

CURRICULUM FOR THREE YEAR
(SIX SEMESTER)
DIPLOMA COURSE IN

=====
: COMPUTER SCIENCE & ENGINEERING :
: Effective from Session :
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: Semester System :
: Revised Syllabus :
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Prepared By

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: Curriculum Development Cell :
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INSTITUTE OF RESEARCH DEVELOPMENT
& TRAINING, U.P., KANPUR

APPROVED BY

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: BOARD OF TECHNICAL EDUCATION :
: U.P. LUCKNOW, :
:CORRECTED AS SYLLABUS COMMITTEE OF:
: B.T.E. MEETING HELD ON 19.04.2017
=====

STUDY AND EVALUATION SCHEME FOR
THREE YEAR SIX SEMESTER) DIPLOMA COURSE IN COMPUTER SCIENCE AND ENGINEERING
(Effective From)

I Semester- (Common To Diploma In Information Technology)

Curriculum						Scheme of Examination									
Periods Per Week						Theory				Practical			Grand Total		
Le	Tut	Dr	Lab	Work	Tot	S U B J E C T	Examination	Sess.	Total	Examination	Sess.	Total			
c.	ori	aw		Shop	al			Marks	Marks	Marks	Marks	Marks	Marks		
	al						Dur.	Marks		Dur.	Marks				
4	-	-	-	-	4	1.1 Foundational Communication	2.5	50	20	70	-	-	-	70	
3	1	-	-	-	4	1.2 Applied Mathematics-I(A)	2.5	50	20	70	-	-	-	70	
3	1	-	-	-	4	1.3 Applied Physics-I	2.5	50	20	70	-	-	-	70	
6	-	-	4	-	10	1.4 Electrical Engineering	2.5	50	20	70	3	50	25	145	
4	-	-	4	-	8	1.5 Basics of Information Technology	2.5	50	20	70	3	50	25	145	
-	-	-	4	-	4	1.6 Student Center Activity#	-	-	-	-	-	-	-	-	
22	2		12		34	T O T A L		250	100	350	-	100	50	150	500
													GAMES/NCC/Social and Cultural activities + Discipline (15+10)	25	
													Total	525	

II Semester-(Common To Diploma In Information Technology)

3	1	-	-	-	4	2.1 Applied Mathematics-I(B)	2.5	50	20	70	-	-	-	70	
3	1	-	4	-	8	2.2 Applied Physics-II	2.5	50	20	70	3	40	20	130	
6	-	-	-	-	6	2.3 Applied Chemistry	2.5	50	20	70	-	-	-	70	
6	-	-	3	-	9	2.4 Fundamental of Electronic Devices	2.5	50	20	70	3	50	25	145	
6	-	-	6	-	12	2.5 Concept of Programming using C	2.5	50	20	70	3	50	30	150	
-	-	-	4	-	4	2.6 Student Center Activity#	-	-	-	-	-	-	-	-	
24	2		17		43	T O T A L		250	100	350	-	140	75	215	565
													GAMES/NCC/Social and Cultural activities + Discipline (15+10)	25	
													Total	590	

- NOTE:- (1) Each period will be of 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) At least 2 industrial visits should be scheduled during the session.

Non credit Subject
Student Center Activity (Annexure 3)

STUDY AND EVALUATION SCHEME FOR
THREE YEAR SIX SEMESTER) DIPLOMA COURSE IN COMPUTER SCIENCE AND ENGINEERING
(Effective From)

III Semester

Curriculum						C O U R S E S / S U B J E C T S	Scheme of Examination							
Periods Per Week							Theory				Practical			
Le	Tut	Dr	Lab	Work	Tot		Examination	Sess.	Total	Examination	Sess.	Total		
c.	ori	aw	Shop	al			Dur.	Marks	Marks	Marks	Dur.	Marks		Marks
5	2	-	-	-	7	3.1 Applied Mathematics-II	2.5	50	20	70	-	-	-	70
5	-	-	5	-	10	3.2 Data Structure using C	2.5	50	20	70	3	60	30	90
4	-	-	4	-	8	3.3 Web Technology-I	2.5	50	20	70	3	70	35	105
6	-	-	4	-	10	3.4 Digital Electronics & Measuring Instrument	2.5	50	20	70	3	90	40	130
4	-	-	6	-	10	3.5 Office Automation Tools	2.5	50	20	70	3	50	25	75
-	-	-	1	-	1	3.6 Student Center Activity#	-	-	-	-	-	-	-	-
24	2	-	22	-	46	T O T A L		250	100	350	-	270	130	400
													Games/NCC/Social and Cultural activities + Discipline (15+10)	25
													Total	775

IV Semester

4	-	-	-	-	4	4.1 Functional Communication	2.5	50	20	70	-	-	-	70
6	-	-	4	-	10	4.2 Data Communication & Computer Network	2.5	50	20	70	3	60	30	90
6	-	-	6	-	12	4.3 Web Technology-II	2.5	50	20	70	3	60	30	90
6	-	-	4	-	10	4.4 Operating System	2.5	50	20	70	3	50	30	80
-	-	-	4	-	4	4.5 Employable Skills(VIVA)	2.5	-	-	-	-	25	15	40
4	-	-	4	-	8	4.6 Microprocessor & Its Application	2.5	50	20	70	3	60	30	90
26	-	-	22	-	48	T O T A L		250	100	350	-	255	135	390
													Games/NCC/Social and Cultural activities + Discipline (15+10)	25
													Total	765

- Note :
- (1) Each period will be of 50 minutes duration.
 - (2) Each session will be of 16 weeks.
 - (3) Effective teaching will be at least 14 weeks.
 - (4) 4 weeks structured and supervised, branch specific, task oriented industrial/field exposure to be organised after IV Semester Student will submit a report. There will be 60 marks for this exposure. These marks will be awarded by project examiner in the VI Semester. (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.

Non credit Subject
Student Center Activity (Annexure 3)

STUDY AND EVALUATION SCHEME FOR
THREE YEAR SIX SEMESTER) DIPLOMA COURSE IN COMPUTER SCIENCE AND ENGINEERING
(Effective From)
(COMMON TO INFORMATION TECHNOLOGY (THREE YEAR)

V Semester-

Curriculum						C O U R S E S		Scheme of Examination							
Periods Per Week						S U B J E C T S		Theory			Practical			Grand	
Le	Tut	Dr	Lab	Work	Tot	S U B J E C T S	Dur.	Marks	Sess.	Total	Examination	Sess.	Total	Total	
c.	ori	aw	Shop	al	Examination										Marks
-	-	-	4	-	4	5.1 Integrative Communication	-	--	--	--	3	40	20	60	60
6	2	-	-	-	8	5.2 Industrial Management and Entrepreneurship Development	2.5	50	20	70	--	--	--	--	70
6	-	-	6	-	12	5.3 Database management System	2.5	50	20	70	3	60	30	90	160
8	-	-	8	-	16	5.4 Object Oriented programming Using JAVA	2.5	50	20	70	3	60	30	90	160
-	-	-	3	-	3	5.5 Computer Hardware And Maintenance	--	--	--	--	3	80	40	120	120
-	-	-	4	-	4	5.5 Student Center Activity#	-	-	-	-	-	-	-	-	-
20	2	-	25	-	47	T O T A L		150	60	210	-	240	120	360	570
Games/NCC/Social and Cultural activities + Discipline (15+10)														25	
Total														595	

VI Semester-

4	-	-	-	-	4	6.1 Environmental Education & Disaster Management	2.5	50	--	--	-	--	--	--	--
6	-	-	4	-	10	6.2 Network Administration & Security	2.5	50	20	70	3	60	30	90	160
6	-	-	-	-	6	6.3 E-Commerce	2.5	50	20	70	-	--	--	--	70
-	-	-	8	-	8	6.4 Project -i. Problem	--	--	--	--	3	90	50	140	140
						ii Exposure	--	--	--	--	-	40	20	60	60
						iii Seminar	--	--	--	--	-	20	20	20	20
-	-	-	4	-	4	6.4 Student Center Activity#	-	-	-	-	-	-	-	-	-
16	-	-	16	-	32	T O T A L		100	40	140	-	190	120	310	450
Games/NCC/Social and Cultural activities + Discipline (15+10)														25	
Total														475	

30% Carry Over of I & II | 335|
70% Carry Over of III & IV | 1078|
100% Carry Over of V & VI | 1070|

NOTE:- (1) Each period will be of 50 minutes duration. Grand Total | 2483|
(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.)

Non credit Subject
Student Center Activity (Annexure 3)

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	II SEMESTER	
2.1	Applied Mathematics-I(B)	45-46
2.2	Applied Physics-II	47-49
2.3	Applied Chemistry	50-54
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3.1	Applied Mathematics-II	59-61
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MAIN FEATURES OF THE CURRICULUM

1. Title of the Course : Diploma In Computer Science & Engineering.
2. Duration of the Course : Three Years(Six Semester)
3. Type of the Course : Full Time Institutional
4. Pattern of the Course : Semester System
5. Intake : 60
6. Entry Qualification : Passed High School with 35% Marks
7. Admission Criteria : State Joint Entrance Examination

Workshops held on 25.07.2016 in which the suggestion, contribution and support of following experts is a matter of obligation to I.R.D.T.

- | | |
|---------------------------------|---------------------------------------|
| 1. Shri Arun Kumar | HOD Computer Science Engg. GGP Jhansi |
| 2. Shri Neeraj Kumar | Lecturer IT GP Kanpur |
| 3. Shri Sumit Babu | Lecturer CS GP Kanpur |
| 4. Miss Puja saxena | Lecturer IT GP Kanpur |
| 5. Shri Prashant Shakya | Lecturer IT GP Mahoba |
| 6. Shri Gaurav Kishor Kanaujiya | Lecturer(IT)I.R.D.T.,Kanpur |

List of Experts

List of experts who contributed the Review & Revision of curriculum of ThreeYear Diploma Course In Computer Science Engg. held on 08/11/2016 at IRDT Kanpur:

- | | | |
|---------------------------------|-----------------|------------------------|
| 1. Shri Ashish Kanujiya | Founder | Electron Kits, Lucknow |
| 2. Shri Shishir Kant Singh | M.D. | Seed Group, Lucknow |
| 3. Shri Arun Kumar | HOD CSE. | GGP Jhansi |
| 4. Shri Y.K. Sharma | HOD Electronics | AITH, Kanpur |
| 5. Shri Kaushalendra Kumar | Lecturer CS | AITH, Kanpur |
| 6. Shri Sumit Babu | Lecturer CS | G.P. Kanpur |
| 7. Shri Alok Kumar | Lecturer IT | G.P. Kanpur |
| 8. Shri Rohit Katiyar | Lecturer IT | G.P. Aurai |
| 9. Shri Gaurav Kishor Kanaujiya | Lecturer IT | IRDT 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 "Computer era". So is the need for developing a course for computer engineering at diploma level. The course aims to develop perssonnels, capable of taking responsibilities such as installation repair and maintenance and operating computer units. It is supposed that such personnel will not face any dearth of employment because of omnipresent nature of computer.

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

V. PROFILE DEVELOPMENT :

A tool in the form of questionnaire for getting information about job potential, job opportunities, manpower requirements and job activities of Diploma holder in Computer Engineering was designed and sent to various organisations, industries, higher technological Institutions and Polytechnics. The response was not very much encouraging. So efforts were made to get feedback through mutual interaction with the experts of above organisations, industries, higher technological institutes and polytechnics. The feedback received was discussed and analysed in a workshop and a draft curriculum was prepared adopting the following procedure.

1. Listing job potential and job activities.
2. Analysing activities into knowledge and skill.
3. Determining course objectives.
4. Planning horizontal and vertical organisation of the subjects.
5. Developing study and evaluation scheme.
6. Development of detailed course content and coverage time keeping in view the knowledge and skill requirement.
7. Determination of resource input in the form of human resource, space, equipment etc.

The so prepared curriculum was sent for comments of experts in various higher technological institutions and senior personnels in industries. The suggestions thus received and those through personal contacts were incorporated where found suitable. Finally revised curriculum was put before an expert Committee approved by the "Government of Uttar Pradesh" for its final approval. The Committee's suggestions though very nominal too were respectfully incorporated to give it its final shape.

It is hoped that revised curriculum of Diploma in Computer Engineering will be useful in producing middle level manpower for world of work.

VI. JOB POTENTIAL/JOB OPORTUNITIES

JOB POTENTIAL

Background Information Regarding Computer Industry:

Most of the industries in computer area are in private sector. The job designations are not standard. They change from firm to firm depending upon the size of firm and the nature of work, the firm is engaged in R & D or marketing software development etc. In general the jobs for a diploma holder in Computer engineering are available in the following areas :

- i. Service Division.
Maintenance, service and installation of computer system.
- ii. Production and Quality Control Division.
- iii. Marketing division.
- iv. Commercial (stores, purchase and pricing)
- v. Research and Development.

Assessment of job potential from Computer Industry:

A questionnaires was sent to 30 different industries dealing with different aspects of Computer Engineering. On the basis of information collected and discussions held during the visits to these industries a chart showing manpower spectrum of some of the computer industries has been prepared. This chart is attached here. In this chart a typical manpower employment in computer is shown. It also shows the relative position of the personnels in computer field. The nomenclature of the designations is by no means standard and the chart only indcates their relatives position.

JOB OPPORTUNITIES

The possible job opportunities for the product of this curriculum are

- 1.3.1. Junior engineer/Design Assistant/Senior Technical Assistant in R&D, Quality Control and Testing activities.
- 1.3.2. Shopfloor manger/Assembly supervisor in manufacturing and production Activities.
- 1.3.3. Installation Engineer/Service Engineer/Junior Engineer/Junior Service Engineer in installation,Service and Custom Support Activities.
- 1.3.4. Junior Marketing Executive/Junior Purchase Officer/Junior Stores Officer in Marketing and Commercial activities

ACTIVITIES/JOB DESCRIPTION

Service Division:

Maintenance, service and installation of computer systems

Identify hardware and software faults and rectify them.

Suggests the desirable changes in the design in view of this maintenance experiences.

Rectify fault by component and card level.

Advise the customer on site preparation and check the site.

Install the systems and test its operation.

Train the customer in the operation and the use of the system.

Production and Quality Control:

Indenting the material from stores and schedule the work of skilled workers.

- Fault finding in assembly work by visual inspection.
- Guiding skilled workers in component identification, component testing and precision assembly work.
- Fabricate (if required) test and interconnect different sub-assemblies and subsystems like power supply, interface, processor and memory units, video display unit, printer, plotter, graphic monitor, hard disc drives interface etc.
- Managing personnel like technicians and skilled workers.

Marketing:

- Meeting with prospective customer under the guidance of sales engineer.
- Arranging demonstration at the site of customer.

Commercial:

- Assists sales engineer in the sales of computer system (Contacts customer, arranges demonstration, preparation of technical documents and specification).
- Purchase material (writes specifications, receiving quotations, prepares and checks comparative statements, checks bills).
- Prepare bill for service charges and cost of materials used.
- Incoming inspection (checking quality, quantity and specification of the material supplied against orders).
- Maintains stocks and records.

Research & Development Work:

- Design simple microprocessor based subsystem (without optimisation) under the guidance of design engineer.
- Printed circuit board (PCB) layout design under the guidance of design engineer.
- Fabricates prototype of a subsystem or system.

- Plans flow of activities for production along with engineer.
- Test systems at card level, subsystem level and at complete system level.
- Documents the layouts, circuit diagram, procedures and processes.
- Develops systems software, the line drivers and interface with the guidance from engineer and runs it.
- Communicates with engineer and assists him in converting technical ideas into practical shape.
- Assist engineer in laying test procedures, tests standards and maintaining the quality of the products.

VII. JOB ACTIVITIES & ACTIVITY ANALYSIS:

ACTIVITY	KNOWLEDGE	SKILLS
1. Service Division (Maintenance, Service & Installation of Computer:		
1.1 Identify hardware & software faults & rectify them.	Working of the total System CPU, peripherals interfaces & system software.	Using diagnostic routines for fault location and identifying the fault at sub system level, card level, chip level, user level.
1.2 Suggests the desirable change in the design in view of his maintenance experience.	Faults diagnoses procedure including introduction of fault and fault diagnosis logics. Diagnostics methods of running them and interpreting results. Fault identification at system level subsystem level, card level component level & user level. Error rates in communication peripherals.	Use of test equipment for fault location. Study of literature (HW & SW) aspects and adapt the engineering change notes. Preventive maintenance.
1.3 Rectify fault at component & card level.	Data communication equipments. Data communication principles, spare parts & identification. Use & knowledge of tools and test equipment for maintenance including PBRS equipement. Understanding and implementing engineering change notes for both hardware & software. Performance measurement of computer system.	
ACTIVITY	KNOWLEDGE	SKILLS

Preventive maintenance Maintenance of log regi-

schedules and its ster and complaint reporting systems maintenance consequence, knowledge of terms like MTBF, MTRR, response time, of user.

Cost of down time.

Log maintenance (Symptoms, diagnosis and corrective action).

Maintenance procedures and techniques for CPU, peripherals, interfaces power supplies.

Complaint reporting system, performance reporting system.

Maintain ability of system software, updating and its consequences user accounting.

