

**BHARAT SANCHAR NIGAM LIMITED  
(A GOVERNMENT OF INDIA ENTERPRISE)  
RECRUITMENT OF MANAGEMENT TRAINEES(EXTERNAL) IN BSNL  
(No. 2-2/2008-Rectt.)**

**EXAMINATION DATE OF SCREENING TEST : 01.02.2009**

**CLOSING DATE OF RECEIPT OF APPLICATION: 18.12.2008**

Bharat Sanchar Nigam Ltd. [BSNL] will recruit about **300** [subject to variation depending on the availability of vacancies] Management Trainees(External) through competitive examinations to be held on All India basis, on different dates, as per the details given below:-

**Management Trainees(External) :**

<b>Stream</b>	<b>No. of vacancies</b>	<b>OBC</b>	<b>SC</b>	<b>ST</b>	<b>OC</b>
<b>Telecom. Operations</b>	100	27	15	7	51
<b>Marketing</b>	50	13	7	3	27
<b>Finance</b>	50	13	7	3	27
<b>HRM</b>	50	13	7	3	27
<b>IT</b>	50	13	7	3	27

Against 3% of vacancies reserved for PH category, recruitment has to be made for LI(Locomotive Impairment) and HI(Hearing Impairment) from various categories within the ceiling of existing reservation as per the following details:

**Management Trainees (External) :**

<b>Stream</b>	<b>No. of vacancies</b>	<b>LI</b>	<b>HI</b>
<b>Telecom. Operations</b>	100	2	1
<b>Marketing</b>	50	1	0
<b>Finance</b>	50	0	1
<b>HRM</b>	50	1	1
<b>IT</b>	50	1	1

Reservation as per Central Govt. guidelines will be applicable for SC/ST/OBC/Physically Handicapped [PH].

In respect of Physically Handicapped persons, candidates with following physical disability were permitted:-

- i. Hearing Impairment - Partially Deaf
- ii. Locomotive Impairment - one arm or one leg or both legs affected

(The minimum degree of disability is 40% in order for a person to be eligible for any concession/benefits)

### **1. Scale of Pay**

The post of Management Trainee is in the IDA pay-scale of Rs. 13000-350-18250. Total emoluments at the minimum of pay scale will be (Basic Pay Rs 13,000/- plus D.P. Rs 6500 plus DA Rs 7917/-)= Rs 27,417 plus HRA, CCA, Perks, Medical Benefits, LTC etc. as admissible. The pay scale is likely to be revised upwards.

### **2. Selection for a Particular Circle & Service liability**

The BSNL comprises a number of territorial Circles and functional Circles. The Management Trainee is an All India Cadre and will be controlled by the BSNL Corporate Office centrally. The officers are liable to be transferred anywhere in India at any place falling in the operational area of BSNL. The BSNL has the right to post any selected Management Trainee to any of the Circles either temporarily or on permanent basis. The decision of BSNL in this regard shall be final and binding. The service conditions, seniority etc. of selected candidates will be determined as per prevailing rules of the Corporation from time to time.

### **3. Eligibility**

- a) Nationality : Only Indian Nationals would be eligible to apply.
- b) Educational Qualifications: Applicant must possess as on 31.12.2009 the educational qualifications as given in Annexure-II. The candidates applying for Management Trainees(External) Examination should possess the first class degree and should have completed his/her courses on a regular full time basis. The candidates

should possess the prescribed qualifications or its equivalent from a recognized Indian Institute/university recognized under Indian Laws.

**c) Age:** - Management Trainee(External) – 30 years, as on 1.8.2009

However, this age is relaxable as per standing instructions on this subject for:-

- i) For Scheduled Castes & Scheduled Tribes upto 5 years;
- ii) For OBC Candidates upto 3 years;
- iii) For PH candidates upto 10 years ; (15 years for SC/ST and 13 years for OBC)
- vi) For certain other categories like ex-servicemen, displaced persons from East Pakistan[now Bangladesh], repatriates from Burma and Ceylon [now Srilanka],residents of Goa, Daman & Diu, persons migrated from Kenya, Uganda, Republic of Tanzania as per instructions issued by the Central Government from time to time in this regard.
- v) For Residents of J&K – Relaxation shall be in accordance with DoP&T O.M. No.15012/7/1991-Estt.(D) dtd. 6.12.2005 pertaining to "Residents of State of Jammu and Kashmir (Relaxation of Upper Age Limit for Recruitment to Central Civil Services & Posts) Rules 1997".

#### **4. Mode of selection and nature of Question Paper**

4.1 The mode of selection is through open Competitive Examination. All the candidates shall have to undergo the similar recruitment process i.e. the Written Examination+Group Discussion+Structured Interview. Scheme of Examination and detailed syllabus appears at Annex-III to Annex-V.

4.2 The Screening Test for Management Trainee (External) will be held on 01.02.2009.

4.3 In case of the successful candidates of Screening test of Management Trainee (External) Examination, the dates of holding Written Examination, Group Discussion, Interview & Personality Test will be intimated in due course.

## **5. Career Progression:**

- 5.1. Appointment as Deputy Manager: On successful completion of Probation-cum-training, the officer shall be appointed as Deputy Manager.
- 5.2. To be promoted as Manager on working as Deputy Manager for two years subject to being adjudged fit for promotion.
- 5.3. Further career progression for promotion to higher grades shall be regulated by concerned recruitment rules to be notified by BSNL in future.
- 5.4. Career progression will also be subject to terms and conditions decided consequent to absorption of Group 'A' Officers in BSNL in future. However, at no stage, the absorbed Group 'A' Officers will be ranked junior to Management Trainees recruited by BSNL unless otherwise not affected due to punishment or being judged unfit for promotion.

## **6. Minimum qualifying standards**

BSNL may fix minimum qualifying marks for OC/OBC/SC/ST/PH candidates for each section as well as in the aggregate. Candidates obtaining less than minimum-qualifying marks in any of the sections or in aggregate shall not be considered for inclusion in the merit-list.

The appearance of the name in the merit-list does not confer any right on the candidate for employment. A final call letter/appointment letter will be issued to the candidate after completion of all other formalities.

## **7. Choice of Examination Centre**

7.1 Applicants are required to indicate their choice of Examination Centre [item 13 of application form] at which they wish to appear. An applicant can opt for any one of the examination centers out of the Circles indicated in the Annexure-I and submit the

application form to the office of the CGM of the Circle concerned at whose examination centre the applicant wishes to appear (e.g. a candidate wishing to appear at Hyderabad centre should submit his/her application to the DGM(Admn), Office of Chief General Manager, Andhra Pradesh). A list of centers and the Deputy General Managers/General Managers to whom the application is to be submitted, is given in Annexure 'I' . Admit cards will be issued to eligible applicants by the Office of the CGM concerned.

7.2 The Examination Centre for the **Screening Test** and **Written examination** of the Management Trainee(External) Examination will be same..

**8.** The centre for holding Group Discussion & Interview and Personality Test to the successful candidates of written exam will be intimated subsequently.

#### **9. Fee for examination and application form**

9.1 The specimen of the application form is included in this advertisement. Neatly typed [only on one side of paper] copy in A4 size [30 cms. X 20 cms.] may be used for making application. The completed application form should be sent by Registered post to the CGM concerned. The envelope containing application form should be marked **"Application for Management Trainees(External) examination"** in bold letters on top of the envelope.

Original advertisement or photocopy of the format in the advertisement must not be used for applying and in case a candidate submits such an application the same will not be entertained. The given application format must be separately typed.

9.2 An examination fee of Rs 1500/- is payable in the form of demand draft drawn in favour of Senior Accounts Officer/Accounts Officer payable at the respective stations as given in *Annexure 'I'*. The amount of fee shall not be accepted in any other form. Fees once paid shall NOT be refunded under any circumstances nor can it be held in reserve for any other examination or selection.

#### **10. No Fee payable by SC/ST/PH**

Applicants belonging to SC/ST/PH categories only are exempted from the examination fee. In the case of Physically handicapped candidates, this exemption will, however, be available to only those handicapped persons who would otherwise be eligible for appointment to the post on the basis of the standards of medical fitness prescribed for the post (including any concessions specifically extended to the physically handicapped) and who enclose with the application form, a necessary certificate from a Govt. Hospital/Medical Board in support of his claim for being handicapped.

## **11. Traveling Allowance**

**11.1.** The applicants belonging to SC/ST categories will be entitled to T.A. as per provisions of Ministry of Finance(Deptt. of Expenditure) O.M. No.19014/3/77-E.IV (B) dated 17.02.1978.

**11.2.** Management Trainee(External) Candidates called for group discussion, interview & personality test shall be entitled for both way Rail fare of three tier AC class if the candidate is coming from outside of the station.

