

STUDY AND EVALUATION SCHEME FOR  
 THREE YEARS DIPLOMA COURSE IN INFORMATION TECHNOLOGY  
 (Effective From 200 -200 )  
 (COMMON TO DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING)

**I Year**

Curriculum								Scheme of Examination									
Periods Per Week				S U B J E C T				Theory				Practical				Gr- nd	
Le-	Tut-	Dr-	Lab-	Work-	Tot-	Examination	Sess.	Total	Examination	Sess.	Total	Examination	Sess.	Total	Tot- al		
c.	ori	aw	Shop	al		Dur.	Marks		Dur.	Marks		Dur.	Marks				
3	-	-	2	-	5	1.1 Professional Communication	2.5	50	20	70	3	20	10	30	100		
3	2/2	-	-	-	4	1.2 Applied Mathematics-I	2.5	50	20	70	-	-	-	-	70		
3	2/2	-	2	-	6	1.3 Applied Physics	2.5	50	20	70	3	40	20	60	130		
3	-	-	-	-	3	1.4 Applied Chemistry	2.5	50	20	70	-	-	-	-	70		
3	-	-	2	-	5	1.5 Electrical Engineering-I	2.5	50	20	70	3	50	25	75	145		
3	-	-	-	-	3	1.6 Engineering Mechanics and Material	2.5	50	20	70	-	-	-	-	70		
4	2	-	-	-	6	1.7 Components Of Information Technology.	2.5	50	20	70	-	-	-	-	70		
4	-	-	4	-	8	1.8 Operating system	2.5	50	20	70	3	50	30	80	150		
3	2/2	-	4	-	8	1.9 Fundamental of Electronic Devices	2.5	50	20	70	3	50	25	75	145		
29	5		14		48		T O T A L		450	180	630	-	210	110	320	950	
GAMES/NCC/Social and Cultural activities + Discipline (30+20)														50			
														Total	1000		

NOTE:-

- (1) Each period will be of 50 minutes duration.
- (2) Each session will be of 32 weeks.
- (3) Effective teaching will be at least 25 weeks.
- (4) At least 2 industrial visits should be scheduled during the session.

STUDY AND EVALUATION SCHEME FOR  
THREE YEARS DIPLOMA COURSE IN INFORMATION TECHNOLOGY  
(Effective From \_\_\_\_\_)

II YEAR

Note : (1) Each period will be of 50 minutes duration.  
(2) Each session will be of 32 weeks.  
(3) Effective teaching will be at least 25 weeks.  
(4) 4 weeks structured and supervised, branch specific, task oriented industrial/field exposure to be organised during summer vacation, after II year Student will submit a report. There will be 60 marks for this exposure. These marks will be awarded by project examiner in the III YEAR.  
(Examination marks : 40, Sess. marks : 20 ).  
(5) At least 2 industrial visits should be scheduled during the session.  
(6) At least 1 seminar should be organised at the institute level with in the session.

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III YEAR

NOTE:- (1) Each period will be of 50 minutes duration.  
(2) Each session will have 5, 16, and

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

(5) At least 2 Field visit and 2 extension lectures are to be organised and managed well in advance at institute level during the session.

(6) (\*) It is compulsory to appear & to pass in examination, But marks will not be included for division and percentage of obtained marks.

(7) At least 1 seminar should be organised at the institute level with in the session, Participation of each student is compulsory and sessional marks for this should be allotted to the student. (No External Exam.)

Grand Total

1 | 2250 |

30% Carry	Over of I YEAR	300
70% Carry	Over of II YEAR	770
100% Carry	Over of III YEAR	1180

Total | 1180 |

70% Carry Over of II YEAR

### 100% Carry Over of III YEAR

### Grand Total

rganised and managed

marks will

rks.

l with in the session,

marks for this should be

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MAIN FEATURES OF THE CURRICULU

1. Title of the Course : Diploma In Information  
: Technology
2. Duration of the Course : Three Years
3. Type of the Course : Full Time Institutional
4. Pattern of the Course : Anual System
5. Intake : 60
6. Entry Qualification : High School 10+ with Science  
Two and Mathematics Two.
7. Admission Criteria : State Joint Entrance  
Examination

List of experts who contributed The Development of curriculum of Three Years Diploma in INFORMATION TECHNOLOGY In Annual System.

1. Smt. Usha Birjee	Director. I.R.D.T., U.P. Kanpur.
2. Shri R. R. Sharma	Sr. Manager (Systems) UPDESCO, Lucknow
3. Shri Raghuveer Singh	Asstt. Professor (Computer) H.B.T.I., kanpur
4. Shri Rajeev Kapoor	T.T.T.I., Chandigarh
5. Shri Nitin Mathur	Asstt. Manager (Systems) UPDESCO, Lucknow
6. Shri Rajesh Km. Tripathi	Scientific Officer/Engg. 'SB' N.I.C. Yojna Bhawan Lucknow
7. Km. Shubhra Srivastava	Scientific Officer/Engg. 'SB' N.I.C. Yojna Bhawan Lucknow
8. Shri Arvind Pandey	I.O.C.S., Civil lines Kanpur
9. Shri Neeraj Jauhari	I.O.C.S., Pandu Nagar
10. Shri Ashraf Ali	Professor I.R.D.T., U.P. Kanpur.

List of experts who contributed in the modification of curriculum of Three Years Diploma Course in INFORMATION TECHNOLOGY In Annual System, held on December, 26, 2000 at Board of Technical Education, Lucknow.

1. Smt. Usha Birjee	Director D.T.E., Kanpur
2. Shri Subhash Tandon	Jt. Manager Uptron India Limited 10, Ashok Marg Lucknow.
3. Shri Ram Singh	Sr. Manager U.P. Jal Nigam 4/18 Gomtinagar, Lucknow.
4. Shri Ranjan Srivastav	Asstt. Professor I.I.I.T., Allhabad.
5. Shri S.K. Verma	Principal G.G. Polytechnic Lucknow.
6. Shri Ashraf Ali	Professor I.R.D.T., Kanpur
7. Shri R.S.K. Sinha	Asstt. Professor Board Of Technical Education Lucknow.
8. Shri Ram Singh	Secretary Board of Technical Education Lucknow.

List of experts who contributed to Change the of curriculum of Three Years Diploma Course in INFORMATION TECHNOLOGY held on 27.02.2003 at I.R.D.T . U.P., Kanpur.

1. Shri Gurdeep Singh	Director. I.R.D.T., U.P. Kanpur.
2. Shri Rajeev Misra	Head of Department Information Technology H.B.T.I. Kanpur
3. Shri Raghu Raj Singh	Head of Department Computer Science & Engg. H.B.T.I. Kanpur.
4. Shri S. C. GUPTA	HOD Computer Science & Engg. Dr. Ambedkar Institute of Technology for handicapped, Kanpur
5. Shri M.A. Idrees	Senior System Analyst NIC, Yojna Bhawan Lucknow.
6. Shri Alok Tiwari	District Informatics Officer Kanpur Dehat.
7. Shri B.R. Verma	Head Computer Govt. Polytechnic Lucknow
8. Shri L.S. Yadav	Head Computer Govt. Polytechnic Kanpur
9. Shri Saurabh Agrawal	Lecturer Computer United Institute of Designing Kanpur
10. Shri Ashok Kushwaha	Lecturer Computer Govt. Girls Polytechnic Lucknow
11. Shri Ashraf Ali	Professor I.R.D.T., U.P. Kanpur.

List of experts who contributed to Change the of curriculum of Three Years Diploma Course in INFORMATION TECHNOLOGY held on 15.10.2003 at I.R.D.T . U.P., Kanpur.

1. Shri Alok Tiwari	District Informatics Officer Kanpur Dehat.
2. Shri B.R. Verma	Head Computer Govt. Polytechnic Lucknow
3. Shri D. Singh	Head Computer Govt. Girls Polytechnic, Allahabad
4. Shri S. N. Singh	Head Computer Govt. Polytechnic Unnao
5. Shri L.S. Yadav	Head Computer Govt. Polytechnic Kanpur

6. Shri Saurabh Agrawal	Lecturer Computer United Institute of Designing Kanpur
7. Shri Alok Gupta	HIG 174, Kalish Vihar, Kalyanpur, Kanpur
8. Shri R. Goel	Programmer, I.E.T., Lucknow
9. Shri Ashraf Ali	Professor I.R.D.T., Kanpur
List of experts who contributed to Change the of curriculum of Three Years Diploma Course in INFORMATION TECHNOLOGY held on 15.11.2007 and 16.11.2007 at I.R.D.T . U.P., Kanpur.	
1. Shri Ashraf Ali	Head (Computer) Govt. Girls Poly., Lucknow
2. Shri L.S. Yadav	Head Computer Govt. Polytechnic, Lucknow
3. Shri B.R. Verma	Head Computer/Asstt. Director D. T. E., Kanpur
4. Shri Alok Tiwari	District Informatics Officer Kanpur Dehat.
5. Shri Jitendra Kumar	Sr. Manager U. P. Tech, Mall Road, Kanpur
6. Shri Kurunesh Yadav	Lecturer, G.G.P., Lucknow
7. Shri Ashok Kushwaha	Lecturer, G.G.P., Lucknow
8. Shri S. K. Agarwal	Lecturer, G.G.P., Allahabad
9. Smt Sarla Agarwal	Lecturer(Electronics), Govt. Poly., Barillary
10. Smt. R. P. Alam.	Assistant Professor I. R. D. T., Kanpur

#### IV. NEED ANALYSIS :

With the development of civilisation, human needs to keep on increasing their fulfilment needed simulation, analysis of lot of informations too became essential. Now the individual responsibilities of every responsible citizen grew up to such a light that it is difficult for him to handle them successfully. Human memory too has its own limitations. So here comes the computer to help in all kind of decision making, whether it is highly complicated research work, war strategy, market speculations or day-to-day need of human life etc. As a matter of fact every individual activity needs decision making. So the computer is the need of organisations and also the need of individual being. It will not be exaggeration if we say that it is "Information era". So is the need for developing a course for "Information Technology" at diploma level. It is supposed that such personnel will not face any dearth of employment because of omnipresent nature of computer.

The syllabus for diploma in "Information Technology" has been developed to meet above mentioned aims. Obviously achievement of any aim requires knowledge of the means and procedures of their utilisation. With this view various courses have been carefully selected and their length and depth decided by experienced experts in the field.

V.

CHANGES IN THE SYLLABUS:

I YEAR

1.7 COMPONENT OF IT

1. In topic no 4. "Mobile Computing" is shifted in topic no. 6 and new matter added as "Tele conferencing".
2. In Topic no. 6 "CPU and Mathematical Logid" is shifted in II Year in Paper No. "2.7 Computer Organisation".

1.8 OPERATING SYSTEM

1. In Topic No 5 and 7 removed.
2. In Topic No. 6 "Types of windows and difference" added.
3. In Lab Experiment No. 1 is Removed.

1.9 FUNDAMENTAL OF ELECTRONICS DEVICE

1. In Topic no. 2- 2.1, 2.2,2.3 removed
2. In Topic no. 3- 3.3 removed.
3. In Topic no. 5- 5.1 and 5.2 shifted to topic no. 4- 4.2
4. In Topic no. 6 "Feedback amplifier" named as topic 7. "Operational Amplifier" added to topic no. 6.
5. In lab experimental no. 18 added "Use of OP-AMP.....".

II YEAR

2.2 PROGRAMMING IN C & C++

1. In Topic no. 4 "Generalasation, Specialization" added.

2.3 DATA COMMUNICATION & COMPUTER NETWORK

1. New paper 2.3 "Data Communication & Computer Network" introduce in place of "Computer Communication Network".

2.4 OFFICE TOOLS

1. New Paper 2.4 "Office Tools" introduce in place of "MS office".

2.5 VISUAL BASIC

1. In topic no. 6 VB.NET is added. and in lab a new experiment VB.NET added.

2.7 COMPUTER ORGANISATION

1. The above new paper introduced.

III YEAR

3.1 INDUSTRIAL MANAGEMENT & ENTREPENURSHIP DEVELOPMENT

1. The above common paper introduced.

### 3.2 INTERNET AND WEB TECHNOLOGY

1. This paper is redesigned in place of 2 paper named as "Internet" and Other as "Web Technology".
- \* ASP programme, redesigned HTML and Web Building added.

### 3.3 CONCEPTS OF RDBMS

1. In topic no. 5 SQL commands introduced.

### 3.6 COMPUTER GRAPHICS

1. The above new paper introduced.

### EQUIPMENT LIST FOR COMPUTER CENTRE, STAFF STRUCTURE & SPACE REQUIREMENT

Equipment list for computer centre revised as per changed syllabus and number of equipment, staff structure and space requirement revised for the intake of 60 students.

VI.        YEAR WISE DISTRIBUTION OF PAPERS

1.        I YEAR

- 1.1 Professional Communication
- 1.2 Applied Mathematics-I
- 1.3 Applied Physics
- 1.4 Applied Chemistry
- 1.5 Electrical Engineering-I
- 1.6 Engineering Mechanics & Material
- 1.7 Components of Information Technology
- 1.8 Operating System
- 1.9 Fundamental of Electronics Devices

II YEAR

- 2.1 Applied Mathematics-II
- 2.2 Programming In C & C++
- 2.3 Data Communication & Computer Network
- 2.4 Office Tools
- 2.5 Visual Basic
- 2.6 UNIX & LINUX
- 2.7 Computer Organisation
- 2.8 Microprocessor & Its Application

III YEAR

- 3.1 Industrial Management & Entrepreneurship Dev.
- 3.2 Data Structure Using C & C++
- 3.3 Internet & Web Technology
- 3.4 Concept of RDBMS Using Oracle
- 3.5 Java Programming
- 3.6 MIS & System Analysis & Design
- 3.7 Computer Graphics
- 3.8 Environmental Education & Disaster Management
- 3.9 Project -i. Problem
  - ii. Field Exposure
  - iii. Seminar

I YEAR

1.1 PROFESSIONAL COMMUNICATION

[ Common to All Engineering/Non Engineering Courses]

L	T	P
3	-	2

Rationale:

Communication forms an important activity of diploma holder. It is essential that he/she should be in a position to communicate in writing and orally with superiors, equals and subordinates. This subject aims at providing working knowledge of languages like Hindi and English so as to train the students in the art of communication. It is suggested that maximum attention should be given in developing Communication abilities in the students while imparting instructions by giving maximum emphasis on practice.