Installation

- 1.4 Advise the customer site preparation & check the site.
- Layout considerations & planning influence of factor like vibration humidity, airconditioning systems on system performance, measurement, dust prevention specification in regard to above. Comparative study of air conditioning system such as window & A.C. plant and package, power disturbances earthing & its specifications. Single, Three Phase supplies, isolation stabilizers switches, power distribution system and components and materials safety design. Low power transformer, Servo regulated power supplies.
- Communication skills oral & written. Measurement of humidity, vibration, temperature, dust, testing of earthing isolation, prepare wiring diagram & trace the wiring system Operate various test equipment, A/C system voltage regulators and isolation transformers. Wiring & preparation of wiring diagrams

ACTIVITY	KNOWLEDGE	SKILLS
1.5 Installs the system & test its operation.	Wiring, interpretation of installation & wiring drawings. Knowledge procedures.	Install the systems, run diagnostics, run system software, rectification of faults, train operators
1.6 Trains the customers in the operation and use of system.	Principles of working of operation of each system and sub system.	Practice in using computer system.
2. Production & Quality Control:		
2.1 Identifying the material from stores and schedule the work of skilled workers.	Concept of production document, drawing concepts principles of working of the components (ICs, discrete components, active passive and metal ware).	Practice of reading, drawing, knowledge of English.
2.2 Fault finding in assembly work by visual inspection.	Material used in assembly process. Handling of LSI and other components.	Practice in soldering & desoldering work.
2.3 Guiding skilled workers in component identification, component testing and precision assembly work.	Reading electronic drawing. Terminology, symbols, correlate the drawing with related components.	Component identification colour code of resistor capacitor.
2.4 Fabricates, (if required) test & interconnects different subassemblies and sub system like power supply, interfaces, processor and memory units, video display unit, printer, plotter, graphic monitor, hard disc, drive interfaces etc.	System block diagram, function of each block run diagnostic programme, diode errors, operation of test equipments like storage oscilloscope logic analyser, logic probe, meters, DBO, oscillator, pulse generator Block diagram of software, linear circuits different devices & digital circuit & microprocessors, magnetic recording techniques, knowledge of assemblers.	Practice in using equipments (Electronic as well as special type), able to write & run a small programme in assembly & high level language (BASIC & COBOL).
2.5 Managing personnel like junior technicians and skilled workers.	Concepts of Human relations, dignity of labour	

ACTIVITY	KNOWLEDGE	SKILLS
3. Marketing		
3.1 Meeting with prospective customer under the guidance of sales engineer.	Commerical term, types of payments, insurance communication skill, command on language advertising technique communicate computer specifications (including various peripherals) understanding of customers application. Analyse specifications, vis-a-vis other computer.	Practice in operation of small computer.
3.2 Arranging demonstrations at the site of customer.		
4. Commercial		
4.1 Assists sales engineer in the sales of computer system (Contacts customer arrange demonstrations, preparation of documents & specifications).		
4.2 Purchase & sales of computer system (Contact customer, arrange demonstration).	Source of supply knowledge of & writing detailed specifications of the materials & equipment needed in computer manufacture; computer peripherals, import procedures. Document preparation for quotations, specifications & demonstration of systems.	Written communication skill. Understand customer needs. Demonstrate the systems. Quotation preparation & ordering equipment.
4.3 Prepares bills for service charge and cost of material.	Commerical terms like FOR, FOB, Desitnation terms of sales & purchase, Sales tax income tax procedure.	Practice in using various forms.
4.4 Incoming inspection (including checking quality, quantity and specifications of the material supplied against orders).	Read specification, data sheet, component testing procedures. Specifications of components, identification of components, stores entries.	Practice in the operation of instruments, testing of component, error report preparation.

ACTIVITY	KNOWLEDGE	SKILLS
	Component identification, detailed specification, storage systems of components.	
4.5 Maintains stocks and records.	Registers, their types & method of maintaining entries.	Practice in dealing with different entries in the registers, inventory control.
5. R & D		
5.1 Design simple up based sub system without optimisation under the guidance of engineer.	Digital logic design, Microprocessor, computer architecture system integration, Application areas, design of memory boards peripheral interfacing techniques using manuals, chip, chip communication modules, multiplexers, A/D & D/A base standards, Communication protocols, Characteristics of components, noise levels and causes.	Working with digital linear and up circuits using VLSI, LSI, MSI chips, for a particular use, Acquiring information regarding the chips from data books/sheets. Chip subsituation, Interfacing of peripherals and information regarding interfacing chips.
5.2 PCB layout design under the guidance of design engineer	Noise, Noise levels & cause, principles of PCB design, familiarity with chips, knowledge of connectors, Knowledge of PC boards, Knowledge of PCB drafting aids and drafting techniques, back pannels and multiboard modules. Standard PCB size.	Drawing layouts, practice in making the layouts.
5.3 Fabricates prototype of a subsystem or system (Contact customer, arrange demonstration).	Mechanical packaging, considerations in packaging & design, organise a small workshop, draw flow of activities, guide, small groups in fabrication, wire wrapping. Thermal properties of metals and components. Mounting modes fuse and safety devices. Connector, cables and wiring, HDS.	Soldering & Desoldering techniques component mounting chassis fabrications, drilling & surface treatment of PCBs. Wire wrapping techniques, screen printing, painting. Testing of PCB circuit.

ACTIVITY	KNOWLEDGE	SKILLS
5.4 Plans flow of activities for production along with engineer.	PERT, time consciousness knowledge of production activities.	
5.5 Test system at card level, sub-system level and at complete systems level.	Locating faults, identification of causes (components or design). Use test equipment including programmable test equipment and calibration of test equipment. Interpretation of test results. Visible defects, chips and equivalent chips. Noise cause.	Fault finding in PCBs, use of test equipment.
5.6 Documents the layouts circuit diagrams, procedures and processes.	Documentation of test equipments, test procedure, flow activities, quality control standard computer equipment and diagnostics programmes of system software.	Documentation skills.
5.7 Develops system software, the line drivers & interfaces with the guidance from engineer and runs it.	Fundamentals of programming, logic, programming language, applications, Knowledge of system software, operating systems, compilers drivers and other system software. Efficient use of system software, write small diagnostic programmes to test system, generation and running of system software, knowledge of application packages and their running. Assembly and machine language programming. Modification & adaption of software.	Programme writing debugging skills in high level & assembly languages. Documentation of programmes. Modification and adaption of software.
5.8 Communicates with engineers and assist him in converting technical ideas into practical shape.	Understand the language of the engineer. Understand the drawing, notation specifications Fabricate, translate or code as per the specification use modules, sub assemblies written/prepared by others.	Fabricatory skills, Coding skills, Translative skills. Modification and adoption of circuits and programs.

ACTIVITY	KNOWLEDGE	SKILLS
5.9 Assists engineer in laying test procedures, test standards and maintaining the quality of the products.	<p>Quality control, quality checking procedures and standards.</p> <p>Documentation of test procedures reporting.</p> <p>Effect of environment on the behaviour of components and systems.</p>	<p>Testing for quality.</p> <p>Documentation & reporting skills</p> <p>Fabricate circuits, test the circuits make PCBs.</p>

VIII. COURSE OBJECTIVE:

Preceding section details the knowledge and skills required for middle level personnel of computer industry. The objectives are derived which deserve greater weightage are marked with asterisk.

Course objectives lay the foundation for planning educational programme.

1. Knowledge:
 - 1.1 He must acquire basic concepts in electronic drawing (including standard symbols for electronic components active as well as passive).
 - 1.2 He must acquire basic concepts and principles of working of linear and digital circuits using discrete components and integrated circuits.
 - 1.3 He must have the knowledge of testing procedure of active and passive components, (including integrated circuits) discrete and digital circuits by making use of different test instruments as per to their specification.
 - 1.4 He must acquire knowledge of system block diagram and working principles of different computer peripherals.
 - 1.5 He must acquire the knowledge of making P.C.B. layouts and learn drafting techniques.
 - 1.6 He must acquire the knowledge of efficient use of system software by writing a small diagnostic programme to test system.
 - 1.7 He must acquire the knowledge of working principles of the total system i.e. C.P.U., peripherals, interfaces and system software.
2. Skill
 - 2.1 He must acquire skill in finding faults in a computer system. The fault may be at component level or at card level or at sub system level. After finding fault he must be able to repair to it.
 - 2.2 He must acquire skill in preparation of site for installation of a computer.
 - 2.3 He must acquire skill in installing different subsystem (Power supply, Video display unit, C.P.U. , Printer, Plotter, Graphic monitor, Disc drives etc.).
 - 2.4 He must acquire skill in operating and testing the working of different subsystems installed.
 - 2.5 He must acquire skill making (or designing) layout on printer circuits board for a given electronic circuit.
 - 2.6 He must acquire skill in fabricating (electronic circuit using different electronic components including ICs) on a printed circuit board according to a given circuit diagram.

- 2.7 He must acquire skill testing the performance of an electronic circuit fabricated on a printed circuit board making use of different electronic instruments.
3. Attitude:
 - 3.1 He should have open minded approach while finding fault in the system.
 - 3.2 He should have analytical approach while dealing with any problem.
 - 3.3 He should be a keen observer while finding fault with the system and circuits.
 - 3.4 He should have habit of reading commercial and technical literature regarding computer.

COURSE OBJECTIVE	CURRICULUM AREA			
	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject	Basic Science Subject
1.1 He must have acquire basic concept in Electronic Drawing (including standard symbols for electronic components (active as well as passive)).		Electronic component & Material	Engineering Drawing, Electrical & Electronic Drawing.	Applied Physics
1.2 He must acquire basic concepts and principles of working of linear and digital circuits using discrete components & integrated circuits.		Electronic Devices & ckts principles of digital electronics.	Electrical Engineering	Applied Physics, Applied Mathematics
1.3 He must have the knowledge of testing procedure of active and passive components (including integrated circuits) by making use of different test instruments as per to their specification.		Electronic Device & circuits; digital ckts Electronic measurement & instrument Electronic workshop (Printed circuits.	Electrical & Electronics Drawing.	
1.4 He must acquire knowledge of system block diagram and working principles of different computer peripherals.	Computer architecture, peripherals & interface.	Digital Ckts & systems.	Applied Electrical Engineering.	Applied Physics, Applied Mathematics
1.5 He must acquire the knowledge of making PCB layouts and learn drafting technique.	Project (He should make layouts of PCB in this project.	Electronic drawing & design; Electronic workshop.		
1.6 He must acquire the knowledge of efficient use of system software by writing a small diagnostic programme to test the system.	Communication & Data Transmission computer architecture microprocessor & application, Communication Data transmission peripherals & Interfaces, Introduction to			Applied Mathematics

COURSE OBJECTIVE	CURRICULUM AREA			
	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject	Basic Science Subject
	system software data structure.			
1.7 He must acquire the knowledge of working principles of the total system, i.e. C.P.U., peripherals, interface and system software.	Peripherals & Interface Introduction to system software computer architecture & microprocessor & its application.	Digital Electronics, Computer test measuring equipment	Engineering Drawing	Applied Mathematics
2. Skills				
2.1 He must have acquire skill in finding faults in a computer system. the fault may be at component level or at card level or at subsystem level. After finding fault he must be able to repair it.	Fault diagnosis installation & Maintenance documentation & fabrication.	Digital Electronics, Electronic devices & circuits Test & measuring equipment	Electronic Drawing, Engineering Drawing.	
2.2 He must acquire skill in preparation of site for installation of computer.	Installation & Maintenance.	Applied Electrical Engg. Principles of Electrical Engg.	Engineering Drawing, Mechanical Engineering Drawing.	
2.3 He must acquire skill in installing different subsystem power supply, VDU, Printer, Plotter, Graphic monitor, Disc drive etc.	Computer architecture installation & maintenance peripherals & interface.	Electronic Devices & Circuits. Digital Electronics.	Engineering Drawing, Workshop Practice	Applied Physics
2.4 He must acquire skill in operating and testing the working of different subsystem installed.	Inatallation & Maintenance Computer Architecture peripheral & interfaces.	Electronic Instruments & Measuring & Digital electronics, Electronic devices & circuits.		
2.5 He must acquire skill in making (or designing layouts on printed circuited board for a given electronic circuit.	Project	Electronic workshop, Electronic device & circuits.		

COURSE OBJECTIVE	CURRICULUM AREA			
	Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Subject	Basic Science Subject
2.6 He must acquire skill in fabrication an electronic components (including ICs) on a printed circuit board according to a given circuit diagram.	Project & Industrial training	Electronic workshop, Electronic devices & circuits, Digital circuit & system, Electronic drawing.	Engineering Drawing, Workshop Practice (Mechanical)	
2.7 He must acquire skill in testing the performance of an electronic circuit fabricated on a printed circuit board.	Project fundamental of digital control	Digital circuits & system, Electronic Device & circuits, Electronic Instrument & measurement, Electronic measurement & Instrument, Electronic drawing, Electric workshop.	Engineering Drawing	
2.8 He must acquire skill in writing specification of a computer and its subsystem and peripherals. Making use of the quotations he must be able to make a comparative statement.	Computer architecture peripheral & interfaces industrial management			
2.9 He must acquire skill in arranging demonstration of a computer system and its peripherals.	Computer architecture Test & measuring equipment Microprocessor & Application. Peripheral & Interface. Industrial training.	Principles of Electrical Engg., Applied Electrical Engg., Electronics Drawing.	Engineering Drawing, Workshop Practice	
2.10 He must acquire skill in preparation of documents (to be used in production, sales, maintenance & installation) with the help and guidance from an engineer.	Documentation Fabrication. Reporting writing. Installation & Maintenance Fault diagnosis peripheral &	Electronic Drawing, Digital Electronics. Electronic Devices & Circuits. Electronic	Engineering Drawing, Workshop Practice	

COURSE OBJECTIVE	CURRICULUM AREA			
Specialised Tech. Area	Core Engg. For Computer Engineering	Basic Engg. Science Subject	Basic Science Subject	
interface project. Computer organisation & programming.	Workshop.			

1.1 I Semester
 FOUNDATIONAL COMMUNICATION
 SECTION "A" (ENGLISH)

L T P
 4 - -

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
Section A English				
1.	PARTS OF SPEECH	12	-	-
2.	VOCABULARY BUILDING	05	-	-
3.	Grammar	15	-	-
4.	DEVELOPMENT OF EXPRESSION (Composition)	12	-	-
Section B Hindi				
5.	Topic 5	2	-	-
6.	Topic 6	5	-	-
7.	Topic 7	5	-	-
		56	-	-

DETAILED CONTENTS

1. **PARTS OF SPEECH :**
 - a. Noun
 - b. The pronoun : Kinds and Usage
 - c. The adjective : Kinds and Degree
 - d. Determiner : Articles
 - e. The verb : Kinds
 - f. The Adverb : Kinds, Degree and Usage
 - g. Prepositions
 - h. Conjunctions
 - i. The Interjections
 - j. Subject: Verb Agreement (Concord)
2. **VOCABULARY BUILDING :**
 - a. Antonyms and Synonyms
 - b. Homophones
 - c. One word substitutions
 - d. Idioms and Phrases
 - e. Abbreviations
3. **Grammar**
 - a. Sentence & its types
 - a. Tenses
 - b. Punctuations
 - c. Active and Passive voice
 - d. Transformation of Sentences
 - e. Synthesis of Sentences
 - f. Direct and Indirect Narrations
4. **DEVELOPMENT OF EXPRESSION (Composition) :**

- a. Paragraph Writing
- b. Essay Writing
- c. Proposal Writing
- d. Letter Writing (Formal, Informal, Business, official etc.)
- f. Report Writing
- g. Note Making
- h. News Making
- i. Application Writing
- j. Minute Writing
- k. Invitation Letter Writing

SECTION "B" (Hindi)

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1.2 APPLIED MATHEMATICS I(A)
[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	8	3	-
2.	Algebra- II	8	3	-
3.	Trigonometry	6	2	-
4.	Differential Calculus-I	10	3	-
5.	Differential Calculus-II	10	3	-
		42	14	-

DETAILED CONTENTS:

1. ALGEBRA-I : (10 Marks)
 - 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, Cramer's rule
2. ALGEBRA-II:(10 Marks)
 - 2.1 Vector algebra : Dot and Cross product, Scaler and vector triple product.
 - 2.2 Complex number.

Complex numbers, Representation, Modulus and amplitude, De Moivre theorem, its application in solving algebraic equations, Mod. function and its properties..
3. TRIGONOMETRY :(8 Marks)
 - 3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relationship between sides and angle of a triangle.
 - 3.2 Inverse circular functions : Simple case only
4. DIFFERENTIAL CALCULUS - I : (12 Marks)
 - 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.
- 5. DIFFERENTIAL CALCULUS -II :(10 Marks)
 - 5.1 Higher order derivatives, Leibnitz theorem.
 - 5.2 Special functions (Exponential, Logarithmic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.
 - 5.3 Application - Finding Tangents, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

1.3 APPLIED PHYSICS-I

[Common to All Engineering Courses]

L T P
3 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.	Units & Dimensions	3	1	-
2.	Errors in Measurement	3	1	-
3.	Circular Motion	4	1	-
4.	Motion of Planets	4	1	-
5.	Dynamics of rigid body (Rotational Motion)	5	1	-
6.	Fluid Mechanics and Friction	4	1	-
7.	Friction	4	1	-
8.	Harmonic Motion	5	2	-
9.	Heat & Thermodynamics	6	4	-
10.	Acoustics	4	1	-
		42	14	-

DETAILED CONTENTS:

1. Units and Dimensions (4 Marks)

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.

2. ERRORS AND MEASUREMENT (4 Marks)

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,

3. Circular Motion (5 Marks)

Central forces. Uniform Circular motion (Horizontal and Vertical cases), 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.