## **12. Closing date for receipt of Application Forms**

Application forms complete in every respect must reach on or before 18.12.2008. Applications received after the closing date or not accompanied by the demand draft [wherever applicable] for the prescribed examination fee or incomplete in any respect shall be summarily rejected and no communication in respect of the rejected application forms shall be entertained. BSNL shall not be responsible for any postal delay.

The applicants would be admitted to the examination on the basis of the information furnished by them in their application form. They are, therefore, advised to ensure that they fulfill all eligibility conditions before applying. In case it is found at a later stage that the information furnished by an applicant is false or an applicant does not fulfill any of the eligibility conditions, the candidature of such applicants would be cancelled and no correspondence in this regard would be entertained. Issuance of an admit card for the examination will NOT confer any right for appointment. Appointment will be solely subject to fulfillment of all eligibility conditions.

## **13. Probation-cum-Training and Bond**

13.1 All Management Trainees(External as well as Internal) will remain on probation-cum-training for a period of one year as per Recruitment Rules of Management Trainees.

13.2 All candidates shall, before their appointment as Management Trainees have to successfully undergo prescribed training as per the training plan laid down and amended by the Company from time to time.

13.3 All candidates provisionally recruited shall execute Bonds in the format specified by the BSNL indicating their willingness to serve the Corporation for a period of at least five years from the date of their appointment as Management Trainee.

**14. List of enclosures**

- a. Five identical passport size photographs out of which one should be pasted (not stapled or pinned) on the application form, duly attested, and the other four attached to the application (not to be pasted or attested)
- b. Five self addressed unstamped envelopes of 27 x 12 cms size
- c. Bank Draft for Rs.1500/- (payable at par at the station of submitting the application) - [Not required for SC/ST/PH candidates]
- d. Medical certificate in respect of Physically Handicapped candidates

**15.** Any dispute in regard to the recruitment will be subject to the Courts/Tribunals having jurisdiction over the place of concerned Circle office of BSNL where the candidate submits his/her application.

**APPLICATION FOR EXAMINATION OF RECRUITMENT OF MANAGEMENT TRAINEES  
(EXTERNAL)**

1. Functional Stream applied for :.....  
(As mentioned in Annex.II-A)
2. Category Code of the Functional Stream applied for :.....  
(As mentioned in Annex.II-A)
3. Full name of the candidate: .....  
[IN BLOCK LETTER]
4. a) Postal Address with PIN CODE to which  
Communication is to be sent: .....  
[IN BLOCK LETTER]  
b) Permanent Home address with PIN CODE: .....  
c) Contact No. Tel/Mobile No.....
5. a) Date of Birth:     \_\_\_ \_\_\_     \_\_\_ \_\_\_     \_\_\_ \_\_\_ \_\_\_ \_\_\_  
  (DD)    (MM)            (YYYY)  
[in the format DD MM YYYY e.g. 1<sup>st</sup> August 2008 will be 01-08-2008]  
[As mentioned in Matriculation or Equivalent Certificate]  
b) Age on <01.08.2009> .....  
c) Whether claiming age relaxation? Yes/No .....  
d) If yes, under what category : .....  
[Write the relevant category i.e. SC/ST/OBC/PH/others]
6. Father's Name : .....
7. State to which the applicant belongs : .....
8. a) Whether belongs to SC/ST/OBC/General : .....  
          [Write the relevant category]  
b) Whether Physically handicapped : Yes/No .....  
c) If yes, indicate the extent of disability percentage: .....  
          [Medical certificate to be attached ]  
d) Hearing impairment/Locomotive impairment :.....  
(Write clearly the relevant category)
9. Gender: [Male/Female] .....

Paste a recent attested Photograph of the applicant [Passport Size]



10. a) Nationality : .....
- b) Whether by birth / by domicile : .....
11. Marital status: [Married/Unmarried] .....
12. Details of Educational qualification :
- [Give details of Degrees obtained only of B.E./B.Tech/M.Tech/MBA/CA/ICWA & above as may be applicable]*
- 12.1. Name of degree with discipline [*BE/B. Tech/M.Tech/MBA/CA/ICWA& above*]......
- 12.2. Name of University/Institute .....
- 12.3. Month and year of obtaining Degree .....
13. Choice of Examination Centre (Name of the Circle):.....
- [An applicant can opt for any of the examination centers out of the Circles indicated in Annexure 'I' and submit the application form at the address, as given in Annexure-I, of the Circle concerned at whose examination centre the applicant wishes to appear]*
14. Details of application fee particulars:-
- 14.1 Demand draft No. and Date : .....
- 14.2 Amount Rs. : .....
- 14.3 Issuing Bank : .....
- 14.4 Payable in favour of ..... at .....

I do hereby declare that all the statements made in the application are true, complete and correct to the best of my knowledge and belief. I understand that in the event of any particular information given above being found false or incorrect, my candidature for the post of Management Trainee is liable to be rejected or cancelled and in the event of any mis-statement or discrepancy in the particulars being detected after my appointment, my services are liable to be terminated forthwith without any notice to me.

I also understand that if appointed, I would rank junior to any Group 'A' Officers who would be absorbed in BSNL in future.

Date:

Place:

Signature of the applicant

**List of the Territorial Telecom Circles with the address to whom the applicants should send their completely filled up forms and in whose favour the Demand Draft should be drawn****(In case of any query/clarification, following Officers as at (3) may be contacted)**

<b>Sr. No (1)</b>	<b>Name of the Territorial Circle (2)</b>	<b>Address to whom the application is to be sent/ Examination Centre City (3)</b>	<b>Demand Draft to be drawn in favour of (4)</b>
1.	Andhra Pradesh	DGM (Admn), O/o the CGM Telecom, BSNL, Andhra Pradesh Telecom Circle, 2 <sup>nd</sup> floor, Doorsanchar Bhavan, Nampalli Station Road, <b>Hyderabad – 500 001.</b> Tel : 040-23203213	Accounts Officer(Cash), BSNL, O/o the CGMT, A.P. Hyderabad
2.	Andaman & Nicobar	DGM (Admn.), O/o the CGM Telecom, BSNL, A&N Telecom Circle, Telephone Bhavan, <b>Port Blair – 744 101.</b> Tel: 03192-238800	A.O.(Cash)BSNL, A&N Telecom Circle, Port Blair
3.	Assam	DGM (Admn), O/o the CGM Telecom, BSNL, Assam Telecom Circle, 3 <sup>rd</sup> floor, BSNL Administrative Building, Panbazar, <b>Guwahati – 781 001.</b> Tel: 0361-2736340	Sr.Accounts Officer (A&P), O/o CGMT, BSNL, Guwahati
4.	Bihar	DGM (Admn), O/o the CGM Telecom, BSNL, Bihar Telecom Circle, Sanchar Sadan, <b>Patna – 800 001.</b> Tel : 0612-2224093	Accounts Officer(B&A), BSNL, O/o CGMT, Bihar Circle, Patna
5.	Gujarat	DGM (OP&C), O/o the CGM Telecom. BSNL, Gujarat Telecom Circle, 6 <sup>th</sup> floor, Telephone Bhavan, Off. C.G. Road, <b>Ahmedabad – 380 006.</b> Tel: 079-26480608	Sr.A.O.(Cash), O/o CGMT, Ahmedabad
6	Jammu & Kashmir	DGM (Planning), O/o the CGM Telecom., BSNL, J&K Telecom Circle, 4 <sup>th</sup> floor, North Block, Bahu Plaza, Rail Head Complex, <b>Jammu – 180 012.</b> Tel: 0191-2577878	Accounts Officer(Cash), O/o CGM, BSNL J&K Circle, Jammu
7	Karnataka	DGM (Staff, O/o CGMT BSNL, Karnataka Telecom Circle, No.1, Swamy Vivekananda Road, Halasuru, <b>Bangalore-560 008.</b> Tel: 080-25363600	Sr. Accounts Officer(Cash), O/o CGM Telecom, BSNL, Karnataka Circle, Bangalore – 560 008

