



**MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI**  
**TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES**

**COURSE NAME : COMPUTER ENGINEERING GROUP**

**COURSE CODE : CO/CD/CM/CW/IF**

**DURATION OF COURSE : 6 SEMESTERS For CO/CM/CW/IF ( 8 SEMESTERS for CD)**

**WITH EFFECT FROM 2012-13**

**SEMESTER : SECOND**

**DURATION : 16 WEEKS**

**FULL TIME / PART TIME : FULL TIME**

**SCHEME : G**

SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (17200)		
				TH	TU	PR	PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)					
								Max	Min	Max	Min	Max	Min	Max	Min				
1	Communication Skills \$	CMS	17201	02	--	02	03	100	40	--	--	25#	10	25@	10	50			
2*	Applied Science	Physics	APH	17210	02	--	02	02	50	100	40	25@	50	20	--		--	--	--
		Chemistry	ACH	17211	02	--	02	02	50		25@	--		--	--		--		
3	Programing in 'C'	PIC	17212	03	--	04	03	100	40	25#	20	--	--	25@	10				
4	Basic Electronics	BEL	17213	03	--	02	03	100	40	--	--	--	--	25@	10				
5	Engineering Mathematics \$	EMS	17216	03	01	--	03	100	40	--	--	--	--	--	--				
6	Development of Life Skills \$	DLS	17010	01	--	02	--	--	--	--	--	25@	10	--	--				
7	Web Page Designing	WPD	17013	01	--	02	--	--	--	50@	20	--	--	--	--				
<b>TOTAL</b>				<b>17</b>	<b>01</b>	<b>16</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>125</b>	<b>--</b>	<b>50</b>	<b>--</b>	<b>75</b>	<b>--</b>	<b>50</b>			

Student Contact Hours Per Week: **34 Hrs.**

**THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.**

Total Marks : **800**

@- Internal Assessment, # - External Assessment,  No Theory Examination, \$ - Common to all branches

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, ,OR-Oral, TW- Term Work, SW- Sessional Work

- Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW).
- Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.
- Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

\* Applied Science is divided into two parts- Applied Science (Physics) and Applied Science (Chemistry). Theory examination of both parts as well as practical examination of both parts will be conducted on separate days. Sum of theory marks of both parts shall be considered for passing theory examination of Applied Science. Similarly it is also applicable to practical examination. It is mandatory to appear theory and practical examination of both parts. Remaining absent in any examination of any part will not be declared successful for that examination head.

\* Candidate remaining absent in examination of any one part of Applied Science subject i.e. Physics, Chemistry will be declare as Absent in Mark List and has to appear for examination. The marks of the part for which candidate was present will not be processed or carried forward.

# Communication Skills [CMS]

F.Y. Diploma : Sem. II  
[All Branches]

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## EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical Exam</b>	–	–
<b>Oral Exam</b>	–	25#
<b>Term Work</b>	–	25@
<b>Sessional Work (Two Test)</b>	–	25 (each)

@ - Internal Assessment; # - External Assessment

## SYLLABUS

### Topic 1 Introduction to Communication

#### Specific Objective

- Describe the process of communication.

#### Content

- Definition of communication
- Process of communication
- Types of communication -- Formal, Informal, Verbal, Nonverbal, Vertical, Horizontal, Diagonal

### Topic 2 Effective communication

#### Specific Objective

- Identify the principles and barriers in the communication process

#### Content

- Principles of communication.
- Barriers to communication
  - (a) **Physical Barrier:**
    - Environmental ( time, noise, distance & surroundings)
    - Personal (deafness, stammering, ill-health, spastic, bad handwriting)
  - (b) **Mechanical :** Machine oriented
  - (c) **Psychological:** Day dreaming, prejudice, emotions, blocked mind, generation gap, phobia, status inattentiveness, perception.
  - (d) **Language :** Difference in language, technical jargons, pronunciation & allusions.

### Topic 3 Non verbal & Graphical communication

#### Specific Objective

- Effective use of body language & nonverbal codes
- View and interpret graphical information precisely.

