Lake.
(3) Principles of Physical Geography—Mori Khouse.
(4) Introduction to Climate—Tire Wartna.
(5) Morphology and landscape—H. Robinson.
(6) General Climatology—H. J. Critenfield.

Gg 120 ELEMENTS OF BIO–GEOGRAPHY

Unit	Sub. Unit	Content areas	Periods
1	2	3	4
		1st term : Plant Geography	
(1) Introduction (*a*) of Biogeography	Field and Function. —	(i) definition (ii) meaning. (iii) nature. (iv) Scope and uses.	2
(*b*) Biosphere.		(*i*) definition. (ii) limits. (iii) composition.	2
(2) Introduction of plant geography.	(i) nature (ii) Scope.	(i) Study subjects of plantgeo. (ii) application in solving. Environmental Hazards.	2
(3) Ecosystem.	(i) Definition. (ii) Constituents. (iii) Functioning.	(i) Definition by Odum and Fosberg. (ii) Structure of the ecosystem. (*a*) inorganic substances (*b*) organic Substances. (*c*) Climate regime (*d*) producers (autotrops) (*e*) macroconsumers (Phagotrophs). (*f*) micro consumers (suprotrophs). (iii) (*a*) energy circuts, food chains, webs, ecological niche. (*b*) species interaction.	1 1 2 2 3
(4) Environmental Factors affecting Plant Life	(i) Physical factors. (ii) Biotic factors	(i) (*a*) Climatic, (*b*) Edaphic, (*c*) Physiographic. (ii) (*a*) influence of organisms, (*b*) human influences, (*c*) fire.	2 3

Unit	Sub. Unit	Content areas	Periods
1	2	3	4
(5) Soil.	(i) Soil Formation.	(i) (*a*) inorganic content, (*b*) organic content, (*c*) soil air, water, (*d*) Parent material, (*e*) topography, (*f*) time.	
	(ii) Soil Characteristics	(ii) (*a*) texture, (*b*) structure, (*c*) thickness, (*d*) colour.	2
(6) Vegetation Types.	(i) Forest	(i) (*a*) Evergreen forest, (*b*) Monsoon forest, (*c*) Coniferous. (Taiga) forest.	8
	(ii) Grassland	(ii) (*a*) Tropical grassland (*b*) Temperate grassland.	
	(iii) Desert.	(iii) (*a*) Hot deserts (*b*) Cold deserts	
(7) Factors affecting distribution of plants.	(i) Dispersal.	(i) (*a*) dispersal by water bodies. (*b*) by wind, (*c*) by animals.	2
	(ii) Barriers.	(ii) (*a*) absence of water, (*b*) obstucles, (*c*) absence of currents. (*d*) freezing.	2
	(iii) Rate of Spread.	(iii) rate of spread.	1
(8) Theories.	(i) Theory of tolerence.	—	2
	(ii) Joly's theory of climatic cycle.	—	
(9) The Role of plants in conservation of Environment And uses of plants.	(i) Conservation of Environment.	(i) (*a*) Conservation of soil, (*b*) refuge to animals ecological balance, (*c*) micro-climate.	
	(ii) Uses of Plants.	(ii) (*a*) as food, (*b*) animal feed, (*c*) industrial raw material, (*d*) Chemical products, (*e*) constructional material, (*f*) Fuel, (*g*) Aesthetic uses.	2
			40