Sr. No (1)	Name of the Territorial Circle (2)	Address to whom the application is to be sent/ Examination Centre City (3)	Demand Draft to be drawn in favour of (4)
8	Kerala	DGM (Admn) O/o the CGM Telecom. BSNL, Kerala Telecom Circle, <b>Thiruvananthapuram – 695 033.</b> Tel: 0471-2307000	Accounts Officer (Cash), O/o the CGMT, Kerala Circle, BSNL, Trivandrum– 695 033
9	Madhya Pradesh)	DGM (HRD), O/o the CGM Telecom. BSNL, M.P. Telecom Circle, BSNL Bhavan, 2 <sup>nd</sup> floor, Room No.213, Hoshangabad Road, <b>Bhopal – 462 015.</b> Tel: 0755-2550600	Accounts Officer (A&B), O/o CGMT, Bhopal
10	Maharashtra	DGM (Admn), O/o the CGMT, BSNL, Maharashtra Telecom Circle, Admn. Bldg., 3 <sup>rd</sup> floor, B-Wing, Juhu Road, Santacruz(West), <b>Mumbai – 400 054.</b> Tel: 022-26619901	Accounts Officer (F&A), BSNL, Maharashtra Telecom Circle, Mumbai 400 054
11	Northern Telecom Region [New Delhi]	DGM (Admn), O/o the CGM (Mtce.), BSNL, Northern Telecom. Region, Kidwai Bhawan, Room No.257, 2 <sup>nd</sup> floor, Janpath, <b>New Delhi-110 001.</b> Tel: 011-23329180	A.O. (Cash) O/o CGM, NTR, New Delhi
12	Orissa	DGM (Admn) O/o the CGM Telecom, BSNL, Orissa Telecom Circle, <b>Bhubaneswar-751 001.</b> Tel: 0674-2544600	A.O. (A&P), O/o the CGM, BSNL, Orissa Telecom Circle, Bhubaneswar-751 001.
13	Punjab	DGM (Estt.), O/o CGMT, BSNL, Punjab Telecom Circle, Room No. 401, 4 <sup>th</sup> Floor, Plot No.2, Sanchar Sadan, Sector-34-A, <b>Chandigarh – 160 022.</b> Tel: 0172-2611666	A.O.(Cash), BSNL O/o CGMT, Punjab Circle, Chandigarh
14	Rajasthan	DGM (Admn), O/o CGMT BSNL, Rajasthan Telecom Circle, Sardar Patel Marg, 'C' Scheme, <b>Jaipur – 302 008.</b> Tel: 0141-2366775	Accounts Officer (Cash), BSNL, O/o CGMT, Rajasthan Telecom. Circle, Jaipur
15	Tamilnadu	DGM (Admn), O/o the CGM Telecom, BSNL, Tamilnadu Telecom Circle, Room No. 325, No. 80 Anna Salai, <b>Chennai – 600 002.</b> Tel: 044-28520494	Accounts Officer (Cash), BSNL, Tamilnadu Circle, Chennai - 600 002
16	Uttar Pradesh [East]	DGM (BD& Rectt.) O/o the CGM Telecom, BSNL, UP (East) Telecom Circle, Hazratganj, <b>Lucknow-226 001.</b> Tel: 0522-2622660	Sr.Accounts Officer (Cash), O/o CGMT UP (East) Circle, Lucknow – 226 001

<b>Sr. No (1)</b>	<b>Name of the Territorial Circle (2)</b>	<b>Address to whom the application is to be sent/ Examination Centre City (3)</b>	<b>Demand Draft to be drawn in favour of (4)</b>
17	Uttar Pradesh [West]	DGM (Admn.), O/o the CGM Telecom , BSNL, UP (West) Telecom Circle, Shastri Nagar Telephone Exchange, Tej Garhi Chauk, <b>Meerut</b> Tel: 0121-2601133	A.O. (Cash), O/o CGMT UP (West) Telecom Circle, Shastri Nagar Telephone Exchange, Tejgarhi Chauk, Meerut
18	West Bengal	DGM (Admn.), O/o the CGM, Telecom. BSNL, West Bengal Telecom Circle, 1, Council House Street, 2nd floor, <b>Kolkata – 700 001.</b> Tel: 033-22487303	Sr. Accounts Officer (Cash), O/o the Chief General Manager, BSNL, West Bengal Telecom Circle, Kolkata

**ESSENTIAL QUALIFICATIONS FOR MANAGEMENT TRAINEES(EXTERNAL )**

<b>Functional streams</b>	<b>Educational Qualification for External Candidates</b>
<b>Operations</b>	Bachelor of Engineering/Bachelor of Technology degree or equivalent engineering Degree in any of the following disciplines:- 1. Telecommunications 2. Electronics 3. Computer/IT <b>PLUS</b> MBA (Preferably with specialization in Telecom related Management) OR M. Tech in above disciplines
<b>Marketing</b>	Bachelor of Engineering/Bachelor of Technology degree or equivalent engineering Degree in any of the following disciplines:- 1. Telecommunications; 2. Electronics; 3. Computer/IT <b>PLUS</b> MBA with specialization in Marketing
<b>Finance</b>	MBA with specialization in Finance OR CA/ICWA
<b>HRM</b>	Bachelor of Engineering/Bachelor of Technology degree <b>PLUS</b> MBA with specialization in HRM
<b>IT &amp; Computer</b>	Bachelor of Engineering/Bachelor of Technology degree in computer/IT <b>PLUS</b> MBA with specialization in Systems Or M.Tech in computer/IT

1. The external candidates applying for Management Trainees should possess the first class degree and should have completed his/her courses on a regular full time basis
2. The candidates should possess the prescribed qualifications or its equivalent from a recognized Indian Institute/university recognized under Indian Laws.

**Functional Streams and Category Code for Management Trainees (External)**

<b>Functional Streams</b>	<b>Category Code</b>	<b>Educational Qualifications</b>
<b>Operations</b>	0101	Bachelor of Engineering/Bachelor of Technology degree or equivalent engineering Degree in any of the following disciplines:- 1. Telecommunications 2. Electronics 3. Computer/IT <b>PLUS</b> MBA (Preferably with specialization in Telecom related Management)
	0102	Bachelor of Engineering/Bachelor of Technology degree or equivalent engineering Degree in any of the following disciplines:- 1. Telecommunications 2. Electronics 3. Computer/IT <b>PLUS</b> M. Tech in above disciplines
<b>Marketing</b>	0103	Bachelor of Engineering/Bachelor of Technology degree or equivalent engineering Degree in any of the following disciplines:- 1. Telecommunications; 2. Electronics; 3. Computer/IT <b>PLUS</b> MBA with specialization in Marketing
<b>Finance</b>	0104	MBA with specialization in Finance or CA/ICWA
<b>HRM</b>	0105	Bachelor of Engineering/Bachelor of Technology degree <b>PLUS</b> MBA with specialization in HRM
<b>IT &amp; Computer</b>	0106	Bachelor of Engineering/Bachelor of Technology degree in computer/IT <b>PLUS</b> MBA with specialization in Systems
	0107	Bachelor of Engineering/Bachelor of Technology degree in computer/IT <b>PLUS</b> M.Tech in computer/IT

**Note:**

1. The external candidates applying for Management Trainees should possess the first class degree and should have completed his/her courses on a regular full time basis
2. The candidates should possess the prescribed qualifications or its equivalent from a recognized Indian Institute/university recognized under Indian Laws.

**Screening Test – for External Candidates**

**1. Scheme of Examination:**

The paper shall comprise of 300 multiple-choice questions (MCQs) with Computer Marked sheets.

**2. No. of Sections : 2 (Two), details and their syllabus mentioned below:**

Section	Description	No. of MCQs	Duration	Maximum Marks
A	General Management & Mental Aptitude	75	120 minutes (2 hours)	75
B	MT – Stream	225		225
Total		300		300

**3. Qualifying Standards:**

The minimum qualifying standards for each category of candidates shall be as prescribed by BSNL.

**4. Syllabus:** The syllabus of the sections A and B shall be as given below:

**4.1 Section – A: General Management & Mental Aptitude:**

1. General Mental Ability	2. Information Systems for Managers
3. Marketing for Managers	4. Accounting & Finance for Managers
5. Management of Human Resources	6. Management Functions & Behaviour
7. Managerial Economics	8. Organisational design, Development and change
9. Quantitative Analysis for Managerial Applications	
10. Current events of National and International importance.	

**4.2 Section – B :**

**4.2.1 Operations Stream :**

**4.2.1.1 *General***

1. Materials and Components	2. Physical Electronics, Electron Devices and ICs
3. Signals and Systems	4. Network theory
5. Electromagnetic Theory	6. Electronic Measurements and Instrumentation
7. Analog Electronic Circuits	8. Digital Electronic circuits
9. Control Systems	10. Communication Systems
11. Microwave Engineering	12. Computer Engineering
13. Power Electronics	

**4.2.1.2 *Technical (for candidates with M.Tech. Qualification):***

The syllabus will include 4.2.1.1 and the following :

1. Wireless Mobile Networks	2. VLSI Design
3. Advanced Digital Signal Processing	4. Communication Networks

#### 4.2.1.3 **Management (for candidates with M.B.A. Qualification)**

The syllabus will include 4.2.1.1 and the following:

1. Operations Research	2. Project Management
3. Management Control Systems	4. Production and Operation Management
5. Team Building in Organisation	6. Management Process and Organisational Behaviour

#### 4.2.2 **IT & Computer Stream.**

##### 4.2.2.1 ***Technical (for candidates with M.Tech. Computer /IT Qualification)***

The syllabus will include 4.2.1.1 and the following:

1. Advanced Computer Architecture	2. Advanced Database Management
3. Network Management and Security	4. Computer Graphics

##### 4.2.2.2 **Management (for candidates with M.B.A. System Qualification)**

The syllabus will include 4.2.1.1. and the following:

1. Software Risk Management	2. Software Project Management
3. Enterprise Resource Planning Systems	4. IT Strategy and I.T. and Process Outsourcing

#### 4.2.3 **Marketing Stream:**

The syllabus will include 4.2.1.1. and the following:

1. Consumer behaviour	2. Sales and Distribution Management
3. Service Marketing	4. Advertising and Brand Management Services
5. International Marketing	6. Rural and Social Marketing
7. Retail Management	8. WTO and Intellectual Property Rights

#### 4.2.4 **HRM Stream**

The syllabus will include 4.2.1.1 and the following:

1. Performance Appraisal Management	2. Strategic Human Resource Management
3. Organisational Development	4. Management Process and Organizational Behaviour
5. Gratuity Act, EPF Act.	6. Global Competitiveness and Strategic Alliances
7. Compensation Management	

#### 4.2.5 **Finance Stream :**

1. Financial Management (an overview)	2. Cost Accounting
3. Financial Management in Public Sector Enterprises	4. Advanced Accounting
5. Principles of Taxation (Tax Laws)	6. Financial Statements
7. Companies Act 1956 (with amendments)	8. Auditing
9. Security analysis and Portfolio Management	10. Bare Acts
11. Financial Markets and Institutions	12. Merchant Banking and Financial Services
13. International Finance Management	14. Future Options and Derivatives
15. Public Finance and Budgeting	16. Treasury Management
17. Insurance and risk Management	
18. Valuation, Merger, Acquisitions and Corporate Restructuring	



**MAIN Exam - for External Candidates**

1. The successful candidates of Screening Test shall undertake Main Examination, which shall have following components :

Sl. No.	Item	Marks	Weightage
1.	Written Examination	450	75%
2.	Group Discussion	75	12.5%
3.	Interview & Personality Test	75	12.5%
Total		600	100%

2. **Scheme of Written Exam.** The written examination shall comprise of 2 papers.

Paper	Section	Item	Duration	Max. Marks
1	A	English	180 minutes (3 hours)	Qualifying only
	B	General Management		150
2	A	MT Stream- General	180 minutes (3 hours)	150
	B	MT Stream-Technical/ Management		150
Total				450

3. **Qualifying Standards:**

The minimum qualifying standards for each category of candidates shall be as prescribed by BSNL.

4. **Syllabus :** The syllabus of the Paper 1 and 2 shall be as given below:

#### 4.1 Paper - 1

##### 4.1.1. Section – A - English

The pattern of questions would be broadly as follows:

- i) Comprehension of given passages.
- ii) Precise Writing.
- iii) Usage and Vocabulary.
- iv) Short Essay.

Note 1: The Papers on English will be of Matriculation or equivalent standard and will be of qualifying nature only. The marks obtained in these papers will not be counted for ranking.

Note 2: The candidates will have to answer the English Papers in English language (except where translation is involved).

Note 3: This section will be marked first and the remaining sections/paper may be marked only of those candidates who have got qualifying marks in this section.

##### 4.1.2. Section – B : General Management :

1. Management Functions & Behaviour	2. Management of Human Resources
3. Economic & Social Environment	4. Accounting & Finance for Managers
5. Strategic Management	6. Organisational Design, Development and Change
7. Information Systems for Managers	8. Managerial Economics
9. Marketing for Managers	10. Quantitative Analysis for Managerial Applications
11. Current events of National & International Importance.	

## 4.2. PAPER – 2

### 4.2.1. Section – A:

#### **MT (Management Trainee) Stream-General :**

For operations, Marketing, HRM and IT & Computer Streams

1. Materials and Components	2. Physical Electronics, Electron Devices and ICs
3. Signals and Systems	4. Network theory
5. Electromagnetic Theory	6. Electronic Measurements and Instrumentation
7. Analog Electronic Circuits	8. Digital Electronic Circuits
9. Control Systems	10. Communication Systems
11. Microwave Engineering	12. Computer Engineering
13. Power Electronics.	

#### **For Finance Stream:**

1. Financial Management (an overview)	2. Cost Accounting
3. Financial Management in Public Sector Enterprises	4. Advanced Accounting
5. Principles of Taxation (Tax Laws)	6. Financial Statements
7. Companies Act 1956 (with amendments)	8. Auditing
9. Bare Acts	

### 4.2.2 Section B :

MT (Management Trainee) Stream – Technical/ Management:

#### 4.2.2.1 Operation Stream :

Technical (for candidates with M.Tech. Qualification) :

1. Wireless Mobile Networks	2. VLSI Design
3. Advanced Digital Signal Processing	4. Communication Networks

Management (for candidates with MBA Qualification) :

1. Operations Research	2. Project Management
3. Management Control Systems	4. Production and Operation Management
5. Team Building in Organisation	6. Management Process and Organisational Behaviour

#### 4.2.2.2 IT & Computer Stream :

Technical (for candidates with M.Tech. Qualification) :

1. Advanced Computer Architecture	2. Advanced Database Management
3. Network Management and Security	4. Computer Graphics

Management (for candidates with MBA with specialisation in systems Qualification) :

1. Software Risk Management	2. Enterprise Resource Planning Systems
3. Software Project Management	4. IT Strategy and IT and Process Outsourcing

#### 4.2.2.3 Marketing Stream :

1. Consumer Behaviour	2. Sales and Distribution Management
3. Service Marketing	4. Advertising and Brand Management Services
5. International Marketing	6. Rural and Social Marketing
7. Retail Management	8. WTO and Intellectual Property Rights.

#### 4.2.2.4 HRM Stream :

1. Performance Appraisal Management	2. Strategic Human Resource Management
3. Organisational Development	4. Management Process and Organisational Behaviour
5. Gratuity Act, EPF Act	6. Global Competitiveness and Strategic Alliances
7. Compensation Management	

#### 4.2.2.5 Finance Stream :

1. Financial Markets and Institutions	2. Merchant Banking and Financial Services
3. International Finance Management	4. Future Options and derivatives
5. Public Finance and budgeting	6. Treasury Management
7. Insurance and risk Management	8. Security analysis and Portfolio Management
9. Valuation, Merger, Acquisitions and Corporate Restructuring	

**Details of the topics covered in the syllabi**

**1. Materials and Components:**

Structure and properties of Electrical Engineering materials; Conductors, Semiconductors and Insulators, magnetic, Ferroelectric, Piezoelectric, Ceramic, Optical and Super-conducting materials. Passive components and characteristics Resistors, Capacitors and Inductors; Ferrites, Quartz crystal Ceramic resonators, Electromagnetic and Electromechanical components.

**2. Physical Electronics, Electron Devices and ICs:**

Electrons and holes in semiconductors, Carrier Statistics, Mechanism of current flow in a semiconductor, Hall effect; Junction theory; Different types of diodes and their characteristics; Bipolar Junction transistor; Field effect transistors; Power switching devices like SCRs, GTOs, power MOSFETS; Basics of ICs-bipolar, MOS and CMOS types; basic of Opto Electronics.

**3. Signals and Systems:**

Classification of signals and systems: System modelling in terms of differential and difference equations; State variable representation; Fourier series; Fourier transforms and their application to system analysis; Laplace transforms and their application to system analysis; Convolution and superposition integrals and their applications; Z-transforms and their applications to the analysis and characterisation of discrete time systems; Random signals and probability, Correlation functions; Spectral density; Response of linear system to random inputs.

**4. Network theory:**

Network analysis techniques; Network theorems, transient response, steady state sinusoidal response; Network graphs and their applications in network analysis; Tellegen's theorem. Two port networks; Z, Y, h and transmission parameters. Combination of two ports, analysis of common two ports. Network functions: parts of network functions, obtaining a network function from a given part. Transmission criteria: delay and rise time, Elmore's and other definitions effect of cascading. Elements of network synthesis.

## **5. Electromagnetic Theory:**

Analysis of electrostatic and magneto-static fields; Laplace's and Poisson's equations; Boundary value problems and their solutions; Maxwell's equations; application to wave propagation in bounded and unbounded media; Transmission-lines: basic theory, standing waves, matching applications, micro-strip lines; Basics of wave guides and resonators; Elements of antenna theory.

## **6. Electronic Measurements and Instrumentation :**

Basic concepts, standards and error analysis; Measurements of basic electrical quantities and parameters; Electronic measuring instruments and their principles of working: analog and digital, comparison, characteristics, application. Transducers; Electronic measurements of non electrical quantities like temperature, pressure, humidity etc; basics of telemetry for industrial use.

## **7. Analog Electronic Circuits :**

Transistor biasing and stabilization. Small signal analysis. Power amplifiers. Frequency response. Wide banding techniques. Feedback amplifiers. Tuned amplifiers. Oscillators. Rectifiers and Power supplies. Op Amp, PLL, other linear integrated circuits and applications. Pulse shaping circuits and waveform generators.