#### Contents

##### 3.1 Non- verbal codes:

- Proxemics
- Chronemics
- Artefacts

### 3.2 Aspects of body language ( Kinesics)

- Facial expression
- Eye contact
- Vocalics, paralanguage
- Gesture
- Posture
- Dress & appearance
- Haptics

### 3.3 Graphical communication

- Advantages & disadvantages of graphical communication
- Tabulation of data & its depiction in the form of bar graphs & pie charts.

## Topic 4 Listening

### Specific Objective

- Effective use of listening

### Contents

- Introduction to listening
- Listening versus hearing
- Merits of good listening
- Types of listening
- Techniques of effective listening

## Topic 5 Formal Written Communication

### Specific Objectives

- Use different formats of formal written skills.

### Contents

- Office Drafting: Notice , memo & e-mail
- Job application with resume.
- Business correspondence: Enquiry letter, order letter ,complaint letter, adjustment letter.
- Report writing: Accident report, fall in production, investigation report.
- Describing objects & giving instructions

### Reference :

1. Text book of Communication Skills, (*MSBTE Mumbai*) MSBTE, Mumbai.
2. CD On Communication Skills, (*MSBTE*) MSBTE, Mumbai.
3. Communication Skills (*Joyeeta Bhattacharya*) Reliable Series.
4. Communication Skills (*Sanjay Kumar, Pushpa Lata*) Oxford University Press.
5. Website: [www.mindtools.com/page8.html-99k](http://www.mindtools.com/page8.html-99k)
6. Website: [www.khake.com/page66htm/-72k](http://www.khake.com/page66htm/-72k)
7. Website: [www.BMConsultant India.Com](http://www.BMConsultantIndia.Com)
8. Website: [www.letstak.co.in](http://www.letstak.co.in)
9. Website: [www.inc.com/guides/growth/23032.html-45k](http://www.inc.com/guides/growth/23032.html-45k)



# Engineering Mathematics [EMS]

F.Y. Diploma : Sem II

[AE/CD/CE/CH/CM/CO/CR/CS/CV/CW/DE/ED/EE/EI/EJ/EN/EP/ET/EV/EX/  
FE/IC/IE/IF/IS/IU/ME/MH/MI/MU/PG/PS/PT]

## EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical Exam</b>	–	–
<b>Oral Exam</b>	–	–
<b>Term Work</b>	–	–
<b>Sessional Work (Two Test)</b>	–	25 (each)

## SYLLABUS

### Topic 1 Complex number

- **Complex number**

#### Specific objectives

- Find roots of algebraic equations which are not in real.
- Definition of complex number, Cartesian, polar and exponential forms of complex number.
- Algebra of complex number such as equality, addition, subtraction, multiplication and division.
- De- Moivre's theorem with simple examples.
- Euler's form of circular functions, hyperbolic functions and relation between circular and hyperbolic functions.

### Topic 2 Differential Calculus

#### 2.1 Function

##### Specific objectives

- Identify the function and find the value of function.
- Definition of function, range and domain of function.
- Value of function at a point.
- Types of functions and examples.

#### 2.2 Limits

##### Specific objectives

- To evaluate limit of function.
- Concept and definition of limit.
- Limits of algebraic, trigonometric, logarithmic and exponential functions with examples.

#### 2.3 Derivatives

##### Specific objectives

- Find the derivatives by first principle.
- Solve problems using rules and methods of derivatives
- Definition of derivatives, notation, derivatives of standard function using first principle.

- Rules of differentiation such as, derivatives of sum or difference, product, and quotient with proofs.
- Derivative of composite function with proof ( Chain rule )
- Derivatives of inverse trigonometric functions using substitution
- Derivatives of inverse function.
- Derivatives of implicit function.
- Derivatives of parametric function.
- Derivatives of one function w.r.t another function.
- Logarithmic differentiation.
- Second order differentiation.