Sr.No.	Units	Coverage time		
		L	T	P
1.	Introduction to communication methods meaning, channels & media written and verbal.	5	-	-
2.	Development of comprehension of English & Hindi through study of text material & language exercises.	20	-	-
3.	Development of expression through A. Letters(English & Hindi) B. Report writing (English) Note making and minutes writing	10	-	-
4.	Composition	10	-	-
5.	Grammer	20	-	-
		75	-	50

1. PART I : COMMUNICATION IN ENGLISH

- 1.1 Concept of communication, importance of effective communication, types of communication, formal, informal, verbal and nonverbal, spoken and written. Techniques of communication, Listening, reading, writing and speaking, Barriers in communication, Modern tools of communication- Fax, e-mail, Telephone, telegram, etc.
- 1.2 Development of comprehension and knowledge of English through the study of text material and language exercises

based on the prescribed text book of English.

1.3 Development of expression through:

1.3.1 Letters :

Kinds of letters:-

Official, demi-official, unofficial, for reply or in reply, quotation, tender and order giving letters.  
Application for a job.

1.3.2 Report writing and Note making and minutes writing.

1.4 Grammer : Transformation of sentences, Preposition, Articles, Idioms and Phrases, One word substitution, Abbreviations.

1.5 Composition on narrative, descriptive, imaginative, argumentative, discussion and factual topics.

## 2. PART II : COMMUNICATION IN HINDI

2.1 Development of comprehension and knowledge of Hindi usage through rapid reading and language exercises based on prescribed text material developed by IRDT.

2.2 Development of expression through ;

Letter writing in Hindi:

Kinds of letters:-

Official, demi-official, unofficial, for reply or in reply, quotation, tender and order giving letters, Application for a job.

(1) Paper should be in two parts, part I - English and part II Hindi.

## COMMUNICATION AND PRESENTATION PRACTICES

1.A. Phonetic transcription

B. Stress and intonation :

(At least 10 word for writing and 10 word for pronunciation)

## 2. ASSIGNMENT : (Written Communication)

Two assignment of approximately 400 word each decided by the teachers.

## SUGGESTED ASSIGNMENTS :

1. a picture/photograph
2. an opening sentence or phrase
3. a newspaper/magazine clipping or report

4. factual writting which should be informative or argumentative.
3. Oral Conversation:
  1. Short speeches/declamation : Bid farewell, Felicitate somebody, Celebrate a public event, Offer condolences
  2. Debate on current problems/topics
  3. MockInterview : Preparation, Unfolding of personality and Expressing ideas effectively
  4. Group discussion on current topics/problems
  5. Role Play/ general conversation : Making polite enquiries at Railway Station, Post Office, Banks and other Public places, Replying to such enquiries, enquiring about various goods sold in the market and discussing their prices. Complaining about service at Hotel, restaurant, Offering apologies in reply to such complaints, complain to a company about a defective product you have brought, reply to such complaints.
  6. Presentation skill, Use of OHP and LCD.
4. Aural :

Listening to conversation/talk/reading of short passage and then writting down the relevant or main points in the specified number of words and answering the given questions

The assignments/projct work are to be evaluated by the internal/ external examiner. The distribution of 30 marks e.g.

10 marks for assignment (Given by subject teacher as sessional marks)  
10 marks for conversation and viva-voce  
10 marks for phonetic transcription

#### STRUCTURE OF COMMUNICATION TECHNIQUE PAPER

##### Distribution of Marks

Theory Paper : 50 Marks  
Sessional : 20 Marks  
Practices : 30 Marks

Q1. Question based on the topics prescribed text material will be set to test the candidates ability to understand the content, explain words and phrases, making sentence of given words and ability to summarise will be included. All questions will have to be answered.

A. from English Text Book	10 Marks
B. from Hindi Text Book	5 Marks

Q2. Candidates will be required to write one letter (English) and one letter in (Hindi) from a choice of two -

A. English Letters	5 Marks
B. Hindi Letters	5 Marks

Q3. Report Writing on given outlines 5 Marks

Q4. There will be a number of short answer questions to test the candidates knowledge of functional grammar, structure and usage of the language. All the items in this question will be compulsory. The grammar questions has four parts -

(Total Part: A For 5 Marks, B For 3 Marks, C For 3 Marks and D For 4 Marks)

A. This part of the question has to do with the transformation of sentences. English uses several patterns of sentence formation and the same meaning can be expressed by several patterns e.g. Active to Passive voice and vice versa, Direct to Indirect and vice versa, Reframing sentences by changing part of speech e.g. Noun to Adjective, Interchanging degree of comparison.

Interchanging Moods - Affirmative to Negative, Assertive to Interrogative or to exclamatory

B. The second part usually requires blanks in a sentence to be filled in with a suitable preposition and articles.

C. The third part is usually an exercise on tenses.

D. The fourth part concerns with one word substitution and abbreviation, uses of idioms and Phrases.

Q5. COMPOSITION : (About 300 Words) (5 marks)

Candidates will be required to select one composition topic from a choice of five. The choice will normally include narrative descriptive, argumentative, discussion and factual topics. The main criteria by which the composition will be marked are as follows

A. the quality of the language employed, the range and appropriateness of vocabulary and sentence structure the correctness of grammatical construction, punctuation and spelling.

B. The degrees to which candidate have been successfully in organising both the composition as a whole and the individual paragraphs.

## 1.2 APPLIED MATHEMATICS I

[ Common to All Engineering Courses]

L	T	P
3	2/2	-

### Rationale:

The study of mathematics is an important requirement for the understanding and development of any branch of engineering. The purpose of teaching mathematics to diploma engineering students is to impart them basic knowledge of mathematics which is needed for full understanding and study of engineering subjects.

S.N.	Units	Coverage Time		
		L	T	P
1.	Algebra-I	18	6	-
2.	Trigonometry	7	2	-
3.	Coordinate Geometry	15	5	-
4.	Differential Calculus-I	15	5	-
5.	Integral Calculus-I	20	7	-
		75	25	-

### DETAILED CONTENTS:

#### 1. ALGEBRA-I :

1.1 Series : AP and GP; Sum, nth term, Mean

1.2 Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem.

1.3 Determinants : Elementary properties of determinant of order 2 and 3, Multiplication system of algebraic equation, Consistency of equation, Crammer's rule

1.4 Vector algebra : Dot and Cross product, Scaler and vector triple product. Application to work done, Moment of a force, Plane geometry.

#### 2. TRIGONOMETRY :

2.1 Relation between sides and angles of a triangle : Statement of various formulae showing relationship between sides and angle of a triangle.

## 2.2 Complex number.

Complex numbers, Representation, Modulus and amplitud  
Demoivre theorem, its application in solving algebraic  
equations, Mod. function and its properties..

## 3. CO-ORDINATE GEOMETRY :

### 3.1 Standard form of curves and their simple properties -

Parabola  $x^2=4ay$ ,  $y^2=4ax$ ,

Ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Hyperbola  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

Tangent and normals

### 3.2 Straight lines, planes and spheres in space -

Distance between two points in space, direction crossing and  
direction ratios, Finding equation of a straight line, and  
shortest distance between two lines

Under different conditions equation of a plane  $lx+my+nz=c$ ,  
relation between lines and planes, sphere  $x^2 + y^2 + z^2 + 2gx$   
 $+ 2fy + 2wz=d$

## 4. DIFFERENTIAL CALCULUS - I :

- 4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.
- 4.2 Methods of finding derivative, - Function of a function, Logarithmic differentiation, Differentiation of implicit functions, Higher order derivatives, Leibnitz theorem.
- 4.3 Special functions (Exponential, Logarithmic, Hyperbolic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.
- 4.4 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, sketching of some simple curves (without assumptions, question, not to be asked in the examination), Rate, Measure, velocity, Acceleration, Errors and approximation.

5. INTEGRAL CALCULUS - I :

- 5.1 Methods of Indefinite Integration :- Integration by substitution, Partial fraction and by parts, Integration of special function of 4.3.
- 5.2 Meaning and properties of definite integrals, Evaluation of definite integrals.
- 5.3 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.
- 5.4 Simpsons and Trapezoidal Rule : their application in simple cases, Concept of error for simple function.

### 1.3 APPLIED PHYSICS

[ Common to All Engineering Courses]

L T P  
3 2/2 2

#### Rationale:

Engineering physics is a foundation Course. Its purpose is to develop proper understanding of physical phenomenon and scientific temper in the students. While teaching the subject, teachers should make maximum use of demonstrations to make the subject interesting to the students.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Measurement	4	1	-
2.	Vector	3	1	-
3.	Force and Motion	4	1	-
4.	Dynamics of rigid body (Rotational Motion)	4	1	-
5.	Fluid Mechanics and Friction	4	1	-
6.	Work, Power and Energy	4	2	-
7.	Elasticity	2	1	-
8.	Simple Harmonic Motion	4	1	-
9.	Heat Transfer & Radiation	4	2	-
10.	Application of Sound Waves, Acoustics and Ultrasonics	6	2	-
11.	A. Optics	4	1	-
	B. Fiber Optics	4	1	-
12.	D.C. Circuits	4	1	-
13.	Dielectrics	4	2	-
14.	Magnetic Fields and Materials	4	2	-
15.	Semi Conductor Physics	5	1	-
16.	Nuclear Physics	4	2	-
17.	Laser & its Application	4	1	-
18.	Non-conventional energy sources	3	1	-

75 25 50

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#### DETAILED CONTENTS:

1. Measurement
  - a) Units and Dimensions

Fundamental and derived units :

S.I. Units & Dimensions of physical quantities, Dimensional

formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to:

- i) Checking the correctness of physical equations,
- ii) Deriving relations among various physical quantities,
- iii) Conversion of numerical values of physical quantities from one system of units into another. Limitations of dimensional analysis.

b. Errors in measurements, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement (Combination of errors in addition, subtraction, multiplication and powers). Significant figures, and order of accuracy in respect to instruments, Standard deviation, Variance.

2. Vector :

Scalar and vector quantities; Addition, Subtraction, Resolution of vector- Cartesian components of vector, Scalar and vector product of two vector.

3. Force and Motion

Parabolic motion, projectiles thrown horizontally and at an angle. Problems on time of flight, horizontal range, and maximum horizontal range. Central forces. Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge. Gravitational force, Motion of satellites, Kepler's laws, Escape velocity, Geostationary satellite, Concept of Black holes, Jet propulsion theory, Motion of Multi-stage Rocket, SLV, PSLV and GSLV Rockets.

4. Dynamics of Rigid Body (Rotational Motion)

Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies, Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling down the slant planes.

5. Fluid Mechanics & Friction

Surface tension, Capillaries, Equation of continuity ( $A_1V_1 = A_2V_2$ ), Bernoulli's theorem, stream line and Turbulent flow, Reynold's number.

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in every day life. Static and dynamic frictional forces. Coefficients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

6. Work, Power and Energy

Work done by force on bodies moving on horizontal and inclined planes in the presence of frictional forces, Concept of power and its units. Calculation of power (simple cases). Concept of kinetic and potential energy, various forms of energy, Conservation of energy. Force constant of spring, potential energy of a stretched spring.

7. Elasticity

Elasticity, stress and strain. Hooke's law, elastic limit. Yielding point and breaking point. Modulus of elasticity Young's modulus, bulk modulus and modulus of rigidity, Poisson ratio, Resilience.

8. Simple Harmonic Motion

Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of their periodic time. Energy conservation in S.H.M. Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. Heat Transfer and Radiation

Modes of heat transfer, coefficient of thermal conductivity and its determination by (i) Searle's method for good conductors, and (ii) Lee's method for poor conductors. Conduction of heat through compound media, Conduction and convection, Radial flow of heat, Blackbody radiation, Stefan's law, Wein's displacement and Raleigh-Jeans laws, Planck's Law.

10. Application of Sound Waves

Acoustics

Standing waves, Closed and Open organ pipes, Resonance, End-correction. Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.

Ultra-Sonic :

Generation, Magnetostriction, Piezoelectric effect, Application in new technology

11.A Optics

Quantum nature of light, Coherence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Biprism, Fraunhofer single and N-slit diffraction, Grating, Resolving and dispersive power, Elementary concept of polarisation.

B. Fibre Optics :

Critical angle, Total internal reflection, Principle of fibre optics, Optical fibre, Pulse dispersion in step-index fibres, Graded index fibre, Single mode fibre, Optical sensor.

12. D.C. Circuits

Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); potentiometer, Kirchoff's Law and their simple application. Principle of Carey-Foster's bridge. Electric potential, potential energy, Energy of a charged capacitor. Fleming left hand rule, torque on a current loop, Moving coil, Galvano meter. Charging/discharging of capacitors, Ballistic galvanometer, its charge sensitivity and Current sensitivity.

13. Dielectrics :

Electric dipole; effect of electric field on dielectrics, polarisation.

14. Magnetic Fields & Materials :

Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Methods of plotting, Hysteresis curve of a ferro magnetic materials and their uses, Magnetic circuits, Energy stored in magnetic fields, Basic idea of super conductivity, Meissner's effect, Applications.

15. Semiconductor Physics

Energy bands in soldis, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semiconductors, Electrons and holes as charge carriers in semiconductors, Effect of temperature in conduction in semiconductors, P-type and N-type semiconductors, P-N

junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Majority and Minority charge carriers, Base, emitter and collector currents and their relationship LED's, Photo-electric effect and photo devices.

#### 16. Nuclear physics

Radioactivity, Nuclear stability, Radioactive emmission, radiation damage, Nuclear fission and fusion, Nuclear reactors (PHWR-type and fast breeder) and their application, Mass-energy relation, Automatic mass unit, Mass defect and binding energy.

#### 17. Lasers and its Applications

Absorbtion and Emission of energy by atom, Spontaneous and Stimulated Emission, Einstein's co-efficients, Poluation inversion, Main component of laser and types of laser- Ruby Laser, He-Ne and Semi-conductor laser and their applications. Principles of Holography, Introduction to MASER.

#### 18. Non-conventional energy sources:

- (a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill, Indian wind energy programme.
- (b) Solar energy: Solar radiation and potentiality of solar radiation in India, unit of solar radiation, Solar constant measurement of solar radiation by pyrometer, and by Insolation meter (suryamapi) uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector, Solar PV plants in India, Modern applications in technology.