## **8. Digital Electronic Circuits :**

Transistor as a switching element; Boolean algebra, simplification of Boolean functions, Karnaguh map and applications; IC Logic gates and their characteristics; IC logic families: DTL, TTL, ECL, NMOS, PMOS and CMOS gates and their comparison; Combinational logic Circuits; Half adder, Full adder; Digital comparator; Multiplexer De-multi-plexer; ROM and their applications, Flip flops. R-S, J – K, D and T flip-flops; Different types of counters and registers Waveform generators. A/D and D/A converters. Semiconductor memories.

## **9. Control Systems :**

Transient and steady state response of control systems; Effect of feedback on stability and sensitivity; Root locus techniques; Frequency response analysis. Concepts of gain and phase margins: Constant-M and Constant-N Nichol's Chart; Approximation of transient response from Constant-N Nichol's Chart; Approximation of transient response from closed loop frequency response; Design of Control Systems, Compensators; Industrial controllers.

## 10. **Communication Systems:**

Basic information theory; Modulation and detection in analogue and digital systems; Sampling and data reconstructions; Quantization & coding; Time division and frequency division multiplexing; Equalisation; Optical Communication: in free space & fiber optic; Propagation of signals at HF, VHF, UHF and microwave frequency; Satellite Communication.

## 11. **Microwave Engineering:**

Microwave Tubes and solid state devices, Microwave generation and amplifiers, Waveguides and other Microwave Components and Circuits, Micro strip circuits, Microwave Antennas, Microwave Measurements, Masers, lasers; Microwave propagation. Microwave Communication Systems terrestrial and Satellite based.

## 12. **Computer Engineering :**

Number Systems, Data representation; Programming; Elements of a high level programming language PASCAL/C; Use of basic data structures; Fundamentals of computer architecture; Processor design; Control unit design; Memory Organisation, I/o System Organisation. Microprocessors: Architecture and instruction set of Microprocessors 8085 and 8086, assembly language Programming. Microprocessor Based system design: typical examples. Personal computers and their typical uses.

## 13. **Power electronics:**

Power Semiconductor devices, Thyristor; Power transistor, MOSFETs, Characteristics and operation, AC to DC convertors: 1 phase and 3 phase DC to DC convertors, AC regulators, Thyristor controlled reactors, switched capacitor networks. Invertors: Single Phase and 3 phase, Pulse with modulation, Sinusoidal modulation with uniform sampling, Switched mode power supplies.

## 14. **Information Systems for Managers :**

Information Technology for Managers, Information Systems, System Analysis and Computers Languages, Support Systems and Management Decision.

## 15. **Marketing for Managers :**

Marketing and its applications, Marketing Planning and organisation, Understanding Consumers, Product Management, Pricing and Promotion Strategy, Distribution and Public Policy.

**16. Accounting & finance for Managers :**

Accounting Framework, Understanding Financial Statements, Cost Management, Financial and Investment Analysis, Financial Decision.

**17. Management of Human Resources :**

Planning personal function, Employee Selection, Development and Growth, Motivation, Job Design and appraisal, Compensation planning, Managing Industrial Relations, Unions and Management.

**18. Management Functions & Behaviour :**

Role of a Manager, Decision Making, Organisational climate and change, Organisation Structure and Process, Behavioural Dynamics.

**19. Managerial Economics :**

Demand and Revenue Analysis, Productions & Cost Analysis, Pricing Decisions, Comprehensive case.

**20. Organisational Design, Development and Change :**

Understanding Organisations, Organisational Design, Work Organisation, Organisational Analysis, Organisational Development & Change.

**21. Quantitative Analysis for Managerial Applications :**

Basic Mathematics for Managers, Data Collections and Analysis, Probability and Probability Distributions, Sampling and Sampling Distributions, Forecasting Methods.

**22. Economic & Social Environment :**

Economic & Social environment, Structure of the Indian Economy, Planning & Policies, External Sector, Economic Reforms.

### 23. **Wireless Mobile Networks :**

Introduction to Personal Communication Services (PCS): PCS architecture, Mobility management, Networks signaling. Global system for Mobile Communication (GSM) system overview: GSM Architecture, Mobility Management, Network signalling. General Packet Radio services (GPRS): GPRS architecture, GPRS Network nodes. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP. Wireless Application Protocol (WAP) : the Mobile Internet standard, WAP gateway and Protocols, Wireless Mark up Languages (WML). Third Generation (3G) Mobile Services; Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (WCDMA) and CDMA 2000, Quality of services in 3G. Wireless local Loop (WLL): Introduction to WLL architecture. WLL technologies, Global Mobile Satellite Systems: Case studies of IRIDIUM and GLOBALSTAR Systems. Bluetooth technology and Wi-Max.

### 24. **VLSI Design:**

Introduction to Transistor Theory: BJT, FET, CMOS; Logic Design with MOSFETs: MOSFET as switches, Complex Logic gates in CMOS, Transmission Gate Circuits, Clocking and Dataflow control. Physical Structure of CMOS: Integrated circuits, Fabrication Structure of CMOS Integrated Circuits, Elements of Physical Design: Layout of basic structures, Cell concepts, FET sizing and the unit transistor, Physical design of Logic gates. Electrical Characteristics of MOSFETs: FET RC Model, Modelling of Small MOSFETs; Electronic analysis of CMOS Logic gates: DC characteristics of the CMOS inverter, inverter switching characteristics, power dissipation, de characteristics: AND and NOR gates, NAND and NOR transient response, Analysis of Complex Logic gates, gate design for transient performance, transmission gates and pass transistors, gate delays, driving large capacitive loads. System-level physical design: Large Scale physical design, Interconnect delay modelling, cross talk, interconnect scaling, Floor planning and Routing, Input and Output Circuits, Power distribution and consumption. VLSI Clocking and System Design: Clocked Flip-flops, CMOS clocking styles, pipeline systems, clock generation and distribution.

### 25. **Advanced Digital Signal Processing :**

Overview of DSP fundamentals: deterministic and random signals, correlation functions, Power spectra, time and frequency domain sampling of discrete time signals, DFT for finite duration and its use for linear filtering, Multiplication of Two DFT's and circular convolution, cepstrum. DSP algorithms in LTI systems, Z transforms and system stability, methods of FIR and IIR filter design and realisation Multi-rate digital signal processing: decimation by a factor  $D$  & interpolation by a factor  $U$ , sampling rate conversion by rational factor  $U/D$ , filter design and implementation for sampling rate conversion, direct form FIR filter and time variant filter structures, applications of multi-rate DSP viz. Sub band coding of speech signals, interfacing



of digital systems with different rates, implementation of digital filter banks. Linear filters and optimum linear filters, Rational power spectra, relationships between filter parameters and auto correlation sequence, forward and backward linear predictions, relationship of AR process to linear prediction, Levinson, Durbin algorithm and FIR Wiener filter, IIR weiner filter. Least-squares method for system modelling and filter design; system identification based on FIR (MA) model, all pole (AR) model, pole zero ARMA model, least square filter design for prediction and deconvolution Introduction to architecture for DSP processors with case studies such as ADSP 21xx, TMS 320C54xx. Application using ALP on these processors for basic DSP algorithms (preferably fixed point).

## 26. **Communication Networks :**

Network Design Issues: Scope, Manageability, node placement, Link topology, Routing Protocol selection. Network Performance Issues: Network Terminology centralised and distributed approaches for networks. Networks Performance analysis, Traffic classes, Traffic Control. Queuing Theory, Poisson's Model. Protocol Study: TCP/IP, ATM, 802.11, Bluetooth, SNMP, IPV6, Routing Algorithms, Socket Programming, Protocol Analysis, performance Analysis of protocols (Mathematical approach), Protocol analyzer. Network Troubleshooting. Network Security: Cryptography, Authentication, Firewalls, and Security, on emails, Network management Security. Network Applications: Wireless Networking connecting components & transmission techniques. LAN, WAN, INTRANET, INTERNET, Case studies, and voice over IP, Video conferencing, Digital Library. Network systems design using Network Processors: Network processor technology and architecture. Study of network processors like Intel's IXP 1200 network processors family.

## 27. **Operations Research:**

Nature and scope of operations research; Problem formulation; Model construction; Deriving solutions from models; Sensitivity analysis; Allocation problem; Assignment and distribution problems; General linear allocation problems; Inventory problems; Replacement, maintenance and reliability problems; dynamic programming; Queuing problems; Sequencing, coordination (PERT and Critical Path) Method and routine problems; Competitive problems; Simulation and problems of implementation.

## 28. **Project Management:**

Project Life Cycle: Economic Factors – Social Cost Benefit Analysis; Financial Factors – Evaluation Techniques; Social Cost Benefit Analysis; Project Evaluation Practices of Domestic Financial Institution.

