

**NORTH MAHARASHTRA UNIVERSITY,  
JALGAON**

**NEW SYLLABI  
OF  
S.Y.B.Sc.  
GEOGRAPHY**

**WITH EFFECT FROM JUNE  
2013**

## **STRUCTURE OF NEW SYLLABI**

**OF**

## **S.Y.B.Sc. GEOGRAPHY**

**Gg 231: Sem III- Paper I : PHYSICAL GEOGRAPHY OF  
MAHARASHTRA**

**Gg 232: Sem III- Paper II :(A) ENVIRONMENTAL  
GEOGRAPHY**

**Gg 241: Sem IV- Paper I : ECONOMIC GEOGRAPHY OF  
MAHARASHTRA**

**Gg 242: Sem IV- Paper II : (B) ENVIRONMENTAL  
GEOGRAPHY**

**Gg 203: (Practical-Annual Pattern): STUDY OF SOI  
TOPOGRAPHICAL MAPS,  
WEATHER IMAGES AND  
SURVEYING**

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

**NEW SYLLABI OF**

**S.Y.B.Sc. GEOGRAPHY,**

**Sem III- Paper I**

**(With Effect From June 2013)**

**Gg 231: : PHYSICAL GEOGRAPHY OF MAHARASHTRA**

**Objectives:**

- To acquaint the students with basic knowledge of our state.
- To make the students ready for NET,SET and Competitive examinations.
- To aware the students with available natural resources and need of conservation and protection.

| S<br>r | Unit                                                     | Sub Unit                                                                                                                                                                                 | Period<br>s |
|--------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1      | Geographic<br>al<br>Personality<br>of<br>Maharashtr<br>a | 1. Intro<br>duction to Maharashtra: Natural, Historical and<br>Political<br>2. Locati<br>on, Extent and Geographical Area<br>3. Admi<br>nistrative Divisions<br>4. Geolo<br>gical Set-up | 10          |
| 2      | Physiograp<br>hy and<br>Drainage                         | 1. Physi<br>ography:<br>a) Konka<br>n Region<br>b) Weste<br>rn Ghat<br>c) Mahar<br>ashtra Plateau<br>2. Drain<br>age:<br>a) Rivers and their basins in                                   | 24          |

|   |                              |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                          |    |
|---|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----|
|   |                              | Konkan Region<br>b) Rivers and their basins in<br>Plateau Region<br>3. Lakes and Ponds                                                                                                                                                                                                                                                           |                                                                                                          |    |
| 3 | Climate                      | 1. Factors affecting climate<br>2. Characteristics of climate<br>3. Seasons<br>4. Regional variations in temperature and rainfall distribution                                                                                                                                                                                                   | Factor<br>Chara<br>Seaso<br>Regio                                                                        | 16 |
| 4 | Soils and Natural Vegetation | A)<br>(a) Types,<br>(b) Spatial Distribution of soil.<br>(c) Characteristics<br>(d) Erosion and Conservation<br>B)<br>Natural Vegetation:<br>(a) Types of Forest<br>(b) Spatial Distribution of Forest<br>(c) Importance of Forest<br>(d) Causes of Deforestation<br>(e) Measures of Forest Conservation<br>C)<br>National Parks and Sanctuaries | Soil:<br>Soil<br>Spatia<br>Chara<br>Soil<br>Natur<br>Types<br>Spatia<br>Impor<br>Cause<br>Measu<br>Natio | 20 |
|   | Total Unit-04                | Total Periods                                                                                                                                                                                                                                                                                                                                    |                                                                                                          | 60 |

**Weight age**

| Unit         | Periods   | Marks     |
|--------------|-----------|-----------|
| 1            | 10        | 06        |
| 2            | 24        | 12        |
| 3            | 16        | 12        |
| 4            | 20        | 12        |
| <b>Total</b> | <b>60</b> | <b>40</b> |

### Reference Books

1. Dixit KR (1986) : Maharashtra in Maps, State Board of Literature and Culture, Govt of Maharashtra, Bombay.
2. Deshpand C.D. (1971) Geography of Maharashtra, National Book Trust of India.
3. Diddee Jaymala, Jog S.R., Kale V.S., Datye V.S. (2002) : Geography of Maharashtra, Rawat Publications, Jaipur and New Delhi.
4. Arunachalam, B. (1967) Geography of Maharashtra
5. Singh R.L. (2008) : A regional Geography of India, National Geographical Society of India, Varanasi-5.