### Topic 3 Numerical Method

#### 3.1 Solution of algebraic equation

##### Specific objectives

- Find the approximate root of algebraic equation
- Bisection method
- Regula falsi method
- Newton Rapshon method

#### 3.2 Numerical solution of simultaneous equations

##### Specific objectives :

- Solve the system of equations in three unknowns.
- Gauss elimination method
- Jacobi's method
- Gauss Seidal method

#### Reference :

1. Mathematics for Polytechnic (*S.P. Deshpande*) Pune Vidyarthi Griha Prakashan – Pune.
2. Calculus : Single Variable (*Robert T. Smith*) Tata McGraw Hill.
3. Advanced Engineering Mathematics (*Dass H.K.*) S. Chand Publication – New Delhi.
4. Fundamentals of Mathematical Statistics (*S.C. Gupta & Kapoor*) S. Chand Publications – New Delhi.
5. Higher Engineering Mathematics (*B.S. Grewal*) Khanna Publication – New Delhi.
6. Applied Mathematics (*P.N. Wartikar*) Pune Vidyarthi Griha Prakashan – Pune.
7. Websites : [www.khan.academy](http://www.khan.academy)



## Basic Electronics [BEL]

F.Y. Diploma : Sem II  
[CO/CM/IF/CD/CW]

### EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	–
Term Work	25@	25
Sessional Work (Two Test)	–	25 (each)

### SYLLABUS

#### Topic 1 Introduction to Passive Circuit Elements

##### Specific Objectives

- To know Electronics & identify Electronics component
- To know active & passive components
- To know color coding of Resistors

##### Contents

- 1.1 Definition & Introduction to Electronics
- 1.2 Applications of Electronics: Industrial Applications, Defense, Medical Science, Instrumentation, Communication & Entertainment
- 1.3 Types of Electronics Components: Active & Passive
- 1.4 Types of Passive Components, Resistor, Inductors and Capacitors.  
Resistors – Resistance, Definition, Symbol, Unit, Specifications.  
Classification of Resistors – Fixed, Variable. Resistor color coding  
Non Linear resistors : LDR, VDR, Thermistors
- 1.5 Inductors – Inductance , Definition, Symbol, unit, specifications  
Classification – Fixed and Variable
- 1.6 Capacitors -Capacitance, Definition, Symbol, Unit, Specifications
- 1.7 Classification – Fixed and Variable

#### Topic 2 Semiconductor Diode

##### Specific Objectives

- To describe the working of semiconductor diodes,
- To know characteristics, applications of semiconductor diodes.

##### Contents

- 2.1 Semiconductor Diode: P-N Junction , Concept of Hole, Majority Charge carriers, minority charge carriers, Formation of depletion layer in PN junction, Barrier Voltage, Biasing the P-N Junction – Forward Bias, Reverse bias, PN Junction Diode – Symbol, VI characteristics (Forward and Reverse characteristics), Ideal characteristics, Static and Dynamic resistance of a diode, Knee voltage, Diode specifications: Forward voltage, Peak Inverse voltage, Maximum Forward current, Reverse Saturation Current.
- 2.2 Types of Diodes
  - 2.2.1 Zener Diode- Symbol, Operating Principle, V-I Characteristics, Zener Breakdown Voltage. Zener as a voltage regulator.
  - 2.2.2 Tunnel Diode – Symbol, operating Principle, V-I Characteristics, applications
  - 2.2.3 Light Emitting Diode- Symbol, Operating Principle, V-I Characteristics, applications

- 2.2.4 Varactor Diode- Symbol, operating Principle, V-I Characteristics, applications
- 2.2.5 Schottky Diode - Symbol, operating Principle, V-I Characteristics, applications

### **Topic 3 Rectifiers, Filters and Regulators**

#### **Specific Objectives**

- To Know the need of regulation, Rectifier, Filter.
- To draw block diagram and to describe the function and working of each block

#### **Contents**

- 3.1 Need for Regulated Power Supply
- 3.2 Basic Block Diagram of Regulated Power Supply
- 3.3 Rectifier- Definition , Need for rectification  
Types of Rectifiers- Half wave Rectifier, Full Wave Rectifier (Centre Tapped and Bridge–Circuit diagram , Operation and input- output Waveforms ( No derivations), Definition of Ripple Factor, Efficiency, PIV Comparison of Rectifiers
- 3.4 Filters- Definition , Need for Filters, Types of Filters – L, C, LC, CLC- Circuit Diagram, Principle of working, Input- Output Waveform. Comparison of Filters

### **Topic 4 Transistors**

#### **Specific Objectives**

- To know the differentiate between Unipolar and Bipolar Transistors.
- To describe the construction, working, Characteristics, and applications of Transistors.