4. MOTION OF PLANETS AND SATELLITES :(5 Marks)

Gravitational force, Acceleration due to gravity and its variation w.r. to height and depth from earth, Kepler's Law, Escape and orbital velocity, Time period of satellite, Geo-stationary, Polar satellites (Concept Only)

5. Dynamics of Rigid Body (Rotational Motion) (6 Marks)

Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies (Lamina, Sphere, Disc, Cylindrical), Concept of Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling of sphere on the slant plane. Concept of Fly wheel.

6. Fluid Mechanics :(5 Marks)

Surface tension, Capillary action and determination of surface tension from capillary rise method, Equation of continuity ($A_1V_1=A_2V_2$), Bernoulli's theorem, and its application stream line and Turbulent flow, Reynold's number.

7. Friction :(4 Marks)

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

8. Harmonic Motion (6 Marks)

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 its periodic time. Energy conservation in S.H.M.. Concept of phase, phase difference, Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. Heat & Thermodynamics: (6 Marks)

Modes of heat transfer (Conduction, Convection and Radiation), coefficient of thermal conductivity Isothermal and adiabatic process. Zeroth First, Second Law of Thermodynamics and Carnot cycle, Heat Engine (Concept Only).

10. Acoustics (5 Marks)

Definition of pitch, loudness, quality and intensity of sound waves. Echo, reverberation and reverberation time. Sabine's formula without Derivation. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.

1.4 ELECTRICAL ENGINEERING
(Common with Three year diploma in IT)

L T P
6 - 4

RATIONALE

Electrical energy is most convenient neat and clean source of energy for industrial applications. The student is supposed to posses 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	4	-	-
2.	Conducting Materials	8	-	-
3.	Insulating Materials	8	-	-
4.	Magnetic Materials	8	-	-
5.	Semi Conductor & Special Purpose Materials	8	-	-
6.	D. C. Circuits	8	-	-
7.	Electrostatics	8	-	-
8.	Electromagnetism	8	-	-
9.	A. C. Theory	8	-	-
10.	Batteries	8	-	-
Total		84	-	56

DETAILED CONTENTS

1. CLASSIFICATION:

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

2. 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.

3. Insulating Materials:

A. Electrical Properties:

Volume resistivity, Sarface 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, Abrasive 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.

4. 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.

5. 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.

6. 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 super position theorem, simple numerical problems.

7. 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.
8. 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.
9. 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.
10. 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.

ELECTRICAL ENGINEERING LAB:

LIST OF PRACTICALS:

1. Identification and study of commonly used electrical materials such as wires, cables, switches, fuses, coiling, rose battens, Cloatd and allied items.
2. Ohm's law verification.
3. To verify the laws of series and parallel connections of resistances i.e. to verify:-
 - (i) The total resistance in series connections.
$$R_T = R_1 + R_2 + R_3 + \dots$$

Where R_T 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.
$$1/R_T = 1/R_1 + 1/R_2 + 1/R_3 + \dots$$

Where R_T 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.
4. 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.
5. 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.
6. To verify Thevenin's and maximum power transfer theorems.
7. 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.
8. To verify the relation:-
$$C_T = (C_1 * C_2) / (C_1 + C_2)$$
and
$$C_T = C_1 + C_2$$

For two capacitors, connected in series and parallel respectively.
9. To test a battery for charged and discharged conditions and to make connections for its charging.
10. 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.

1.5 Basics of Information Technology

L T P
4 - 4

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

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction of Information Technology	8	-	-
2.	Component of Information technology	10	-	-
3.	Data Representation	12	-	-
4.	Emerging Trends	8	-	-
5.	Components of Computers	8	-	-
6.	Mobile Computing	10	-	-
		56	-	56

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 Octa decimal 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 .

5. Components of computer

Types of PC e.g. Desktops, Laptops, Notebooks, Palmtops, Memory System of a PC, Primary Memory, RAM(Random Access Memory, ROM(read only Memory), Secondary Memory, Types of

Secondary Storage, Access Mechanism of storage Devices, PC setup and ROM-BIOS, Elementary Trouble shooting.

6. MOBILE COMPUTING :

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

LIST OF PRACTICALS

1. Given a PC, name its various components and list their functions
2. Identification of various parts of a computer and peripherals
3. Practice in installing a computer system by giving connection
4. DOS Commands (internal / external) e.g. TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP
5. Exercises on entering text and data (Typing Practice using any tutor)
6. Features of Windows as an operating system
 - Start
 - Shutdown and restore
 - Creating and operating on the icons
 - Opening closing and sizing the windows
 - Using elementary job commands like - creating, saving, modifying, renaming, finding and deleting a file
 - Creating and operating on a folder
 - Changing setting like, date, time color (background and foreground)
 - Using short cuts
 - Using on line help

II Semester
2.1 APPLIED MATHEMATICS I (B)
 [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.	Integral Calculus-I	12	4	-
2.	Integral Calculus-II	12	4	-
3.	Coordinate Geometry (2 Dimensional)	10	3	-
4.	Coordinate Geometry (3 Dimensional)	8	3	-
		42	14	-

DETAILED CONTENTS:

1. INTEGRAL CALCULUS - I : (14 Marks)
 - Methods of Indefinite Integration :-
 - 1.1 Integration by substitution.
 - 1.2 Integration by rational function.
 - 1.3 Integration by partial fraction.
 - 1.4 Integration by parts.
2. INTEGRAL CALCULUS -II :(14 Marks)
 - 2.1 Meaning and properties of definite integrals, Evaluation of definite integrals. Integration of special function.
 - 2.2 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.
 - 2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases.
3. CO-ORDINATE GEOMETRY (2 DIMENSION):(14 Marks)
 - 3.1 CIRCLE :
 - Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.
 - 3.2 Standard form and simple properties
 - Parabola $x^2=4ay$, $y^2=4ax$,

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

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

4. CO-ORDINATE GEOMETRY (3 DIMENSION):(8 Marks)

4.1 Straight lines and planes in space -

Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line and Plane (Different Forms),

4.2 Sphere $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz = d$ (Radius, Centre and General Equation)

2.2 APPLIED PHYSICS-II

[Common to All Engineering Courses]

L T P
3 2/2 4

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.	Optics	4	1	-
2.	Introduction To Fiber Optics	4	1	-
3.	Laser & its Application	4	1	-
4.	Electrostatics	4	1	-
5.	D.C. Circuits	4	1	-
6.	Magnetic Materials & Their Properties	4	1	-
7.	Semi Conductor Physics	4	1	-
8.	Introduction Diode & Transistors	4	2	-
9.	Introduction To Digital Electronics	4	2	-
10.	Non-conventional energy sources	6	3	-
		42	14	56

1. Optics (4 Marks)

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Destructive), Diffraction and Polarization (Concept Only), Law of Malus and Polaroids.

2. Introduction To Fibre Optics :(5 Marks)

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.

3. Lasers and its Applications (4 Marks)

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :(4 Marks)

Coulomb's Law, Electric field, Electric potential, Potential energy, Capacitor, Energy of a charged capacitor, Effect of dielectric on capacitors.

5. D.C. Circuits (5 Marks)

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties: (5 Marks)

Dia, Para and Ferro-magnetism, Ferrites, Magnatic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics (4 Marks)

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

8. Junction Diode and Transister : (6 Marks)

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

9. Introduction To Digital Electronics : (6 Marks)

Concept of binary numbers, Interconversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources: (7 Marks)

- (a) Wind energy : Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill.
- (b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

PHYSICS LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph T^2 verses l and using the formula $g=4\pi^2/\text{Slope of the graph line}$
3. Determine the force constant of combination of springs incase of 1. Series 2. Parallel.

4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of E_1/E_2 of cells by potentiometer.
8. Determination of specific resistance by Carey Foster bridge.
9. Determination of resistivity by P.O.Box.
10. Verification of Kirchoff's Law.
11. To draw Characteristics of p-n Junction diode.
12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

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.

2.3 APPLIED CHEMISTRY

[Common to All Engineering Courses]

L T P
6 - -

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	4	-	-
4.	Electro Chemistry-I	7	-	-
5.	Electro Chemistry-II	8	-	-
6.	Chemical Kinetics	4	-	-
7.	Catalysis	4	-	-
8.	Solid State	4	-	-
9.	Fuels	4	-	-
10.	Water Treatment	6	-	-
11.	Colloidal State	4	-	-
12.	Lubricants	4	-	-
13.	Hydrocarbons	7	-	-
14.	Organic Reactions & Mechanism	8	-	-
15.	Polymers	4	-	-
16.	Synthetic Materials	6	-	-
-----		84	-	-

DETAILED CONTENTS:

1. ATOMIC STRUCTURE :(3 MARKS)
Basic concept of atomic structure, Matter wave concept, Quantum number, Haisenberg's Uncertainty Principle, Shaples of orbitals.
2. CHEMICAL BONDING :(4 MARKS)
Covalent bond, Ionic & Co-ordinate, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory.
3. CLASSIFICATION OF ELEMENTS :(3 MARKS)
Modern classification of elements (s,p,d and f blcok elements), Periodic properties : Ionisation potential electro negativity, Electron affinity.

4. ELECTRO CHEMISTRY-I:(3 MARKS)

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 numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application,

5. ELECTRO CHEMISTRY-II:(3 MARKS)

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. Chemical and Electrochemical theory of corrosion, Galvenic Series. Prevention of corrosion by various method.

6. CHEMICAL KINETICS :(3 MARKS)

Law of mass action, order and molecularity of rection. Activation energy, rate constants, Ist order reactions and 2nd order reactions.

7. CATALYSIS :(2 MARKS)

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

8. SOLID STATE :(2 MARKS)

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. FUELS :(3 MARKS)

Definition, its classification, high & low Calorific value.Determination of calorific value of solid and liquid fuels by Bomb calorimeter.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alchol. Knocking, Anti-knocking agents, Octane number and Cetane number.

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

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

Numerical Problems based on topics

10. WATER TREATMENT :(3 MARKS)

Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, scale and sludge formation, Corrosion, Caustic embrittlement, primming and

foaming in bioreactors.

Disinfecting of Water By Chloramine-T, Ozone and Chlorine. Advantage and disadvantage of chlorination, Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical Problems based on topics.

11. COLLOIDAL STATE OF MATTER : (3 MARKS)

Concept of colloidal and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electro dialysis. 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.

12. LUBRICANTS : (3 MARKS)

Definition, classification, Necessity 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.

13. HYDROCARBONS: (4 MARKS)

- A. Classification and IUPAC nomenclature of organic compounds homologous series (Functional Group)
- B. Preparation, properties and uses of Ethane, Ethene, Ethyne (Acetylene), Benzene and Toluene.

14. ORGANIC REACTIONS & MECHANISM: (4 MARKS)

- 1. Fundamental aspects -
 - A. Electrophiles and nucleophiles, Reaction Intermediates, Free radical, Carbocation, Carbanion
 - B. Inductive effect, Mesomeric effect, Electromeric effect.
- 2.A. Mechanism of addition reaction (Markovnikov'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.

15. POLYMERS : (3 MARKS)

- 1. Polymers and their classification. Average degree of polymerisation, Average molecular weight, Free radical polymerisation (Mechanisms)

2. Thermosetting and Thermoplastic resins -
 - 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. General concept of Bio polymers, Biodegradable polymers and inorganic polymers(Silicon)
16. SYNTHETIC MATERIALS :(4 MARKS)
 - A. Introduction - Fats and Oils
 - B. Saponification of fats and oils , Manufacturing of soap.
 - C. Synthetic detergents, types of detergents and its manufacturing.
3. EXPLOSIVES: TNT, RDX, Dynamite.
4. Paint and Varnish

2.4 FUNDAMENTALS OF ELECTRONICS DEVICES.
(Common With Three Year Diploma Course In IT)

L T P
6 - 3

Rationale:

Knowledge of Electronics Devices is quite essential for a student 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.

TOPIC WISE DISTRIBUTION OF PERIODS

Sr. No.	Units	Coverage Time		
		L	T	P
1.	Introduction	8	-	-
2.	Introduction of active & Passive components	8	-	-
3.	Semiconductor Physics	10	-	-
4.	Semiconductor Diodes	12	-	-
5.	Transistor	10	-	-
6.	Transistor as an amplifier	10	-	-
7.	Concepts of Feedback	10	-	-
8.	Transistor as a Switch	8	-	-
9.	Integrated Circuits	8	-	-
Total		84	-	42

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. Introduction of active & Passive components

- 2.1 Resistor-Working characteristics/properties, resistors -carbon film, metal film, carbon composition, wire wound and variable type (presets and potentiometers), characteristics (size, voltage, tolerance)
- 2.2 Capacitors-Working characteristics/Properties, capacitors -polyester, metalized polyester, ceramic paper mica and electronic tantalum, solid aluminium types

3. SEMICONDUCTOR PHYSICS:

- 3.1 Analyzing conductivity of elements, Types of conductors.
- 3.2 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.
- 3.3 Doping the Intrinsic semiconductors with a pentavalent

valent/tri-valent element(i.e. doner and acceptor type impurity) in small amount, effect of doping on strength of charge carrirs(formation of immobile ions and majority and minority carriers), P,N Junction.

3.4 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.

4. SEMICONDUCTORS DIODES:

4.1 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.

4.2 Analyzing the flow of current in both the directions, cause of the difference in magnitudes of current in the two directions.

4.3 Characteristics of a P-N Junction diode in forward/reverse biasing.

4.4 Concepts of unidirectional and bi-directional flow of currents. Effect of putting in diode in series with a load connected across an ac source.

4.5 Half wave rectifier, Full wave rectifier⁹ using C.T. transformer, using bridge circuits)

4.6 Special purpose diodes:Zener diode, Vreactor diode,Photo Diode,Light emitting Diode (LED), their chractersitics and uses.

5. TRANSISTOR:

5.1 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;

5.2 Various configurations of transistor (CB,CE,CC);relation between.Transistor action in three configuration; Comparison between the three configuration of transistor;

5.3 Input and Output characteristics of a transistor;

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

6. TRANSISTOR AS AN AMPLIFIER:

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

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

- 6.3 Need of using multi- stages; how to couple two stages ; various coupling arrangements(R-C coupling,Transformer coupling, Direct coupling):
- 6.4 Effect of coupling arrangement on the requery response of a two stage amplifieer; frequency response curve of a RC coupled amplifier; a transformer coupled amplifier; band with of an amplfier.
- 7. OPERATIONAL AMPLIFIERS:
 - 7.1 Specifications of ideal operational amplifier and its block diagram.
 - 7.2 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 (CMMR), power supply rejection ratio (PSRR) and slew rate.
 - 7.3 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 appliation and IC power amplifier.
- 8. FEED BACK IN AMPLIFIER:
 - 8.1 Concept of Feed back;
 - 8.2 Types of feed back(Positive, Negative); different arrangement of feed back(series voltage, series- current, shunt -voltage, shunt current);
 - 8.3 Voltage gain of feed back amplifier;($A' = A / (a + A)$)
 - 8.4 Analysis of Negative feed back arrangement on (Gain,Stability, Noise, Input/output impedances, Band width); Amplifier circuits with negative feed back;
 - 8.5 Positive feed back; condition for infinite gain($AB=1$ in Positive feed back)
 - 8.6 Oscillator as an infinite gain feed back.
- 9. INTEGRATED CIRCUITS:
 - 9.1 Introduction;
 - 9.2 Manufacturing process;
 - 9.3 SSI, MSI, LSI, VLSI, ICs;
 - 9.4 Linear and Digital ICs;
 - 9.5 Switching and Gating ICs;
 - 9.6 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. Use OP-AMP as inverting and non-inverting amplifier, Use as Adder, Subtractor, Intergator and differentator.

2.5 CONCEPT OF PROGRAMMING USING C
(Common with Three year diploma in IT)

L T P
6 - 6

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	12	-	
2.	Introduction to Programming in C	12	-	-
3.	Fundamentals of C Programming	12	-	
4.	Conditional Program Execution	12	-	
5.	Function	12	-	
6.	Arrays	12	-	
7.	Pointers	12	-	
		84	-	84

DETAILED CONTENTS

1. CONCEPT OF PROGRAMMING:
 Concept of Flowcharting, algorithm, programming, Structured Programming Various techniques of programming, Use of programming.
2. INTRODUCTON TO PROGRAMMING IN C:
 Standard I/o in C, Fundamental data types- Character types, Integer, Short, Long, Unsigned, Single and Double floating point, Storage classes - Automatic, Register, Static and External, Operators and Expression using numeric and relational operators, Mixed operands, Type of conversion, Logical operators, Bit operators, Assignment operator, Operator precedence and associatively.
3. FUNDAMENTALS OF C PROGRAMMING :
 Structure of C program, writing and executing the first C program, components of C language, Standard I/O in C.
4. CONDITIONAL PROGRAM EXECUTION :
 Applying if and switch statements, nesting if and else, use of break and default with switch, program loops and iterations: use of while, do while and for loops, multiple loops variables, use of break and continue statement.
5. FUNCTIONS :
 Introduction, types of functions, functions with array, passing values to functions, recursive fuctions.

6. ARRAYS :

Array notation and representation, manipulating array elements, using multi dimensional arrays, Structure, union, enumerated data types.

7. POINTERS :

Introduction, decaration, applicaitons, File handling, standard C preprocessors, defining and calling macros, conditonal compilation, passing values to the compiler.