## **29. Management Control Systems:**

Management Control – An Overview: Nature, Scope and Concept of Management Control Systems. Organizational Goals, Strategic Planning and Implementations, Organizational Structure, Position of Controller in the Organizational Structure of an Organization; Control Process: Programming, Budgetary Planning and Procedure. Budgetary Control, Flexible, Zero Base Budgeting and Performance Budgeting. Analysis of Variances, Performance Evaluation, Analysis and Reporting; Control Strategies: Design, Implementation and Evaluation of Management Control System. Management Information Elements; Data Base Information System. Behavioral Aspects of Management Control – Impact of Social Psychology; Management Control Structure: Responsibility Centre, Responsibility Accounting, Cost Centre, Profit Centre and Investment Centre; Transfer Pricing: Methods, Problems and Applications; Management Control in Specialized Organisation: Distinctive features of Management Control Systems in Public Sector Undertakings and other Non-Profit Organizations.

## **30. Production and Operation Management:**

Operations Management, Product Design and Process Selection, Total Quality Management, Planning (Designing) of Systems, Capacity Planning, Facility Location and Layout, Job design Production, Operations Standard & Work Measurement, Project Planning and Control, Aggregate Planning, Inventory Systems, Operation Scheduling, Improving the Systems.

## **31. Team Building in Organization :**

Role of leaders in team. Work Groups Vs. Teams. Transforming Groups to teams. Leaders as facilitators, mentors. Synergy in teams, self managed teams. Measuring team effectiveness. Communications and effectiveness: traditional brain storming, electronic brain storming, negative brain storming.

## **32. Management Process and Organizational Behaviour:-**

Management Approaches, Processes, Managerial Skills, Tasks and Responsibilities of a Professional Manager. Organizational culture and climate, Managerial Ethos, Organizational structure & Design, and Managerial Communication. Organizational Behaviour: Behavioural Dynamics. Individual Determinants of Organization. Behaviour: Perception, Learning, Personality, Attitudes and Values, Motivation, Job Anxiety and Stress. Group Dynamics and Interpersonal Relations, Management of Organizational Conflicts, Management of Change, Leadership and Theories and Styles. Planning and Controlling: Planning Types and Process, Management by Objectives, Decision-Making Types and Models, Problem Solving Techniques, Controlling: Process and Techniques. Performance Evaluation Techniques: Introduction to Budgeting and

Budgetary Control; Performance Budgeting; Classification of Budget; Standard Costing and Variance Analysis; Balanced Scorecard; Responsibility Accounting.

### **33. Advanced Computer Architecture**

Parallel computer models: The state of computing, Classification of parallel computers, Multiprocessors and multi-computers, Multi-vector and SIMD computers. Program and network properties: Conditions of parallelism, Data and resource Dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain Size and Latency, Program flow mechanisms, Control flow versus data flow, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms. System Interconnect Architectures: Network properties and routing, Static interconnection Networks, Dynamic interconnection Networks, Multiprocessor system Interconnects, Hierarchical bus systems, Crossbar switch and multiport-memory, Multistage and combining network. Advanced processors: Advanced processor technology, Instruction-set Architectures, CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors. Pipelining: Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer arithmetic Principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines. Memory Hierarchy Design: Cache basics and cache performance, reducing miss rate and miss penalty, multilevel cache hierarchies, main memory organizations, design of memory hierarchies. Multiprocessor architectures: Symmetric shared memory architectures, distributed shared memory architectures, models of memory consistency, cache coherence protocols (MSI, MESI, MOESI), scalable cache coherence, overview of directory based approaches, design challenges of directory protocols, memory based directory protocols, cache based directory protocols, protocol design tradeoffs, synchronization. Scalable point – point interfaces: Alpha 364 and HT protocols, high performance signalling layer. Enterprise Memory subsystem Architecture: Enterprise RAS Feature set : Machine check, hot add/remove, domain partitioning, memory mirroring/migration, patrol scrubbing, fault tolerant system.

### **34. Advanced Database Management:**

Relational Databases: Integrity Constraints revisited, Extended ER diagram, Relational Algebra & Calculus, Functional, Multi-valued and Join Dependency, Normal Forms, Rules about functional dependencies. Query Processing and Optimization: Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information. Deductive Databases: Data log and Recursion, Evaluation of Data-log program, Recursive queries with negation. Objected Oriented and Object Relational Databases: Modelling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases. Parallel and Distributed

Databases: Distributed Data Storage-Fragmentation & Replication, Location and Fragment Transparency Distributed Query Processing and Optimization, Distributed Transaction Modelling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation. Advanced Transaction Processing: Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors. Active Database and Real Time Databases: Triggers in SQL, Event Constraint and Action : ECA Rules, Query Processing and Concurrency Control, Compensation and Databases Recovery. Image and Multimedia Databases: Modelling and Storage of Image and Multimedia Data, Data Structures – R-tree, k-d tree, Quad trees, Content Based Retrieval: Color Histograms, Textures, etc., Image Features, Spatial and Topological Relationships, Multimedia Data Formats, Video Data Model, Audio & Handwritten Data, Geographic Information Systems (GIS). WEB Database: Accessing Databases through WEB, WEB Servers, XML Databases, Commercial, Systems. Data Mining: Knowledge Representation Using Rules, Association and Classification Rules, Sequential Patterns, Algorithms for Rule Discovery. Data Warehousing: Data Warehousing Architecture, Multidimensional Data Model, Update Propagation OLAP Queries.

### **35. Network Management and Security :**

Network Security Platform Options, IPSec VPN design considerations, Secured networking threats, Encryption Techniques, Designing secured networks, Secret network Management and Network security Management.

### **36. Computer Graphics:**

Line Drawing and transformation : Basic raster graphical algorithm for 2D primitives, Line drawing algorithm, 2D and 3D transformation. Clipping: Window, Viewport, Clipping algorithm; Curves and Surfaces: Circle drawing algorithm, Ellipse drawing algorithm, Bezier curve, b-spline curve, surfaces, Solid modelling. Projection: Parallel projection, Perspective projection, Computation of vanishing point. Visible surface determination: Z-buffer algorithm, Scan line algorithm, Area subdivision algorithm, Raytracing algorithm. Shading: Illumination mode, Specular reflection model, Shading models for curve surfaces, Radiosity method, Rendering, Recursive ray tracing, Texture mapping. Advanced Modelling Techniques; Procedural Models, Fractal Models, Grammar based models, particle systems. Animation; 3D animation, morphing, simulation of key frames.

### **37. Software Risk Management**

Concepts of software risk; Software risk models in general and their applications; Software failures and the associated costs: Types of software reliability modelling; Various models of software risk and the concepts

of software failure, fault, reliability and risk; software product characteristics; the concept of Software quality and the associated cost.

### **38. Software Project Management**

Understanding of the unique risks, issues, and critical success factors associated with software projects design & design methodology; the stages and process of the project life cycle; the various techniques for software project estimation & costing; basic methodologies for software development, testing and implementation; various techniques for managing post software development auditing security with context to present cyber-law and practical models for E Commerce.

### **39. Enterprise Resource Planning Systems:**

The development of the integrated enterprise information systems; planning, design and implementation of cross-functional integrated ERP systems; evolution of ERP systems-from internally focused client/server systems to externally focused extended ERP systems and comprehensive managerial perspective on Enterprise Systems. Aspects of SAP R/3, mySAP and Microsoft Business Solutions – Navision and Axapta.

### **40. IT & Process Outsourcing and IT Strategy:**

Global sourcing of IT services and IT applications, software products and embedded software; Management of outsourcing relationships across multiple organizations with multifaceted interfaces; Basic principles and skill-sets, practices for developing outsourcing strategies. IT as a strategy and its Alignment with Business; IT as a tool for new E Business model development for existing enterprises; IT as re-engineering tool to bring strategic agility in the enterprise; Strategy of IT management; issues of managing IT, tools, people, assets, long term as well as short term view and IT services as a business opportunity.

### **41. Consumer Behaviour:**

Introduction to Consumer Behaviour: Scope and Relevance of Consumer Behaviour Studies; Buying Decision Process; Basic Model of Consumer Behavior; Problem Recognition-Methods of Problem Solving; Information Search, Alternative Evaluation and Selection, Outlet Selection and Purchase, Post Purchase Behaviour and Customer Satisfaction, Role of Involvement. Individual Determinants of Consumer Behaviour: Role of Motivation; Personality and Self Concept; Attention and Perception; Consumer Learning; Consumer Attitudes – Formation and Change; Consumer Values and Lifestyles. External Determinants of Consumer Behaviour: Influence of Culture and Subculture; Social Class; Reference Groups and Family Influences; Diffusion of Innovations. Models of Consumer Behaviour; Researching Consumer Behaviour; Online Customer Behaviour.