#### **Contents**

- 4.1 Introduction to Unipolar and Bipolar junction Transistors
- 4.2 Bipolar junction Transistors – Definition, Types (PNP, NPN), Symbol, Working Principle of NPN transistor, Types of Transistor Configuration – CE, CB, CC (Only circuit Diagrams), Characteristics of CE configuration – Input /Output Characteristics. Identification of Cut off, Active and Saturation Region, Input resistance, Output resistance , Current gain ( $\alpha$  and  $\beta$  ), Relation between  $\alpha$  and  $\beta$ , Transistor Biasing- Need for biasing, DC load line, Q- point, Types of biasing – Voltage divider bias
- 4.3 Field Effect Transistor – Types ( JFET and MOSFET), JFET- N Channel and P channel– Symbol, Construction, working principle. Characteristics of JFET – Drain and Transfer Characteristics FET parameters – DC Drain Resistance, AC drain Resistance, Transconductance, Amplification Factor, Input Resistance, Comparison of JFET and BJT
- 4.4 MOSFET: Types, Symbol, working principle.
- 4.5 Applications of BJT, FET and MOSFET.

### **Topic 5 Amplifiers and Oscillators**

#### **Specific Objectives**

- To know the need of amplifiers, their types, frequency response
- To know the need for oscillators, multivibrators and their applications

#### **Contents**

- 5.1 Transistor as an amplifier- Single Stage CE amplifier, Circuit Diagram, Function of various components, Frequency and Bandwidth, Definition of Current gain, Voltage Gain and Power Gain, Need for Multi stage Amplifiers, Types of Coupling – RC coupled, Direct Coupled and Transformer Coupled , Two- stage amplifiers, Circuit Diagram and function of each component. Application of each type of multistage Amplifiers

- 5.2 Oscillators - Need for oscillators , Crystal Oscillator, Circuit Diagram - Operating principle and application
- 5.3 Transistor as a switch- circuit Diagram, Operation, application, Astable Multivibrator using transistors- circuit diagram, operation, application, Bistable multivibrator using Transistors–Circuit diagram, working principle and applications

## **Topic 6    Integrated Circuits**

### **Specific Objectives**

- To identify ICs
- To state advantages and limitations of ICs.

### **Contents**

- 6.1 Introduction to ICs- Classification – Analog and Digital ICs
- 6.2 Advantages and Disadvantages of ICs

### **Reference :**

1. A textbook of Applied Electronics, (*R.S. Sedha*) S. Chand (1<sup>st</sup> Edition –Reprint 2009).
2. Basic Electronics, (*Ghatak*) Pearson (1<sup>st</sup> Edition-2011)
3. Make Electronics, (*Charles Patt*) O REILLY (1<sup>st</sup> Edition-2011)
4. Electronic Devices and Circuits, (*Salivahanan & N. suresh Kumar*) Tata McGraw Hill (2<sup>nd</sup> Edition-2011)





# Programming in 'C' [PIC]

F.Y. Diploma : Sem II  
[CO/CM/IF/CD/CW]

## EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical Exam</b>	25#	25
<b>Oral Exam</b>	–	–
<b>Term Work</b>	25@	25
<b>Sessional Work (Two Test)</b>	–	25 (each)

## SYLLABUS

### Topic 1 Basics of C

#### Specific Objectives

- State rules for declaration of variables, constants and operators
- Write simple program using formatted input and formatted output.

#### Contents

- History of C, where C stands
- C character set, tokens, constants, variables, keywords, identifiers
- C operators- arithmetic, Logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence, C expressions data types
- Problem solving techniques : flowchart and algorithm. Formatted input, formatted output instructions.