List of Experiments
(Using GCC/Turbo/Borland compiler techniques)

1. WAP to Print an Integer Entered by the User
2. WAP to Add Two Integers
3. WAP to Multiply two Floating Point Numbers
4. WAP to Find ASCII Value of a Character
5. WAP to Swap Two Numbers
6. WAP to Check Whether a Number is Even or Odd
7. WAP to Find the Largest Number Among Three Numbers
8. WAP to Check Leap Year
9. WAP to Find GCD of two Numbers
10. WAP to Find LCM of two Numbers
11. WAP to Display Fibonacci Sequence
12. WAP to Count Number of Digits of an Integer
13. WAP to Check Whether a word is Palindrome or Not
14. WAP to Check Whether a Number is Prime or Not
15. WAP to Make a Simple Calculator Using switch...case
16. WAP to Display Prime Numbers Between Intervals Using Function
17. WAP to Check Whether a Number can be Express as Sum of Two Prime Numbers
18. WAP to Find the Sum of Natural Numbers using Recursion
19. WAP to Find the Length of a String
20. WAP to Concatenate Two Strings
21. WAP to Find Largest Element of an Array
22. WAP to Add Two Matrix Using Multi-dimensional Arrays
23. WAP to Access Elements of an Array Using Pointer
24. Write a C++ program to take user input for ten numbers and then display the average of these numbers.
25. Write a C++ to make a simple calculator that performs addition, subtraction, multiplication and division using used defined functions.

III Semester

3.1 APPLIED MATHEMATICS II [Common to All Engineering Courses]

L	T	P
5	2	-

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	16	6	-
2.	Differential Calculus	15	6	-
2.	Differential Equations	15	6	-
4.	Integral Calculus	12	5	-
5.	Probability & Statistics	12	5	-
		70	28	-

DETAILED CONTENTS

1. MATRICES :(12 Marks)

1.1 Algebra of Matrices, Inverse :

Addition, Multiplication of matrices, Null matrix and a unit matrix, Square matrix, Symmetric, Skew symmetric, Hermitian, Skew hermitian, Orthogonal, Unitary, diagonal and Triangular matrix, Determinant of a matrix.

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 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. DIFFERENTIAL CALCULUS :(10 Marks)
- 2.1 Function of two variables, identification of surfaces in space, conicoids
- 2.2 Partial Differentiation :
Directional derivative, Gradient, Use of gradient f , Partial derivatives, Chain rule, Higher order derivatives, Eulers theorem for homogeneous functions, Jacobians.
- 2.3 Vector Calculus :
Vector function, Introduction to double and triple integral, differentiation and integration of vector functions, gradient, divergence and curl, differential derivatives.
3. DIFFERENTIAL EQUATION :(10 Marks)
- 3.1 Formation, Order, Degree, Types, Solution :
Formation of differential equations through physical, geometrical, mechanical and electrical considerations, Order, Degree of a differential equation, Linear, Nonlinear equation.
- 3.2 First Order Equations :
Variable seperable, equations reducible to seperable forms, Homogeneous equations, equations reducible to homogeneous forms, Linear and Bernoulli form exact equation and their solutions.
- 3.3 Higher Order Linear Equation :
Property of solution, Linear differential equation with constant coefficients (PI for $X=e^{ax}$, $\sin ax$, $\cos ax$, X^n , $e^{ax}V$, XV).
- 3.4 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
4. INTEGRAL CALCULUS - II: (12 Marks)
- 4.1 Beta and Gamma Functions :
Definition, Use, Relation between the two, their use in evaluating integrals.
- 4.2 Fourier Series :
Fourier series of $f(x)$, $-n < x < n$, Odd and even function, Half range series.
- 4.3 Laplace Transform :

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

5. PROBABILITY AND STATISTICS :(6 Marks)

5.1 Probability :

Introduction, Addition and Multiplication theorem and simple problem.

5.2 Distribution :

Discrete and continuous distribution, Binomial Distribution, Poisson Distribution, Normal Distribution..

3.2 DATA STRUCTURE USING C
(Common with Three year diploma in I.T, Post G. Diploma In Computer Application)

L T P
5 - 5

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.	6	-	
2.	Lists	12	-	
3.	Stacks And Queues	10	-	
4.	Sorting & Merging	10	-	
5.	Tables	10	-	
6.	Trees	12	-	
7.	Graphs	10	-	
		70	-	70

DETAILED CONTENTS

1. BASIC CONCEPTS:

- 1.1 Problem solving concept, top down and bottom up design, Structured programming, concept of data type, variable And constants, Concept of pointer variable and constant, Introduction to data structure(Linear, Non Linear, Primitive, Non Primitive), Concept of data structure(Array, Linked list Stack, Queue, Trees, Graphs).
- 1.2 Arrays : Concept of arrays, single dimensional array, Two Dimensional array Representation of two dimensional array (Base address, L.B., U.B), Operation of arrays with algorithms (Searching, traversing, inserting, deleting)

2. LISTS:

Introduction to linked list and double linked list, Representation Of linked lists in memory, comparison between linked list and Array, Traversing a link list, Searching a link list, Insertion And deletion into linked list(Ar first node, Specified Position, Last node), Application of link list, Doubly linked lists, Traversing a doubly link lists, Insertion and deletion into doubly Link list.

3. Stacks And Queues

Introduction to stacks, representation of stacks with array and link List, Implementation of stacks, Application of stacks (Polish Notations, converting infix to post fix notation, evaluation of Post fix notation, tower of Hanoi), Recursion : concept and Comparison between recursion and iteration, Introduction to queues, Implementation of queues, Circular queues, De-queues

4. SORTING ALGORITHMS

Introduction, Search algorithm(Linear and Binary), Concept
Of sorting.
Insertion sorts, Bubble sort, Quicksort, Mergesort, Heapsort

5. Tables: -

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

6. TREES

Concept of Binary Trees (Complete, Extended Binary Tree), Concept
Of representation of Binary Tree, Concept of balance Binary Tree,
Traversing Binary Tree(Pre order, Post order and In Order), Searching
Inserting and deleting in binary search tree.

7. Graphs:

Depths-first-search.

DATA STRUCTURE USING C

List of Experiments

1. Make a program to insert 10 elements in an array by taking user input.
2. Make a program that demonstrates deletion of elements from beginning, middle, last position from an array.
3. Make a program for merging of elements of two arrays.
4. Make a program that demonstrates PUSH operation of stack.
5. Make a program that demonstrates POP operation of stack.
6. Make a program to insert elements in a linear queue.
7. Make a program to insert elements in a circular queue.
8. Make a program that demonstrates the working of simple list for inserting elements at beginning position, middle position and at the end of list.
9. Make a program that demonstrates the working of circular list for inserting elements at beginning position, middle position and at the end of list.
10. Write a program for insertion sorting.
11. Write a program for bubble sorting.
12. Write a program for quick sort.
13. Write a program for merge sort.
14. Write a program for heap sort.
15. Make a program for binary search.
16. Make a program for linear search.
17. WAP to Create a Tree.
18. WAP to check whether a Tree is a Binary Search Tree.
19. WAP program to construct a B Tree.
20. WAP for Depth First Binary Tree Search

LIST OF BOOKS

1. Data Structure - Schaum's Outline Series - McGraw Hill
2. Data Structure - Schaum's Series - McGraw Hill Publications
3. Horwitz and Sartaj Sahni - Data Structure
4. Tanenbaum - Data Structures - Prentice Hall of India, New Delhi
5. Kanekar Yashwant - Data Structure through C, BPB Publication

3.3 WEB TECHNOLOGY - I
(Common with Three year diploma in IT)

L T P
4 - 4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	10	-	-
2.	Topic 2	14	-	-
3.	Topic 3	14	-	-
4.	Topic 4	8	-	-
5.	Topic 5	10	-	-
		56	-	56

1. HTML :

Elements of HTML, HTML sources and Rules of nesting, Syntax conventions, HTML categories, Text tags, Formatting Web Pages by using styles, Adding pictures, Image attribute, introduction to forms, tables and models, advantages and limitations of tables, frames, link, CSS cascading style sheets, XHTML, XML, Client side scripting, Server side scripting, Managing data with SQL.

2. JAVA SCRIPTS:

What is Java scripts, adding, Java scripts to documents, embedding Java scripts, Linking Java scripts, Creating a page program with scripts, What is Java and its applets to make webpage run server scripts, active X.

3. XML :

Introduction to XML, Difference between XML and HTML, Use of XML, XML Syntax Rules, XML Elements, XML attribute, XML name space, Displaying XML, XML validator, XML application, RSS FEED,JSON.

4. CSS :

CSS Introduction, CSS Syntax, CSS selectors : Element Selector, id Selector, Class Selector, Grouping Selectors, Implementing CSS, JQuery, Image Format (JPG, PNG, GIF).

5. JQUERY :

Jquery Concept, jquery library functions, use of custom script

LIST OF PRACTICALS

1. Exercises on to static web sites.
2. Development of different web sites using open source tools

3.4 DIGITAL ELECTRONICS & MEASURING INSTRUMENTS

L P
6 4

S.NO.	Topics	L	P
1	Introduction to digital electronics	4	
2	Number system	4	
3	Codes and code conversion	4	
4	Logic gates	8	
5	Logic families and digital ics	10	
6	Encoder, decoders & display devices	8	
7	associated circuits	12	
8	Flip flops and counters	8	
9	Shift registers	8	
10	Memories	6	
11	A/d and d/a converters	12	
	Basic measuring instruments		
Total		84	56

1. INTRODUCTION TO DIGITAL ELECTRONICS;
 - 1.1 Basic difference between analog and digital Signal.
 - 1.2 Application and advantages of digital signal processing.
2. NUMBER SYSTEM;
 - 2.1 Binary, Octal and Hexadecimal number system; conversion From decimal octal and hexadecimal to binary and vice-versa.
 - 2.2 Binary addition, subtraction, multiplication and division including binary numbers
 - 2.3 1's and 2's complements method subtraction.
3. CODES AND CODE CONVERSION
 - 3.1 The 8421 and excess-3 codes; mention of other popular BCD Codes
 - 3.2 Addition of 8421, BCD coded numbers its limitations and Excess-3 coded numbers.
4. LOGIC GATES;
 - 4.1 Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates.
 - 4.2 Concept of negative and positive logic. Use of NAND and NOR Gate as universal gate.
 - 4.3 Overview of Half Adder/Subtractor and Full Adder/ Subtractor (Block Diagram Only)
5. LOGIC FAMILIES AND DIGITAL ICS;
 - Logic family classification:
 - 5.1 Concept of Bipolar Logic, Diode Logic, Transistor Inverter, TTL logic, MOS, CMOS logic, ECL Logic
6. ENCODER, DECODERS & DISPLAY DEVICES ASSOCIATED CIRCUITS;
 - 6.1 LED, LCD, seven segment display. Basic operation of various commonly used types.
 - 6.2 Decoder circuits -for 7 segment display.
 - 6.3 Basic decimal to BCD encoder circuits.
 - 6.4 Basic Multiplexer and De multiplexer
7. FLIP FLOPS AND COUNTERS :
 - 7.1. Brief idea of Flip-Flops and their operations. RS, T, D, JK, Master/Slave JK Flip Flop mention commonly used ICs Flip flops.
 - 7.2 Counters and counters classification.
 - 7.3 Familiarization with commercial TTL/CMOS counters ICs.
8. SHIFT REGISTERS;
 - 8.1 Introduction and Basic concepts including shift left and shift right.
 - 8.2 Serial In Serial Out
Serial In Parallel Out

Parallel In Serial Out
Parallel In Parallel Out

8.3 Universal shift register.

9. MEMORIES

9.1 Classification according to the following heads.

- (a) Volatile and non-volatile memories.
- (b) Random access memories and sequential access.
- (c) Semiconductor and non-semiconductor memories.
- (d) Destructive and non-destructive memories.

9.2 Semi-conductor ROMs, PROMs, EPROM, FLASH, SRAM. DRAM, structure and working of CCD. R/W memory.

10. A/D AND D/A CONVERTERS:

10.1 Use of A/D and D/A converters.

11. BASIC MEASURING INSTRUMENTS

11.1 Multimeters - Analog & Digital - Basic principles of measurement & specifications

11.2 Cathode Rays Oscilloscope - Block diagram & basic working, specification, Different uses of CRO, Different types of CRO - dual trace, storage (Brief introduction)

LIST OF PRACTICALS

- 1 Verification of truth table for 2 input NOT, AND, OR, NAND, NOR, XOR Gates.
- 2 To construct a 4-bit even/odd parity generator/checker using XOR gates and to verify their truth tables.
- 3 Verification of truth table for half adder and half subtractor
- 4 Verification of truth table for full adder.
- 5 To construct a full adder circuit with XOR and NAND gates.
- 6 To verify the truth table for J-K, M/S and D type, R-S F/F.
- 7 To decode a 3 line to 8 line encode from 8 line to 3 line and to observe input and outputs.
- 8 Measurement of voltage, . Frequency of a signal using CRO.
 9. Different applications of a multimeter

3.5 OFFICE AUTOMATION TOOLS

(Common to Three Year Diploma in Information Technology)

L T P
4 - 6

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.

TOOLS : Following tools can be used for this subject
Libre Office, Open Office, MS Office

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Word Processing	14	-	-
2.	Spreadsheets	14	-	-
3.	Presentation	14	-	-
4.	Electronic Mail	14	-	-
		56	-	84

DETAILED CONTENTS

1. 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. SPREADSHEET:

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. PRESENTATION

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, Narration, View on two screen, Active buttons, Preset Animation, Custom - animation, Slide transition.

Window : New window, Arrange icons, Fit to page, Cascade.

4. Electronic Mail :

- Composing an Email Message
- Working with Address Book
- Automatically Add contents to Your Address Book
- Reading Email using Outlook Express
- Reading a message
- Checking for New Messages
- Reading file Attachment
- Taking Acting on a Messages
- Web Based Email
- Advantage os using Web Based Email.

List Of Practicals

1. Create a document using funcation : Saveas, Page Number, Bullets adn Numbering.
2. Create a document using styles and formatting option
3. Create a document using different fonts.
4. Create a document using the function page setup and page preview, then print that document.
5. Create a table and perform operation in it.
6. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. How to use mail merge in MS Word.
8. Create a Power Point presentation using slide designing.
9. Create, Save and Print the Power Point Presentation.
10. Create a Power Point Presentation using Clipart, Word Art Gallery and then add transition and animation effect.

LIST OF BOOKS

1. Microsoft Office 2010 For Dummies By Wallace Wang
2. 2007 Microsoft Office System Plain & Simple by Jerry Joyce- Microsoft Press
3. Office XP : The Complete Reference- Stephen L. Selson - Tata McGraw Hill Education.
4. Working in Microsoft Office - Richard Mansfield - Tata McGraw Hill Education.

IV Semester
4.1 Functional Communication

L T P
4 - -

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
Section A English				
1.	On Communication	04	-	-
2.	Exploring Space	04	-	-
3.	Sir C.V. Raman	04	-	-
4.	Professional Development	04	-	-
5.	Buying a Second Hand Bicycle	04	-	-
6.	Leadership and Supervision	04	-	-
7.	First Aid	03	-	-
8.	The Romanance of Reading	03	-	-
9.	No Escape from Computers	03	-	-
10.	Bureau of Indian Standards	03	-	-
Section B Hindi				
1.	Topic 1	02	-	-
2.	Topic 2	02	-	-
3.	Topic 3	02	-	-
4.	Topic 4	02	-	-
5.	Topic 5	02	-	-
6.	Topic 6	02	-	-
7.	Topic 7	02	-	-
8.	Topic 8	01	-	-
9.	Topic 9	02	-	-
10.	Topic 10	02	-	-
11.	Topic 11	01	-	-
56		-	-	-

Section "A" (English)

Text Lessons

- Unit I. On Communication
- Unit.II Exploring Space
- Unit.III Sir C.V. Raman
- Unit.IV Professional Development of Technicians
- Unit.V Buying a Second Hand Bicycle
- Unit.VI Leadership and Supervision
- Unit.VII First Aid
- Unit.VIII The Romanance of Reading
- Unit.IX No Escape from Computers
- Unit.X Bureau of Indian Standards

Section "B" Hindi

- 1& Lojkt xkj
- 2& Hkkj rh; oKkfudka , oa rduhfd; ka dk Hkkj r ds fodkl ea ; kxnku
- 3& xkE; fodkl

4& i fjokj fu; kstu
5& l keftd l l.Fkk; a
6& fu; kstu vlsj tu dY; k.k
7& Hkkjr ea i ks| kfxdh ds fodkl dk bfrgkl
8& gfjr dkkur
9& i ; kbj.k , oaekuo i mkk.k
10& Jfed dY; k.k
11& Hkkjr ea Jfed vktUnkyu

4.2 DATA COMMUNICATION AND COMPUTER NETWORKS

(Common to Diploma In Information Technology, Post Diploma In Information Technology)

L	T	P
6	-	4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	12	-	-
2.	Topic 2	9	-	-
3.	Topic 3	12	-	-
4.	Topic 4	9	-	-
5.	Topic 5	12	-	-
6.	Topic 6	9	-	-
7.	Topic 7	12	-	-
8.	Topic 8	9	-	-
		84	-	56

DETAILED CONTENTS

1. OVERVIEW OF DATA COMMUNICATION AND NETWORKING :

Introduction; Data Communication; Components, data representation (ASCII, ISO, etc.). Direction of Gata Flow (Simplex, Half duplex, Full duplex), Network; Distributed processing, Network criteria, Physical structure (Types of connection, Topology), Categories of network (LAN, MAN, WAN); Internet; Brief history, Internet today; Protocols and standards; Reference models; OSI reference model TCP/IP reference model, their comparative study.