## **42. Sales and Distribution Management:**

Introduction to Sales Management: The Sales Management Function – Scope and Importance; Personal Selling Process and Approaches; The Evolving Face of Personal Selling; Sales Organization Structure; Sales Forecasting; Sales Territory Design. Sales Force Management: Sales Force Job Analysis and Description; Recruiting and Selecting Sales Personnel; Training Sales Personnel; Motivating the Sales Force; Sales Force Compensation; Evaluating Sales Performance; Ethical and Legal Issues in Sales Management. Distribution, Planning and Control: Role and Function of Intermediaries; Selection and Motivation of Intermediaries; Distribution Analysis; Control and Management; Channel Dynamics-Vertical Marketing Systems; Horizontal Marketing Systems; Multichannel Marketing Systems; Channel Conflict and Management. Distribution System and Logistics: Physical Distribution System – Decision Areas; Different Modes of Transport in India; Their Characteristics; Logistics Introduction – Functional Areas of Logistics; Logistics Integration for Customer Satisfaction; Distribution costs; Control and Customer Service; Supply Chain Management (SCM); Integration of Sales and Distribution Strategy; Case Studies.

## **43. Service Marketing:**

Introduction to Service Marketing: Growing Importance of Services Sector; Meaning and Nature of Services; Classification of Services and Marketing Implications; Services Marketing Process. Understanding Customers buying Considerations and Behaviour; Customer Expectations and Perceptions; Defining and Measuring Service Quality (Servequal and Servepref); GAPS Model; Defining and Measuring Customer Satisfaction, Service Recovery. Services Marketing Mix: Services Design and Development; Service Blueprinting; Service Process; Physical Evidence and Service scape; Pricing of services; Services Distribution Management; Managing the Integrated Services Communication Mix; Managing Service Personnel; Employee and Customer Role in Service Delivery. Marketing Application in Select Service Industries: Hospitality Services, Tourism Services, Banking Services; Health and Insurance Services.

## **44. Advertising and Brand Management:**

Role of Integrated Marketing Communication in the Marketing Programme; Process of Marketing Communication; Definition and Scope of Advertising Management; Determination of Target Audience, Advertising and Consumer Behaviour; Setting Advertising Objectives, DAGMAR; Determining Advertising Budgets; Advertising Planning and Strategy, Creative Strategy Development and Implementation. Media Planning: Setting Media Objectives; Developing Media Strategies, Evaluation of Different Media and Media Selection; Media Buying; Measuring Advertising Effectiveness; The Organisation for Advertising; Social, Ethical and Legal Aspect of Advertising. Brand-concept: Nature and Importance of Brand; Brand vs. Generics, Brand Life Cycle, Brand Name and Brand Management; Brand Identity: Conceiving Planning and Executing (Aaker Model), Brand Loyalty, Measures of Loyalty; Brand Equity: Concepts and Measures of Brand Equity-Cost, Price and Consumer Based Methods; Sustaining Brand Equity; Brand Personality:

Definition of Brand Personality, Measures of Personality, Formulation of Brand Personality; Brand Image Vs Brand Personality. Brand Positioning: Concepts and Definitions, Repositioning, Celebrity Endorsement, Brand Extension; Differential Advantage: Strategies for Competitive Advantage, Brand Pyramid; Branding in different sectors; Role of Information in Brand Management; Role of e-communities in Brand Management.

#### **45. International Marketing:**

International Marketing: Meaning, Nature and Importance; International Marketing Orientation: E.P.R.G. – Approach: An overview of the International Marketing Management Process; International Marketing Environment. International Market Segmentation and Positioning; Screening and Selection of Markets; International Market Entry Strategies: Exporting, Licensing, Contract Manufacturing, Joint Venture M & A, Setting-up of Wholly Owned Subsidiaries Abroad, Strategic Alliances. International Product and Pricing Strategies: Product Designing; Product Standardisation Vs. Adaptation; Managing Product Line, International Trade Product: Life Cycle, New Product Development; Pricing for International Markets: Factors Affecting International Price Determination; Price Quotations and Terms of Sale. Managing International Distribution and Promotion: Distribution Channel Strategy-International Distribution, Channels, their Roles and Functions; Selection and Management of Overseas Agents; International Distribution Logistics; Planning for trade Fairs and Exhibitions; International Promotion Mix- Advertising and other Modes of Communication. Emerging Trends in International Marketing; Regionalism v/s Multi-lateralism; Trade Blocks; Important Grouping in the World; Legal Dimensions in International Marketing (Role of WTO); Marketing Research for Identifying Opportunities in International Markets.

#### **46. Rural and social Marketing:**

Rural Marketing Introduction: Definition; Myths and Reality of Rural markets; Characteristics of Rural people; Rural market Environment; Rural Infrastructure; Problems of Rural Marketing as regards Product Positioning; Distributions; Language; Media; Transport etc. Challenges for Rural marketing. Rural Marketing Strategies: Rural Market Segmentation; Product Strategies; Pricing Strategies; Promotion Strategies; Distributor Strategies; Rural Marketing Research; Role of IT in Rural Marketing (e-Chaupals etc.) with few case studies; Marketing of Rural and Cottage Industry Products. Future of Rural Marketing in India. Foundation of Social Marketing: Definition; Nature and Scope; Social Marketing Challenges; Conceptual Frame Work of Social Marketing; Need for Social Marketing. Social Marketing Strategies and Applications: Social Markets Segmentation; Product Strategies; Marketing Mix; Pricing Strategies; Promoter Strategies: Role of Govt. and NGO's in Social Marketing; Social Marketing; Applied in Family Planning; Medicare; Small Savings; AIDS Prevention.

#### **47. Retail Management:**

Definition, importance and scope of Retailing; Evolution of Retail Competition,- The Wheel of Retailing, the Accordion, the Retail Life Cycle; Emerging Trends in Retailing; The Retail Scenario in India; Retail Formats. Information Gathering in Retailing; Retail Strategic Planning and Operation Management; Retail Financial Strategy; Target Market Selection and Retail Location; Store Design and Layout; Visual Merchandising and Displays. Merchandise Planning, Buying and Handling; Merchandise Pricing; Retail Communication Mix; Promotional Strategy; Retail Human Resources Management; Customer Service, the GAPs Model, Customer Relationship Management. Retail Management Information Systems; Retail Audits; Online Retailing; Global Retailing; Legal and Ethical Issues in Retailing.

#### **48. WTO and Intellectual Property Rights:**

GATT and Evolution of World Trade Organisation (WTO), Role of WTO in International Trade, Main Features of WTO, New Issues in WTO: Environment, Investment, Competition Policy, Government Procurement, Trade Facilitation, Electronic Commerce, Social Clause, Labour Standards; Implementation and Implication. General Introduction in the Intellectual Property Law: The Notion of Intellectual Property, Historical Background, The Main Fields of Intellectual Property, Industrial property law: Inventions, Industrial Creations Characterised by Relative Novelty (innovations, know-how, Industrial Designs and Models, Utility Models, Layout-designs of Semiconductor Integrated Circuits (semiconductor chips ), Plant Varieties, Trademarks, Geographical Indications, Trade names, Emblems, Other Distinctive Signs; Scientific Discoveries, neighbouring Rights. IPR and Economic Development, Copyright Law ("Rights of Authors"), Correlation of Intellectual Property Law with Unfair Competition, Common Features of the Intellectual Property Rights, Legal Nature of the Intellectual Property Rights, Position of the Intellectual Property Law in the Legal System. International Protection of Intellectual Property: The World Intellectual Property Organisation, The Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPS"), The Paris convention for the protection of Industrial Property, The Patent Cooperation Treaty, The Hague Agreement Concerning the Deposit of Industrial Designs, The International Convention for the Protection of New Varieties of Plants, The Budapest Treaty on the International Recognition of the Deposit of Microorganisms, The Madrid Agreement Concerning the International Registration of Trademarks and the Protocol Relating to the Madrid Agreement, The Trademark Law Treaty, The Berne Convention for the Protection of Literary and Artistic Works, The Rome International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisation, The Geneva Convention for the Protection of Producers of Phonograms Against Unauthorised Duplications of their Phonograms.



#### **49. Performance Appraisal and Management:**

Introduction to Performance Management and Performance Appraisal: Foundations of Performance Appraisal. Performance Management Process- Conceptual Model and its Application, Philosophy Behind Performance Management. Various Aspects of Performance Appraisal: Identifying and Measuring Employee Performance, Uses of Performance Appraisal, Who Conducts Appraisals, e-HR Managing 360 Degree; Methods for Appraising Performance. Performance Audit: Developing Performance Standards – DRA's Process. Conducting Performance Reviews; Performance Management Documentation, Potential Appraisal. Feedback Counselling and Coaching: Ongoing Mentoring and Protégé Development, Annual Stock Taking, Performance – Related Pay; Appraising for Recognition & Reward.