2nd Term : Zoogeography

(1) Introduction to Zoogeography.	(i) Nature (ii) Scope.	(i) Definition nature (ii) Scope (field of zoogeography) (iii) (*a*) difference between Animals and plants. (*b*) Animal characteristics.	3 1
(2) Environmental factors affecting distribution of animals.	(i) Physical factors. (ii) Biotic factors.	(i) (*a*) climate, (*b*) physiographic. (ii) (*a*) vegetation, (*b*) human.	3 3
(3) Zoo-geographical Regions (faunal Regions)	(i) zoo-geographical Regions of the world. (ii) Zoo-geographical Regions of India.	(i) (*a*) Arctogea, (*b*) Neogea, (*c*) Notogea. (ii) (*a*) Himalayan Sub-region (i) Forest Zone. (ii) Western zone. (iii) transition zone. (iv) Tibetan zone. (*b*) Indian peninsular Sub-Region. (*i*) Desert region, (ii) Grangetic plain, (iii) Main peninsula. (iv) Malabar Coast.	4 3 3
(4) Darwin's theory of Evolution.	—	(i) introduction. (ii) nature of the theory. (iii) merits and demerits.	2 2 2
(5) Migration of birds.	—	(i) (*a*) Introduction : what is bird migration. (*b*) Causes of migration. (*c*) Extent of migration and velocity of flight. (*d*) Accuracy and regularity of returns.	1 1 1 1
(6) The Problems regarding conservation of animals.	(i) need for conservation. (ii) strategy for conservation.	(i) (*a*) Conservation of habitat. (*b*) Biosphere reserve. (ii) (*a*) Control of destructive exploitation. (*b*) Creation of protection areas.	3 3
(7) Uses of animals and Economic activities.	(i) Providers of food and raw material. (ii) Beast of burden, transport. (iii) pets. (iv) Use as a biological control.	,, ,, ,, ,,	4

List of Books :

(1) Plant Geography—Bharucha.
(2) Biogeography—Robinson.
(3) Plant ecology—Odum.
(4) Zoogeography—Bharucha.
(5) Biogeography—Ahirrao and others.

Gg 101 : F.Y.B.Sc. Practicals

Unit	Sub-unit	Areas to developed	Periods
(1) Interpretation of Toposheets	Introduction to the Toposheets(SOI)	To acquire the skill of reading topographical maps.	4
	Indexing of the Toposheets and Marginal Information of the SOI	To understand the meaning of Grid.	4
	Toposheets. Grid and Grid references.	To practice finding out the object with the help of gird references.	4
	Information about Toposheets :		
	1 : 1000,000		
	1 : 250,000		
	1 : 50,000		
	1 : 25,000 sheets		
Scales	V.S.	To acquire the skill of constructing the three types of scale.	6
	R.F.		
	Simple graphical scale.		
(2) Contour maps	Forms of Relief representation : Confour Patterns for various relief features.	To identify various relief features on map (only frequently occuring features).	6
	Cross profiles, Longitudinal profiles inter visibility.		8
	Map Reading (at least two toposheets).		
	(i) Hilly and Mountainous area		8
	(ii) Plain area.		
			40

(3) Weather Maps	Information about I.M.D. weather maps with weather symbols Representation of weather data Bor and Line graph Isotherms, Isobars and Isohytes	(1) To acquire the knowledge of Indian daily weather report. (2) To understnad the meaning of signs and symbols in weather chart. (3) To develop the skill of drawing the signs and symbols.	4 8
(4) Weather Instruments	Functions and Mechanism and use of following weather instruments Temperature (A) : (1) Thermometers. (2) Maximum and Minimum Thermometer. (3) Thermograph Pressure (B) : (1) Barometers Aneroid and fortin's. (2) Barograph. Humidity (C) : (1) Hair Hygrograph. (2) Dry ' Wet bulb thermometer. (3) Hair Hygrometer. Winidity (D) : (1) Wind Vane. (2) Cup Anemometer.	(1) To acquire the knowledge of measurement of temoerature pressure humidity wind velocity, precipitation. (2) To acquire the knowledge of all the different types of weather instruments. (3) To understand the principle, construction working, uses and draw backs of the instruments. (4) To develop the mathematical skill of solving the problem. (5) To develop the skill of systematic drawing of the instruments and naming the different parts. (6) To develop the skill of readings of temp. press, humidity, ppt. wind velocity and skill of reading diff. types of graphes.	4 4 4

Unit	Sub-unit	Areas to developoled	
	Rainfall (E) :		
	(1) Rain Guage Patterns.	(1) To understand the meaning of isobars.	4
	(2) Isoberic Patterns Cyclones, Wedege, Trough etc.	(2) To develop the skill of drawing issbaric shapes and patterns.	
	(3) Reading of weather maps (One each for summer, weather and rainy season).	(1) To acquire the knowledge of Indian daily weather report.	8
		(2) To develop the skill of correct representation of the weather reports to read the report.	8
			40

List of Books :

(1) Mapwork and Practical Geography—Singh and Kanauja.
(2) Geographical Interpretation of Indian Topographical maps—Tamaskar and Deshmukh.
(3) Map Interpretation -R. Ramamurty.
(4) Map Interpretation—Dury.
(5) Practicals in Geography—Singh and Dulla.
(6) Map work—Bigat.