## PHYSICS LAB

Note: Any ten experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'Y' (Young's Modulus) by Searle's Method.
3. Determination of 'g' by plotting a graph  $T_2$  verses  $l$  and using the formula  $g=4n^2/\text{Slope of the graph line}$
4. Determination of Spring constant.
5. Determination of viscosity coefficient of a lubricant by Stoke's law.
6. Determination of 'k' for good conductor (Searle's Method).
7. Determination of frequency of AC mains by melde's methods (Transverse and Longitudinal Mode)
8. Determination of velocity of sound by resonance tube.
9. Determination of  $E_1/E_2$  by potentio meter.
10. Determination of specific resistance by Carry Foster bridge.
11. Determination of resistivity by P.O.Box.
12. Verification of Kirchoff's Law.
13. To observe Characteristics of p-n Junction diode on oscilloscope.
14. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.
15. To measure solar intensity (determine solar constant) with the help of Insolation meter ( Suryamapi ).
16. Demonstration of He-Ne laser (Interferometer)
17. Determination of internal resistance by potentiometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

## 1.4 APPLIED CHEMISTRY

[ Common to All Engineering Courses]

L	T	P
3	-	-

### Rationale:

Engineering Chemistry has profound and deep relationship with the industrial and environmental technology. This curriculum intends to impart technical knowledge alongwith productive practice to the students of the diploma engineering. The teachers are expected to guide the students in the classroom and the laboratories according to the curriculum by demonstrations and by showing relevant materials and equipments to inculcate interests in learning among students.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Atomic Structure	4	-	-
2	Chemical Bonding	6	-	-
3.	Classification of Elements	3	-	-
4.	Instrumental Methods	4	-	-
5.	Electro Chemistry	6	-	-
6.	Chemical Kinetics	4	-	-
7.	Catalysis	3	-	-
8.	Solid State	3	-	-
9.	Colloids	3	-	-
10.	Lubricants	3	-	-
11.	Environmental Pollution and Control	3	-	-
12.	Water Treatment	5	-	-
13.	Corrosion	3	-	-
14.	Fuels	3	-	-
15.	Glass and Ceramics	3	-	-
16.	Stereochemistry of Organic Compounds	4	-	-
17.	Organic Reactions	6	-	-
18.	Organic Materials	9	-	-
				75

### DETAILED CONTENTS:

#### 1. ATOMIC STRUCTURE :

Basic concept of atomic structure, Matter wave concept, Schrodinger wave equation, Quantum number, Haisenberg's Uncertainty Principle, Shapes of orbitals.

#### 2. CHEMICAL BONDING :

Overview of basic concept, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory, Co-ordination bond, Crystal field theory for tetrahedral carbon.

3. CLASSIFICATION OF ELEMENTS :

Modern classification of elements (s,p,d and f block elements), Periodic properties : Ionisation potential, electro negativity, Electron affinity, Born-Haber cycle.

4. INSTRUMENTAL METHODS :

UV-visible, IR and NMR spectroscopy, Basic principles, Beer-Lamberts Law and Application of spectroscopy.

5. ELECTRO CHEMISTRY :

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and its measurement by pH meter. Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions, Electrode potential (Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its application.

Concentration cells, reference electrodes (Hydrogen electrode) cells - Primary, Secondary and Fuel cell, LaClanche's or dry cell, Acid storage cell (Lead accumulator) and Alkali storage cell (Edison accumulator), Fuel cell, Solar cell (Photovoltaic cell), Numerical problems based on topics.

6. CHEMICAL KINETICS :

Introduction, order and molecularity of reaction. Activation energy, Rate loss, rate constants, 1st order reactions and 2nd order reactions.

7. CATALYSIS :

Definition Characteristics of catalytic reactions, Catalytic promoters and poison, Autocatalysis and Negative catalysis, Activation energy, Theory of catalysis, Application

8. SOLID STATE :

Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of

solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9. COLLOIDAL STATE OF MATTER :

Concept of colloidal and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophilic and hydrophobic colloids. Protection and protective colloids. Emulsion, Types, preparation, properties and uses. Application of colloids chemistry in different industries.

10. LUBRICANTS :

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compounds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

11. ENVIRONMENTAL POLLUTION AND ITS CONTROL :

Concept and various types of environmental pollution with special reference to air pollution and water pollution. General measures to control environmental pollution. depletion of Ozone layer, Green house effect, Acid rain, Smog formation, Chemical and photochemical reaction, Various species in atmosphere. Specific industrial pollution like Euro-I and Euro-II.

12. WATER TREATMENT :

Concept of hard and soft water, Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sod lime, Zeolite and Ion exchange resin process). Disadvantage of hard water in different industries, Boiler feed water boiler scale formation, Corrosion, Caustic embrittlement, primming and foaming.

Characteristics imparted by various impurities or contaminants such as colour, odour, taste and sediments and their analysis.

Analysis of Water :

- A. Estimation of chlorides in water.
- B. Determination of dissolved oxygen.

### Disinfecting of Water :

By Chloramic, Ozone and Chlorination with its mechanism, Advantage and disadvantage of chlorination, Break point chlorination (Free residual chlorination). Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Recycling of water-Theory and Process. Numerical problems based on topics.

### 13. CORROSION :

Concept of metallic corrosion, Types of corrosion and factors affecting the corrosion rate, Chemical and electrochemical theory of corrosion, Oxide film formation and its characteristics, tarnishing fogging and rusting, Prevention of corrosion by various methods.

### 14. FUELS :

Definition of fuel, its classification and their composition, Calorific value and determination of calorific value of solid and liquid fuels by Bomb calorimeter by Dulong's formula.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alcohol.

Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasolining from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG, CNG and Solar energy

Numerical Problems based on topics

### 15. GLASS AND CERAMICS :

Concept of glass and its constituents, Classification and uses of different glass, Elementary idea of manufacturing process of glass. Introduction to ceramics materials, Its constituent. Industrial application of glass and ceramic.

### 16. STEREOCHEMISTRY OF ORGANIC COMPOUND:

- Isomerism

- Types of isomerism

1. Structural isomerism
2. Stereoisomerism (a) Geometrical (b) Optical

- Definition of chiral, achiral stereogenic centre, plane of symmetry.
- Types of stereoisomers-
  1. Conformers or Rotamers (Only ethanes)
  2. Configurational isomers
    - a. Enantiomers
    - b. Diastereoisomers

17. ORGANIC REACTIONS :

- 1. Fundamental aspects -
  - A. Regents electrophiles and nucleophiles
  - B. Reaction Intermediates
    - i. Free radical
    - ii. Carbocation
    - iii. Carbanion
  - C. Various effects of substituents - Inductive, Mesomeric, Electromeric.
- 2.A. Mechanism of addition reaction (Markonicove's Rule, Cyanohydrin and Peroxide effect),
- B. Mechanism of Substitution reactions (Nucleophilic-hydrolysis of alkyl halide, electrophilic substitution halogenation, Sulphonation, Nitration and Friedel-Craft reaction.
- C. Mechanism of Elimination reaction - Dehydration of primary alcohol, Dehydrohalogenation of primary alkyl halide.

18. ORGANIC MATERIALS :

- A. POLYMERS :
  1. Introduction to basic terms used in polymer chemistry and technology. Monomers, Average degree of polymerisation, Average molecular weight, Polymers, Polymerisation.
  2. Characteristics of Polymers and their classification
    - A. Addition polymers and their industrial application- Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon.
    - B. Condensation polymer and their industrial application : Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Decron, Polyurethanes.
  3. Free radical polymerisation (Mechanism)

4. General idea of Bio polymers
5. Brief idea of bio degradable polymers.
6. Inorganic polymers - Silicones

B. SOAPS AND DETERGENTS :

1. Introduction - A. Lipids, B. Fats and Oils
2. Saponification of fats and oils , Manufacturing of soap.
3. Synthetic detergents, types of detergents and its manufacturing.

C. EXPLOSIVES: TNT, RDX, Dynamite.

E. Paint and Varnish

F. Adhesives

## 1.5 ELECTRICAL ENGINEERING-I

(Common With Diploma In Electronics Engineering, Instrumentation Engineering and Computer Science & Engineering)

L	T	P
3	-	2

### RATIONALE

Electrical energy is most convenient neat and clean source of energy for industrial applications. The student is supposed to possess basic knowledge of electrical engineering materials such as conducting, non conducting, insulating, magnetic, semi conductor and some special purpose materials. Fundamental knowledge of electrostatics, electromagnetism will be helpful in understanding the performance of D.C. and A.C. circuits. To face the routine problems of world of work chapters on batteries, transients and harmonics have also been added.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sr. No.	Units	Coverage Time		
		L	T	P
1.	Classification	3	-	-
2.	Conducting Materials	8	-	-
3.	Insulating Materials	8	-	-
4.	Magnetic Materials	6	-	-
5.	Semi Conductor & Special Purpose Materials	6	-	-
6.	D. C. Circuits	6	-	-
7.	Electrostatics	8	-	-
8.	Electromagnetism	8	-	-
9.	A. C. Theory	8	-	-
10.	Batteries	6	-	-
11.	Transients & Harmonics	8	-	-
Total		75	-	50

### DETAILED CONTENTS

#### 1. CLASSIFICATION:

Classification of materials into Conducting materials, Insulating materials, Semi-conducting materials with reference to their atomic structure.

1.1 Conducting Materials:

- A. Resistivity and factors affecting resistivity such as temperature, alloying and mechanical stressing.
- B. Classification of conducting materials into low resistivity and high resistivity materials. Some examples of each and their typical applications.

1.2 Insulating Materials:

A. Electrical Properties:

Volume resistivity, Surface resistance, Dielectric loss, Dielectric strength (Break down voltage) and Dielectric constant.

B. Chemical Properties:

Solubility, Chemical resistance, Weather ability.

C. Physical Properties:

Hygroscopicity, tensile and compressive strength, Abrassive resistance, Brittleness.

D. Thermal Properties:

Heat resistance, classification according to permissible temperature rise, Effect of electrical overloading on the life of an electrical appliance.

E. Plastic Insulating Materials:

Classification into thermoplastic and thermosetting categories, examples of each and their typical applications.

1.3 MAGNETIC MATERIALS:

- A. Ferromagnetism, domains, permeability, hysteresis loop- (including coercive force and residual magnetism) and magnetic saturation.
- B. Soft and Hard magnetic materials, their examples and typical applications.

1.4 SEMI CONDUCTOR AND SPECIAL PURPOSE MATERIALS:

N-type and P-type materials, application of semi-conductor materials, materials used in transistor and I.C. manufacture.

1.5 D.C. CIRCUITS:

- (i) Ohm's law, resistivity, effect of temperature on resistances, heating effect of electric current, conversion of mechanical units into electrical units.
- (ii) Kirchoff's laws, application of Kirchoff's laws to solve, simple d.c. circuits.
- (iii) Thevenin's theorem, maximum power transfer theorem, Norton's theorem and superposition theorem, simple numerical problems.

#### 1.6 ELECTROSTATICS:

- (i) Capacitance and capacitor, definition, various types.
- (ii) Charging and discharging of a capacitor, growth and decay of current in a capacitive circuit.
- (iii) Energy stored in a capacitor.
- (iv) Capacitance in terms of dimensions of parallel plate capacitor.
- (v) Dielectric constant of material, Break down voltage of a capacitor.
- (vi) Series and parallel connection of capacitors.

#### 1.7 ELECTRO MAGNETISM:

- (i) Concept of mmf, flux, reluctance and permeability.
- (ii) Energy stored in a magnetic field and an inductor.
- (iii) Solution of problems on magnetic circuits.
- (iv) Faraday's laws of electromagnetic induction, Lenz's law, Physical explanation of self and mutual inductance.
- (v) B-H curve, Hysteresis, Eddy currents elementary ideas and significance.
- (vi) Growth and decay of current in an inductive circuit.
- (vii) Force between two parallel current carrying conductors and its significance.
- (viii) Current carrying conductor in a magnetic field and its significance.

#### 1.8 A.C. THEORY:

- (i) Concept of alternating voltage and current, difference between A.C and D.C..
- (ii) Generation of alternating voltage, equation of sinusoidal waveform.
- (iii) Definition and concept of cycle, frequency, Time period, amplitude, instantaneous value, average value, RMS value, peak value, form factor, Peak factor.
- (iv) Phase and phase difference, representation of alternating quantities by phasor, addition and subtraction of alternating quantities.

#### 2.1 BATTERIES:

- (i) Construction of lead acid and nickel cadmium batteries.
- (ii) Charging and maintenance of batteries.
- (iii) Rating of batteries.
- (iv) Back up batteries (Lithium & Silver Oxide batteries)
- (v) Shelf life of batteries.

#### 2.2 TRANSIENTS & HARMONICS:

Introduction, Types of transients, Important differential equations, First and Second order equations, Transients in R-L series circuits (D.C.), Short circuit current, Time constant, Transients in R-L series circuits (A.C.), Transients in R-C series circuits (D.C.), Transients in R-C series circuits (A.C), Double energy transients.

Fundamental wave and harmonics, Different complex waveforms, General equation of complex wave, R.M.S. value of a complex wave, Power supplied by complex wave, Harmonics in single phase a.c. circuits, Selective resonance due to harmonics, Effect of harmonics on measurement of inductance and capacitance

ELECTRICAL ENGINEERING LAB:

LIST OF PRACTICALS:

1. Ohm's law verification.
2. To verify the laws of series and parallel connections of resistances i.e. to verify:-

- (i) The total resistance in series connections.

$$RT=R_1+R_2+R_3\ldots\ldots$$

Where  $RT$  is the total resistance and  $R_1, R_2, R_3$  etc. are the resistances connected in series.

- (ii) The total resistance in parallel connections.

$$1/RT=1/R_1 + 1/R_2 + 1/R_3\ldots\ldots$$

Where  $RT$  is the total resistance and  $R_1, R_2, R_3$  etc. are the resistances connected in parallel. Also to conclude that the total resistance value of a parallel circuit is less than the any individual resistance.

3. To verify Kirchoff's following laws:-

- (i) The algebraic sum of the currents at a junction is zero.
- (ii) The algebraic sum of the e.m.f. in any closed circuit is equal to the algebraic sum of  $IR$  products (drops) in that circuit.

4. To measure the resistance of an ammeter and a voltmeter and to conclude that ammeter has very low resistance whereas voltmeter has very high resistance.
5. To verify Thevenin's and maximum power transfer theorems.
6. To find the ratio of inductance values of a coil having air core and iron core respectively and thus see that by the introduction of a magnetic material inside the coil, the inductance value of the coil is substantially increased.
7. To verify the relation:-

$$CT=(C_1 \cdot C_2)/(C_1 + C_2)$$

and

$$CT=C_1 + C_2$$

For two capacitors, connected in series and parallel respectively.