### Topic 2 Decision making

#### Specific Objectives:

- Write a simple program using decision making, branching statement, looping statement
  - Describe use of break and continue statement.
- 2.1 Decision making and branching if-statement – if, if-else, else-if ladder, nested if else, switch case statement, break statement
- 2.2 Decision making and looping - while, do, do- while statement, for loop, continue statement

### Topic 3 Arrays and Strings

#### Specific Objectives:

- Give syntax of single dimensional, multidimensional array and strings.
  - Write a program using array and string.
- 3.1 Arrays Declaration and initialization of one dimensional, two Dimensional and character arrays accessing array elements.
- 3.2 Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp()

### Topic 4 Functions and Structures

#### Specific Objectives:

- State the scope of local and global variable.
- Understand the category of function call and function type and write program.
- Write and execute the program using command-line argument.
- Write a program using structure

- 4.1 Functions: - Need of functions, scope and lifetime of variables, defining functions, function call, call by value, call by reference, return values, storage classes, category of function - No argument No return value, No argument with return value, argument with return value, recursion, command line arguments
- 4.2 Structures: - Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.

## Topic 5 Pointers

### Specific Objectives:

- State the declaration syntax of pointer, pointer initialization
- Write the program using pointer arithmetic

Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, Pointers arithmetic

### Reference :

1. Let us 'C' (*Kanitkar*) BPB (3<sup>rd</sup> Edition).
2. Programming in 'C' (*Balgurusamy*) Tata McGraw Hill (5<sup>th</sup> Edition).
3. C for beginners (*Madhusudan Mothe*) SPD (1<sup>st</sup> Edition)
4. <http://cplus.about.com/od/beginnerctutorial/a/blctut.htm>
5. <http://computer.howstuffworks.com/c.htm>
6. <http://www.java2s.com/Tutorial/C/CatalogC.htm>
7. <http://www.cprogramming.com/tutorial.html>
8. <http://www.indiastudycenter.com/studyguides/sc/objtest/default.asp>



# Applied Physics [APH]

F.Y. Diploma : Sem. II

[EE/EP/EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ED/EI/IU/CO/CM/IF/CD/CW]

## EVALUATION SYSTEM

	Time	Marks
Theory Exam	2 Hrs.	50
Practical Exam	–	25@
Oral Exam	–	–
Term Work	–	–
Sessional Work (Two Test)	–	25 (each)

@ - Internal Assessment

## SYLLABUS

### Topic 1 Basic Electric circuits

#### Specific objectives

- Calculate basic electric parameters for designing the simple electric circuits.
- Use basic electronic components like resistor, capacitor in electronic circuits.
- Use various networks such as Whetastone's network , potentiometer
- Study principle and applications of condenser

#### 1.1 Simple D.C. electric circuits

Electric current: definition, symbol and unit, Ohm's law: statement, mathematical expression, resistivity: definition, unit, conductivity: definition, unit.

#### 1.2 Wheatstone's network and potentiometer

Wheatstone's network, working principle, balancing condition, principle of potentiometer, potential gradient.

#### 1.3 Condensers

Capacity of condenser-definition and its unit, definition of 1 farad capacity, principle of condenser, derivation of capacity of parallel plate condenser, statement and derivation of series and parallel combination of condensers.

### Topic 2 Semiconductor Physics

#### Specific objectives

- Differentiate between conductor, semiconductor, insulator
- Verify characteristics of P-N junction diode
- Study applications of P-N junction diode, photodiode.
- Classification of solids on the basis of band theory: forbidden energy gap, conductor, insulator, semiconductor.
- Classification of semiconductors, P-N junction diode, forward characteristics of P-N junction diode, reverse characteristics of P-N junction diode, photodiode, its symbol, principle and applications.