Circular No. 189 of 1989

Subject :—B.Sc. Defence Studies revised syllabus.

In pursuance of the decision taken by the University authorities, it is hereby notified for the information of all concerned that the revised syllabus of dfence Studies at F.Y., S.Y. and T.Y.B.Sc. is as given in enclosure. This syllabus will be implemented from June 1989.

Ganeshkhine, Pune–411 007.
Ref. No. CBM/1232
Date : 17–7–1989

V. S. Pol,
for Registrar.

B.Sc. New Syllabus w.e.f. June 1989
(Defence and Strategic Studies)

F.Y.B.Sc. (3 courses, Total 300 marks).

1. Indian Military History (Ancient and Medieval).
2. Indian Military History (Maratha Period).
3. Western Military History.

F.Y.B.Sc. Course I—Indian Military History
(Ancient and Medieval Period)

Part I :

1. Meaning, scope and sources of military history.
2. Military system during the Indus Valley Civilization.
3. Military system in Vedic Period.
4. Military system in Ramayan and Mahabharat period.
5. Indo-Greek art of war with special reference to the bettle of Zellum (326 B.C.)
6. Kautilya's philosophy of war, military organisation, weapons, forts, pattern of warfare, interstate relations espionage, concept of defence and security.
7. Military system of Gupta Empire.

Part—II :

8. Rajput military system and the art of warfare.
9. Turk military system with special reference to the battle of Somanath and Tarrain.
10. Military system, warfare and reforms during the Sultanate period (1206 to 1526 A.D.).
11. Mughal military system, organisation training, weapon system, art of warfare; battle of panipat (1526 A.D.) battle of Haldighat (1576 A.D.)
12. Southern Indian Empires—1. Vijayanagar, 2. Cholas.

Notes :—The course fourses on the evolution of the system : of warfare, strategy and tactics.

Books :

(1) B. K. Mujumdar—*Military System in Ancient India.*
(2) J. E. C. Fuller (Maj, Gen.) -*Generalship of Alexander the Great.*
(3) K. P. Kangley—*Kautilya Arthashastra.*
(4) J. N. Sarkar—*Military History of India.*
(5) Erskin—*Memories of Babar.*
(6) William Irvin- *Army of the Indian Mughals.*
(7) S. N. Sen—*The Military System of Markathas.*
(8) F. S. Bajwa –*The Military Sysyem of Sikh.*
(9) Fortesque—*History of the British Army.*

F.Y.B.Sc. Course II -Indian Military History
(Maratha Period)

Part—I :

1. Political, Social, economic religious and geographical situation in Maharashtra before Shivaji.
2. Shivaji : Roll of Jijabai and Dadoji Kondev.
3. Shivaji and Adilshahi : 1. Jawali incident, 2. Battle of Pratapgad.
4. Shivaji and Mughals : 1. Raid on Shaistekhan, 2. Compaign of Mirza Raje Jaisingh and the threaty of Purandar.
5. Shivaji's Karnataka campaign.
6. Evaluation of Shivaji as a military leader and guerilla tactics.
7. Organisation of Maratha armed forces and forts under Shivaji.
8. Military leadership of Sambhaji.

Part—II :

9. Struggle with Mughals—Santaji, Dhanaji, Rajaram, Tarabai.
10. Warfare during the period of Peshwas : 1. Bajirao-I, 2. Nanasaheb Peshwa- with special reference to their battles like Palkhed, Bhopal, Panipat (1761 A.D.), Rakshashbuvan, Kharada, 3. Maratha Navy under Kanhoji Angre.
11. Anglo-Maratha Wars (First, Second and Third).
12. Military organisation of Shikhs under Guru Govindsingh, Ranjitsingh, Anglo-Sikh Wars (With special reference to the battle of Sobran).
13. Decline of Maratha Power.