8. To test a battery for charged and discharged conditions and to make connections for its charging.
9. To show that the range of an ammeter (d.c. and a.c.) and a voltmeter (d.c. and a.c.) can be extended with the use of shunts and multiplier.
10. To convert the given galvanometer into a voltmeter and an ammeter.

## 1.6 ENGINEERING MECHANICS AND MATERIALS

(Common With Electronics Engg & Instrumentation & Control Engg. & Computer Science & Engineering)

L	T	P
3	-	-

### RATIONALE

#### TOPIC WISE DISTRIBUTION OF PERIODS

SL.No.	Topic	L	T	P
1.	Introduction	5	-	-
2.	Force Analysis	12	-	-
3.	General condition of equilibrium	12	-	-
4.	Stress & Strain	12	-	-
5.	Beam & Trusses	12	-	-
6.	Materials & Concepts Use In Electronics	22	-	-
Total		75	-	-

#### DETAILED CONTENTS

##### 1. Introduction:

Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

##### 2. Forces Analysis:

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a particle, conditions of equilibrium of coplaner concurrent force system.

##### 3. General Condition of Equilibrium:

General condition of equilibrium of a rigid body under

the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

4. Stresses and strains:

Concept of stress and strain. Concept of various types of stresses and strains. Definitions of tension, compression shear, bending, torsion. Concept of volumetric and lateral strains, Poisson's ratio. Mechanical properties of MS, SS, CI Al and etc.

5. Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, calculation of reaction at the support of cantilever and simply supported beams and trusses. (simple problems only)

6.A. MATERIALS & CONCEPT USED IN ELECTRONICS :

Soldering materials - Type, chemical composition and properties, Soldering alloys - Tin lead, Tin antimony, Tin silver, Lead silver, Tin zinc, Different types of flux and their properties, Properties of plastics materials, Epoxy materials for PCB (Single and multi layer board), Emulsion parameters, Film emulsion, Type of laminates (Phenolic, Epoxy, Polyester, Silicon, Melamine, Polymide), Properties of copper clad laminates, Material (Filler, Resin, Copper Foil) Photo printing basic for double side PCB, Photo resin materials coating process materials, Screen printing and its materials Etching agent, Film processing and used materials.

(B) Soldering & Brazing:

For black Galvanised and Tincoated Iron sheet, brass and copper sheets only.

- (1) Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.
- (2) Soldering operation- edge preparation of joints, Pickling and degreasing, Fluxing, Tinning and Soldering. Wave soldering, solder mask, Dip soldering, Drag soldering,
- (3) Materials Used-Common fluxes, soft and hard solder, solder wire (Plain and Resin core) and sticks, spelters and their specifications and description ( For Identification Only), forge soldering bits.

- (4) Electric soldering iron, other soldering tools.
- (5) Common defects likely to occurs during and after soldering.
- (6) Safety of Personnel, Equipment & Tools to be observed.

## 1.7 Components of Information Technology

(Common to Computer Science & Engineering, Post Graduate Diploma in Computer Application).

L	T	P
4	2	-

### Rationale

Computers have become an integral part of modern industrial atmosphere. Every technician is supposed to be aware of the application of computers. A student having knowledge of popular software and computer peripherals will prove useful to accept any challenge in day today working.

### TOPIC WISE DISTRIBUTION OF PERIODS

L	T	P
3	1	-

Sl.No.	Units	Coverage	Time
1.	Introduction of Information Technology	20	10
2.	Component of Information technology	15	6
3.	Data Representation	20	10
4.	Emerging Trends	15	10
5.	Components of Computers	15	6
6.	Mobile Computing	15	8
		100	50

### 1. Introduction of Information Technology

Definition Of Information, difference between data and information, need for information, qualities of information, value of information, categories of information, level of Information. Use of Information Technology in Office Automation, Computers & Its Types.

### 2. Components of Information Technology:

Components Hardware & its Functioning - Input Unit, Control Processing Unit, Output Unit, Types of Input Units & Output Units Computer Software - Types of Software, System Software, Application Software.

### 3. Data Representation :

Binary Number System, Conversion from Decimal to Binary, Conversion from Binary to Decimal, Hexadecimal and Octadecimal No. System, Memory Addressing and its Importance, ASCII and EBCDIC coding System.

4. Emerging Trends in Information Technology -

Concepts of Networking and Local Area Networking, Advanced Input/Output Devices and their use(MICR,OCR,Scanners, Light pen, Plotters, Microfilms, Rewritable, CD-ROMS, Multimedia, Video Conferencing, Tele Conferencing, Tele Comferencing .

5. Components of computer

Types of PC e.g. Desktops, Labtops, Notebooks, Palmtops, Memory System of a PC, Primary Memory, RAM(Random Access Memory, ROM(read only Memory), Secondary Memory, Types of Secondary Storage, Acces Mechanism of storage Devices, PC setup and ROM-BIOS, Elemantry Trouble shooting.

6. MOBILE COMPUTING :

Introduction, Personnel Communication Services (PCS), Gobal System Mobile Communication (GSM), GPRS, Mobile Data Communication, WAP, 3G Mobile service.

## 1.8 OPERATING SYSTEM

(Common to Computer Science & Engineering)

L T P  
4 — 4

Rationale :

For effective use of computer, the knowledge about computer operating system, Windows, DOS, UNIX, C.P.U. share prove useful for a technician working in a computer centre.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction	10	-	-
2.	File System	15	-	-
3.	C.P.U. & Disk, Drum scheduling	25	-	-
4.	Memory Management	25	-	-
5.	Features WINDOWS	25	-	-
		100	-	100

### DETAILED CONTENTS

#### 1. Introduction

What is O.S., Multiprogramming, Time Sharing, Real Time System, Multitasking.

#### 2. File System

File concepts, Access methods, Allocation methods, Directory System.

#### 3. C.P.U. & Disk, Drum Scheduling.

Scheduling concepts, Scheduling Algorithm, Multiprocessor, FCFS Scheduling, Shortest Seek-time first, Scan.

#### 4. Memory Management

Swapping, Multiple partitions, Paging, Segmentation, Demand paging, page replacement.

#### 5. Features of Windows

Types of Window & differences, GUI, What is interface, Windowing, windows environment, menus of Dialog

boxes, Concepts of Icon, Functions of  
Programms, Documents, Setting, Run Command.

#### List Of Practicals

1. Excercise on Widows 98/2000/VISTA.

**1.9 FUNDAMENTALS OF ELECTRONICS DEVICES.**  
 (Common With Computer Science & Engineering)

**Rationale:**

Knowledge of Electronics Devices is quite essential for a students of diploma Computer Engineering. The knowledge of concepts , constructions & working of these devices, will help students in understanding the working and behaviour of different hardware constituents of computer.

L      T      P  
 3      2/2      4

**TOPIC WISE DISTRIBUTION OF PERIODS**

Sr. No.	Units	Coverage Time		
		L	T	P
1.	Introduction	3	1	-
2.	Semiconductor Physics	8	3	-
3.	Semiconductor Diodes	8	3	-
4.	Transistor	8	2	-
5.	Transistor as an amplifier	12	5	-
6.	Concepts of Feedback	8	3	-
7.	Transistor as a Switch	8	2	-
8.	Multivibrators	6	2	-
9.	Multivibrators as a Memory Elements	6	2	-
10.	Integrated Circuits	8	2	-
Total		75	25	100

**1. INTRODUCTION:**

- 1.1 Application of electronics in different fields.
- 1.2 Electronic devices in computer system. e.g. power supply, micro processor and other ICs, amplifiers, clock & other signal generators.
- 1.3 Advancements in electronics technology and its impact on computers size reduction, capacity expansion, increase in reliability, cost reduction)

**2. SEMICONDUCTOR PHYSICS:**

- 2.1 Analyzing conductivity of elements, Types of conductors.
- 2.2 Pure(Intrinsic) semiconductors-Silicon, Germanium:Thermal Generation(formation of charge carrier-Positive & Negative charge carriers i.e. electron-hole pair), Recombination, Displacement of hole, mobility of free electron and moving

hole, effect of variation in temperature, behavior of intrinsic semiconductors at 0 K.

- 2.3 Doping the Intrinsic semiconductors with a pentra-valent/tri-valent element(i.e. donor and accepter type impurity) in small amount, effect of doping on strength of charge carriers(formation of immobile ions and majority and minority carriers), P,N Junction.
- 2.4 Effect of doping a crystal parity 'P' type and parity: concepts of diffusion & drift, formation of depletion layer(potential barrier)i.e. formation of P-N Junction.

### 3. SEMICONDUCTORS DIODES:

- 3.1 Effect of applying electrical potential across a P-N Junction in the following ways:
  - (a) Positive of the source to 'P' type terminal & Negative to the 'N' type terminal
  - (b) Positive of the source to 'N' type terminal & Negative to the 'P' type terminal.
- 3.2 Analyzing the flow of current in both the directions, cause of the difference in magnitudes of current in the two directions.
- 3.3 Characteristics of a P-N Junction diode in forward/reverse biasing.
- 3.4 Concepts of unidirectional and bi-directional flow of currents. Effect of putting in diode in series with a load connected across an ac source.
- 3.5 Half wave rectifier, Full wave rectifier9 using C.T. transformer, using bridge circuits)
- 3.6 Special purpose diodes:Zener diode, Varactor diode,Photo Diode,Light emitting Diode (LED), their characteristics and uses.

### 4. TRANSISTOR:

- 4.1 Growing a Crystal having two P-N Junction back to back (i.e.PNP & NPN); Junction transistor structure; action of transistor in FF,RR,FR and RF biasing; working of a transistor; relation between different currents in a transistor;
- 4.2 Various configurations of transistor (CB,CE,CC);relation between Transistor action in three configuration; Comparison between the three configuration of transistor;

4.3 Input and Output characteristics of a transistor;

4.4 Field - effect transistor ( JFET,IGFET,MOSFET);

5. TRANSISTOR AS AN AMPLIFIER:

5.1 Transistor biasing: DC Operating: need of biasing & bias stabilization in a transistor circuit; various biasing circuits( Fixed, Collector to base, emitter, and potential devider.);

5.2 DC and AC load lines in a typical CE amplifier circuit;

5.3 Need of using multi- stages; how to couple two stages ; various coupling arrangements( R-C coupling,Transformer coupling, Direct coupling):

5.4 Effect of coupling arrangement on the frequency response of a two stage amplifier; frequency response curve of a RC coupled amplifier; a transformer coupled amplifier; band width of an amplifier.

6. OPERATIONAL AMPLIFIERS:

6.1 Specifications of ideal operational amplifier and its block diagram.

6.2 Definition of inverting and noninverting inputs, differential voltage gain and input and output off set, voltage input offset current, input bias current, common mode rejection ratio (CMRR), power supply rejection ratio (PSRR) and slew rate.

6.3 Method of offset null adjustments, use of op.amp. as an inverter scale changer, adder, subtractor, differential amplifier, buffer amplifier, differentiator, integrator, comparator, Schmitt Trigger, Generation of Square and Triangular Waveform, log and anti-log amplifiers, PLL and its application and IC power amplifier.

7. FEED BACK IN AMPLIFIER:

7.1 Concept of Feed back;

7.2 Types of feed back( Positive, Negative); different arrangement of feed back( series voltage, series- current, shunt -voltage, shunt current );

7.3 Voltage gain of feed back amplifier; ( $A' = A/(a) + A$ )

7.4 Analysis of Negative feed back arrangement on ( Gain, Stability, Noise, Input/output impedances, Band width); Amplifier circuits with negative feed back;

7.5 Positive feed back; condition for infinite gain( AB=1 in Positive feed back)

7.6 Oscillator as an infinite gain feed back.

8. TRANSISTOR AS A SWITCH:

8.1 Control action of base current on the collector current in a transistor circuit .

8.2 Large singal amplifier (input changing from cut-off to saturation ).

8.3 Remote control of a realy - opertated lamp employing amplifier .

8.4 Requirements of a transistor - switch .

9. MULTIVIBRATORS:

9.1 Regeneration: relaxation oscllators;

9.2 Simple astable MV circuit arrangement for its self starting;

9.3 Study and analysis of BI - STABLE MULTIVIBRATOR;

9.4 Study and analysis of mono stable multivibrator;

9.5 Triggering requirements;

9.6 Schmit trigger circuit;

10. INTEGRATED CIRCUITS:

10.1 Introduction;

10.2 Manufacturing process;

10.3 SSI, MSI, LSI, VLSI, ICs;

10.4 Linear and Digital ICs;

10.5 Switching and Gating ICs;

10.6 DTL, TTL, ICs;

#### LIST OF PRACTICALS

1. To Identify electronic devices and common passive components: such as Diodes (Rectifier, Zeners, Signal Diodes, Varacter diode, etc.); LED's; Transistors; Ics; Resistors, Capacitors, (Colour code for them); Inductors, Transformers.
2. To Plot characteristics (FB/RB) of Semiconductor rectifier diode.
3. To Plot characteristics (FB/RB) of a zener diode.
4. Observe the output wave of a Half wave rectifier circuit with/without shunt capacitor filter.
5. Observe the O/P wave of a full wave (C.T.) Rectifier circuit with/without Shunt capacitor filter.
6. Observe the O/P wave of a Bridge Rectifier circuit with/without shunt capacitor filter.
7. To Plot input/output characteristics of a Transistor in CB.
8. To Plot input/output characteristics of a Transistor in CE.
9. To Plot input/output characteristics of a FET.
10. To measure Voltage gain of a transistor amplifier at 1 KHz signal, at different load.
11. To measure over all Voltage gain of a 2 stage RC coupled transistor amplifier a 1 KHz signal.
12. To plot frequency response of a RC coupled amplifier at 1 KHz signal.
13. To measure input and output impedance of a negative feedback amplifier.
14. To fabricate a transistor switch and verify its working.
15. To observe the output of an Astable multivibrator.
16. To observe the output of a Bi-stable multivibrator.
17. To observe the output of an Monostable multivibrator.
18. Use OP-AMP as inverting and non-inverting amplifier, Use as Adder, Subtractor, Integrator and differentiator.

II YEAR

2.1 APPLIED MATHEMATICS II  
[ Common to All Engineering Courses]

L T P  
3 1 -

Rationale :

The study of mathematics is an important requirement for the understanding and development of concepts of Engg. The purpose of teaching mathematics to the Diploma Engg. students is to give them basic foundation and understanding of mathematics so that they can use the same for the understanding of engineering subjects and their advancements.