2. PHYSICAL LAYER :

Overview of data (Analog and Digital), Singnal (Analog and Digital), Transmission (Analog and Digital) and Transmission media (Guided and Non-guided); TDM, FDM, WDM; Circuit switching; Time division and space division switch, TDM bus; Telephone network.

3. DATA LINK LAYER :

Types of errors, Framing (Character and bit stuffing), Error detection and Correction methods; Flow control; Protocols Stop and wait ARQ, Go-Back, NARQ, Selective repeat ARQ, HDLC.

Medium Access Sub Layer :

Point to point protocol, LCP, NCP, FDDI, Token bus, Toke ring; Reservation, Polling, Concetration; Multiple access protocols, CSMA,CSMA/CD, FDMA, TDMA, CDMA; Traditional Ethernet, Fast Ethernet.

4. NETWORK LAYER :

Internetworking and devices : Repeaters, Hubs, Bridges, Switches, Router, Gateway; Addressing : Internet address, Classful address, Subnetting; Routing : Techniques, Static vs. dynamic routing, Routing table for classful address; Routing algorithms: Shortest path algorithm, Flooding, Distance vector routing, Link state routing; Protocols ARP, RARP, IP, ICMP, IPV6; Unicast and multicast routing protocols.

5. TRANSPORT LAYER :

Process to process delivery; UDP, TCP; Congestion control algorithm; Leaky bucket algorithm, Token bucket algorithm, Choke packets; Quality of service; Techniques to improve QoS.

6. SESSION LAYER :

Functioning of session layer, OSI primitives.

7. APPLICATION LAYER :

DNS;SMTP;SNMP;FTP; HTTP & WWW; Security; Cryptography, Use authentication, Security protocols in internet Firewalls

8. EMERGING TECHNOLOGIES IN NETWORKING :

ISDN services and ATM; DSL technology, Cable modem, Sonet wireless LAN: IEEE 802.11; Introduction to blue-tooth, VLAN's, Cellular telephony and Satellite network.

Text Books

1. B. A. Forouzan - Data Communication and Networking (3 Ed.) - TMH.
2. A. S. Tanenbaum - Computer Networks (4 Ed.) - Pearson Education/ PHI.
3. W. Stallings - Data and Computer Communication (5 Ed.) - Pearson Education/ PHI.

LIST OF PRACTICALS

1. Identification of various networks components
 - Connection, BNC, RJ-45, I/O box
 - Cables, Co-axial, twisted pair, UTP
 - NIC (Network Interface Card)
 - Switch, Hub
2. Sketch wiring diagram of network cabling considering a computer lab of 20 systems.

3. Interfacing with the network card (Ethernet)
4. Preparing of network cables.
5. Establishment of a LAN
6. Use of protocols in establishing LAN
7. Trouble shooting of networks.
8. Installation of network device drivers.
9. Installation of networks (Peer Networking client server interconnection.
10. Use/installation of proxy server.

4.3 WEB TECHNOLOGY-II
(Common to Three Year Diploma in Information Technology)

L T P
6 - 6

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	20	-	-
2.	Topic 2	15	-	-
3.	Topic 3	15	-	-
4.	Topic 4	14	-	-
5.	Topic 5	20	-	-
		84	-	84

1. JAVA SERVLET :

Introduction to Server Mangement (Using TOM Cat)

Servlet introduction, working of servlet advantage of servlet, servlet terminology, introduction to servlet API, Servlet interface, Generics Servlet class, Http servlet class, Life cycle of a servlet.

2. JSP :

JSP introduction, JSP - Environment setup, JSP - Architecture, JSP- Life cycle, JSP-syntax, JSP-Directive, JSP-Actions, JSP- Implicit objects, JSP - Client request, JSP - Server response, JSP intergration with database.

3. AJAX :

AJAX Introduction, XMLHttpRequest, Request object, server response, AJAX events, Validation, Intratation with API

4. CROSS BROWSER COMPATIBILITY :

Introduction, Cross Browser compatibility issue, Fixing cross browser compatibility issue.

5. SESSION AND COOKIES :

Introduction to session and cookies, Session Management, Create and deletion of cookie with Java Script, Function to set a cookie, Function to get a cookie, Function to check and cookie.

LIST OF PRACTICALS

1. Exercises related to Java Servlet
2. Exercises related to JSP
3. Exercises related to ASP.
4. Exercises related to AJAX.
5. Exercises related to Cross Browser Compatibility.
6. Exercises related to Session and Cookies.

4.4 OPERATING SYSTEM

(Common to Three Year Diploma in Information Technology)

L T P
6 - 4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction	14	-	-
2.	Management of Operating System	40	-	-
3.	Case Study	30	-	-
		84	-	56

DETAILED CONTENTS

1. Introduction
Evolution of Operating, Computer system overview, characteristics of operating system, GUI, CUI, Single user, Multi user operating system Time Sharing and Real Time System.
2. Management of Operating System :
 - A. Process Management - Process concept, Process schedule, Process Synchronization, Inter process communication, CPU scheduling and dead lock.
 - B. Memory Management - Main memory, Contiguous memory allocation, Segmentation, Paging, Virtual memory, Demand paging, Page replacement, Allocation, Threading.
 - C. Input Output Management - Mass storage structure, Overview, Disk scheduling and Management. +
 - D. File Management - File concepts, File system and structure, Directory structure.
3. CASE STUDY :
Linux and Unix basic concepts, system administration requirement for Linux, System Administration

List Of Practicals

1. Practices on commands using Linux.
2. Practices on commands using Unix

LIST OF BOOKS

1. Milenekovie - Operating System Concept - McGraw Hill
2. Petersons - Operating System - Addison Wesley
3. Dietal - An Introduction To Operating System- Addison

Wesley

4. Tannenbaum - Operating System Design and Implementation - PHI
5. Gary Nutt- Operating System, A Modern Perspective- Addison Wesley
6. Stalling, William - Operating System - Maxwell Macmillan
7. Silveschatza, Peterson J - Operating System Concepts - Willey
8. Crowley - Operating System - TMH
9. UNIX Concepts and Applications, 4th Edition, Sumitabha Das- Tata McGraw Hill
10. UNIX and Shell Programming, Behrouz A Forouzan and Richard F Gilberg - Thomson Course Technology.
11. Unix Shell Programming - Y Kanetkar - BPB Publication

4.5 EMPLOYABLE SKILLS
(Common to Three Year Diploma in Information Technology)

L T P
- - 4

Rationale:

Diploma holders are required to not only possess subject related knowledge but also soft skills to get good jobs and to rise steadily at their workplace. This subject is included to develop employability skills amongst the student.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	-	-	-
2.	Topic 2	-	-	-
3.	Topic 3	-	-	-
4.	Topic 4	-	-	-
5.	Topic 5	-	-	-
6.	Topic 6	-	-	-
7.	Topic 7	-	-	-
8.	Topic 8	-	-	-
9.	Topic 9	-	-	-
10.	Topic 10	-	-	-
		-	-	56

DETAILED CONTENTS

1. Industrial Scenario Engineering Education and expectations of competences from an employee by employer.
2. Personality types, characteristic and features for a successful employee.
3. Employee desirable values and ethics and their development. Relation between profession, Society and environment.
4. Managing Project - Leadership, Motivation, Time Management, Resource Management, Computer Software, Interpersonal relationship, Engineer economics and fundamentals.
5. Effective Communication - Listening, Speaking, Writing, Presentation techniques/seminar, Group discussion.
6. Preparing for Employment - Searching for jobs/jobs hunting, Resume writing. Interview techniques in personal interview, telephonic interview, panel interview, group interview, video conference.
7. Managing Self - Managers body, mind, emotion and spirit, Stress management, Conflict resolution.
8. Continuing Professional Development - Organising learning and knowledge, Use of computer for organising knowledge resource.
9. Creativity, Innovation and Intellectual Property Right-

Concept and need in present time for an engineer.

10. Basic rules, laws and norms to be adhered by engineers during their working.

4.6 MICROPROCESSORS AND APPLICATIONS

L T P
6 - 6

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Over View of Microcomputer System	6	-	-
2.	Memory of A Microcomputer	15	-	-
3.	C.P.U. and Control	12	-	-
4.	Introduction To 8085 Microprocessor	15	-	-
5.	Architecture of 8086 Microprocessor	12	-	-
6.	Assembly Language Programming	15	-	-
7.	Basic I/O Interfacing	12	-	-
8.	Memory Interfacing	12	-	-
9.	Advance Microprocessor & Micro Controllers	12	-	-
		84	-	84

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 :

Brief idea of Microcontroller 8051, 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. - Microprocessor Interfacing and Application - New Age International.
3. Brey, Barry B. - INTEL Microprocessor - Prentice Hall (India)-4th Edition.
4. Liu and Gibson G.A. - Microcomputer System - The 8086/8088 Family-Prentice Hall (India) 2nd Edition.
5. Sombir Singh - Microprocessor and Its Application - Jai Prakesh Publication, Meerut

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.

v Semester

5.1 INTEGRATIVE COMMUNICATION

L T P
- - 4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Introduction to Personality Development	-	-	02
2.	Factors Influencing / Shaping Personality	-	-	02
3.	Self Awareness - 1	-	-	03
4.	Self Awareness - 2	-	-	02
5.	Self Awareness - 3	-	-	02
6.	Change Your Mind Set	-	-	02
7.	Interpersonal Relationship and Communication	-	-	03
8.	Non-Verbal communication Communication Skills	-	-	02
9 .	Communication Skills ACTIVITIES	-	-	06
10.	Body Language skills	-	-	03
11.	Leadership Traits & Skills	-	-	03
12.	Attitude	-	-	03
13.	Analyzing & Solving a Problem skills	-	-	02
14.	Time Management skills	-	-	03
15.	Stress Management Skills	-	-	02
16.	Interview Skills	-	-	04
17.	Conflict Motives	-	-	02
18.	Negotiation / Influencing Skills	-	-	02
19.	Sociability	-	-	03
20.	Importance of Group	-	-	03
21.	Values / Code of Ethics	-	-	02
		-	-	56

PERSONALITY DEVELOPMENT

1 Introduction to Personality Development

AIM, Skills, Types of Skills, LIFE SKILLS VS OTHER SKILLS, Concept of Life Skills. Ten core Life Skills identified by WHO

2. Factors Influencing / Shaping Personality :

Introduction, Physical and Social Factors Influencing / Shaping Personality (Hereditary, Self-Development, Environment, Education, Life-situations) Psychological AND Philosophical Factors Influencing / Shaping Personality (Past Experiences, Dreams and Ambitions, Self-Image, Values)

3. Self Awareness - 1

DIMENSIONS OF SELF AWARENESS (Self Realization, Self Knowledge or Self Exploration, Self Confidence, Self Talk, Self Motivation, Self Esteem, Self Image, Self Control, Self Purpose, Individuality and Uniqueness, Personality, Values, Attitude, Character), SELF REALIZATION AND SELF EXPLORATION THROUGH SWOT ANALYSIS AND JOHARI WINDOW,

4. Self Awareness - 2

SYMPATHY VS EMPATHY AND ALTRUISM, Importance of Empathizing with Others,

5. Self Awareness - 3

Self-Awareness through Activity, Body Image (What is Body Image, What Decides our Body Image, What is Poor Body

Image, What are the Harmful Effects of Poor Body Image),
Tackling Poor Body Image(Enhance Self-Esteem, Build Up
Critical Thinking, Build up Positive Qualities, Understand
Cultural Variation, Dispel Myths, Utilize Life Skills)

6. Change Your Mind Set

What is Mindset, HOW TO CHANGE YOUR MINDSET (Get the
Best Information Only, Make the best people your Role Model,
Examine Your Current Beliefs, Shape Your Mindset with Vision
and Goals, Find Your Voice, Protect Your Mindset, Let Go of
Comparisons, Put An End To Perfectionism, Look At The
Evidence, Redefine What Failure Means, Stop Worrying About
What "People" Think)

INTERPERSONAL SKILLS

7. Interpersonal Relationship and Communication

INTERPERSONAL RELATIONSHIP , Forms of Interpersonal
Relationship, Must Have in an Interpersonal Relationship,
Interpersonal Relationship between a Man and a Woman (Passion,
Intimacy, Commitment), Relationship Between
Friends, ROLE OF COMMUNICATION IN INTERPERSONAL
RELATIONSHIP (Take Care Of Your Tone And Pitch, Choice of
Words is Important in Relationships, Interact Regularly, Be
Polite, Try To Understand The Other Person's Point Of View As
Well, Individuals Can Also Communicate Through Emails,

8. NON-VERBAL COMMUNICATION Communication Skills

Non-Verbal Communication,
We Communicate with Our Eyes, Communication with Facial
Expression, A Good Gesture, Appearance, Posture and Gait,
Proximity and Touch), IMPORTANCE OF LISTENING,
Characteristics of Good and Effective Listener(Is Attentive, Do
Not Assume, Listen for Feelings and Facts, Concentrate on the
Other Speakers Kindly and Generously, Opportunities)

9. Communication Skills ACTIVITIES -

Activities in Making Collages, Making Advertisements, PPT Preparation &
Presentation, Speaking -Seminars, Group Discussions, Debates,
Extempore Speeches, Listening to an audio clip and telling its
gist, Answering a telephone call, Making enquiries, General tips-
Pronunciation, Tone, Pitch, Pace, Volume, relevance, brief,
simple Reading Newspaper, Magazines (Current Affairs,
Economic magazines, Technical magazines), How to read a
report, article, Writing- Resume Writing, Writing joining report,
Notice writing, Report making, Proposal writing, Advertisement,
Notice for tender, Minutes writing, E-Mail writing,
Listening News, Listening to audio clips.(Lecture, poetry, speech,
songs),

10. Body Language skills

Introduction, What is Body Language , Body Language Parts,
Personal Space Distances (Intimate Distance, Personal Distance,
Social Distance, Public Distance), IMPORTANT BODY
LANGUAGE SIGNS AND THEIR MEANING

UNDERSTANDING OTHERS

11. Leadership Traits & Skills :

Introduction, Important Leadership Traits (Alertness, Bearing,
Courage, Decisiveness, Dependability, Endurance, Enthusiasm,
Initiative, Integrity, Judgment, Justice, Knowledge, Loyalty, Sense
of Humour), Other Useful traits (Truthfulness, Esprit-de-corps,
Unselfishness, Humility and sympathy, Tact without loss of moral
courage, Patience and a sense of urgency as appropriate, Selfconfidence,
Maturity, Mental including emotional stability)

12. Attitude

Types of Attitude, Components of Attitudes (Cognitive Component, Affective Component, Behavioral Component), Types of Attitudes (Positive Attitude, Negative Attitude, Neutral Attitude, Rebellious Attitude, Rational and Irrational Attitudes, Individual and Social Attitudes), Kinds of Attitude, ASSERTIVENESS, How to Develop Assertiveness (Experiment and Try New Things, Extend Your Social Circle, Learn to Make Decisions for Yourself, Indulge in Knowledge, Admire Yourself & Others), Negotiation (Be Sensitive to The Needs Others, Be Willing To Compromise, Develop Your Problem-Solving Skills, Learn to Welcome Conflict, Practice Patience, Increase Your Tolerance For Stress, Improve Your Listening Skills, Learn To Identify Bottom-Line Issues Quickly, Be Assertive, Not Aggressive)

PROBLEM SOLVING

13. **Analyzing & Solving a Problem skills**
Critical Thinking, Creative Thinking, Decision Making, Goal Setting & Planning, Problem Solving
14. **Time Management skills**
Need of Time Management, TIME WASTERS (Telephone, Visitors , Paper work, Lack of Planning & Fire Fighting , Socializing , Indecision , TV , Procrastination), PRINCIPLES OF TIME MANAGEMENT - Develop a Personal Sense of Time (Time Log , value of other people's time), Identify Long-Term Goals , Concentrate on High Return Activities , Weekly & Daily Planning (The Mechanics of Weekly Planning , Daily Planning), Make the Best Use of Your Best Time , Organize Office Work (Controlling Interruptions , Organizing Paper Work), Manage Meetings, Delegate Effectively, Make Use of Committed Time, Manage Your Health,
15. **Stress Management Skills**
INTRODUCTION, Understanding Stress and its Impact, Expected Responses (Physical, Emotional, Behavioral), stress signals(thoughts, feelings, behaviors and physical), STRESS MANAGEMENT TECHNIQUES (Take Deep Breath, Talk It Out, Take A Break, Create a Quite Place in Your Mind, Pay Attention to Physical Comfort, Move, Take Care of Your Body, Laugh, Mange Your Time, Know Your Limits, Do You Have To Be Right Always, Have A Good Cry, Look for the Good Things Around You, Talk Less, Listen More), UNDERSTANDING EMOTIONS AND FEELINGS-through Activity
16. **Interview Skills (2 sessions from Industry Expert is Compulsory)**
Curriculum Vitae (When Should a CV be Used, What Information Should a CV Include, personal profile, Covering Letter, What Makes a Good CV, How Long Should a CV Be, Tips on Presentation), Different Types of CV (Chronological, Skills-Based), BEFORE THE INTERVIEW , CONDUCTING YOURSELF DURING THE INTERVIEW , FOLLOWING THROUGH AFTER THE INTERVIEW , Interview Questions To Think About , MOCK INTERVIEW - Activity (MOCK INTERVIEW EVALUATION - NON-VERBAL BEHAVIORS, VERBAL BEHAVIORS, General Etiquettes to face the Board , Telephonic interview
17. **Conflict Motives -Resolution**
Motives of Conflict(Competition for Limited Resources, The Generation Gap and Personality Clashes, Aggressive Personalities, Culturally Diverse Teams, Competing Work and Family Demands, Gender Based Harassment), Merits and Demerits of Conflict , Levels of Conflict (Interpersonal Conflict, Role Conflict, Inter-group Conflict, Multi-Party Conflict, International Conflict), Methods of Conflict Resolution (The Win-