### Marathi Books:

1. Prakrutik Bhugol va Maharashtrache Prakrutik Paryawaran : Dr. S.R. Chaudhari & Dr. M.B.Chavan, Himalaya Publishing House, Mumbai and Nagpur
2. Manavi Bhugol Va Maharashtrache Manavi Paryavaran : Dr. S.R. Chaudhari & Dr. M.B.Chavan

| <b>Unit</b> | <b>Topic</b>                      | <b>Sub-Topics</b>                                                                                      | <b>Periods</b> |
|-------------|-----------------------------------|--------------------------------------------------------------------------------------------------------|----------------|
| 1           | Nature and Scope of Environmental | 1. Definitions.<br>2. Interdisciplinary and Dynamic Nature.<br>3. Scope and importance need for Public | 10             |

3. Dastane Santosh (2011-12)  
Maharashtra, Published by Dastane  
Ramchandra and Comp.,Pune
4. Khatib, K.A. (2005)  
Maharashtracha Boogol, K'Sagar Publications Pune.
5. Dr. Sarang Subhashchandra  
(1997) Maharashtra Bhoogol, Vidya Prakashan, Nagpur

**SNORTH MAHARASHTRA UNIVERSITY- JALGAON**  
**Syllabus for S.Y.B.Sc. Geography**

**Semester - III -Paper - II**

**Gg. 232: (A) ENVIRONMENTAL SCIENCE**

[with effect from -June-2013.]

**Objectives:**

- 1) To acquaint the students to fundamental concepts of Environmental Science.
- 2) To acquaint the students to past, present and future utility and potentials of Environmental Science at regional, national and global levels.
- 3) To make aware the students about problems of Environment for utilization and conservation in the view of sustainable development.

|   | Science-     | Awareness.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |
|---|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 2 | Ecosystem    | <ol style="list-style-type: none"> <li>1. Meaning and Concept of Ecosystem.</li> <li>2. Cardinal Principles of an Ecosystem.                             <ol style="list-style-type: none"> <li>(a) Structure – Components -A biotic and Biotic.</li> <li>(b) Nutrient Cycling in Ecosystem.</li> </ol> </li> <li>3. Carbon cycle, Nitrogen cycle, Phosphorous Cycle:                             <ol style="list-style-type: none"> <li>(a) Energy Flow in ecosystem.</li> <li>(b) Food chain.</li> <li>(c) Food web.</li> </ol> </li> <li>4. Ecological Pyramid.                             <ol style="list-style-type: none"> <li>Biological population pyramid,</li> <li>Bio-mass pyramid,</li> <li>Biotic Energy Pyramid.</li> </ol> </li> <li>5. Ecological Succession.                             <ol style="list-style-type: none"> <li>(a). Primary (b) Secondary.</li> </ol> </li> <li>6. Types of Ecosystems:                             <ol style="list-style-type: none"> <li>(a) Forest ecosystem</li> <li>(b) Grassland ecosystem</li> <li>(c) Desert ecosystem</li> </ol> </li> </ol> | 22 |
| 3 | Biodiversity | <ol style="list-style-type: none"> <li>1. Definitions</li> <li>2. Genetic species and ecosystem diversity.</li> <li>3. Value of Biodiversity.</li> <li>4. Biodiversity at global, National and local levels.</li> <li>5. India as a mega-diversity nation</li> <li>6. Hot-sports of biodiversity.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16 |

|   |                   |                                                                                                                                    |    |
|---|-------------------|------------------------------------------------------------------------------------------------------------------------------------|----|
|   |                   | 7. Threats of Biodiversity                                                                                                         |    |
| 4 | Energy Resources. | 1. Concept and definition<br>2. Types of energy Resources:<br>a) Conventional – Coal.<br>b) Non-conventional - Wind, Solar, Hydal. | 12 |

Total Periods- 60

### Weightage

| UNIT           | Marks |
|----------------|-------|
| 1              | 08    |
| 2              | 12    |
| 3              | 10    |
| 4              | 10    |
| Total Marks    | 40    |
| Internal Marks | 10    |

### Reference Books

1. Ahirrao and Alizad : Environmental Science, Nirali Publishing house, Pune
2. Savindra Singh :Environmental Geography, Prayag Pustak Bhawan, Alahabad-  
211002
3. H.M.Saxena : Environmental Studies, Rawat Publication, Jaipur & New Delhi.