Note :—The course fourses on the evolution of the system of warfare, strategy and tactics.

Books :

(1) Sardesai, G. S.—*New History of Marathas.*
(2) Sarkar, J. N.- -*Shivaji and his Times.*
(3) Sarkar, S. N.—*House of Shivaji.*
(4) Sen, S. N.—*Military System of the Marathas.*

F.Y.B.Sc. Course 3—Western Military History

Part—I :

1. Military System of Greeks.
   (*a*) Organisations Weapons, art of war etc.
   (*b*) Alexander-the-great.
2. Military System of Romans.
   (*a*) Organisations weapons, tactics etc.
   (*b*) Julius Caesar.
3. Hanibal and Scipio-contribution to the art of war-Battle of Zama, Battle of Cane.
4. The age of Cavalry.
5. Revival of Infantry.
6. Gun-Powder and Fire arms.
7. Assessment of Gustavus Adophus, Fredvick the Great and Nepolion.

Part—II :

8. Causes of World War—I.
9. Schliffon plan of German Offensives.
10. Various kind of warfare.
    (*a*) Trench warfare.
    (*b*) Tank warfare.
    (*c*) Gas warfare.
    (*d*) Psychological warfare.
11. Role of 'U' Boats in world war—I.
12. Treaty of versailes.
13. Background of world war—II.
14. Blitzkreig Technique and Pansar Division of Germany.
15. Rise of Japan as military power and its attack on Pearl-Harbour.
16. Tactical and Strategical use of Air Power in World war—II.
17. Development of Artillery during world war—II.

Note :—The course focuses on the castution of the system of warfare, strategy and tactics.

Circular No. 282 of 1989

Subject :—**Changes in F.Y. and S.Y.B.Sc. Botany Syllabus.**

In pursuance of the decision taken by the University authorities, it is hereby notified for the information of all concerned that the changes in F.Y. and S.Y.B.Sc. Botany are as given in Appendix "A".

The above said changes will be effective from this year.

Ganeshkhind, Punc–411007
Ref. No. CBS/Botany/1676
Dated : 9-10-1989

V. S. Pol,
for Registrar.

Change in F.Y.B.Sc. and S.Y.B.Sc. Botany Syllabi

Over the last year(s) it has been observed by teachers teaching the F.Y.B.Sc. and S.Y.B.Sc. course in Botany that there are.

(1) Some overlapping of topic(s) and

(2) Some topics have been with many details which can not be given justice in the time available, therefore the B.O.S. in Botany held on 28–3–1989 resolves that the following portion(s) in Theory and Practicals in the syllabus be deleted or corrected for teaching the subject, From June 1989.

The details of this are as follows :

DELETION/AND CORRECTION FROM F.Y.B.Sc. SYLLABUS

BOTANY—PAPER I—CRYPTOGAMS

First Term—CRYPTOGAMS 1

DELETION

B–1 Economic importance.

B–2 Study of life-history of *Nostoc.*

C–1 Economic importance.

D Lichens

CORRECTION

N.B. :—Number of periods alloted to

B–1 4 instead of 5

C–1 3 instead of 4.

Second Term—CRYPTOGAMS II

DELETION

A–3 Study of life-history of *Anthoceros.*

B–2 Study of life-history of *Psilotum.*

BOTANY- PAPET II—CELL BIOLOGY AND ENVIRONMENTAL BIOLOGY

First Term- CELL BIOLOGY

DELETION

B Contributions of following scientists. Hook, Brown, Schleiden and Schwann, Virchow.

H–2 Chloroplast—(1) Ultrastructure. (2) Chemical composition, (3) functions.

CORRECTION

Number of periods alloted to :

C 2 instead of 3.

D 2 instead of 3.

F 3 instead of 4.

G 5 instead of 6.

H 1 instead of 3.

K 4 instead of 5.

Second Term—ENVIRONMENTAL BIOLOGY

DELETION

G Ecological succession,

H Ecological indicators

I Polution.