### Topic 3 Modern physics

#### Specific objectives

- State the concept of photocell
- State applications of X – ray
- State properties and applications of LASER

### 3.1 Photo electricity

- Photon (quantum), Plank's hypothesis, energy of photon, properties of photons.
- Photo electric effect: circuit diagram, process of photoelectric emission, definitions:- threshold frequency, threshold wavelength, stopping potential, characteristics of photoelectric effect
- Work function, Einstein's photoelectric equation, photo resistor (LDR) – symbol, principle, applications, photoelectric cell:- principle, applications.

### 3.2 X-rays

- Origin of X-rays, production of X-rays using Coolidge's X-ray tube, minimum wavelength of X-ray, properties of X-rays, applications of X- rays: engineering, medical and scientific.

### 3.3 Laser

- Laser, properties of laser, spontaneous and stimulated emission, population inversion, optical pumping.
- He-Ne Laser: Principle, construction and working, engineering applications of Laser

## Topic 4 Physics of Nanoparticles

### Specific Objectives

- Study properties of nanoparticles.
- Study applications of nanotechnology.
- History, nanoparticles, properties of nanoparticles, methods of synthesis of nanoparticles: physical method of synthesis of nanoparticles, engineering applications of nanotechnology.

### Reference :

1. Physics (*Resnick and Hailday*) Wisley Toppan Publishers – England.
2. Engineering Physics (*B.L. Theraja*) S. Chand Publishers – New Delhi.
3. Engineering Physics (*V. Rajendran*) Tata McGraw-Hill Publications.
4. Conceptual Physics (*P.G.Hewitt*) Pearson education (10<sup>th</sup> Edition).
5. Physics for Engineers (*M.R.Srinivasan*) New Age international publishers.
6. Physics- Std XI, Std XII, HSC board/CBSE Board
7. Engineering Physics (*D.K. Bhattachrya A. Bhaskaran*) Oxford university press
6. Website : <http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>
7. Website : <http://physics.info>
8. Website : <http://physics.org>
9. Website : <http://about.com>
10. Website : <http://classroom.com>
11. Website : <http://101science.com>
12. CD : Educational Cd of NCERT  
Educational cd of Pearson education India
13. Videos : <http://www.youtube.com> Laser cutter  
<http://www.cmslaser.com>
14. PPT  
[www.slideshare.net/donpraju/laser-ppt](http://www.slideshare.net/donpraju/laser-ppt)  
[www.research.usf.edu/cs/rad/laser-ppt](http://www.research.usf.edu/cs/rad/laser-ppt)  
[www.studyvilla.com/laser-ppt-ruby](http://www.studyvilla.com/laser-ppt-ruby) laser  
[www.coursesuperconductor.ppt](http://www.coursesuperconductor.ppt)  
[www.khanacademy.com](http://www.khanacademy.com)



# Applied Chemistry [ACH]

F.Y. Diploma : Sem. II

[EE/EP/EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ED/EI/IU/CO/CM/IF/CD/CW]

## EVALUATION SYSTEM

	Time	Marks
Theory Exam	2 Hrs.	50
Practical Exam	–	25@
Oral Exam	–	–
Term Work	–	–
Sessional Work (Two Test)	–	25 (each)

@ - Internal Assessment

## SYLLABUS

### Topic 1 Metallurgy

#### Specific Objectives

- Describe the extraction processes of copper and aluminium.
- State engineering applications of copper and aluminium based on their properties.

#### 1.1 Metallurgy of Copper

Definition of metallurgy, Extraction process: Ores of copper, extraction of copper from copper pyrite by concentration, roasting, smelting, bessemerisation, electrolytic refining, Physical, chemical properties – action of air, water, acid, alkali. Applications of copper.

#### 1.2 Metallurgy of Aluminium

Extraction process: Ores of aluminium, extraction of aluminium from bauxite by Bayer's process, electrolytic reduction of alumina, electrolytic refining of aluminium, Physical, chemical properties–action of air, water, acid, alkali. Applications of aluminium, anodizing of aluminium.

#### 1.3 Solders

Composition, properties and applications of- soft solder, tinmann's solder, brazing alloy, rose metal, plumber's solder.