### Marathi Medium:

4. Prof.S.V.Dhake, Dr.Ingale, Dr.V.J.Patil: Paryavaranshastra , Prashant Publication, Pune.
5. Dr. Chaudhari S.R : Environmental studies, Himalaya Publishing House, Mumbai



**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

**S.Y. B.Sc.**

**(Semester IV, Paper I)**

**Gg 241: ECONOMIC GEOGRAPHY OF MAHARASHTRA**

**(With effect from June 2013)**

**Objectives:**

1. To know the economic activities of Maharashtra in the context of geographical conditions
2. To study the availability & utility of economic resources in Maharashtra.
3. To focus on the problems and prospects of economic resources in Maharashtra.
4. To study the necessity of protection and conservation of resources in Maharashtra.
5. To know the demographic structure of Maharashtra
6. To acquire the basic knowledge of economic background of Maharashtra for competitive examinations.

| <b>Unit</b> | <b>Topic</b>            | <b>Sub-topics</b>                                                                                                                                                                                                                                                                                                                               | <b>Periods</b> |
|-------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| I           | Population<br>Resources | 1. Population growth in Maharashtra<br>2. Population density and its regions<br>a) High population density regions<br>b) Moderate population density regions<br>c) Low population density regions<br>3. Factors affecting spatial distribution of population in Maharashtra.<br>a) Physical factors<br>b) Economic factors<br>c) Social factors | 14             |

|     |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |
|-----|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|     |                                         | <p>4. Socio-economic &amp; demographic features in Maharashtra.</p> <p>5. Growth of urban population in Maharashtra.</p>                                                                                                                                                                                                                                                                                                                                                                                                             |    |
|     | General Landuse & Agriculture           | <p>1. General Landuse of Maharashtra</p> <p>a. Area under forest</p> <p>b. Area under agriculture</p> <p>c. Area not available for cultivation</p> <p>d. Other uncultivated land (Excluding fallow land)</p> <p>e. Fallow land</p> <p>2. Role of agriculture in the economy of Maharashtra</p> <p>3. Types of agriculture:</p> <p>a) Subsistence farming</p> <p>b) Intensive subsistence farming</p> <p>c) Horticulture</p> <p>4. Agro-climatic zones in Maharashtra</p> <p>5. Problems of agriculture and its remedial measures</p> | 14 |
| III | Minerals, energy resources & industries | <p>1. Major minerals and their production and Distribution:</p> <p>(a) Manganese</p> <p>(b) Iron ore</p> <p>(c) Bauxite</p> <p>2. Energy resources-Production and Distribution:</p>                                                                                                                                                                                                                                                                                                                                                  | 16 |

|    |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |
|----|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|    |                     | <p>(a) Coal</p> <p>(b) Thermal power projects</p> <p>(c) Hydel power projects</p> <p>(d) Wind mills</p> <p>3. Industries:</p> <p>a) The cotton textile industry –</p> <p style="padding-left: 40px;">I) Factors governing the location of cotton textile industry</p> <p style="padding-left: 40px;">II) Distribution and problems faced by cotton textile industries</p> <p>b) The sugar industry – Distribution and difficulties of sugar industries.</p>                                                                                                                                                                                                                                                 |    |
| IV | Trade and Transport | <p>1. Trade: International, National and internal trade of Maharashtra.</p> <p>2. Transportation: Meaning and different modes of transportation</p> <p>a) Roads: Classification of roads</p> <p style="padding-left: 40px;">I) National Highways</p> <p style="padding-left: 40px;">II) State Highways</p> <p style="padding-left: 40px;">III) Major District Roads</p> <p style="padding-left: 40px;">IV) Other district Roads</p> <p style="padding-left: 40px;">V) Village Roads</p> <p>b) Railways:</p> <p style="padding-left: 40px;">I) General information about length , distribution and types of gauges</p> <p style="padding-left: 40px;">II) Main railway lines passing through Maharashtra</p> | 16 |

|  |  |                                                                                            |  |
|--|--|--------------------------------------------------------------------------------------------|--|
|  |  | <p>III) Importance of Konkan railway</p> <p>c) Water transport</p> <p>d) Air transport</p> |  |
|--|--|--------------------------------------------------------------------------------------------|--|

**\*Weightage**

| <b>Unit</b>  | <b>Periods</b> | <b>Marks</b> |
|--------------|----------------|--------------|
| I            | 14             | 08           |
| II           | 14             | 10           |
| III          | 16             | 12           |
| IV           | 16             | 10           |
| <b>Total</b> | <b>60</b>      | <b>40</b>    |