PRACTICALS I—TERM (CRYPTOGAMS)

DELETION

2. Study of *Nostoc.*

6. Study of *Lichens.*

10. Study of *Anthoceros.*

11. Study of *Psilotum.*

PRACTICALS II TERM (CELL BIOLOGY AND ENVIRONMENTAL BIOLOGY)

DELETION

4. Analysis of water sample from polluted and unpolluted ecological situation with respect to the following.
(i) smell, (ii) colour, (iii) Suspended matter, (iv) pH, (v) Hardness (by titration method) (vi) Presence of pollution indicators-plants and animals.

8. (ii) Visit to Locations affected with pollution.
(iii) Visit to an area so as to study stages in succession.

Circular No. 186 of 1989

Subject :—**F.Y.B.Sc. Geology Syllabus.**

In pursuance of the decision taken by the University authorities, it is hereby notified for the information of all concerned that the syllabus for F.Y.B.Sc. Geology is as enclosed in Appendix 'A'.

The said syllabus will be implemented from July 1989.

Ganeshkhind, Pune 411007
Ref. No. CBS/Geology/1218
Dated : 4/13–7–89

Sd/–
for Registrar.

APPENDIX 'A'

Syllabus for F.Y.B.Sc. Geology

Paper I :—

Physics and chemistry of the earth's constituents :

(*a*) Mineralogy : 1st Term.

(*b*) Petrology : IInd Term.

Paper II :—

General Geology : 1st Term.

Palaeontology : IInd Term.

Physics and Chemistry of the earth's constituent Term I Paper I (Mineralogy)

1. *Chemistry of the minerals :*

(*a*) Definition of mineral.

(*b*) Geological processes of mineral formation.

(*c*) Major elements constituting minerals.

(*d*) Chemical affinity of elements in the formation of minerals.

(*e*) Principles of crystal chemistry :—

(i) Bonding of atoms.

(ii) Sizes of ions.

(iii) Isomorphism.

(iv) Polymorphism.

(v) Pseudomorphism.

(vi) Non-crystalline minerals. **6**

2. *Physics of minerals :*

(*a*) Specific gravity, methods to determine specific gravity of minerals.

(*b*) Cleavage and fracture.

(*c*) Hardness.

(*d*) Forms of minerals.

(*e*) Characters dependent upon light :

(i) Color and streak.

(ii) Lustre.

(iii) Fluorescence.

(iv) Phosphorescence.

(*f*) Magnetic properties.

(*g*) Electrical properties.

(*h*) Radioactive properties. **8**

3. *Crystallography :*

(*a*) Definition.

(*b*) External characters of crystals.

(*c*) Interfacial angle.

(*d*) Solid angle.

(*e*) Law of constancy of interfacial angle.

(*f*) Symmetry of crystals.

(*g*) Elements of symmetry.

(*h*) Crystallographic axis.

(*i*) Crystallegraphic and geometrical symmentry.

(*j*) Parameter.
(*k*) Axial ratio.
(*l*) Indices.
(*m*) Parameter system of weiss.
(*n*) Index system of Miller.
(*o*) Law of rational indices.
(*p*) Lettering and order of crystallographic axes and conventions in notations.
(*q*) Classification of crystals of normal class.
(*r*) A comparative study of elements of symmetry, axis, forms with indices of cubic (Glena type),

Terragonal (Zincon type) and Orthorohomic (Barytes type) Classification and their comparison. 7

4. *Description of minerals* :

(*a*) Class I :—Native elements : Gold, Silver, Copper, Sulphur, Carbon.
(*b*) Class II : Sulphides : Galena, Chalocopyrite, Pyrite,
(*c*) Class III : Oxides and hydroxides : Magnetite, Chromite, corundum, Haematite, Psilomelane, Bauxite.
(*d*) Class IV : Halides : Fluuorite, rock salt.
(*e*) Class V : Carbonates : Calcite, Magnesite, Nitrates, Bortes.
(*f*) Class VI : Sulphates, Chromates, Molybdates, Tungstates, Barites, Gypsum.
(*g*) Class VII : Phosphates Aresenates, Vanadates, Apatite.
(*h*) Class VIII : Silicates : Quartz and its, varieties, Orthoclase, Microcline, Plagioclase, Stilbite, Talc, Muscovite and biotite, Hornblende, Augite, Beryl, Tourmaline, Olivine, Kyanite and Garnet.