Lose Approach, The Lose-Lose Strategy, The Win-Win Approach), Techniques for Resolving Conflicts (Confrontation and Problem Solving Leading to Win-Win, Disarm the Opposition, Cognitive Restructuring, Appeal to Third Party, The Grievance Procedure)

18. Negotiation / Influencing Skills

Why Influencing, What Is Influencing, TYPES OF INFLUENCING SKILLS (Probing And Listening, Building Rapport, Sign Posting, Pacing, Selling, Assertiveness), LAWS AND PRINCIPLES OF INFLUENCE, The Six Laws of Influence (The Law of Scarcity, The Law of Reciprocity, The Law of Authority, The Law of Liking, The Law of Social Proof, The Law of Commitment and Consistency), Influencing Principles (Making a Start, Buy Yourself Thinking Time, Dealing With Disagreement, Difficult And Sensitive Situations)

19. Sociability : Etiquettes And Mannerism & Social Skills

Need for Etiquette , Types of Etiquettes (Social Etiquette, Bathroom Etiquette, Corporate Etiquette, Wedding Etiquette, Meeting Etiquette, Telephone Etiquette, Eating Etiquette, Business Etiquette, E-Mail Etiquettes,), MANNERISMS, HOW TO IMPROVE YOUR SOCIAL SKILLS (Be Yourself, Be Responsible, Be Open & Approachable, Be Attentive, Be Polite, Be Aware, Be Cautious)

20. Importance of Group / Cross Cultural Teams / Team Work skills

Introduction, Types and Characteristics of Groups (Definition of a Group, Classification / Types of Groups, Friendship Group, Task Group, Formal Groups, Informal Group, Effective Group), Importance of a Group, Characteristics of a Mature Group, TYPES AND CHARACTERISTICS OF A TEAM (Definition of a Team, Types of Teams, Functional Teams, Problem Solving Teams, Cross - Functional Teams, Self - Managed Teams), Importance of a Team, Characteristics of a Team

21. VALUES / CODE OF ETHICS

Meaning, A FEW IMPORTANT VALUES (Honesty, Integrity, Purity, Discipline, Selflessness, Loyalty, Fairness, Equality, Trust, Support, Respect, etc)

Note : One Orientation module for the faculty is must.
Involvement of Industry Experts is necessary for Interview Skills

5.2 INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

L T P
6 2 -

RATIONALE

The knowledge of this subject is required for all engineers/technicians who wish to choose industry/field as their career. This course is designed to develop understanding of various functions of management, role of workers and engineers and providing knowledge about industrial and tax laws.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Principles of Management	8	-	-
2.	Human Resource Development	10	-	-
3.	Wages and Incentives	4	-	-
4.	Human and Industrial Relations	6	-	-
5.	Professional Ethics	2	-	-
6.	Sales and Marketing management	10	-	-
7.	Labour Legislation Act	10	-	-
8.	Material Management	8	-	-
9.	Financial Management	8	-	-
10.	Entrepreneurship Development	8	-	-
11.	Fundamental of Economics	5	-	-
12.	Accidents and Safety	5	-	-
		84	-	-

DETAILED CONTENTS

1. **Principles of Management**
 - 1.1 Management, Different Functions: Planning, Organising, Leading, Controlling.
 - 1.2 Organizational Structure, Types, Functions of different departments.
 - 1.3 Motivation: Factors, characteristics, methods of improving motivation, incentives, pay, promotion, rewards, job satisfaction, job enrichment.
 - 1.4 Need for leadership, Functions of a leader, Factors for accomplishing effective leadership, Manager as a leader, promoting team work.
2. **Human Resource Development**
 - 2.1 Introduction, objectives and functions of human resource development (HRD) department.
 - 2.2 Recruitment, methods of selection, training strategies and career development.
 - 2.3 Responsibilities of human resource management - policies and functions, selection - Mode of selection - Procedure - training of workers, Job evaluation and Merit rating.
3. **Wages and Incentives**
 - 3.1 Definition and factors affecting wages, methods of wage payment.
 - 3.2 Wage incentive - type of incentive, difference in wage, incentive and bonus; incentives of supervisor.
 - 3.3 Job evaluation and merit rating.
4. **Human and Industrial Relations**
 - 4.1 Industrial relations and disputes.
 - 4.2 Relations with subordinates, peers and superiors.
 - 4.3 Characteristics of group behaviour and trade unionism.
 - 4.4 Mob psychology.
 - 4.5 Grievance, Handling of grievances.
 - 4.6 Agitations, strikes, Lockouts, Picketing and Gherao.
 - 4.7 Labour welfare schemes.

- 4.8 Workers' participation in management.
- 5. **Professional Ethics**
 - 5.1 Concept of professional ethics.
 - 5.2 Need for code of professional ethics.
 - 5.3 Professional bodies and their role.
- 6. **Sales and Marketing management**
 - 6.1 Functions and duties of sales department.
 - 6.2 Sales forecasting, sales promotion, advertisement and after sale services.
 - 6.3 Concept of marketing.
 - 6.4 Problems of marketing.
 - 6.5 Pricing policy, break even analysis.
 - 6.6 Distribution channels and methods of marketing.
- 7. **Labour Legislation Act (as amended on date)**
 - 7.1 Factory Act 1948.
 - 7.2 Workmen's Compensation Act 1923.
 - 7.3 Apprentices Act 1961.
 - 7.4 PF Act, ESI Act.
 - 7.5 Industrial Dispute Act 1947.
 - 7.6 Employers State Insurance Act 1948.
 - 7.7 Payment of Wages Act, 1936.
 - 7.8 Intellectual Property Rights Act
- 8. **Material Management**
 - 8.1 Inventory control models.
 - 8.2 ABC Analysis, Safety stock, Economic ordering quantity.
 - 8.3 Stores equipment, Stores records, purchasing procedures, Bin card, Cardex.
 - 8.4 Material handling techniques.
- 9. **Financial Management**
 - 9.1 Importance of ledger and cash book.
 - 9.2 Profit and loss Account, Balance sheet.
 - 9.3 Interpretation of Statements, Project financing, Project appraisal, return on investments.
- 10. **Entrepreneurship Development**
 - 10.1 Concept of entrepreneur and need of entrepreneurship in the context of prevailing employment conditions.
 - 10.2 Distinction between an entrepreneur and a manager.
 - 10.3 Project identification and selection.
 - 10.4 Project formulation.
 - 10.5 Project appraisal.
 - 10.6 Facilities and incentives to an entrepreneur.
- 11. **Fundamental of Economics**
 - 11.1 Micro economics.
 - 11.2 Macro economics.
- 12. **Accidents and Safety**
 - 12.1 Classification of accidents based on nature of injuries, event and place.
 - 12.2 Causes and effects of accidents.
 - 12.3 Accident-prone workers.
 - 12.4 Action to be taken in case of accidents with machines, electric shock, fires and erection and construction accidents.
 - 12.5 Safety consciousness and publicity.
 - 12.6 Safety procedures.
 - 12.7 Safety measures - Do's and Don'ts and god housing keeping.

5.3 DATABASE MANAGEMENT SYSTEM
(Common to Three Year Diploma In Information Technology)

L T P
6 - 6

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.	Topic 1	10	-	-
2.	Topic 2	10	-	-
3.	Topic 3	10	-	-
4.	Topic 4	10	-	-
5.	Topic 5	14	-	-
6.	Topic 6	10	-	-
7.	Topic 7	10	-	-
8.	Topic 8	10	-	-
		84	-	84

DETAILED CONTENTS

1. OVERVIEW OF DBMS :

Data, Representation of Data, Record, Data item, Field name, File, Data and Information, Database (Properties), Benefits of Database approach, Database Management System (Capabilities, Advantages, Disadvantages) and Functions of DBMS. Basic DBMS terminology (Data items, Entities and Attributes, Schema and Subschema, Database users, Instance and Schemas). Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence.

2. DATA MODELS :

Define data model, classify data model, Local Models : Object and Record based- Object Oriented Model- Entry relationship Models - Entity sets and relationship sets- Attributes - Keys in entity and relationship sets : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key - Mapping constraints. Object based logical models, E-R model, E-R diagram, Notations, Hierarchical Model (Advantage, Disadvantages), Network model (Advantages, Disadvantages), Relational Model (Advantages, Disadvantages), Object oriented database, Object oriented relational database.

3. RELATIONAL MODEL :

Advantages, Disadvantages, Codd's 12 rules, Definition of

Relations, Degree and Cardinality, Relational Model Constraints (Domain, Tuple Uniqueness, Key Constraints, Integrity Constraints, Entity constraints). Relations algebra (Basic operation : Union intersection and difference), Additional Relational Algebraic Operations (Projection, Selection rows, Division)

4. RELATIONAL DATABASE DESIGN :

Functional dependencies (I, II & III), Normal forms, Normalization, Boyce Codd Normal Form, Multivalued dependencies and Fourth Normal Form, Join Dependencies and Fifth normal forms.

5. STRUCTURE QUERY LANGUAGE (SQL) :

SQL, Object naming conventions, Object naming guidelines, Data types (Varchar 2, Number, Long, Date, Raw, Long Raw, Rowid, Char etc.), Tables, Views, Indexes, SQL Command :- DESCRIBE, SELECT, COLUMN ALIASES, CONCATENATION OPERATOR, DISTINCT CLAUSE, ORDER BY, WHERE CLAUSE, LOGICAL OPERATIONS, SQL OPERATORS, Accessing Metadata.

6. RATIONAL DATABASE :

Data definition language- Data manipulation language- Relational algebra - Operators : Select, Project, Join, Rename, etc. - Simple example.

7. SECURITY :

Authorization and View- Security constraints - Integrity Constraints- Encryption.

8. PL :

User defined function, Control of flow statement of PL/SQL, Procedures/Stored procedures, transaction, triggers, cursors, granting and revoking.

LIST OF BOOKS

1. An Introduction to Database System - C. J. Date
2. Database System Concepts - A. Silberschatz & H. F. Korth
3. Database Concepts and Systems - Ivan Bayroos/SPD
4. Fundamental of Database System - R. Elmashri & S. B. Navathe

DATABASE MANAGEMENT SYSTEM LAB

STRUCTURED QUERY LANGUAGE

1. Creating Database
 - Creating a database
 - Creating a table

- Specifying relational data types
 - Specifying constraints
 - Creating indexes
2. Table and Record Handling
- INSERT statement
 - Using SELECT and INSERT together
 - DELETE, UPDATE, TRUNCATE Statement.
 - DROP, ALTER statement
3. Retrieving Data From a Database
- The SELECT statement
 - Using the WHERE clause
 - Using Logical Operators in the WHERE clause
 - Using In, BETWEEN, LIKE, ORDER BY, GROUP BY & HAVING clause
 - Using Aggregate Functions
 - Combining Tables Using JOINS

5.4 Object Oriented Programming using JAVA

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

L T P
8 - 8

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	8	-	-
2.	Topic 2	10	-	-
3.	Topic 3	12	-	-
4.	Topic 4	12	-	-
5.	Topic 5	12	-	-
6.	Topic 6	12	-	-
7.	Topic 7	12	-	-
8.	Topic 8	12	-	-
9.	Topic 9	10	-	-
10.	Topic 10	12	-	-
		112	-	112

1. Introduction and feature of Object Oriented Programming
2. An Overview of JAVA:-

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

Integer, floating point type, character, boolean, all Operators, JAVA's selection statements, iteration and jump statement.
4. Classes & Methods:

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

Inheritance basics, member access and inheritance. Overriding : Method overriding, super keyword, polymorphism and virtual function.
6. Packages and Interfece :

Defining, Creating and accessing a package, Understanding CLASSPATH, Inporting packages, difference between classes and interface, defining an interface, implementing interface, applying interface, variable in interface and extending interface, Exploring Java io.
7. Exception Handling :

Concept of exception handling, benefits of exception handling, termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally,

built in exceptions, creating won exception sub classes.
string handling, exploring java.util.

8. Multithreading :

Difference between multi threading and multi tasking, thread life cycle, creating threads, thread priorities, synchronizing threds inter thread communication, thread groups, daemon threads, enumerations, autoboxing annotations, generics.

9. Event Handling :

Events, Evants sources, Event classes, Event Listeners, Delegation event model, handling mouse and key board events, Adapter classes. The AWT class hieracrchy, user interface components - labels, button, vanvas, scrollbars, text components, check box, check box groups, choice, list panels - scrollpane, dialogs, menubar, graphics, layout manager - layout manager types border, grid, flaow card and grid bag.

10. Applets :

Concept of Applets, difference between applets and application, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Swing - Introduciton, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Lables, text fields, buttion - the JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees and Tables.

LIST OF PRACTICALS

1. WAP to find the average and sum of the N numbers using command line argument.
2. WAP to demonstrate type casting.
3. WAP to find the number of arguments provide at run time.
4. WAP to test the prime number.
5. WAP to calculate the simple interest and input by users.
6. WAP to create a simple class to find out the area and perimeter of rectangle and box using super and this keyword.
7. WAP to find G.C.D. of the number.
8. WAP to design a class account using the inheritance and static that show all function of bank (withdrawal, deposite).
9. WAP to find the factorial of a given number using Recursion.
10. WAP to desing a class using abstract methods and classes.
11. WAP to design a string class that perform string method (equal, reverse the string, change case).

12. WAP to handle the exception using try and multiple catch block.
13. WAP that implement the Nested try statements.
14. WAP to create a package that access the member of external class as well as same package.
15. WAP that import the user defined package and access the member variable of classes that contained by package.
16. WAP that show the partial implementation of interface.
17. WAP to handle the user defined exception using throw keyword.
18. WAP to create a thread that implement the Runnable interface.
19. WAP to implement Interthread communication.
20. WAP to create a class component that show controls and event handling on that controls (math calculation).
21. WAP to draw the line, rectangle, oval, text using the graphics method.
22. WAP to create a menu using the frame.
23. WAP to create a dialogbox.
24. WAP to implement the flow layout and border layout.
25. WAP to implement the grid layout, card layout.

LIST OF BOOKS

1. Core Java II Advanced Feature 8th Edition, Sun Microsystems
2. The Complete Reference JAVA Seventh Edition
3. Thinking in Java, Third Edition, Bruce Eckel Pearson Education.
4. JAVA 6 By Rogers Cadenhead, Laura Lemay, Pearson Education.

5.5 COMPUTER HARDWARE & MAINTENANCE

L P
- 6

COMPUTER HARDWARE & MAINTENANCE LAB

1. Study various mother boards- non-integrated, semi-integrated, integrated
2. Understand the mother board component
3. Familiarize the different types of expansion slot (ISA, EISA, PCI, AMR, PCI-E).
4. Study the expansion cards namely add-on-cards (audio, graphics, i/o, tv tuner, etc).
5. Study different types of switch mode power supply - AT, ATX, NLX
6. Understand the power requirements for various components in a system
7. Study the different connectors and ports of a PC
8. Understand the various cables in a computer system
9. Familiarize the different types of memory modules.
10. Study various secondary storage- Floppy drive/Disk, Hard disk, Flash drive, CD.
11. Understand the internal structure of HDD, Flash drive, CD drive.
12. Understand the procedure of assembling a computer system.
13. Study the various techniques for formatting/partitioning.
14. Familiarize the hard disk partitioning using different tools.
15. Study the procedure for installing operating system - LINUX & Windows.
16. Familiarize the management of operating system components.
17. Exercise of DOS commands, UNIX, LINUX commands.
18. Study of various printers (Dot Matrix, Ink Jet, Laser, Multi Function).
19. Familiarize the interfacing of printers and installing driver software
20. Understand the interfacing, installation, working of various device such as Scanner, Projector, etc.
21. Understand the system Maintenance and trouble shooting.
22. Wi-Fi Concepts/Bluetooth concepts
23. Microprocessor socket types

VI Semester

6.1 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT

L T P
4 - -

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	4		
2.1	Water Pollution	8		
2.2	Air Pollution	8		
2.3	Noise Pollution	4		
2.4	Radio Active Pollution	6		
2.5	Solid Waste Management	6		
3.	Legislations	4		
4.	Environmental Impact Assessment	4		
5.	Disaster Management	6		
TOTAL		56	-	-

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, CO, 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. Bog 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.