**Reference Books:**

1. Dixit, K.R. (1986): "Maharashtra in Maps", State Board of Literature and Culture, Government of Maharashtra, Bombay.
2. Deshpande, C.D. (1971): "Geography of Maharashtra", National Book Trust of India.
3. Editors – Diddee Jaymala, Jog S.R., Kale V.S., and Datye V.S. (2002): "Geography of Maharashtra", Rawat Publications, Jaipur and New Delhi.
4. Arunachalam, B. (1967): "Geography of Maharashtra"
5. Tirth, Ranjit (2002): "Geography of India", Rawat publications, Jaipur
6. Samudra Archana (2008): "Geography of India (with special reference to Maharashtra)", K'Sagar Publications, Pune.
7. Editor R.L.Singh (2008): "India – A Regional Geography" , National Geographical Society of India, Varanasi-5.
8. Sharma T.C. & Coutinho O (1981)" Economic & Commercial Geography of India", Vikas publishing house pvt. Ltd, New Delhi.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

New Syllabus for S. Y. B. Sc. Geography

**Sem. IV, Paper-II****Gg 242: (B) ENVIRONMENTAL GEOGRAPHY**

(With Effect from June 2013)

| Unit No. | Topic                                         | Sub-Topics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Periods |
|----------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 1        | Environmental Pollution                       | 1.1 : Definition of Pollution and Pollutants<br>1.2 : Types of Pollutions<br>A) Air Pollution:<br>i. Sources of Air Pollution<br>ii. Adverse Effects of Air Pollution on Human Health, Vegetation and property<br>iii. Measures to Prevent and Control Air Pollution<br>B) Water Pollution<br>i. Sources of Water Pollution<br>ii. Adverse Effects of Water Pollution<br>iii. Measures to Prevent and Control Water Pollution<br>C) Noise Pollution<br>i. Sources of Noise Pollution<br>ii. Adverse Effects of Noise Pollution on Human Health<br>iii. Measures to Prevent and Control Noise Pollution<br>D) Solid Waste Pollution<br>i. Sources of Solid Waste Pollution<br>ii. Adverse Effects of Solid Waste<br>iii. Management and Measures to Control Solid Waste Pollution | 22      |
| 2        | Environmental Hazards and Disaster Management | 2.1: Meaning, Concept and Types of Disasters<br>2.2: Definition, Causes and Management (pre, during and post) of following Disasters<br>A) Atmospheric: Cyclone<br>B) Hydrological: Droughts and Floods                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 14      |

|   |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                |    |
|---|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|   |                                                  | C) Terrestrial: Earthquake<br>D) Biological: Weeds and Pests                                                                                                                                                                                                                                                                                                                                                                   |    |
| 3 | Environmental Issues and Possible Solutions      | 3.1: Green House Effect, Global Warming and Climate Change<br>3.2: Depletion of Ozone Layer<br>3.3: Deforestation<br>3.4 : Adverse Effects of Pesticides and Insecticides                                                                                                                                                                                                                                                      | 10 |
| 4 | Conservation of Resources and Environmental Acts | 4.1 Meaning and Methods of Conservation of Resources<br>A) Soil Conservation<br>B) Water Conservation<br>C) Forest Conservation and Carbon Credit<br>D) Wild Life Conservation<br>4.2 Environmental Acts<br>A) Air Pollution Act<br>B) Wildlife Protection Act<br>C) Water Pollution Act<br>D) Forest Conservation Act<br>4.3 Environmental Movements / NGO's<br>A) Green Peace<br>B) Center for Science and Environment (CSE) | 14 |

**Weightage of Marks: -**

| Unit | Unit                                             | Marks | Periods |
|------|--------------------------------------------------|-------|---------|
| 1    | Environmental Pollution                          | 16    | 22      |
| 2    | Environmental Hazards and Disaster Management    | 08    | 14      |
| 3    | Environmental Issues and Possible Solutions      | 08    | 10      |
| 4    | Conservation of Resources and Environmental Acts | 08    | 14      |
|      | Total                                            | 40    | 60      |

**References: -**

1. Savindar Sing (2001): Environmental Geography, Prayag Pustak Bhawan, Allahabad-110002
2. Benny Joseph (2005) : Environmental Studies, Tata McGraw-Hill Publishing Company, New Delhi.
3. P. D. Sharma (2004) : Ecology and Environment, Rastogi Publications, Shivaji Road, Meerut.
4. Turk and Turk: Environmental Studies

5. : H. M. Saxena : Environmental Studies, Rawat Publication, Jaipur.