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Matrices	15	5	-
2.	Ordinary Differential Equations	15	5	-
3.	Differential Calculus-II	15	5	-
4.	Integral Calculus-II	15	5	-
5.	Probability & Statistics	15	5	-
		75	25	-

DETAILED CONTENTS

1. MATRICES :

1.1 Algebra of Matrices, Inverse :

Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Determinant of a matrix, Cofactors, Definition and Computation of inverse of a matrix.

1.2 Elementary Row/Column Transformation :

Meaning and use in computing inverse and rank of a matrix.

1.3 Linear Dependence, Rank of a Matrix :

Linear dependence/independence of vectors, Definition and computation of a rank of matrix. Computing rank through determinants, Elementary row transformation and through the

concept of a set of independent vectors, Consistency of equations.

#### 1.4 Types of Matrices :

Symmetric, Skew symmetric, Hermitian, Skew hermitian, Orthogonal, Unitary, diagonal and Triangular.

#### 1.5 Eigen Pairs, Cayley-Hamilton Theorem :

Definition and evaluation of eigen values and eigen vectors of a matrix of order two and three, Cayley-Hamilton theorem (without Proof) and its verification, Use in finding inverse and powers of a matrix.

### 2. ORDINARY DIFFERENTIAL EQUATION :

#### 2.1 Formation, Order, Degree, Types, Solution :

Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree and Meaning of solution of a differential equation, Linear, Nonlinear equation.

#### 2.2 First Order Equations :

Variable separable, equations reducible to separable forms, Linear and Bernoulli form exact equation and their solutions.

#### 2.3 Second Order Linear Equation :

Property of solution, Linear equation with constant coefficients, Cauchy type equation. Homogeneous and Non-homogeneous equations, equations reducible to linear form with constant coefficients.

#### 2.4 Simple Applications :

LCR circuit, Motion under gravity, Newton's law of cooling, radioactive decay, Population growth, Force vibration of a mass point attached to spring with and without damping effect. Equivalence of electrical and mechanical system

### 3. DIFFERENTIAL CALCULUS-II :

#### 3.1 Function of two variables, identification of surfaces in space

$$z = x^2 + y^2, \quad x^2 + y^2 = a^2, \quad x + y = 2$$

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

3.2 Partial Derivatives :

Directional derivative, Gradient, Use of gradient  $f$ , Partial derivatives, Chain rule, Higher order derivatives, Eulens theorem for homogeneous functions, Jacobians.

3.3 Vector Calculus :

Vector function, derivatives, gradient, divergence and curl Some indentities among these. Five integrals, double and triple integral, surface integral, Grean, Gauss and stokes theorem and application

4. INTEGRAL CALCULUS - II

4.1 Laplace Transform :

Definition, Basic theorem and properties, Unit step and Periodic functions, Solution of ordinary differential equations.

4.2 Beta and Gamma Functions :

Definition, Use, Relation between the two, their use in evaluating integrals.

4.3 Fourier Series :

Fourier series of  $f(n)$  -  $n < x < n$ , Odd and even function, Meaning of the sum of the series at various pairs.

5. PROBABILITY AND STATISTICS :

5.1 Probability :

Laws and Conditional probability

5.2 Distribution :

Discrete and continuous distribution.

5.3 Binomial Distribution :

Properties and application through problems.

5.4 Poisson Distribution :

Properties and application through problems

5.5 Normal Distribution :

Properties and applications through problems

5.6 Method of Lease-square.

## 2.2 PROGRAMMING IN C & C++

(Common to Post Graduate In Computer Application, Post Diploma In Information Technology, Diploma In Computer Science & Engineering)

L	T	P
3	1	4

Rationale :

For solution of different problems, C is a very powerful high level language. It is widely used in research and engineering problems. A software technician must be aware of this language for working in computer environment.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Concept of Programming	10	5	-
2.	Programming in C	30	15	-
3.	Classes & Objects	30	15	-
4.	Programming in C++	30	15	-
		100	25	100

### DETAILED CONTENTS

#### 1. CONCEPT OF PROGRAMMING:

Concept of Flowcharting, algorithm, programming, Structured Programming Various techniques of programming, Use of programming.

#### 2. Programming in C:

Data Types, Operators and Expressions; Input & Output printf, scanf, library Control Statement: IF- ELSE, While, For, Do-While, Switch; Functions and modular programming; Scope of variables, parameter passing, recursion, block structure; preprocessor statements; pointers and arrays; structures and unions; File handling.

#### 3. CLASSES & OBJECT:

What is a class, what is an object, constructors, types of object (external, automatic, static, Dynamic objects) Metaclass, role of meta class. Scope of classes, array of objects, objects as a function argument.

#### 4. Programming in C++

What is object-orientation, area of object technology,C++, getting to grips with C++(data types,escape sequence,characters, variables, operator, notation, Arrays,Function conditional statements.call by value,call by reference.Pointer : C++ memory map, dynamic allocation pointers,pointers with arrays.Structure,structure with arrays,passing, structure of function.Enumerated data types, Inheritance, apolymorphism & Overloading.

#### PROGRAMMING IN C & C++

##### List of Experiments

1. Exercises involving output and input format controls in Pascal.
2. Exercises involving control transfer statements in C & C++
3. Exercises with arrays & Pointers in C & C++.
4. Exercises with functions in C & C++.
5. Exercises with files in C & C++.

### 2.3 DATA COMMUNICATION AND COMPUTER NETWORKS

(Common to Post Graduate In Computer Application, Post Diploma In Information Technology, Diploma In Computer Science & Engineering)

L	T	P
3	2/2	-

Rationale :

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Data Communications	5	2	-
2.	Transmission Media	10	3	-
3.	Protocols and Architecture	10	3	-
4.	Data Link Control & Protocol	10	3	-
5.	Local Area Network	10	3	-
6.	Network Layer	10	3	-
7.	Transport Protocols	10	4	-
8.	Wide Area Networks	10	4	-
		75	25	-

#### DETAILED CONTENTS

##### 1. DATA COMMUNICATION :

Data Transmission : Analog Transmission, Digital Transmission.

Data Encoding : Digital Data- digital signals, Digital Data - analog signals, Analog Data-Digital Signals, Analog Data-Analog Signals, Synchronous and Asynchronous Transfer.

##### 2. TRANSMISSION MEDIA :

Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves, Infrared.

##### 3. PROTOCOLS AND ARCHITECTURE :

Protocols, OSI reference models, TCP/IP protocol suit.

4. DATA LINK CONTROL AND PROTOCOL :

Flow Control - Stop and Wait, Sliding window, Error Detection, Error Control, HDLC.

5. LOCAL AREA NETWORK :

LAN architecture, LAN topologies - BUS/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMS/CD), Tokenring and FDDI.

6. NETWORK LAYER :

Introduction, Routers, Routing Algorithms, Congestion control algorithm, Addressing, Internet working.

7. TRANSPORT PROTOCOLS :

Transport services, TCP, UDP.

8. WIDE AREA NETWORKS :

WAN, Circuit switching, Packet switching, Frame relay, ATM, ISDN.

## 2.4 OFFICE TOOLS

(Common to Computer Science & Engineering, Post Graduate Diploma in Computer Application.)

L	T	P
3	-	4

Rationale :

The PC's are gaining their image as personal assistants to every individual in day today life. It is only because of the softwares like Electronic spread sheet, Data base and Word Star, Without these this image of the pc's is of no worth.

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	MS Word	20	-	-
2.	MS Excel	20	-	-
3.	Power Point	20	-	-
4.	Corel Draw	15	-	-
		75	-	100

### DETAILED CONTENTS

#### 1. MS WORD PROCESSING:

File : Open, Close, Save and Find File, Print and Page Setup  
Edit : Cut, Copy, Find, Replace  
Insert: Page Insert, Page No., Symbole  
Font : Paragraph, Tabs, Boder & Shading, Change Case  
Tools : Spelling, Mail Merge  
Table : Insert Table, Delete Cells, Merge Cell, Sort Text

#### 2. MS Excel:

File : Open, Close, Save and Find File, Print and Page Setup  
Edit : Cut, Copy, Find, Replace, Undo, Redo  
Insert: Cell, Row, Worksheet, Chart  
Format: Data, Sort, Filter, Form, Table

#### 3. POWER POINT

File : New,Open,Close,Save as HTML,Pack and Go,Page setup,Send to ,Properties  
 Edit : Cut, Copy, Find, Replace, Undo, Redo,Duplicate.  
 View : Slide\_Outline,Slide\_sorter,Notepage,Slideshow,Master, Black & white slide,Toolbars,Ruler ,Guides  
 Insert : New slide,Duplicate slide,Picture,Text box,Movies & sound,Hyperlink.  
 Format : Font,Bullet,Alignment,Line spacing,Slide layout.  
 Tool : Power point,Presentation & conference,Expand slide,Macro,customise.  
  
 Slide show: View show,Rehearse timing,Naration,View on two screen ,Active buttons,Preset Animation,Custom - animation,Slide transition.  
 Window : New window,Arrange icons,Fit to page,Cascade.

4. COREL DRAW :

Corel Group, Corel Photopaint, Corel Ventura, Corel Draw, Corel show and other packages.

MS-OFFICE

List Of Practicals

1. Creating, Editing, Modifying database file, Label, Report, Format & Query.
2. Write programme for small systems like Marksheets preparation, Payroll, Inventory Control, Accounting, etc.
3. Use all the features and utilities of MS Word.
4. Creating, Editing, Modifying Spread Sheet, Graph, Database.
5. Use of macros and printing of well formatted reports.
6. Selection of command using Windows.
7. Small projects of Power Point Presentation.
8. Small Projects of Corel Draw.

## 2.5 VISUAL BASIC.NET

(Common to Computer Science & Engineering, Post Graduate Diploma in Computer Application, Post Diploma in information Technology.)

L T P  
3 - 4

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No. Time	Units	Coverage		
		L	T	P
1.	Fundamental of Visual BASIC	10	-	-
2.	Introduction to Visual Basic.NET	10	-	-
3.	Programming with Module & Procedure	10	-	-
4.	Program flow & Decision Making	15	-	-
5.	Array & Control Functions	15	-	-
6.	Designing Customs Menus	15	-	-
		75	-	100

### DETAILED CONTENTS

#### 1. FUNDAMENTAL OF VISUAL BASIC:-

Understanding Events, preparing to create the program, creating program user interface, Caption & name properties, attaching code to objects, properties for form appearance and behaviour, Control properties, Caption property, Enable property, Value property and Text property.

#### 2. INTRODUCTION TO VISUAL BASIC.NET :

Introduction to .NET framework and the common language routine, Visual Basic integrated development environment, Visual Basic.NET Application

#### 3. PROGRAMMING WITH MODULES & PROCEDURES :

Placing code in modules, understand the procedure, use standard code writing conventions, work with data types, variables.

#### 4. PROGRAMME FLOW AND DECISION MAKING :

Unconditional branching, conditional testing and branching, looping.

5. ARRAYS & CONTROL FUNCTIONS:

Control arrays and sequential files, one dimensional and multi dimensional arrays. List box, combobox control, timer control, format control, data type conversion, input box functions, create message box.

6. DESIGNING CUSTOM MENUS :

- i) Understand the menu, editor, window, create menu application, edit menu, polish the appearance of menus, code menu option.
- ii) How to interact with ms access database with visual basic.net.

LIST OF PRACTICAL

- 1. Develop small software using visual basic and Visual Basic.NET (all commands).

## 2.6 LINUX & UNIX

L	T	P
3	-	3

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	LINUX	35	-	-
2.	UNIX	40	-	-
		75	25	75

### DETAILED CONTENTS

**LINUX:** Overview of Linux, what is Linux, history/evaluation of Linux, features of Linux:(System Features, software features), File structures, File handling in Linux, Commands of Linux , how to create file & directory, hardware and software requirements.

**UNIX:**What is Unix Operating System, Unix file system,Commands files: chmod , chown File System: types of files in unix, structure of file system, parent child relationship, mkdir, pwd, cd, PATH, and directories, cat, cp,mv, rm, ls, pg, tail & head commands. File attributes: ls, ls-l output,changing file permission chmod, chownd directory permissions,chggrp, unmask. editors:ed, vi, sed, standard input/output:( pipes, tree, )Shell as a interpreter EX. c shell , bourne shell, korn shell, restricted shell.

**Administrations:**Why does a unix system need administrator (System security, accounting, uucp, ) su, system startup & shutdown, init process, cat shutdown, what is cron, creating file system, mounting and unmounting file system, saving and restoring file systems, adding and removing users, unix accounting system, accounting summary files.administrating the uucp system,permission of systems.

### PRACTICALS

Practices on commands using Linux.

Practices on commands using Unix

## 2.7 COMPUTER ORGANISATION

L	T	P
3	2/2	-

Rationale :

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Digital Logic Fundamentals	5	2	-
2.	Introduction To Computer Organisation	10	3	-
3.	C.P.U. & Mathematical Logic	10	4	-
4.	C.P.U. Organization	10	4	-
5.	Computer Arithmetic	10	4	-
6.	Input-Output Organization	10	4	-
7.	Memory Organization	10	4	-
		75	25	-

### DETAILED CONTENTS

#### 1. DIGITAL LOGIC FUNDAMENTALS :

Boolean Algebra : Basic function, Logic gates, Map simplification, Combinational Logic : Decoder/Encoder, Multiplexer, Sequential Cks, Flip-Flop, Registers.

#### 2. INTRODUCTION TO COMPUTER ORGANISATION:

Basic computer organization : Functional units operational concepts, System buses and instruction cycle, CPU organization, Memory subsystem organization : Memory location, Address and encoding of information, Types of memory, Internal chip organization.

#### 3. C.P.U.& MATHEMATICAL LOGIC

Processor Bus Organization, CPU Architecture Arithmetic Logic Unit, Stack Organization, Instruction formats, Addressing

Modes, Data transfer manipulations, Program Control, Interrupt, Microprocessor Organization, Parallel processing. Logic gates, Boolean Algebra, Map simplification, Combinational Circuits, Flip-flops, Sequential circuits.

4. CPU ORGANIZATION :

Register Organization : General register organization, Stack organization, Programmer visible register, Status and control register. Microoperations : Register transfer, Bus and Memory transfer, Arithmetic, Logic and shift microoperation. Control Unit : Structure of Control Unit, Hard wired control unit. Case Study : 8085 Microprocessor.

5. COMPUTER ARITHMETIC :

Addition and subtraction, Multiplication algorithms, Division algorithms, Floating point arithmetic operations.