6.2 NETWORK ADMINISTRATION & SECURITY
(Common to One Year PG Diploma in Computer Hardware & Networking)

L T P
6 - 4

1. Introduction to Windows server, Professional and Windows 2003 server, Installation & configuration of Windows server professional, Installation & configuration of Windows server.
2. User & Group Managements, NTFS & share permissions. Using device manager, Drivers signing & signature verification. Managing Ports, Installing & Managing & configuring printers. Disk Management Tools & Tasks, File Systems, User Management. Installing Active Directory.
3. Domain user account, configuring user account properties. Domain groups. Viewing a user's effective permission. Creating and managing shares. Implementing files and folder NTFS & share permission, Special permission, inheritance. Implementing Shadow copies. Implementing and Managing the Distributed File system(DFS). Auditing Access to Resources.
4. Installing and Configuring Terminal Services. Managing servers remotely using terminal services (Remote desktop). Backup restoring data.
5. Installing DNS. Implementing DNS in windows networks.
6. Installing and configuring DHCP. Monitoring and Managing Internet information services (IIS 6.0) Remote Access server. Configuring & Implementing VPN. Configuring & Implementing Remote Access services.
7. Configuring & Implementing routing services. Configuring & implementing ICS. Active directory services. Implementing active directory services forest.
8. Planning implementing an OU structure. Implementing server roles. Restoring active directory.
9. Local and domain security policies. Working with group policy

NETWORK SECURITY

1. Introduction
Need for securing a network; Principles of Security, Type of attacks, introduction to cyber crime, cyber law-Indian Perspective (IT Act 2000 and amended 2008), cyber ethics, ethical hacking. What is hacking? attacker, phreaker .
2. Securing Data over Internet
Introduction to basic encryption and decryption, concept of symmetric and asymmetric key cryptography, overview of DES, RSA and PGP. Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures, Digital certification, IPsec
3. Virus, Worms and Trojans
Definitions, preventive measures - access control, checksum verification, process configuration, virus scanners, heuristic scanners, application level virus scanners, deploying virus protection.
4. Firewalls
Definition and types of firewalls, firewall configuration, Limitations of firewall.
5. Intrusion Detection System (IDS)
Introduction; IDS limitations - teardrop attacks, counter measures; Host based IDS set up
6. Handling Cyber Assets- Configuration policy as per standards, Disposable policy

7. Virtual Private Network (VPN)
Basics, setting of VPN, VPN diagram, configuration of required objects,
exchanging keys, modifying security policy
8. Disaster and Recovery
Disaster categories; network disasters - cabling, topology, single point of
failure, save configuration files; server disasters - UPS, RAID, Clustering,
Backups, server recovery

List Of Practicals

1. Installation & configuration of Windows professional.
2. Installation & configuration of Windows server.
3. Installing and Configuring Terminal Services
4. Installing DNS. Implementing DNS in windows networks.
5. Installing and configuring DHCP.
6. Configuring & Implementing routing services
7. Configuration and setup of adhoc network and infrastructure network.
8. NET tools, Deployment of NETTOOLS.
9. Tracing of email origin using email trace pro utility.
10. Use of keylogges and anti key logger to secure your system.

6.3 E-COMMERCE

(Common to 3 year Diploma in Information Technology)

L T P
6 - -

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Units	Coverage Time		
		L	T	P
1.	Topic 1	8	-	-
2.	Topic 2	8	-	-
3.	Topic 3	8	-	-
4.	Topic 4	8	-	-
5.	Topic 5	10	-	-
6.	Topic 6	10	-	-
7.	Topic 7	10	-	-
8.	Topic 8	6	-	-
9.	Topic 9	8	-	-
10.	Topic 10	8	-	-
		84	-	-

1. ELECTRONIC COMMERCE :

Overview, Definitions, Advantages and Disadvantages of E-commerce, threats of E-commerce, Managerial Prospective, Rules and Regulations For controlling E-commerce, Cyber Laws.

2. TECHNOLOGY :

Relationship Between E-Commerce and Networking, Different Types of Networking For E-commerce, Internet, Internet and Extranet, EDI System Wireless Application Protocol : Definition, Hand Held Devices, Mobility and Commerce, Mobile computing, Wireless Web, Web Security, Infrastructure Requirement Form E-Commerce.

3. BUSINESS MODELS OF E-COMMERCE :

Model based on transaction, Type, Model Based on Transaction Party -B2B, B2C,C2b, C2c, E-Governance.

4. E-STRATEGY :

Overview, Strategic, Methods for developing E-commerce.

5. FOUR C's:

Four C's (Convergence, Collaborative Computing, Content Management and Call Center)

6. SUPPLY CHAIN MANAGEMENT :

E-logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE-Framework, Internet's effect on Supply Chain Power.

7. E-PAYMENT MECHANISM :
Payment through card system, E-Cheque, E-Cash, E-Payment Threats and protections.
8. E-MARKETING :
Home-Shopping, E-Marketing, Tele-Marketing.
9. ELECTRONIC DATA INTERCHANGE (EDI):
Meaning, Benifits, Concepts, Application, Edi Model.
10. RISK OF E-COMMERCE :
Overview, Security for E-commerce, Security Standards, Firewall, Cryptography, Key Management, Passward system, Digital certificates, Digital signatures.

LIST OF BOOKS

1. E-Commerce-M. M. Oka- EPH
2. Electronic Commerce- Technologies & Application - Bhaskar Bharat - TMH
3. E-Commerce :Strategy Technologies and Applications - Tata McGraw Hill

6.4 PROJECT

L T P
- - 8

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.

DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING
STAFF STRUCTURE

Intake of the Course 60
Pattern of the Course SEMESTER SYSTEM

Sl. No.	Name of Post	No.
1.	Principal	1
2.	H.O.D.	1
3.	Lecturer Electronics	1
4.	Lecturer In Computer Science & Engineering	6
5.	Computer Programmer Cum Operator	3
6.	Lecturer in Maths	1
7.	Lecturer in Physics	1
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
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1.	Principal's Room	30
2.	Confidential 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 8 Lecturers	80
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	180
2.	Drawing Hall	90	90
3.	Physics Lab		75
4.	Electrical Engg. Lab		120
5.	Electronic Laboratory		120
6.	Digital Electronics & Microprocessor Lab		120
7.	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 Amenities

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) including kitchen & store	45	

[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

Priority to be given in following order

- (1)
- Administrative Building
 - Labs
 - Over head Tank
 - Boundary Wall
 - Principal Residence
 - Forth Class Quarters (2/3)

- (2)
- Hostel
 - Students Aminities

- (3)
- Residences of employee

ELECTRONICS LABORATORY

Electronic Components And Devices Lab.

S.No.	Name of the Equipment/ Board/Kit Etc.	Elex. Components & Devices Lab.		Elex. Devices & Ckts.Lab.		Total		Total No. Recommen- ded		Rate per Piece In Rs.	Total Cost	
		Intake 60	75	Intake 60	75	Intake 60	75	Intake 60	75		Intake 60	75
1.	Audio Oscillator (20HZ-50KHZ)	4	5	12	13	30	34	26	28	3500	91000	98000
2.	Multimeter, 20 K. Ohm per volt Sensitivity, + 1% accuracy d.c.	4	5	-	-	12	15	10	12	2500	25000	35000

	voltage 1000 v. max.											
3.	Digital Elex. multimeter. 3.5/4.5/5.5 Digit Led, AC & DC Voltage Current, Frequency, Resistance, Capacitors, DC Voltage Accuracy +0.005 AC Voltage + 0.1	14	16	16	17	48	54	24	27	4500	108000	121500
4.	Regulated Power Supply 0-30 V, 0.5/1 Amps.	10	12	16	17	30	34	20	22	4000	80000	88000
5.	Multi output Power Supply 0-30V 1 Amp. 0-+-12 V, 1 Amp., 5 V. 2 Amp.	4	5	4	5	8	10	6	7	3500	21000	24500
6.	Power Supply 0-300 Volt, 1 Amp.	-	-	-	-	4	5	4	5	4000	16000	20000
7.	Dual Trace C.R.O. (0-30 MHz) Operating Mode Channel I, Channel II, Channel I & II, Accuracy +3, Hold off-variable control for stable triggering slope +ve or -ve, sensitivity Int, 0.5 div, Ext 0.8v, Trace Rotation- Adjustable on Front Panel, Interface-USB	4	5	10	11	24	27	16	18	30000	480000	540000
8.	R.F.Signal Generator (AM/FM) 500 KHZ to 1.3 GHZ Standard Mak	-	-	4	5	4	5	4	5	10000	40000	50000
9.	Function Generator upto 10MHZ, Amplitude 0-20V PP LED Display, Frequency Variation Fine Control Output Protected against short circuit, Input 230V AC +10 50HZ	-	-	6	7	6	7	6	7	10000	60000	70000

S.No.	Name of the Equipment/ Board/Kit Etc.	Elex. Components & Devices Lab.		Elex. Devices & Ckts.Lab.		Total		Total No. Recommen- ded		Rate per Piece In Rs.	Total Cost	
		Intake 60	75	Intake 60	75	Intake 60	75	Intake 60	75		Intake 60	75
10.	A.C. Millivolt Meter/Micto Meter (Elex.)	-	-	8	9	8	9	8	9	3500	28000	28500
11.	Out Put Audio Power Meter 4 Ohm.- 20 K & 1 MW - 10 W	-	-	2	3	2	3	2	3	1500	3000	4500
12.	Digital MultiMeter/Micro Meter Digital Millivoltmeter (Suitable range)	4	9	-	-	12	14	8	9	600	4800	5400
13.	D.C. Voltmeter /D.C. Milliamme- ter/D.C. Micrometer (suitable range)	30	40	10	12	40	52	30	35	600	18000	21000
14.	Decade Resistance Box (Different ranges) Min 4/5/6 Dials Max Working Voltag 500V	-	-	-	-	6	7	6	7	1200	7200	8400
15.	Decade Capacitor Box (Different range) Min 4/5/6 Dial Cont	-	-	-	-	8	9	8	9	3000	24000	27000
16.	Decade Inductance Box Min 4/5 Dials	-	-	-	-	8	9	8	9	3500	28000	31500
17.	Different Transducers : pressure type, thermo couple, LVFT, Opto pick electromagnetic pick up; Thermal relay, ultra- sonic pick up and potentiometer etc. including strain gauge, Piezoelectric Transduser, Diff. types of Photo sources & Detec- tor,Optical Fibre sensors	-	-	-	-	8	8	LS	LS (8 set of experimen tal kit/ board)	8000	64000	64000
18.	Experimental Kit/ Teaching Modules/ Training boards/ Learning kits. of relevant subject.	2*	3*	0	0	4*	6*	LS	LS	50000	100000	100000
		+	+	+	+	+	+					
		30	40	60	80	140	182					

19.	Component Storage rack	4	4	4	4	16	16	16	16	8000	128000	128000
20.	Consumable Items	LS	LS	LS	LS	LS	LS	LS	LS	--	30000	30000
21.	Miscellaneous	LS	LS	LS	LS	LS	LS	LS	LS	--	50000	50000
22.	Power Operated Drilling Machine	2	3	2	3	2	3	2	3	3500	7000	10500
23.	Servo Voltage Stabilizer 5 KVA	1	2	1	2	1	2	1	2	75000	75000	150000
S.No.	Name of the Equipment/ Board/Kit Etc.	Elex. Components & Devices Lab.		Elex. Devices & Ckts.Lab.		Total		Total No. Recommen- ded		Rate per Piece	Total Cost	
		Intake 60 75		Intake 60 75		Intake 60 75		Intake 60 75		In Rs.	Intake 60 75	
24.	Invertor 1 KVA with Battery	1	2	1	2	1	2	1	2	15000	15000	30000
25.	One Desk Top Core i5/i7 -760 Processor, Genuine Window-7 Professional, 18 inch HD,Flat Panel MONitor, Optical Mouse Key Board and All related media Or Latest Version	2	3	2	3	2	3	2	3	40000	80000	120000
26.	Electronics Software For Electronics Lab Virtual Lab/ Circuit Maker etc. of Latest Version	LS	LS	LS	LS	LS	LS	LS	LS	--	300000	300000

NOTE:- * Represents the quantity of learning kits/teaching module. This item is more costly as compared to training boards/experimental kits etc.

DIGITAL ELECTRONICS AND MICROPROCESSOR LAB

Principles of Digital Electronics Lab. (Second Year)
Microprocessors And Applications Lab. (Third Year)

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 @ Rs.	Total Cost	
		Intake 60	75	Intake 60	75	Intake 60	75	Intake 60	75		Intake 60	75
1.	CRO dual trace with delayed time base, 25 MHz or higher band width.	2	2	-	-	4	4	4	4	25000	100000	100000
2.	CRO dual trace 100MHz. Digital storage oscilloscope 4 Kpts of Memory, 2 Channels with additional external trigger input, Large 15 Cm. colour display, 20 automatic measurement & 4 math function advance triggering selectable video, mask test,USB interface for PC Connectivity	2	3	-	-	2	3	2	3	30000	60000	90000
3.	CRO dual trace 30 MHz. Accuracy +3%, Variable Cont. For Stable triggering, Slope Positive or Negative Trace Rotation adjustable on front panel, CRT 140 mm Z Modulation	4	4	2	3	8	10	6	7	15000	90000	105000
4.	Multimeter, 20 K Ohm/volt sensitivity, 1% accuracy in D.C. voltage range, Max. D.C. voltage range 2500 V, A.C Current.	4	6	-	-	6	10	6	8	3500	21000	28000
5.	Multimeter, Digital hand held 3.5/4.5digit, 0.3% accuracy 1000 V D.C. and 20 m ohm resistance range protected against transients.	4	6	2	4	8	14	8	10	3500	28000	35000
6.	Logic Probe	30	35	10	15	40	50	40	50	500	20000	25000
7.	Logic board/trainer including +5 Volt, 1Amp + 15 V, 0.3 Amp. power supply and bread board and flexible leads.	20	28	-	-	20	28	20	28	5000	100000	140000
8.	Microprocessor trainer kits with 8085 system (EC 85 or similar).	-	-	16	20	16	20	16	20	12000	192000	240000
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 @ Rs.	Total Cost	
		Intake 60	75	Intake 60	75	Intake 60	75	Intake 60	75		Intake 60	75
9.	Component rack 144 tray (small) & 24 large tray.	4	4	2	2	6	6	6	6	8000	48000	48000
10.	Consumable material such as components ICs, resistors transistors etc.	LS	LS	LS	LS	LS	LS	LS	LS	--	80000	
11.	Miscellaneous	LS	LS	LS	LS	LS	LS	LS	LS	--	100000	
12.	Micro Controller Kits/PLC	LS	LS	LS	LS	LS	LS	LS	LS	--	50000	
13.	Trainer Kits of Universal Shift Register (SISO,SIPO,PIPO,PISO) Decade Counter, Universal Counter(Up, Down & Updown) & Different Flip Flops	LS	LS	-	-	LS	LS	LS	LS	--	50000	
14.	Dual power supply (0-30v/.5amp)	-	-	-	-	4	6	4	6	5000	20000	30000

15.	Minimum 12 line electronic telephone exchange with telephone instrument sets and power supply (Cardless)	-	-	-	-	2	2	2	2	50000	100000	100000
16.	Mobile Phone-GSM 3G/HSDPA Supported with Wi-Fi, Bluetooth Connectivity, Android 2.3 Operating System Supported with Colour Display TFT Screen with SD Memory Card, Battery 1300 mAH or Higher	-	-	-	-	8	8	8	8	15000	120000	120000
17.	Tablet PC-Min 7 inch Capacitive Touch Screen, Android 4.0 or Upper Operating System, 2D/3D Graphic Processor, 4GB internal Memory Expendable upto 40GB with Front Camera, Battery 2800 mAH or Higher	-	-	-	-	8	8	8	8	1000	8000	8000
18.	Experimental Kits for demonstrating ASK, FSK, PSK circuits	-	-	-	-	2	2	2	2	80000	160000	160000
19.	Experimental Kits for Optical Fibre Communication	-	-	-	-	LS				LS	100000	
20.	Mobiles Phones Trainer Kit with Fault Finding Facilities, Various Test Point Facilities	-	-	-	-	4	4	2	2	25000	50000	50000
S.No.	Name of the Equipment/ Board/Kit Etc.	Principles of Digital Eltx. Lab.		Microprocessors & Application Lab.		Total		Total No. Recommended		Rate per Piece	Total Cost	
		Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	@ Rs.	Intake 60	Intake 75
21.	Computers System Dual Core i5/i7 with internet connection and UPS	-	-	-	-	2	2	2	2	50000	100000	100000
22.	Microprocessor Training Kit of 8086	-	-	12	15					LS	100000	
23.	Fax Machine (Multi Function)	-	-	-	-	2	3	2	3	10000	20000	30000
24.	Universal Data Book	1	1	1	1	1	1	1	1	5000	5000	5000
25.	Software	-	-	-	-	-	-	-	-	LS	200000	

ELECTRONICS WORKSHOP AND PROJECT LABORATORY

Electronics Workshop
Electronics Instruments and Measurements Lab.