**Marathi Medium Books :**

1. Dr. S. R. Chaudhari : Paryavaran Va Arthik Kriya, Himalaya Publications.
2. Prof. S. V. Dhake, Dr. Ingale, Dr. V. J. Patil: Paryavaranshastra, Prashant Publications, Pune.
3. Dr. D. S. Suryavanshi: Paryavaranshastra, Shri Vidya Prakashan, Pune.

**NORTH MAHARASHTRA UNIVERSITY, JALGAON.**

**S.Y.B.Sc. GEOGRAPHY**

**PAPER IV: PRACTICAL (ANNUAL)**

**Gg 203: STUDY OF SOI TOPOGRAPHICAL MAP, WEATHER IMAGES AND SURVEYING**  
(Per Batch 12 Students)

| <b>Unit</b> | <b>Topic</b>                            | <b>Sub Topic</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Periods</b> |
|-------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>1</b>    | Topographical Maps                      | 1.1: Representation of Relief features<br>a) Elevation b) Depression<br>1.2: Introduction of S.O.I Toposheets<br>1.3: Indexing of Toposheets<br>1.4: Signs, Symbols and grid reference<br>1.5: Interpretation of topographical maps<br>a) Plain Region<br>b) Plateau region<br>c) Mountain region                                                                                                                                            | 30             |
| <b>2</b>    | Daily Weather Maps and Satellite Images | 2.1: Introduction to I.M.D. weather Map<br>2.2: I.M.D. weather signs<br>2.3: Isobaric patterns<br>a) cyclone b) Anticyclone c) trough/<br>V- shaped depression d) Secondary<br>Depression (e) wedge/ ridge f) col<br>2.4: Interpretation of I.M.D. Daily<br>Weather Images:(weather images of<br>Kalpana satellite): Rainy, Winter &<br>Summer Season)<br>1) Images of Visible Winds (VISW)<br>2) Kalpana I Sector<br>3) Kalpana I NE Sector | 30             |

|          |                                               |                                                                                                                                                                                                                                                                                        |            |
|----------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|          |                                               | 4) Kalpana I NW Sector<br>5) Cloud Motion Vector (CMV)<br>6) Water Vapour Winds (WWV)<br>7) Low Level Winds (LLW)<br>8) High Level Winds (HLW)                                                                                                                                         |            |
| <b>3</b> | Surveying                                     | 3.1. Definition of surveying<br>3.2. Types of Survey<br>3.3. Plane table survey<br>A) Open traverse survey<br>B) Close traverse<br>3.4. Measurement of Plots, Agricultural land<br>3.5. Preparation of layout as per Govt. record                                                      | 30         |
| <b>4</b> | Remote Sensing and GIS                        | 4.1: Definition and Meaning of Remote Sensing<br>4.2: Types of Remote sensing<br>4.3: Basic Characteristics of Photo Interpretation<br>4.4: Introduction to Stereo pair and Land Sat Imageries<br>4.5: Fundaments of GIS<br>4.6: Function of GIS<br>4.7: Introduction to GIS Softwares | 20         |
| <b>5</b> | Village Survey Or Project Report or Excursion | 5.1 Submission of Socio-Economic Survey report Or Census Survey Report of a village Or Excursion report                                                                                                                                                                                | 10         |
|          |                                               | <b>Total Periods</b>                                                                                                                                                                                                                                                                   | <b>120</b> |

**Weight ages**

| Unit                                                                         | Marks    |
|------------------------------------------------------------------------------|----------|
| 1: Topographical Maps<br>(a) Interpretation<br>(b) Short answering questions | 10<br>05 |
| 2: (a) Daily Weather Maps<br>b) Satellite Images                             | 10<br>05 |
| 3: Surveying :<br>a) Field Survey<br>b) Short answering questions            | 15<br>05 |
| 4: Remote Sensing and GIS                                                    | 10       |
| 5: Village Survey Report                                                     | 10       |
| Journal and Viva -voce                                                       | 10       |



### **Reference Books**

- 1) Element of Practical Geography : Singh & Dutta
- 2) Map Work and Practical Geography : Gopal Singh
- 3) Map work and Practical : R.L.Singh & L.R.Singh
- 4) Fundamental of cartography : R.P.Mishra & Romesh
- 5) Surveying and Leveling : Kanitkar & Kulkarni
- 6) Remote Sensing : Dr. Karlekar.
- 7) IMD Weather web site- [www.imd.gov.in/section/satmet/dynamic/insat.htm](http://www.imd.gov.in/section/satmet/dynamic/insat.htm)