6. INPUT OUTPUT ORGANIZATION :

I/O devices : Accesing, I/O interfaces, Asynchronous data transfer : Strobe control, Hand shaking, Modes of transfer : Programmed I/O, Interrupt - Initiated I/O, DMA interrupt hardware and priority I/O processes.

7. MEMORY ORGANIZATION :

Memory hierarchy, Main memory : RAM and ROM, Memory address map, Auxiliary memory. Cache Memory : Associative memory, Virtual memory concept.

## 2.8 MICROPROCESSORS AND APPLICATIONS

(Common with Electronics Engineering, Instrumentation & Control Engineering and Computer Engineering)

L T P  
3 2/2 4

### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Over View of Microcomputer System	6	2	-
2.	Memory of A Microcomputer	12	4	-
3.	C.P.U. and Control	12	4	-
4.	Introduction To 8085 Microprocessor	12	4	-
5.	Architecture of 8086 Microprocessor	12	4	-
6.	Assembly Language Programming	12	4	-
7.	Basic I/O Interfacing	12	4	-
8.	Memory Interfacing	12	4	-
9.	Advance Microprocessor & Micro Controllers	12	4	-
		75	25	100

### DETAILED CONTENTS

#### 1. OVERVIEW OF MICROCOMPUTERS SYSTEM:

##### 1.1 Functional block.

(a) CPU.

(b) Memory.

(c) Input/Out devices (Key board, Floppy drive, Harddisk  
drive, Tape drive, VDU, Printer, Plotter).

##### 1.2 Concept of programme and data memory.

(a) Registers (general purpose).

(b) external memory for storing data and results.

##### 1.3 Data transfer between registers.

1.4 Concept of tristate bus.

1.5 Control on registers.

2. MEMORY OF A MICROCOMPUTER:

2.1 Concept of byte organised memory.

(a) Address inputs.

(b) Address space.

(c) Data input/output.

2.2 Addressing and Address decoding.

(a) Memory system organisation.

(b) Partitioning of total memory space into small blocks.

(c) Bus contention and how to avoid it.

2.3 Memory chips.

(a) Types of ROM, RAM, EPROM, PROM.

(b) Read/Write inputs.

(c) Chip enable/select input.

(d) Other control input/output signals.

- Address latching.

- Read output.

- Address strobes.

(f) Power supply inputs.

2.4 Extension of memory.

- In terms of word length and depth.

3. C P U & CONTROL:

3.1 General microprocessor architecture.

3.1 Instruction pointer and instruction register.

3.2 Instruction format.

- Machine and Mnemonics codes.
- Machine and Assembly language.

3.3 Instruction decoder and control action.

3.4 Use of Arithmetic Logic Unit.

- Accumulator.
- Temporary Register.
- Flag flip-flop to indicate overflow, underflow, zero result occurrence.

3.5 Timing and control circuit.

- Crystal and frequency range for CPU operation.
- Control bus to control peripherals.

4. INTRODUCTION OF 8085 MICROPROCESSOR:

Evolution of Microprocessor, Register Structure, ALU, BUS Organization, Timing and Control.

5. INTRODUCTION OF 8086 MICROPROCESSOR:

Internal organization of 8086, Bus Interface Unit, Execution Unit, Unit, register, Organization, Sequential Memory Organization, Bus Cycle.

6. ASSEMBLY LANGUAGE PROGRAMMING :

Addressing Modes, Data Transfer, Instructions, Arithmetic and Logic Instruction, Program Control Instructions (Jumps, Conditional Jumps, Subroutine Call) Loop and String Instructions, Assembler Directives.

7. BASIC I/O INTERFACING :

Programmed I/O, Interrupt Driven I/O, DMA, Parallel I/O (8255-PPI, Centronics Parallel Port), Serial I/O (8251/8250, RS-232 Standard), 8259-Programmable Interrupt Controller, 8237-DMA Controller, 8253/8254-Programmable Timer/Counter, A/D and D/A conversion.

8. MEMORY INTERFACING :

Types of Memory, RAM and ROM Interfacing with Timing Considerations, DRAM Interfacing.

9. ADVANCE MICROPROCESSOR AND MICRO CONTROLLERS :

Pentium and Power PC

NOTE :

Study of Popular ICs Read/Write Chips-8155/8156, 2114, 2148, 2164. ROM Chips- 8355, 2716, 2732, 8755. Other support chips - 8279, 8257, 8275, 8205.

LIST OF BOOKS

1. Singh, B. P. - Advanced Microprocessor and Microcontrollers- New Age International.
2. Singh, B. P. - Microprcessor Interfacing and Application - New Age International.
3. Brey, Barry B. - INTEL Microprocessor - Prentic Hall (India)-4th Edition.
4. Liu and Gibson G.A. - Microcomputer System - The 8086/8088 Faimly-Prentice Hall (India) 2nd Edition.

MICROPROCESSORS AND APPLICATIONS LAB

List Of Practicals

1. Assembly language programming :- Programming of simple problems.
2. Simple programming problems using 8085 and 8086 microprocessor. Trainer kit to gain competence in the use of
  - (a) 8085 and 8086 Instruction set.
  - (b) Support chips of 8085 and 8086.

**III YEAR****3.1 INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT**

L	T	P
2	2/2	-

**Rationale:**

The knowledge of this subject is required for all engineering technicians, but it becomes more important for those technicians who wish to choose industry as their career. This course is designed to develop understanding of various functions of management, role of workers, and engineers, industrial safety, trade unions, wages and incentives, marketing, entrepreneurship, inventory control and industrial legislation.

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Principles of Management	10	4	-
2.	Human Resource Management	3	2	-
3.	Human and Industrial Relations	4	3	-
4.	Personnel Management	6	3	-
5.	Financial Management	6	3	-
6.	Material Management	4	3	-
7.	Labour, Industrial and Tax Laws	4	2	-
8.	Entrepreneurship Development	8	4	-
9.	Intellectual Property Rights	5	1	-
			50	25
				-

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**DETAILED CONTENTS****1. PRINCIPLES OF MANAGEMENT :**

Definition of management, Administration organisation, Functions management, Planning, Organizing, Co-ordination and control, Structure and function of industrial organisations, Leadership- Need for leadership, Factors to be considered for accomplishing effective leadership, Communication -Importance, Processes, Barriers to communication, Making communication, Effective, formal and informal communication, Motivation - Factors determining motivation, Positive and negative motivation, Methods for improving motivation, Incentives, Pay promotion and rewards, Controlling - Just in time, Total quality management, Quality circle, Zero defect concept. Concept of Stress Management

2. HUMAN RESOURCE DEVELOPMENT :

Introduction, Staff development and career development, Training strategies and methods.

3. HUMAN AND INDUSTRIAL RELATIONS :

Human relations and performance in organisation, Understand self and others for effective behaviour, Industrial relations and disputes, Characteristics of group behaviour and Trade unionism, Mob psychology, Labour welfare, Workers participation in management.

4. PERSONNEL MANAGEMENT :

Responsibilities of human resource management - Policies and functions, Selection - Mode of selection - Procedure - training of workers, Job evaluation and Merit rating - Objectives and importance wage and salary administration - Classification of wage, Payment schemes, Components of wage, Wage fixation.

5. FINANCIAL MANAGEMENT :

Fixed and working capital - resource of capital, Shares, types preference and equity shares, Debenture types, Public deposits, Factory costing, Direct cost, Indirect cost, Factory overhead, Fixation of selling price of product, Depreciation- Causes, Methods.

6. MATERIAL MANAGEMENT :

Objective of a good stock control system - ABC analysis of inventory, Procurement and consumption cycle, Reorder level, Lead time, Economic order quantity, Purchasing procedure, Stock keeping, Bin card.

7. LABOUR, INDUSTRIAL AND TAX LAWS :

Importance and necessity of industrial legislation, Types of labour laws and dispute, Factory Act 1948, Payment of Wages Act 1947, Employee State Insurance Act 1948, Various types of taxes - Production Tax, Local Tax, Trade tax, Excise duty, Income Tax.

8. ENTREPRENEURSHIP DEVELOPMENT :

Concept of entrepreneurship, need of entrepreneurship in context of prevailing employment conditions of the country. Successful entrepreneurship and training for entrepreneurship development. Idea of project report preparation.

9. INTELLECTUAL PROPERTY RIGHTS :

Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Nonpatentable invention including product versus Process.

NOTE : Entrepreneurship Awareness camp to be organised at a stretch for Two or Three days. Lectures will be delivered on Entrepreneurship by industries experts at institute level.

### 3.2 DATA STRUCTURE USING C & C++

(Common to Post Diploma in Computer Science & Engg. and Post Graduate Diploma In Computer Application)

L T P  
3 2/2 4

#### Rationale :

For solution of different problems 'C' is a very powerful high level language. It is widely used in research and engineering problems. A software technician aware of this language will be useful for working in computer environment.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Basic Concepts.	8	3	
2.	Stacks And Queues	10	3	
3.	Lists	12	4	
4.	Sorting & Merging	11	4	
5.	Tables	11	3	
6.	Trees	12	4	
7.	Graphs	11	4	
		75	25	100

#### DETAILED CONTENTS

##### 1. BASIC CONCEPTS:

Basic concepts and notation & Mathematical background

##### 2. Stacks And Queues

Representation of stacks & queues, linked sequential.

##### 3. LISTS:

List representation techniques, Multilinked structures, Dynamic storage allocation techniques.

##### 4. SORTING ALGORITHMS

Insertion sorts, Bubble sort, Quicksort, Mergesort, Heapsort

##### 5. Tables: -

Searching sequential tables, Hash tables and Symbol tables, Heaps.r

6. TREES

Definitions and basic concepts, Linked tree representations, binary tree traversal algorithms, B-trees and their applications.

7. Graphs:

Depths-first-search.

DATA STRUCTURE USING C & C++

List of Experiments

1. Write a program on Linked List Using 'C' & C++.
2. Exercise on Stack, Queues. Using C & C++
3. Exercises on Sorting .

### 3.3 INTERNET & WEB TECHNOLOGY

(Common with Post Graduate Diploma In Computer Application,  
Post Diploma In Information Technology)

L T P  
3 - 4

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Internet		30	- -
2.	Web Technology		45	-
		75 -		100

#### INTERNET

Introducing Internet, Its Uses : Why Internet, Basic internet Tools, E-Mail, Ftp, Telnet, Usenet News, Web Browsers, Search Engines, Yahoo, Archie, Infoseek, Veronica, World Wide Web.

How Internet works: Administration of Internet, How to Go On Internet : Requirements, Hardware, Software, ISP, Internet Account PPP/Shell. How to Use E-Mail Services On Internet Introducing Hotmail/Yahoo/Vsa-Net, How To Operate E-Mail address, How to Operate E-Mail Services : Sending E-Mail, Forwarding, Saving, Reading etc., How to attach files,

#### 2. WEB TECHNOLOGY :

##### A. HTML:

Elements of HTML, HTML sources & Rules of nesting, syntax conventions, HTML Categories, text tags, Formatting WebPages by using Styles, adding pictures, image attribute , introduction to forms, tables and models,advantages & limitations of tables, frames, links. SS cascading style sheets, XHTML, XML, Client Side Scripting, Server Side Scripting, Managing data with SQL.

##### B. JAVA SCRIPTS:

i)JAVA SCRIPTS:what is a Java Scripts, adding, Java scripts to documents, embedding java scripts, linking java scripts, creating a page program with scripts. What is a Java and its applets, to make webpages run server scripts, activeX.

C. ASP PROGRAMMES :

What is ASP, What can ASP do for you, How to install IIS and Run ASP on windows XP, Basic syntax rules (V.B. Script, Java Script and o/p syntax used in ASP, Procedures, Functions, Forms. Radio buttons, Check Box, Data Base Connectivity.

D. Web building.

PRACTICAL

1. Exercises on E-Mail.
2. Exercises on to see web sites.
3. Development of different Websites using all tools.
4. Development of Websites using Frontpage

### 3.4 CONCEPTS OF RELATIONAL DATABASE MANAGEMENT SYSTEM USING ORACLE.

(Common to Computer Science & Engineering, Post Graduate Diploma in Computer Application, Post Diploma in Information Technology).

L T P  
3 1 3

#### Rationale:

Relational Database management system is the modern technique of managing data. The knowledge of DBMS is very useful & effective in preparation of different types of application software like Inventory, Financial & Accounting system etc. The student equipped with knowledge of this subject will be useful in the areas of the computer application.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Concepts of DBMS	13	4	-
2.	Relational Database design	17	6	-
3.	File Organisation Techniques	13	5	-
4.	Security and Privacy	17	6	-
5.	SQL	15	6	-
		75	25	75

#### DETAILED CONTENTS

##### 1. CONCEPTS OF DBMS :

Data items, DBA, Entity, Attributes, Logical and Physical data, Primary and secondary keys, Form of query, Redundancy, Schema and Sub-schema.

##### 2. RELATIONAL DATABASE DESIGN

Define data model, classify data model, object based logical model, Record based data model, entity, attribute, Relationship, data model, network model, hierarchy model, top down approach, bottom approach of logical database, need of normalization. Types of normal form function and dependency, properties of relation.

##### 3. FILE ORGANISATION TECHNIQUES

Sequential index, Sequential and Random File organisation

technique and their relative advantages and disadvantages.

4. SECURITY AND PRIVACY

Integrity, protection, security, concurrency, recovery.

5. SQL

Introduction to SQL commands, Type of SQL commands and its application -DDL, DML, DLL, PL/SQL Commands.

## RELATIONAL DATA BASE MANAGEMENT SYSTEM

### List Of Practicals

1. Programms in ORACLE using relational structures for complicated systems.
2. Programms and reports generation through ORACLE & SQL.

### 3.5 JAVA PROGRAMMING

L T P  
3 - 4

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	An Overview of Java	15	-	-
2.	Data Types & Control Statement	12	-	-
3.	Introducing Classes & Methods	12	-	-
4.	Inheritance	12	-	-
5.	Multi threaded Programming	12	-	-
6.	Input/Output Applits	12	-	-
			75	- 100

#### 1. An Overview of JAVA:-

Introduction to Object Oriented Programming (two paradigms, abstraction, the three oops principles) creation of JAVA, JAVA Applits & applications, security & portability.

#### 2. Data Types & Control statements:

Integer, floating point type, character, boolean, all Operators, JAVA's selection statements, iteration and jump statement

#### 3. Introducing Classes & Methods:

Class fundamentals, declaring objects, overloading methods & constructs, access control, nested and inner classes, exploring the string class, Inheritance

#### 4. Inheritance:

Inheritance basics, member access and inheritance.