S.No.	Name of the Equipment/ Board/Kit Etc.	Electronics Work-Shop		Electronics Inst. & Measurements Lab		Total		Total No. Recommended		Rate per Piece	Total Cost	
		Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	In Rs.	Intake 60	Intake 75
1.	D C Voltmeter (1K/2K/10K/20K Ohm per Volt)	-	-	8	8	8	8	8	8	600	4800	4800
2.	Gen.purpose multimeter	4	6	4	6	12	18	8	10	2500	20000	25000
3.	Digital Multimeter	4	6	6	8	14	20	10	12	3500	35000	42000
4.	Regulated Power Supply Variable 0-30 V; 1 A	2	2	4	6	14	18	8	10	3000	24000	30000
5.	Transistor power supply (+,-,Comm)0-30 V / 1 A variable	2	2	2	3	12	15	8	10	3500	28000	35000
6.	Unregulated power supply 0-30 V; 1 A	2	2	2	2	4	4	2	2	2500	10000	10000
7.	A.F. signal generator. Output Digital AES 75W on a BN connector,AES/EBU on terminal block connector, S/PDIF on a RCA connector and To link balanced Stereo 600 W on a Terminal block connector with power adaptor	4	6	8	10	16	22	10	12	10000	100000	120000
8.	RF signal generator Frequency Range 100KHz to 150 Mhz in seven steps, accuracy on scale +5%, RF output min 100mv (upto 30 Mhz), RMS modulation AM, Audio Frequency Range 150 Hz-1.5 Khz, Audio output 2V RMS, Ext. Audio Input 50 Hz to 20 Khz at less than IV RMS Mains 230 V	4	6	10	12	18	24	10	12	15000	100000	180000
9.	Function Generator Operating modes sine, square, triangle and DC output Frequency Range 0.1-1Mhz in seven decade steps, Variable control between steps, Frequency Accuracy +0.5% Display LCD controlled by	2	3	2	3	6	9	4	6	25000	100000	150000
S.No.	Name of the Equipment/ Board/Kit Etc.	Electronics Work-Shop		Electronics Inst. & Measurements Lab		Total		Total No. Recommended		Rate per Piece	Total Cost	
		Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	In Rs.	Intake 60	Intake 75
	micro controller, Main supply 200V +10%, 50 Hz output voltage max 10V into 50W, attenuation two step variable											
10.	Std. Signal Generator	4	6	2	2	8	11	4	6	15000	60000	90000
11.	AC/DC Voltmeter (M.I.type)	-	-	4	6	4	6	4	6	600	2400	3600
12.	CRO 200 Mhz Digital Storage oscilloscope-upto 1GSa/s Simple Rate Memory 4 Kpts or Higher, 2 Chennel with additional ext. trigger input, Colour Display 15 cm(5.7 inc.) 20 automatic measurement & 4 math function including FFTs, Advance Triggering,Delayed Sweep Mode	-	-	4	4	10	14	8	10	35000	280000	350000

	Mask Test, USB Interface For PC Connectivity											
13.	Dual Trace CRO 100 MHz Digital Storage oscilloscope-upto 1GSa/s Simple Rate Memory 4 Kpts or Higher, 2 Chennel with additional ext. trigger input, Colour Display 15 cm(5.7 inc.) 20 automatic measurement & 4 math function including FFTs, Advance Triggering, Delayed Sweep Mode Mask Test, USB Interface For PC Connectivity	-	-	4	4	10	14	8	10	35000	280000	350000
14.	Q Meter-8 Digit LED 0.8 inch Height, Range Indicator .999 count & Status indicators Via 3 LEDs, Measuring Frequency 250 ms	-	-	2	3	2	3	2	3	8000	16000	24000
15.	RLC/Universal Bridge AC/DC Bridge	-	-	2	3	2	4	4	5	8000	32000	40000
16.	Universal Digital Freq. Counter	-	-	2	3	4	6	2	3	20000	40000	60000
17.	Distortion Factor Meter	-	-	2	2	2	2	2	2	12000	24000	24000
18.	Decade Resistance Box 4/5/6 Dials	-	-	2	3	4	6	4	6	1500	6000	9000
19.	Decade Cap. Box 4/5/6 Dials	-	-	1	2	2	4	2	3	3000	6000	9500
S.No.	Name of the Equipment/ Board/Kit Etc.	Electronics Work-Shop		Electronics Inst. & Measurements Lab		Total		Total No. Recommended		Rate per Piece	Total Cost	
		Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	Intake 60	Intake 75	In Rs.	Intake 60	Intake 75
20.	Std. Inductance (Diff. Value)	-	-	4	6	4	6	4	6	600	2400	3600
21.	Charts, Models, displays for safety/rules etc.	LS	LS	-	-	LS	LS	LS	LS	--	10000	10000
22.	Digital Multimeter 4.5 Digit Display, AC/DC Voltage, AC/DC Current 20A Resistance, Capacitors Frequency Diode Test, Transistor Test & Continuity Test	2	3	6	6	12	15	6	8	5000	30000	40000
23.	Single Phase Variac 5 Amp, 15 Amp (Oil/Air cool)	4	10	2	4	18	22	10	12	5000 av.	50000	60000
24.	Calibrated Dual Trace CRO 100 Mhz Digital Storage oscilloscope-upto 1GSa/s Simple Rate Memory 4 Kpts or Higher, 2 Chennel with additional ext. trigger input, Colour Display 15 cm(5.7 inc.) 20 automatic measurement & 4 math function including FFTs, Advance Triggering, Delayed Sweep Mode Mask Test, USB Interface For PC Connectivity	2	3	-	-	6	8	4	6	30000	120000	180000
25.	Tools Kit	20 SET	30 SET	-	-	40 SET	60 SET	30 SET	40 SET	1500	45000	60000
26.	Misc. Active Components	LS	LS	-	-	LS	LS	LS	LS	--	15000	
27.	Misc. Accessories as per req.	LS	LS	-	-	LS	LS	LS	LS	--	10000	
28.	Misc. Passive components.	LS	LS	-	-	LS	LS	LS	LS	--	15000	
29.	Working Models of analog and digital equipment	LS	LS	-	-	LS	LS	LS	LS	--	20000	
30.	Dark room with Camera, Enlarger, Developing setup, Fixing & Printing setup etc.	LS	LS	-	-	LS	LS	LS	LS	--	80000	
31.	Manual Etching Setup	LS	LS	-	-	LS	LS	LS	LS	--	10000	

32.	Mechanised Etching Setup	LS	LS	-	-	LS	LS	LS	LS	--	10000	
33.	Silk-Screen Printing Setup	LS	LS	-	-	LS	LS	LS	LS	--	10000	
S.No.	Name of the Equipment/ Board/Kit Etc.	Electron- ics Work- Shop		Electro- nics Inst. & Measurem ents Lab		Total		Total No. Recommen- ded		Rate per Piece	Total Cost	
		Intake		Intake		Intake		Intake		In Rs.	Intake	
		60	75	60	75	60	75	60	75		60	75
34.	Drill Machine Power Operated	2	3	-	-	4	8	4	6	3500	14000	21000
35.	PCB Drill Machine	2	3	-	-	6	9	4	6	500	2000	3000
36.	Misc. Items	LS	LS	-	-	LS	LS	LS	LS	--	80000	
37.	Consumable(Not specified above)	LS	LS	LS	LS	LS	LS	LS	LS	--	258000	

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."

NOTE : Equipment for different shop and lab of latest version should be purchased.

I. APPLIED PHYSICS LAB

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
1.	Brass ball with hook dia 1.8 Cm to 2 Cm diameter	2	50	100
2.	Stop watch least count Least Count 0.1 Sec.(non-magnetic) 0.01 sec to 0.001 sec (Electronic Desirable)	4	750	3000
3.	Wall bracket with clamping arrangement 8" to 10" length	2	50	100
4.	Meter scale Least count 0.1cm, wooden 1meter	5	40	200
5.	Meter scale Least count 0.1cm, wooden 50 Cm	5	40	200
6.	Searl's conductivity apparatus with copper & steel rods 25 cm length 4 cm.diameter with all accessaries	2 set	1500	3000
7.	Constant Level Water Flow Container of one liter capacity vertical stand & rubber tubing	2	250	500
8.	Thermometer 0-110oC(Least count 0.1oC desirable)	4	100	400
9.	Potentiometer - 10 wires (1 meter length of each wire) with jockey, sunmoical top	4	750	3000
10.	Moving coil galvenometer 30-0-30 with moving mounting	5	300	1500
11.	Rheostat 50 ohm., 100 Ohm., 150 Ohm. 16 capacity		300	4800
12.	Lead Accumulator 2V, 6V (1 No. Each)	2	250	500
13.	Meterbridge 1 meter length, sunmica top copper strips fitted with scale	2	300	600
14.	Resistance Coil (Standard) 1 ohm. to 10 ohm.	10	50	500
15.	Moving coil ammeter 0-1 amp., 0-2 amp., 0-5 amp. with mounting	8	250	2000
16.	Moving coil voltmeter 0-1 V., 0-2V 0-5 V., 0-10 V. with mounting	8	250	2000
17.	Denial cell with complete accessories	2	250	500

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
18.	Leclanche Cell with complete accessories	2	250	500
19.	Standard Cadmium Cell with complete accessories	2	250	500
20.	Battery Charger with complete accessories	1set	1800	1800
21.	Battery Eliminator Multi range	2set	750	1500
22.	Multimeter(Digital)	1set	800	800
23.	Carey Foster Bridge (With all accessories)	2set	4500	9000
24.	Resistance Box (2 No. Each) 0-1 Ohm, 0-100 Ohm.	4	850	3400
25.	Fractional Resistance Box 0-1 Ohm.	2	1200	2400
26.	Post office box Key type	2	1200	2400
27.	Post office box Dial type	2	1200	2400
28.	Resistance Wire(100 Gm.) (Constanton/Maganin)	1 lacchi	100	100
29.	Connecting Wire Copper(1/2 Kg.) (Cotton Insulated)	1 lacchi	700	700
30.	Screw gauge L.c 1/100 mm	5set	150	750
31.	Vernier Callipers L.c. 1/10 mm	5set	100	500
32.	Appratus for determining character- stics of P-N junction diode complete with all accessories	2 set	1500	3000
33.	Resonance Column of steel One Meter length and 3-4 Cm diameter fitted with scale & water level arrangement	2	1600	3200
34.	App. for determining coefficient of friction on a horrizontal plane (Complete with all accessories)	2 set	700	1400
35.	Tuning Fork's Sets Set of different frequency (with rubber pad)	3set	350	1050
36.	Physical balance with weight box Complete with Fractional weight	2	800	1600
37.	Anemometer with counter cup type	1	1000	1000
38.	Spring Force Constant Apparatus with graduated mirror & pointer, weight set with hanger	2	1200	2400
39.	Viscosity Apparatus (Stock law) with steel balls and viscous liquid & timer	2set	1600	3200
40.	Thermometer of different range Mercury thermometer 0-50oC to 0-110oC	10set	100	1000
41.	Wall Thermometer Alcohol Filled 0-50oC	2set	20	40
42.	Sprit Level Technical Type	1set	60	60
43.	Drilling Machine Electric with different size bits	1set	800	800
44.	LPG Gas Burner with Cylinder	1set	800	800
45.	Tool Kit with different tools Complete	1set	800	800
46.	Lab stools	30		

S.No.	Name of Equipment	No.	@ Rs. Aprox.	Amt.in Rs. Aprox.
47.	Lab tables	8		
48.	Plug Keys One Way	5	50	250
49.	Plug Keys Two Way	5	100	500
50	Helical Springs - Soft, 10 cm each	6	100	600

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 1	600 600
14.	Variable inductor single phase, 250 V, 2.5 KVA 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
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

Sl. No.	Equipment	Qty.	Price
20.	Kelvin double bridge 10 x 0.1 ohms circular slide wire devided 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 varibale.	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	1	2000
	Frequency meter digital portable 3.5 digit LED display range 20-99 Hz	1	2000
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

Sl. No.	Equipment	Qty.	Price
35.	Wire wound rheostats		
	15 ohms, 10 A	2	1200
	100 ohms, 5 A	2	1200
	250 ohms, 5 A	2	1200
	1000 ohms, 0.5 A	2	1200
	2500 ohms, 0.1 A	2	1200
36.	Stop watch least count 0.01 Sec.	2	2000
37.	Stop watch (digital) LED	2	2000

COMPUTER CENTRE

S.No.	DESCRIPTION	QTY.	APPROX. COST (in Rs.)
1.	Core-2 Quad Processor, 4GB RAM 1 GB SATA HDD, 19" TFT Mointor OS-Windows 2007/2008/Latest Version	02 Server	1,20,000=00
2.	General Desktop Computer-Intel i5 60 node or Higher, 2GB RAM, 320 GB SATA HDD, 17" TFT/LCD/LED Monitor, DVD Wirter Multi Media Kit with Speakers & Microphone Key Board-Multimedia, Mouse- Optical Scroll or Latest, 32 Bit PCI ETHERNET CARD (10/100) Mbps, Internet Modem, Pen Drive 16 GB, Pre loaded Windows 2007/2008/latest Pre Loaded Latest Anti Virus with Life time Subscription, Licence Media and Manual with UPS 660 VA OR Computer of latest Specification		36,00,000=00
3.	Lap Top (Latest Version) with damage Warranty & 3 Hour backup battery	04	250000.00
4.	Software (With Licence):		LS
	i. ORACLE 11i/My SQL 5.5 or Latest Window based (30 users) & Development (Latest)		
	ii. VISUAL STUDIO (Professional 2012)		
	iii. MS OFFICE 2010		
	iv. COMPILER 0 'C', C++, JAVA-7		
	v. Unix & Linux - Red Hat/UBUNTU/Fedora or Latest		
	vi. Page Maker, Corel Draw(Full Package), Adobe Reader, Adobe Dream Weaver CS6, Flash Photoshop, Net Beams		
	vii. Tally ERP 9		
	viii. Personal Web Server, HTML, IIS		
5.	Hardware		5,00,000.00 LS
	i. Switch-32 Port	02	
	ii. Router	02	
	iii.Hub	04(8 Port)	
	iv. Ext. Modem	02	
	v. Wireless N/W Adaptor	02	
	vi. Series Access Point	02	
	vii.LAN Cable Meter	05	
	viii. LAN Cable Analyzer	05	
	ix. LAN Trainer Board	05	
	x. DATA Communication Trainer Board	05	
	ix. Crimping Tool	15	
	and all other accessories related to Networking		
6.	Scanner- Flat Bed A4/Auto Lighter (Bit depth 48)	02	20,000

7.	132 Column 600 CPS or faster 9 Pin dot matrix printer with 500 million character head life	02	50,000
8.	Laser Jet-A4 All In one 20 page per min (2 Each)	04	10,000
9.	Desk Jet-A4 Photo Smart (2 Each)	04	40,000
10.	5 KVA on line UPS with minimum 30 minute battery backup along with sealed maintenance free batteries. Provision for connecting external batteries with network connectivity.(For 2 Labs)	04	8,00000
11.	Split Air Conditioner 1.5 tones capctity with ISI mark alongwith electronic voltage stablizer with over viltage and time delay circuit	08	35,0000
12.	Room preparation and furniture	LS	
13.	19" rack, 24-port switch. connector RJ-45 Cat-6 cabling for network	LS	10,0000
14.	2 KVA Inverter Cum UPS	02	6,0000
15.	Digital Camera (Latest Version)	01	20000
16.	Fire Extinguisher (2 Kg.)	04	15000
17.	Fire Extinguisher (5 Kg.)	04	25000
18.	Vaccum Cleaner	02	25000
19.	LCD Projector 3000 Lumen with all accessories	02	350000
20.	Pen Drive 16 GB	10	10000
21.	DVD Writer External	02	10000
22.	HDD External 500 GB	02	15000
23.	PAD (Latest Configuration)	02	15000
24.	Boardband For Internet(Speed Min. 8mbps)	04	LS
25.	USB Modem	02	8000
26.	Generator 15 KVA Water Coolent	01	450000

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

HARDWARE MAINTENANCE & PROJECT LAB

S.No.	Description	Qty.	Approximate Cost.
1.	Digital Multimeter 3 1/2 to 4 1/2 digits, 1000 Volt DC, 2 Mega Ohm range, Resistance, capacitance, Freq., Diode, transistor, Continuity testing, AC/DC Change	15	55,000
2.	Power Supply Regulated/transistorized 0-30 V	15	50,000
3.	Intel i5 or Higher-2 Processor 2 GB RAM, 320 GB HDD, or Higher, CD/DVD Drive	15	1000000
4.	Printer (600 cps) a) Dot Matrix b) Desk Jet c) Laser	3 Each	200000
5.	Constant Voltage Transformer	5	50,000
6.	PC Card Sets (One Mother Board, 4 Cards)	5	50,000
7.	Spike Buster	15	20,000
8.	Trainer Board i. To demonstrate assembly & working of multimedia computer system ii. To study mother board with different chip set and processor iii To study Hard Disk (SATA/IDE) iv. To study construction and working of TFT/LCD/LED monitor v. To study dot-matrix, Ink Jet, Laser Jet Printer	05 Set of each Board	500000
9.	Tool Kit	15	75000

7. LEARNING RESOURCE MATERIALS

1.	LCD Projector with Screen	1	--	20000
2.	Handicam	1	--	30000
3.	Cutting, Binding & Stitching equipment.	1	--	30000
4.	Desk Top Computer with Internet Core i5/i7- 760, Processor, Genuine Windiw 7, Professional 18 inch HD, Flat Panel Monitor Optical Mouse, Key Board & all related media or latest version	1	--	40000
5.	Home Theater Support Disc type CD. CDR/CDRW DVDR/DVDRW, VCD Supported with USB Port Support-DIVX/JPEG/MP3	1	--	25000
6.	Commerical P A System 16 W-220W output, AC & 24V DC Operated, 5 Mic. & 2 Auxilary input, Speaker output 4 Ohm, 8 Ohm, 17 V & 100 V	1	--	20000
7.	Interactive Board	1	--	50000

ote :

1. This center will be only one at the institute level irrespective of all branches.

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 Computer Science (Semester System).

PURPOSE: To design and develop Three Year (Six Semester) diploma curriculum in Computer Science (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 _____
Computer Science.

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

- | | | |
|----|----|----|
| 1. | 2. | 3. |
| 4. | 5. | 6. |

7. What proficiencies are expected from a diploma holder in
Computer Science.

- | | | |
|----|----|----|
| 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 | -----% |

- | 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. | Yes/ No |
| 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 Computer Science. | |

(Signature)

Kindly mail the above questionnaire duly filled to:-

Gaurav Kishor Kanaujiya
Lecturer-IT
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 perform 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.

ANNEXURE- 3 STUDENT CENTER ACTIVITY

The purpose of this subject to enhance the skills of student in following areas

1. English proficiency
2. Level of academic knowledge
3. Presentation skills

To achieve above goals, small group of students or individual students with similar needs work independently.