### Topic 2 Corrosion

#### Specific Objectives

- Explain Mechanism of atmospheric corrosion and immersed corrosion.
- Describe different methods of protection of metal from corrosion

#### 2.1 Corrosion

Definition of corrosion, Types of corrosion, Atmospheric Corrosion: Definition, mechanism of oxidation corrosion, types of oxide films and their significance, factors affecting rate of atmospheric corrosion. Immersed Corrosion: Definition, mechanism of immersed corrosion by galvanic cell action- with evolution of hydrogen gas and absorption of oxygen gas, factors affecting immersed corrosion.

#### 2.2 Protection of metals by

Modification of environment, modification of properties of metal, electrochemical protection by sacrificial anodic protection and impressed current cathodic protection, use of protective coatings. Application of metallic coatings: By galvanising, tinning, metal spraying, electroplating, metal cladding, cementation- sherardizing, chromising, colourising. Application of non-metallic coatings: paint-definition, characteristics, constituents of paint and their functions.

### Topic 3 Cells and Batteries

#### Specific Objectives

- Explain the concept of electrochemical cell.
- Describe construction and working of different types of cells.

#### Electrochemical cells/ batteries

- Basic concepts : Definition of electrolyte, conductivity of electrolytes, Ohm's law, specific conductance, equivalent conductance, cell, battery, electrolytic cell, electrochemical cell, charging, discharging.
- Classification of electrochemical cells: Primary and secondary cells.
- Primary cells: construction, working and applications of - Dry Cell, Daniel cell.
- Secondary cells: construction, working and applications of - Lead-acid storage cell, Ni-Cd Cell.
- Fuel cell : Definition, construction, working, advantages, limitations and applications of Hydrogen- oxygen fuel cell.

### Topic 4 Chemistry of Electronic Materials

#### Specific Objectives

- State role of polymers in electronic engineering.
- Describe applications of dielectrics and insulators in electronic devices.

#### 4.1 Polymers

Definitions, examples and applications of electrically conducting polymers, photoconductive polymers, electrically insulating polymers, liquid crystal polymers (LCP).

#### 4.2 Insulators, Dielectrics and Adhesives

Definition of dielectrics and insulator, Properties of gaseous, liquid and solid insulators, their examples. Properties and applications of- inert gases, silicone fluids, teflon, bakelite, ceramics and glass.

Definition, characteristics, advantages of adhesives, properties and applications of phenol formaldehyde resin, urea formaldehyde resin and epoxy resin.

#### Reference :

1. Engineering Chemistry (*S.S. Dara*) S. Chand Publication.
2. Engineering Chemistry (*Jain & Jain*) Dhanpat Rai and Sons.
3. Engineering Chemistry (*B. Sivasankar*) The McGraw-Hill Companies.
4. Environmental Chemistry (*K. B. Chandrasekhar, U. N. Das, Sujatha Mishra*) SCITECH.
5. Website : [http://en.wikipedia.org/wiki/conductive\\_polymer](http://en.wikipedia.org/wiki/conductive_polymer)  
<http://en.wikipedia.org/wiki/waste-management>  
<http://www.footprints-science.co.uk/Chemistry.htm>  
<http://www.youtube.com/watch?v=8tqfDE6vqcs&feature=related>  
<http://www.splung.com/content/sid/3/page/batteries>  
[www.teachnet-uk.org.uk/...Metals/...metals/Properties%20of%20Meta...](http://www.teachnet-uk.org.uk/...Metals/...metals/Properties%20of%20Meta...)  
[http://www.substech.com/dokuwiki/doku.php?id=full\\_index\\_of\\_articles\\_on\\_ceramics](http://www.substech.com/dokuwiki/doku.php?id=full_index_of_articles_on_ceramics)  
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<http://www.powerstream.com/BatteryFAQ.html>  
<http://physchem.co.za/OB12-sys/batteries.htm#lead-acid> (Dry Cell & Lead acid cell)