5. *Optical Mineralogy* :

(*a*) Nature of Light, plane polarised light, Nicol's prism and polaroids.
(*b*) Double refraction (with the help of calcite crystal) of light, petrological microscope.
(*c*) Properties in plane polarised light : Colour, Form, Cleavage, cracks, relief, paleochrosim, twinking.

Properties between crossed Nicols : Isotropism, Anisotropism, Extriction position interference colours, Twinning.

Books

(1) Elements of Mineralogy : Read H. H.
(2) A text book of mineralogy by Dana and Ford.
(3) A Course of Mineralogy by Betekhtin.
(4) Mineralogy for students, M. H. Bettey.

General Geology

Term I Paper II — *Lectures*

1. Scope of Geology and subdivisions of geology. 1
2. History of the Earth :
   (*a*) The earth in space.
   (*b*) Origin of universe (Big bang Theory).
   (*c*) Origin of Solar system (Nebular Theory), Encounter theory.
   (*d*) Size, shape : density, internal shell of the earth.
   (*e*) Age of the earth. 6

Lectures

3. Concept of Geological Time Scale.
   (*a*) Divisions and subdivisions.
   (*b*) Major events in earth's history. 4
4. Distribution of land and sea through geological ages.
   (*a*) Distribution of land and sea in palaeozoic.
   (*b*) Distribution of land and sea in Megozoic.
   (*c*) Distribution of land and sea in Tertiary. 3
5. Iscastacy.
   (*a*) Definition.
   (*b*) Airy's and Prath's theories. 2
6. Mountain and mountain building processes.
   (*a*) Types of mountains. 2
   (*b*) Mountain building processes in short. 2
7. Erosional and depositional landforms formed by the action of river, wind, sea and glaciers. 4
8. Volcanoes and earthquakes. 4
9. Major mountain ranges and river system of India with special reference to Maharashtra. 4

Books

(1) Essentials of Earth History : W. Stokes, P. Hall.
(2) Principles of Physical Geology : A. Holmes.
(3) History of the earth : D. Eicher, P. Hall, MC Arester.
(4) General Geology : Radhakrishnan.
(5) Geology of India and Burma : M S. Krishnan.
(6) Historical Geology : Dunbar.

Petrology

Term II : Paper I

1. Definitions of the terms Petrography, Petrogenesis, Petrology and lithology. Major devisions of Rocks; Igeneous, Sedimentary, Metamorphic. The rock cycle. Diagenostic characteristics of each Devision of rock. 2
2. Igneous Petrology : 11
   Formation of igeneous rocks. Forms of igneous bodies : Concordant and discordant. Distinction between contemporaneous lava flow and sill.
   Common textures and structures of igneous rocks (Textures : Grabitic, Porphyritic, Ophitic, subophitic and glass. Structures : Vesicular, amydaloidal blocky, ropy, pillow and flow).
   Factors controlling textures of igneous rocks in brief. Textures of plutonic rocks and textures of volcanic rocks.
   As given above.

Magma and its composition, pyrogenetic minerals (common minerals of igneous rocks).

Classification of igeneous rocks : Tabular classification : Alk and calc. Alk series and up-to basic rocks of plutonic, volcanic types and following hypabyssal rocks are to be shown in the table classification, at their proper places.

Graphic granite, Pegmatite, Pitchstone, Dolerite, Porphyritic granite.

Plutonic : Granite–granodiorite
Syenite : Diorite
Alk. Gabbro, Gabbro

Volcanic : Obsidian, Rhyolite, Pumice } Dacite
Trachyte–Andesite
Alk basalt–Basalt

3. Sedimentary Petrology : 12

Derivation, Transportation and deposition of sediments. Derivation : Mechanical (disintegration) weathering Chemical (decompsition) weathering.

Transportation : Mechanical and Chemical modes.

Deposition : Causes and mode of deposition.

Classification of sedimentary rocks based on grain-size. Classification based on exogenic (mechanical) and endogenic (chemical) sediments (tabular).