#### 5. Muti threaded Programming.:

The JAVA thread model, thread priority, synchronization, Messaging.

6. Input/Output Applets:

I/O Basics, byte streams & character streams, predefined streams, reading and writing console input/output, reading and writing files, applet fundamentals, applet class.

LIST OF PRACTICALS

PROGRAMS USING CONTROL STATEMENTS.

### 3.6 MIS & SYSTEM ANALYSIS & DESIGN

(Common to Post Diploma in Information Technology, Diploma in Computer Science & Engineering)

L	T	P
3	-	-

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction to Management System	6	-	-
2.	Level Of Management	10	-	-
3.	Influence of Information Technology	12	-	-
4.	The System Concepts & Characteristics	10	-	-
5.	Elements of a System & System Development	10	-	-
6.	Detailed System Analysis	9	-	-
7.	Structured System Analysis Tools	9	-	-
8.	The process and Stages of System Design	9	-	-
		75	-	-

#### 1. Introduction to Management System.

What is information, components of Information system. What is MIS, Meaning, need role and importance, evaluation of MIS, Traditional management System Vs MIS, components of MIS, Common managerial, Process, Planning, organising & Controlling. Types of information system TPS, DSS, MIS. Assumptions & limitations of each system. System requirements.

#### 2. Level Of Management

Strategic, tactical & operational level, different functions of each level, characteristics of informations & its need. flow of information in levels, concepts of balance MIS, effectiveness and efficiency criteria.

#### 3. Influence of Information Technology

Problems with MIS, causes and solutions, Knowledge requirements for MIS, need and role in decision making, advantages of knowledge based system, types of knowledge system. Knowledge requirement for MIS.

#### 4. The System Concepts, Characteristics -

Organization, Interaction, Interdependence, Integration, Control Objective.

5. Elements of a System & System Development:  
Inputs and outputs, Processors, Controls, Feedback, Environment, Boundaries and Interface, Examples of System. System Development Life Cycle, Phrases in SDLC(Only Definition) - Problems Identification, Preliminary Investigation/Study, Types of Feasibility - Operational, Technical, Economical, System Analysis, System Design, Testing, Implementation.
6. Detailed System Analysis-  
Primary Investigation, Facts, Gathering and its techniques( Interviews, Questionnaires, Background Reading, On site Observation, Record Gathering)
7. Structured System Analysis Tools for  
SSA(Data Flow Diagrams, Data Dictionary. Decision Tree, Decision Table, Pros and Cons of each Table.
8. The process and Stages of System Design:  
Logical & Physical-Design, Design methodologies in Brief, Input/Output and Forms Design, Input Design(Input Data, Media and devices), Output Design.

### 3.7 COMPUTER GRAPHICS

L	T	P
3	-	4

#### Rationale :

Computers are, now a days, used in industry for designing and manufacturing purposes also. Computer graphics is a powerful tool for obtaining plenty of designs by variation of different parameters which are not ordinarily possible. It also gives quality assurance in the manufacturing industries. A student equipped with must knows, how will be useful in the relevant field.

#### TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction of Graphics	15	-	-
2.	Display Techniques & Devices	15	-	-
3.	Graphic Package & Display Files	15	-	-
4.	Two Dimensional transformation	15	-	-
5.	Input Devices	15	-	-
		75	-	100

#### DETAILED CONTENTS

##### 1. INTRODUCTION:

Origins of computer Graphics, Display Device - General purpose Graphics Software, display of solids object.

##### 2. DISPLAY TECHNIQUES AND DEVICES

Display Techniques and Devices: Point Plotting Technique, Coordinate systems and incremental methods, line-Drawing Algorithms, circle Generators, Display Devices, CRT, Inherent Memory Devices, The storage tube display, Refresh line-draw display.

##### 3. GRAPHIC PACKAGES AND DISPLAY FILES:

A Simple Graphics package Segments, Functions for Segmenting the Display files, posting and Unposting, Segment naming

schemes, Appending the Segment display file structure. Geometric Models. Defining symbols procedures, Display procedure.

4. TWO DIMENSIONAL TRANFORMATION

Principles, concatenation Matrix representation. A line clipping Algorithm, Midpoint, division, Clipping other Graphics Entities, Polygon Clipping, Viewing Transformation. The windowing Transformation.

5. INPUT DEVICES:

Pointing and positioning Devices, Mouse lets, the light pen, Three Dimensional input devices.

LIst of Experiments

1. Practice on Computer Aided Drafting and Design.
2. Draw the Line & Circles
3. Transformation, Scaling, rotation of any objects.

### 3.8 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT

L T P  
2 - -

#### RATIONALE:

A diploma student must have the knowledge of different types of pollution caused due to industrialisation and construction activities, so as he may help in balancing of eco-system and control pollution by providing controlling measures. They should be also aware of the environmental laws for effectively controlling the pollution of environment. The topics are to be taught in light of legislation Para-3.

#### TOPIC WISE DISTRIBUTION OF PERIODS:

SL. NO.	TOPIC	L	T	P
1.	Introduction	6		
2.	Pollution	3		
2.1	Water Pollution	8		
2.2	Air Pollution	8		
2.3	Noise Pollution	3		
2.4	Radio Active Pollution	4		
2.5	Solid Waste Management	5		
3.	Legislations	3		
4.	Environmental Impact Assessment	4		
5.	Disaster Management	6		
TOTAL		50	-	-

#### DETAILED CONTENTS

1. INTRODUCTION :
  - Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigation, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects.
  - Lowering of water level , Urbanization.
  - Biodegradation and Biodegradability, composting, bio remediation, Microbes .Use of biopesticides and biofungicides.
  - Global warning concerns, Ozone layer depletion, Green house effect, Acid rain,etc.

2. POLLUTION :

Sources of pollution, natural and man made, their effects on living environments and related legislation.

2.1 WATER POLLUTION :

- Factors contributing water pollution and their effect.
- Domestic waste water and industrial waste water. Heavy metals, microbes and leaching metal.
- Physical, Chemical and Biological Characteristics of waste water.
- Indian Standards for quality of drinking water.
- Indian Standards for quality of treated waste water.
- Treatment methods of effluent (domestic waste water and industrial/ mining waste water), its reuse/safe disposal.

2.2 AIR POLLUTION :

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment.

- Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e.
  - A. Settling chambers
  - B. Cyclones
  - C. Scrubbers (Dry and Wet)
  - D. Multi Clones
  - E. Electro Static Precipitations
  - F. Bag Fillers.
- Ambient air quality measurement and their standards.
- Process and domestic emission control
- Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION :

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION :

Sources and its effect on human, animal, plant and material,

means to control and preventive measures.

#### 2.5 SOLID WASTE MANAGEMENT :

Municipal solid waste, Biomedical waste, Industrial and Hazardous waste, Plastic waste and its management.

#### 3. LEGISLATION :

Preliminary knowledge of the following Acts and rules made thereunder-

- The Water (Prevention and Control of Pollution) Act - 1974.
- The Air (Prevention and Control of Pollution) Act - 1981.
- The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz.
- # The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000
- # The Hazardous Wastes (Management and Handling ) Amendment Rules, 2003.
- # Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.
- # The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.
- # Municipal Solid Wastes (Management and Handling) Rules, 2000.
- # The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

#### 4. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

- Basic concepts, objective and methodology of EIA.
- Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

#### 5. DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of

vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

### 3.9 PROJECT

L	T	P
-	-	4

#### Rationale:

The purpose of including project in curriculum is to develop skill and knowledge specifications of software used in computers.

#### 1. INFORMATION TECHNOLOGY PROJECT:

The student is expected to work on a project in consultation and acceptance with the instructor on either system software aspects related to industrial environment.

The end targets for the project should be well defined and evaluation should place major importance on meeting these targets.

#### 2. DATA PROCESSING PROJECT:

The student is expected to work and learn from implementing an application software and study its functional and performance aspects and submit a report.

The evaluation must be based on the project report and the seminars.

#### 3. SOFTWARE MAINTENANCE PROJECT:

Similar as Information Technology Project (Software), related to maintenance operation and evaluation of the systems.

# THREE YEAR DIPLOMA IN INFORMATION TECHNOLOGY STAFF STRUCTURE

Intake of the Course	60
Pattern of the Course	ANNUAL SYSTEM

Sl. No.	Name of Post	No.
1.	Principal	1
2.	H.O.D.	1
3.	Lecturer In Information Technology	4
4.	Computer Programmer Cum Operator	3
5.	Lecturer in Maths	1--
6.	Lecturer in Physics	1
7.	Lecturer in Electronics	Common with Other discipline
8.	Lecturer in Comm. Tech.	1
9.	Lecturer in Elect. Engg.	1
10.	Steno Typist	1
11.	Accountant / Cashier	1
12.	Student / Library Clerk	1
13.	Store Keeper	1
14.	Class IV	6
15.	Sweeper	Part time as per requirement
16.	Chaukidar & Mali	As per justification

Note :

1. Services of other discipline staff of the Institute may be utilized if possible
2. Qualifications of Staff : as per service rule

### SPACE REQUIREMENT

#### [A] ADMINISTRATIVE BLOCK

Sl. No.	Details of Space	Floor Area Sq. metres
1.	Principal's Room	30
2.	Confidencial Room	10
3.	Steno's Room	6
4. (a)	Office including Drawing Office	80
(b)	Record Room	20
5.	Staff Room	
	(a) Head 1	15
	(b) Lecturer 10 sq.m./ Lect. for 7 Lecturers	70
6.	Library and Reading room	150
7.	Store	100
8.	Students Common room	80
9.	Model Room	90

#### [B] Academic Block

Sl.No.	Detail of Space	@ Sq.m	Floor Area Sq.m.
1.	Class Room	60	120
2.	Physics Lab		75
3.	Electrical Engg. Lab/Shop		120
4.	Digital Electronics & Microprocessor Lab		120
5.	Computer Centre (Air Cond. Glass Partition and Special type pvc flooring and false ceiling ), Two Computer Centers For Space of 60 Sq. m		120

#### [D] Student's Aminities

1.	Hostel	40	%	of Strength of Students
2.	Cycle Stand	50	%	of Strength of Students
3.	Canteen and Tuck shop	50		
4.	N.C.C. Room	70		
5.	Dispensary	40		
6.	Guest Room(Attached Bath)	45		
	including kitchen & store			

[ E ] STAFF RESIDENCES

1.	Principal	1	100	100
2.	Head of the Department	1	100	100
3.	Lecturer	4	80	320
4.	Non teaching & Supporting staff	8	60	480
5.	Class IV	6	30	180

Priorty to be given in following order

- (1)
  - a. Administrative Building
  - b. Labs
  - c. Over head Tank
  - d. Boundary Wall
  - e. Principal Residence
  - f. Forth Class Quarters (2/3)
  
- (2)
  - a. Hostel
  - b. Students Aminities
  
- (3)
  - Residences of employee

### LIST OF EQUIPMENTS

Only those of the equipments given below which are essentially required for the conduction of practicals mentioned in the curriculum are to be procured by the institutions.

"Machine/Equipments/Instruments of old BTE list which are not included below are to be retained in the Lab/Shop for Demonstration purpose but not to be demanded fresh for purchase."

#### APPLIED PHYSICS LAB

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Brass ball with hook 2 cm. dia	2	20	40
2.	Stop clock least count 0.1 Sec	2	500	1000
3.	Wall bracket with clamping arrangement	2	50	100
4.	Meter scale	5	20	100
5.	Convex lenses of focal length 10 cm., 20 cm., 50 cm. and 100 cm. 2 nos. of each	8	10	80
6.	Optical bench steel with pin and lence holders	2	500	1000
7.	Anstronomical telescope	1	500	500
8.	Searl's conductivity apparatus with copper & steel rods 25 X 4 cm. diameter with all accessaries	1 set	1000	1000
9.	Lea's conductivity app. complete with all accessaries	1 set	1000	1000
10.	Constant water flow arrangement	2	400	800
11.	Boiler made of copper 2 lt. cap.	4	200	800
12.	Platinum resistance thermometer	2	800	1600
13.	Potentiometer - 10 wires with jockey	1	500	500
14.	Meter bridge complete	1	250	250
15.	Lead accumulator 2.2 V. and 20 amp. hour capacity	2	250	500
16.	Moving coil galvenometer	3	200	600
17.	Moving coil ammeter 0-1 amp., 0-5 amp., 0-10 amp., 1 no of each	3	250	750
18.	Moving coil voltmeter 0-1 V. 0-5 V., 0-10 V. 1 No of each	3	250	750
19.	Lechlanchi cell complete	3	100	300
20.	Resonance col. of steel tube with tuning forcs and other accessaries	1	500	500
21.	Tuning forcs set of different frequencies	1 set	1000	1000
22.	App. for determining coefficient of friction on a horrrizontal plane	1 set	1000	1000
23.	Appratus for determining characteristics of P-N junction diode complete with all accessaries	1 set	1500	1500

S.No.	Name of Equipment	No.	@ Rs. Amt.in Rs.	
24.	Post office box dial type	1	1200	1200
25.	Resistance box 0-10 ohm., 0-100 ohm. 2 nos. each	4	400	1600
26.	Rehostat of different ohm.capacity	8	250	2000
27.	Physical balance with weight box	2	800	1600
28.	Set of fractional weights	10	20	200
29.	Fortin's barometer with mercury	1	2500	2500
30.	Battery eleminator 6 V. & 3 amp.	1	250	250
31.	Lab tables	3	8000	24000
32.	Lab stools	10	100	1000
33.	Anemometer cup type	1	1000	1000
34.	Anemometer hand held	1	1000	1000
35.	Suryamapi	1	1500	1500
36.	Insolation meter	1	1500	1500
	Misc.		Lum	Sum
				5000