#### **50. Strategic Human Resource Management:**

The objective of competitive advantage; the HRM Environment: Evolution of HRM, HRs New Role Orientation, HRM for Competitive Advantage, HR and Organizational Performance. Investment perspective of HR: Investment in Training & Development, Investment Practices for Improved Retention, Non-traditional Investment Approaches: Investment in Disabled Employees, Employee Assistance Programmes etc. Strategy and HR Planning: Importance of Human Resources to Strategy, Overview of Theoretical Foundations of Strategic Concepts, Strategy Driven Role Behaviours and Practices, Integration of Strategy and HR planning, Determinants of Integration and Problems with Integration. Strategy Implementation and Workforce Utilization: Selection of Employees, Strategically Oriented Performance Management and Compensation Systems. Role of Strategic HR Leader, Future Roles and Leadership Competencies, Managing Workforce Diversity, Cultural Issues of Expatriates.

#### **51. Organizational Development:**

Objectives; Introduction to Organizational Development: Foundations of Organizational Development and Managing the Organizational Development Process. Organizational Development Interventions: Sensitivity Training, Team Interventions, Third-Party Peacemaking Interventions, Inter Group Interventions, Comprehensive Interventions, MBO, Role Playing, Future Challenges. Designing Organizational Structures: Functional, Divisional (Product, Geographic, Market), Nature and Network Structure, the Learning Organization, Virtual/Boundary Less Organization. Key Issues in Organizational Development: Issues in Consultant client Relationships, Action Research, Ethical Issues in Organizational Development and Future of Organisational Development.

## **52. Global Competitiveness and Strategic Alliances:**

Global Competitiveness: An Overview – Macroeconomic and Business Strategy Perspective, Framework for Assessing Competitiveness – Various Approaches; International and National Competitiveness Studies. Developing Competitiveness - Government Policy and Competitiveness, Role of Quality and Productivity in Achieving World Class Competitiveness; Attaining Competitiveness through Integrative Process Management; Science, Technology and Innovation Policy, Human Capital and Competitiveness, Role of Information Systems in Building Competitiveness, Industrial Clusters and Business Development, Strategic Management of Technology and Innovation. Global Competitiveness of Indian Industry – Status; cause of Uncompetitiveness; Strategic Options for Building Competitiveness, Internationalization of Indian Business: Selected Case Studies of Globally Competitive Indian Companies. Strategic Alliances – Value creation in alliances strategy, Management of Strategic Alliances; Strategic Alliances in Indian Context.

## **53. Compensation Management:**

Introduction to Compensation : Compensation Defined, Goals of Compensation System, Compensation Strategy Monetary & Non-Monetary Rewards, Intrinsic Rewards Cafeteria Style Compensation, Fringe Benefits and Supplementary Compensation. Compensation for Workers: Wage Theories, Evolution of Modern Day Labour Force, Incentive Plans, ESOP's, EVA Reward Management in TNC's, Discrimination in Labour Market, Quality in Labour Market. Compensation for Chief Executives and Other Employees: Guidelines of Companies Act Relating to CEO Compensation. Different Components of Compensation Package. "Job Evaluation" Job Description and Job Specification: Job Analysis & Its Process, Methods of Job Evaluation, Internal and External Equity in Reward Management, Role of Wage Board & Pay Commissions, International Compensation, Knowledge Based Compensation, Team Compensation, Competency Based Compensation.

## **54. Financial Management ( an overview):**

An overview; Goals of Financial Management, Key activities of Financial Management, relationship of Finance to Accounting and Finance, Organization of Finance Functions.

## **55. Cost Accounting:**

Management Accounting, Material Cost, Labour Cost, Overhead: Actual versus pre-determined overhead rates, Under – or over absorption of overheads; job, batch, contract and operating costing, Process Costing, Cost Accounting Systems; Marginal costing and break-even analysis, Marginal costing. Activity Based Costing; Decision Making, Standard costing and analysis of variances, Integrated and Non-

Integrated Accounting Systems, Reconciliation of cost and financial accounts, Systems Choice: Decentralization and Transfer Pricing.

**56. Financial Management in Public Sector Enterprise:**

Investment and Project Appraisal Systems in PSUs; Funds Mobilization by PSUs; Financial Performance of PSUs. Capital Budgeting, Long term financing, Working Capital Management, Memorandum of understanding, Financial Control.

**57. Advanced Accounting**

Company Accounts introduction; shares & debentures etc.; Company Accounts; Final accounts; Cash and fund flow statements; Accounting standards.

**58. Principles of Taxation (Tax Laws):**

Income Tax: Basic Concepts, Residential Status, Incidental of Tax; Income Exempt from Tax, Computation of Income; Set off and Carry forward of Losses, deductions and rebates, deduction of Tax at source (TDS) and Advance payment of Tax, Assessment of Individual, duties and responsibilities of DDO; Central Excises Act, 1944 and Central Excise Tariff Act, 1985, Customs Duty, Finance Act 1994.

**59. Financial Statements:**

Basic concepts underlying accounting, Balance Sheet, Profit and Loss Accounts, Source and usage of final statements, Financial topics related to balances received and profit and loss accounts, Analyzing financial performance, Financial ratios, Applications of financial analysis, Problems in financial statements and analysis, Break-even analysis and leverages.

**60. Companies Act 1956 (with amendments):**

Incorporation of Companies, Prospectus & Allotment, Share Capital & Debentures & Registration of Charges, Management & Administration, Reconstruction, Mergers & Acquisitions.

**61. Auditing:**

Nature, objective and basic principles of auditing; Techniques of auditing-physical verification, examination of documents and vouching, direct confirmation, analytical review; Planning and audit, audit programmes, working papers, audit press; Valuation of internal controls.

## **62. Security Analysis and Portfolio Management:**

Investment Decisions, Investment Risk, Valuation of Securities, Analysis of Stock Markets, Financial Derivative Instruments, Portfolio Theory.

## **63. Bare Acts:**

Contract Act, Partnership Act, Payment of Gratuity Act, Consumer Protection Act, Industrial Dispute Act, Sales Tax Act, Payment of Bonus Act.

## **64. Financial Markets and Institution:**

Financial System and Economic Development, Financial Markets: Capital Market, SEBI: Role and Regulatory Aspects; Government Securities Market, Money Market; Reserve Bank of India: Role as Banker to the Government, Credit Control and other Regulatory Aspects, Indian Foreign Exchange Market: Foreign Exchange Management Act (FEMA); Financial Institutions: Banking Institutions, Non-Banking Financial Companies, Mutual Funds, Insurance Organizations, Development Finance Institutions.

## **65. Merchant Banking & Financial Services:**

Merchant Banking: Issue Management, SEBI Guidelines, Institutional & Operational Framework, Regulation of Merchant Banking Activities, Obligations of Merchant Bankers; Mergers, Amalgamations, Acquisitions/Takeovers; Loan Syndication. Financial Services: Service Sector in India, Overview of Financial Services in India, Nature Scope and Types of Financial Services, Loan Syndication and Loan Consortium: Domestic and External, Venture capital, Factoring, Housing Finance, Consumer Credit; Forfaiting, Leasing, Hire-Purchase, Securitization, Portfolio Advisory Services, Stock Broking, Credit Rating.

## **66. International Financial Management:**

Introduction to International Finance, Global Foreign Exchange Markets, Risks in International Business, Foreign Investment, Financial Management of MNCs.

## **67. Future Options and Derivatives:**

Financing Strategy and Financing Instruments including: Derivatives; Corporate risk Management; Hedging; Forwards and futures; Options and swaps; Practical aspects of risk management.

## **68. Public Finance and Budgeting:**

Public Financial Administration, Public Expenditure, Budgeting, Revenue, Public Debt, Modern Techniques in Budgeting, Central Government Budgeting Process, Public Investment-Programming and Management, Fiscal Responsibility, Parliamentary Financial Committees.

#### **69. Treasuring Management:**

Scope and Functions: Conceptual framework for Treasury function, Responsibility of a Treasurer-Funds Management; Financial Markets and Instruments: Money Markets and Money Market Instruments: Repos, Commercial Papers, CDs, Treasury Bills, Money Market Mutual Funds etc., Capital Markets and Capital Market Instruments, Recent Developments and Emerging Trends; Treasury functions for Short-Term Finance: Estimating W.C. requirement, Managing Liquidity, Managing Receivables, Managing Inventory. Treasury functions for Long-Term Finance: Estimating Long-term needs, Financing Growth opportunities, Sources and Cost of Capital, Managing Banking Relationships.

#### **70. Insurance and Risk Management:**

Concept of Insurance, its need; Regulation of risk reduction; Re-insurance, co-insurance, assignment; Computation of premium; Risk evaluation and prediction, application of techniques risk avoidance, disaster risk management; Principle of indemnity, estoppels, endowment, insurance.

#### **71. Valuations, Mergers, Acquisitions and Corporate Restructuring:**

Aspects of mergers/amalgamation: legal, labour; Regulations, take-over code, approval from courts. Valuation of business-methods of valuation; Motives for mergers, types of mergers; Post merger HR and cultural issues; Criteria for negotiating for friendly take-over; Defence against hostile take-over.