Study of Rudaceous, arenaceous and argillaceous rocks. chemical and organic deposits.

Common textures and structures of sedimentary rocks. Textures : clastic and non clastic textures. Structures : Graded bedding, current bedding and ripple marks.

4. Metamorphic Petrology : 8

Definition of metamorphism, agents of metamorphism, kinds of metamorphism and their characteristics. Study of following rock types : Slate, marble, quartrite phyllite, mica schist, hornblendes schist and Hornablende gneiss. Structures of metamor, phic rocks : granulose, schistose and gneissose structures.

Books

(1) Principles of Petrology by G. W. Tyrrel.

Palaeontology

Term II : Paper II

1. Definition of palaeontology, fossils.
Branches of Palaeontology
Conditions of fossilization.
Modes of preservation-exceptionally well preserved fauna
Techniques of collection, preservation, illustration and description.
Uses of fossils.

2. Systematic position, geological and geographical distribution and morphology of hard parts of the following :— 25

Phylum : Mollusca, class : Bivalvia Morphology of hard parts of the shell and ornamentation and types of hinge Lines.

Class : Cephalopoda : Morphology of hard parts of Nautilus, Ammonoids, Belemnites, Types of suture lines.

Phylum : Brachiopoda : Morphology of hard parts of class articulata and inarticulata. Brachial skeleton and types.

Phylum : Echinodermata class : Echinoidea. Morphology of hard parts of regularia and irregularia. Variation in the apical disc in echinoids.

Phylum : Arthropoda class : Trilobita. Morphology of hard parts of Trilobites.

Phylum Coelenterata class : Anthozoa, order : Zoanthadria, Morphology of hard parts of Madréporaria, Montilivaltia, Calceola etc.

3. Life through ages. 2

35

Books

(1) Invertebrate Palaeontology by Woods.
(2) Invertebrate Palaeontology Rhona Black.
(3) Invertebrate Palaeontology shock and Twenhofel.

F.Y.B.Sc. Practical Course

Physics and Chemistry of the Earth (Mineralogy)

1. Physical properties of the following minerals :

Class I	..Copper, Carbon (Graphite)
Class II	..Galena. Chalcopyrite, Pyrite.
Class III	..Magnetite, Chromite, Corundum, Haematite, Psilomelane, Bauxite.
Class IV	..Fluorite.
Class V	..Calcite, Magnesite.
Class VI	..Baryte, Gypsum.
Class VII	..Apatite.
Class VIII	..Quartz and its varieties, orthoclase, Microcline, Plagioclase, stilbite, Talc, Muscovite, Biotite, Hornblende, Augite. Beryl. Tourmaline, Olivine, Kyanite, Garnet.

2. Experiment to find out specific gravity of minerals and rocks by Walkers Steelyard Balance and Jollys Spring Balance

3. *Crystallography :*

Study of Elements of symmetry, Crystallographic Axis, Forms and Indices of Cubic system (Galena type), Tetragonal system (Zircon Type) and Orthorhombic system (Baryte Type) atleast four models to be studied in addition to the fundamental forms (except cubic system).

Optical Mineralogy –Study of optical properties of minerals as given in theory course (identification of mineral not included).

General Geology :

1. Study of contour maps, Geological map with horizontal beds, Reading of Toposheets.
2. Location of major mountain ranges and river systems of India on map of India.

Palaeontology :

Study of atleast two specimens from each phylla and total number of specimens should not be less than 15.

1. Phyllum Mollusca (Bivalves, Gastropoda, Cephalopoda).
2. Phyllum Brachiopoda.
3. Phyllum Echinodermate.
4. Phyllum Arthropoda (Triobites).
5. Phyllum Coelentrata (Corals).

Petrology :

Megascopic study of following rocks :

1. Igneous—Granite, Gabbro, Rhyolite, Basalt, Pegmatite (Classification based on colour index, grain size and depth).
2. Metamorphic—Slate, Marble, Quartzite, Schist and Gnesis.
3. Sedimentary—Conglomerate, Breccia, Crit, Sandstone, Shale, Mudstone, Limestone, Organic Limestone and structure (Graded Bedding), Current bedding and Ripple marks.

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