ELECTRICAL ENGINEERING LAB

Sl. No.	Equipment	Qty.	Price
1.	Ammeter -dynamometer type portable, moving coil, permanent magnet 150 mm uniform scale		
a.	Range 0 - 2.5 - 5 Amp.	2	1200
b.	Range 0 - 50 m A	1	500
c.	Range 0 - 500 mA	2	1000
2.	Ammeter - moving iron type Portable moving iron permanent magnet, 150 mm uniform scale		
a.	Range 0 - 5 Amp.	2	1000
b.	Range 0 - 10/20 Amp.	2	1000
c.	Range 0 - 500 mA/1000 mA	2	1000
3.	Voltmeter dynamometer type portable moving coil permanent magnet 150 mm uniform scale		
a.	Range 0 - 5/10 V	2	1000
b.	Range 0 - 15/30 V	1	1000
c.	Range 0 - 50 mv/100 mv	1	1000
d.	Range 0 - 125/500 V	1	1000
e.	Range 250/500 V		
4.	Digital multimeter 3.5 digit - display D.C. voltage 0 - 1000 V in 5 steps A.C. voltage 0 - 750 V in 5 steps Resistance 0 - 20 M ohm in 6 steps D.C. 0 - 10 A in 6 steps A.C. 0 - 10 A in 6 steps Power supply 9 V.	1	3000
5.	Analog multimeter (Portable) D.C. Voltage 0 0 1000 V AC Voltage 0 2/5/10/25/100/250/1100 V. Resistance 0 200 M ohm DC 0 - 50 micro Amp./1 mA/10 mA/100mA/1A/10A AC 0 - 100 mA/1A/25 A/10A	1	1000
6.	Wattmeter single phase (LPF= 0.2) portable dynamometer type, scale 150 mm current range 0 - 5/10 Amps voltage Range 0 - 250/500 V	2	5000
7.	Decade resistance box constantan coils, single dial 10x10, 10x100, 10x1000, 10x10,000 ohms	1	1000
8.	Continuously variable 0 - 1000 micro farad, 250 V	1	1000

Sl. No.	Equipment	Qty.	Price
9.	Energymeter single phase induction type, industrial grade 5 A or 10 A, 250 V, 50 Hz.	1	2000
10.	Energymeter (Substandard) single phase, induction type 5 A/10A, 250 V, 50 Hz.	1	3000
11.	Power factor meter dynamometer type, eddy current damping, 50 Hz, scale length 150 mm range upto 20 amp, voltage range 300 V 10 F. range 0.5 log, unity 0.5 load.	1	5000
12.	Frequency meter (Reed type) 230 V, range for having 21 reeds for 40-60 Hz range.	1	500
13.	Rheostat sliding rheostats wound with evenly oxidised iron free nickel copper on vitreous enamelled round steel tube 150 ohms 2 Amps. 110 ohms 2.5 Amps.	1	600
		1	600
14.	Variable inductor single phase, 250 V, 2.5 KVar continuously variable	1	2000
15.	Battery charger 12 V silicon bridge rectifier AC input 230 V, DC output suitable for charging 6 V And 12 V batteries provided with MC voltmeter 0 - 20 V and ammeter 0 - 5 A	1	1000
16.	Capacitors 2.5 microfarad, electrolytic type	4	200
17.	Q Meter frequency 0 - 30 MHz Q 0 to 500	1	4000
18.	LCR meter (digital) 3.5 digit display capacitance 0 to 20,000 microfarad inductance 0 to 200 Henry resistance 0 to 20 M ohms	1	8000

Sl. No.	Equipment	Qty.	Price
19.	LCR/Q bridge capable of measuring resistance, inductance and capacitance of range 8 amps, 0.012 to 10 M ohms, 4 to 10,000 H, 0.5 pico farad to 10 F.	1	5000
20.	Kelvin double bridge 10 x 0.1 ohms circular slide wire divided into 200 equal parts		
21.	Energy meter 3 phase induction type, 4 wire, industrial grade, 50 Hz, 10 A, 440 Volt	1	5000
22.	Energy meter (Sub standard) 3 phase, 4 wire, 440 V, 10A, 50 Hz induction type.		
23.	Transformer single phase core type, 230/110 V, 1 KVA, 50 Hz.	1	5000
24.	Universal shunt 0 - 75 A	1	2000
25.	Current transformer 10/25/50/5A as per IS 4201/1967 and 2705/1981	1	2000
26.	Potential transformer 10 VA, 415/110 V as per IS 4201/1967 and 2705/1981	1	2000
27.	Maxwells bridge	1	1000
28.	Laboratory D.C. power supply (220 V) static converter input from 3 phase 50 Hz, 415 volts A.C., output rating of 200 watts to 260 watts, 50 amps, continuously variable.	1	50,000
29.	Watt meter 3 phase induction type 2 element voltage range 0/300/600 V current range 0/5/10 A	1	2000
30.	Frequency meter - portable (Reed type) 45-55 Hz with 21 reeds Frequency meter digital portable 3.5 digit LED display range 20-99 Hz	1	2000

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Sl. No.	Equipment	Qty.	Price
31.	Phase sequence indicator (Rotary) 3 phase, 415 V, 50 Hz	1	1000
32.	Phase sequence indicator (Indicating type) 3 phase, 400 V, 50 Hz	1	1000
33.	Galvanometer centre zero response time 1.8 sec.	1	1000
34.	VAR meter 1/5 A, 300/600 V	1	2000
35.	Wire wound rheostats 15 ohms, 10 A 100 ohms, 5 A 250 ohms, 5 A 1000 ohms, 0.5 A 2500 ohms, 0.1 A	2 2 2 2 2	1200 1200 1200 1200 1200
36.	Stop watch least count 0.01 Sec.	2	2000
37.	Stop watch (digital) LED	2	2000

COMPUTER CENTRE

COST	S.No.	DESCRIPTION	QTY.	APPROX.
				(in Rs.)
	1	Latest Version-Core-2 Dual Processor 62 2 MB L2 Cache, 2.4 Ghz ofr Higher 1 GB DDR2 RAM,160 GB SATA HDD,72K RPM MONITOR COLOUR 17" TFT DVD Writer, Multi Media Kit with Speaker & Microphone FDD - 1.44 MB Key Board - Multimedia Mouse - Optical Scrool Fibre Mouse 32 Bit PCI ETHERNET CARD(10/100) Mbps Internal Modem, Pen Drive 2GB, Blue Tooth Pre loaded Windows XP/2000/VISTA Pre loaded latest Anti Virus with licence media and manual with UPS 660 VA		20,000,00=00 (60+2Server)

OR

Computer of latest Specification

2.	Lap Top (Latest Version)	04	300000.00
3.	Software : (With Licence)		

- i      WINDOWS - XP/2000/VISTA
- ii     ORACLE 9i or Latest Windows based  
20 USERS) & Development (Latest)
- iii.  VISUAL STUDIO (professional)
- iv.    MS OFFICE XP
- v.    COMPILER - 'C',C++, JAVA
- vi.   Unix & Linux
- vii.  Front Pange, Internet Explorer,Page Maker  
Corel Draw, Dream Weaver
- viii. Personal Web Server, HTML, IIS
- ix.    Tally

3. Hardware

4.	i. Switch-16,8,24 Port all accessories related to Networking.	01	100000.00
	ii. Scanner- A4/Auto lighter Scanner	02	25000.00
	132 Column 600 CPS or faster 9 Pin dot matrix printer with 500 million character head life	02	50000.00
5.	Laser Jet-A4,All In One (2 Each)	04	70000.00
6.	Desk Jet-A4, Photo Smart(2 Each)	04	40000.00
7.	5 KVA on line UPS with minimum 30 minute battery backup along	04	400000.00

	with sealed maintenance free batteries. Provision for connecting external batteries with network connectivity. (For 2 Labs)		
7.	Split Air Conditioner 1.5 tones capcity with ISI mark alongwith electronic voltage stablizer with over voltage and time delay circuit	08	300000.00
8.	Room preparation and furniture	LS	
9.	Cat-6 cabling for network	LS	
10.	2 KVA Inverter Cum UPS	02	50000.00
11.	Digital Camera	01	25000.00
14.	Fire Extinguisher (2 Kg.)	04	15000.00
16.	Fire Extinguisher (5 Kg.)	04	30000.00
17.	Vaccum Cleaner	02	15000.00
18.	LCD Projector	02	200000.00
19.	Pen drive 1GB, 2GB, 4 GB	10	15000.00
20.	DVD writer External	02	5000.00
21.	HDD External 160 GB	02	10000.00
22.	PDA (Latest Configuration)	02	10000.00
23.	Broadband For Internet(Speed Min. 8mbps)	04	
24.	USB Modem	02	10000.00
25.	Generator 10 KVA Water Coolent	01	100000.00

NOTE : All the above items should be equally distributed in the 2 computer centres

Principles of Digital Electronics Lab. )  
Microprocessors And Applications Lab.)

S.No.	Name of the Equipment/ Board/Kit Etc.	Principles of Digital Eltx. Lab.	Micropro- cessors & Applicat- ion Lab.		Total		Total No. Recommen- ded	Rate per Piece	Total Cost	
			Intake 30	Intake 45	Intake 30	Intake 45			Intake 30	Intake 45
1.	CRO dual trace with delayed time base, 25 MHz or higher band width.	1	1	-	-	1	1	1	25000	25000
2.	CRO dual trace 15 MHz.	1	2	-	-	1	2	1	15000	15000
3.	CRO dual trace 10 MHz.	2	2	1	2	3	4	3	10000	30000
4.	Multimeter, 20 K Ohm/volt sensitivity, 1% accuracy in D.C. voltage range, Max. D.C. voltage range 2500 V, A.C Current.	2	3	-	-	2	3	2	2500	5000
5.	Multimeter, Digital hand held 3 1/2 digit, 0.3% accuracy 1000 V D.C. and 20 m ohm resistance range protected against transients.	2	3	1	2	3	5	3	2000	6000
6.	Logic Probe	15	18	5	7	20	25	20	300	6000
7.	Logic board/trainer including +5 Volt, 1Amp + 15 V, 0.3 Amp. power supply and bread board and flexible leads.	10	14	-	-	10	14	10	3500	35000
8.	Microprocessor trainer kits with 8085 system (EC 85 or similar).	-	-	8	10	8	10	8	8000	64000
9.	Component rack 144 tray (small) & 24 large tray.	2	2	1	1	3	3	3	5000	15000
10.	Consumable material such as components ICs, resistors transistors etc.	LS	LS	LS	LS	LS	LS	LS	--	50000
11.	Miscellaneous	LS	LS	LS	LS	LS	LS	LS	--	40000
										45000

LEARNING RESOURCE EQUIPMENT

1.	Overhead Projector with screen	1	--	20000
2.	35 m.m. Slide cum Film Projector	1	--	50000
3.	Audio Cassette Recorder	1	--	15000
4.	V.C.R. with Monitor & Accessories	1	--	35000
5.	Photography Camera for Production of slide and film strips, 35 mm still camera dark room equipment.	1		100000
6.	Cutting, Binding & Stitching equipment.	1	--	30000
7.	L. C. D. Projector	1	--	400000

ANNEXURE-QUESTIONNAIRE

INSTITUTE OF RESEARCH, DEVELOPMENT AND TRAINING U.P.KANPUR -208024

SUBJECT: Questionnaire for ascertaining the job potential and activities of diploma holder in Information Technology (Semester System).

PURPOSE: To design and develop Three Year (Six Semester) diploma curriculum in Information Technology (Semester System).

NOTE: 1. Please answer the questions to the points given in the questionnaire.  
2. Any other point or suggestion not covered in this questionnaire may be written on a separate paper and enclosed with the questionnaire.

1. Name of the organisation: \_\_\_\_\_  
\_\_\_\_\_

2. Name & Designation of the officer \_\_\_\_\_  
filling the questionnaire \_\_\_\_\_

3. Name of the department/section/  
shop \_\_\_\_\_  
\_\_\_\_\_

4. Important functions of the  
department/section/shop \_\_\_\_\_  
\_\_\_\_\_

5. Number of diploma holder employees  
under your charge in the area of \_\_\_\_\_  
Information Technology.

6. Please give names of modern equipments/machines handled by a  
diploma holder in Information Technology.

1.

2.

3.

4.

5.

6.

7. What proficiencies are expected from a diploma holder in  
Information Technology.

1.

2.

3.

4.

5.

6.

8. Mention the approximate percentage of the following desired in Diploma teaching.

1. Theoretical knowledge	-----%
2. Practical knowledge	-----%
3. Skill Development	-----%

9. Do you think " on the job training" / Industrial training should form a part of curriculum. ( Yes/ No)  
if yes then

(a) Duration of training	-----
(b) Mode of training	1. Spread over different semesters 2. After completion of course 3. Any other mode

10. What mode of recruitment is followed by your organisation.

1. Academic merit
2. Written test
3. Group discussion
4. Interview
5. On the job test.

11. Mention the capabilities/ Qualities looked for while recruiting

diploma holder in Information Technology.

(a) Technical knowledge	-----
(b) Practical skill	-----
(c) Etiquettes and behaviour	-----
(d) Aptitude	-----
(e) Health, habit and social background	-----
(f) Institution where trained	-----

12. Does your organisation have any system for the survey of Home articles of different countries/States. Yes/No

13. Does your organisation conduct field survey to know users views regarding. Yes/No

1. Home Articles for different age groups and sex.
2. Effect of climatic conditions
3. Any other

If yes ; Please give brief account of each.

14. Which type of assignment do you suggest for an entrepreneur in Information Technology.

15. In which types of organisations can a diploma holder in Information Technology can work or serve.

1

2

3

4

5

6

16. Job prospects for the diploma holder in Information Technology the next ten years in the state / country.
17. In your opinion what should be the subjects to be taught to a diploma student in Information Technology.

Theory

Practical

18. Kindly mention particulars regarding topics/areas which should be given more emphasis in the curriculum .

Theory

Practical

19. Kindly state whether your organisation can contribute towards improvement of curriculum in above field.  
If yes : Please give names of experts in your organisation to whom contact.
20. Kindly give your valuable suggestions for being considered at the time of finalisation of curriculum.
21. What changes in technologies are to be incorporated in the development of curriculum in Information Technology.

( Signature )

Kindly mail the above questionaire duly filled to:-

R. P. Alam  
Assistant Professor  
Institute of Research,Development & Training,U.P.  
Kanpur-208024

( Please note that all information in this survey is confidential for the use of curriculum design only )

## ANNEXURE- 2 FIELD EXPOSURE SCHEDULE

All the students of second year after annual examination will undergo in industrial training for a period of four week in Industries dealing with computers. It will in all respect end by the end of summer vacation. It will be arranged and supervised by institute staff . The performa for preparing a report of his stay. There in the industry given below can be taken as a guide for the purpose.

1. Name & Address of the organisation
2. Nature of the industry and its activity.
3. Date of
  - i. Joining
  - ii. Leaving
4. Details of the sections of the industry visited.
  - i. Name of tools, equipments instruments in use.
  - ii. Activities of the section
  - iii. Study of the components, devices used in complete assemblies.
  - iv. Soldering and de-soldering techniques used in circuit fabrication.
  - v. Study of PCB Lay out developing and preparation.
  - vi. Checking and testing of the components used.
  - vii. Final checking of the product.
  - viii. Discription of quality control measures taken in industry.