<http://www.kentchemistry.com/links/Redox/flash/RedoxAgentsElectrodesBattery.swf>  
(Battery)  
<http://www.kentchemistry.com/links/Redox/flash/battery.swf>  
<http://www.kentchemistry.com/links/Redox/flash/halfcells.swf> (Voltaic Cell)  
<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/animations/ZnCbatteryV8web.html>(Dry Cell)  
<http://www.ausetute.com.au/battery.html> (Batteries)  
[http://www.sherardizing.com/resources/files/9\\_Sherardizing\\_Corrosion.pdf](http://www.sherardizing.com/resources/files/9_Sherardizing_Corrosion.pdf)  
(Sheradizing)  
[http://www.galvanizeit.org/aga/animation/4728?keepThis=true&TB\\_iframe=true&height=480&width=640](http://www.galvanizeit.org/aga/animation/4728?keepThis=true&TB_iframe=true&height=480&width=640) (Galvanizing)  
[http://www.galvanizeit.org/aga/animation/4728?keepThis=true&TB\\_iframe=true&height=480&width=640](http://www.galvanizeit.org/aga/animation/4728?keepThis=true&TB_iframe=true&height=480&width=640) (Galvanizing)  
[http://www.ehow.com/list\\_6725219\\_different-types-metal-cladding.html](http://www.ehow.com/list_6725219_different-types-metal-cladding.html) (Metal Clading)  
<http://www.authorstream.com/Presentation/sheelachawla-590475-insulators/> (Insulators)  
[http://www.sut.ac.th/engineering/metal/pdf/Nonferrous/02\\_Aluminium%20and%20aluminium%20alloy.pdf](http://www.sut.ac.th/engineering/metal/pdf/Nonferrous/02_Aluminium%20and%20aluminium%20alloy.pdf)  
<http://www.youtube.com/watch?v=zU5sP64DeYA> (Flow chart of extraction of Al)  
[http://www.youtube.com/watch?v=0Rs4vHo6\\_oc&feature=related](http://www.youtube.com/watch?v=0Rs4vHo6_oc&feature=related) ( extraction of Al)  
<http://www.youtube.com/watch?v=XWGbUYsChOI> ( extraction of Cu)  
<fka.ump.edu.my/images/fka/.../5.2%20Adhesives.ppt>  
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## Development of Life Skills [DLS]

F.Y. Diploma : Sem. II

[All Branches]

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### EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	–	–
<b>Practical Exam</b>	–	–
<b>Oral Exam</b>	–	25@
<b>Term Work</b>	–	–

@ - Internal Assessment

### SYLLABUS

#### Topic 1 SELF ANALYSIS

##### Specific Objectives

- To introduce oneself.

##### Contents

- 1.1 Need of Self Analysis
- 1.2 Attitude and types (positive, negative, optimistic and pessimistic) Guidelines for developing positive attitude.

#### Topic 2 STUDY TECHNIQUES

##### Specific Objectives

- To identify different process and strategies.
- To improve reading, listening and notes taking skills.

##### Contents

- 2.1 Learning strategies
- 2.2 Learning process
- 2.3 Organization of knowledge
- 2.4 Reading skills
- 2.5 Listening skills
- 2.6 Notes taking
- 2.7 Enhancing memory

#### Topic 3 INFORMATION SEARCH

##### Specific Objectives

- To search information as per the need.

##### Contents

- 3.1 Sources of information
- 3.2 Techniques of information search (library, internet, etc)

#### Topic 4 SELF DEVELOPMENT

##### Specific Objectives:

- To set primary goals using SMART parameters.
- To Priorities the work effectively.
- To cope up with stress effectively.



### **Contents**

- 4.1 Goal setting and its importance.
- 4.2 Characteristics of Goal setting (**SMART**- Specific, Measurable, Attainable, Realistic, Time bound)
- 4.3 Time Management - Importance, prioritization of work, time matrix, time savers, and time wasters.
- 4.4 Stress Management - Definition, types of stress, causes of stress, managing stress, and stress busters.

## **Topic 5 PRESENTATION TECHNIQUES**

### **Specific Objectives**

- To plan for presentation.
- To prepare contents for presentation.

### **Contents**

- 5.1 Importance of presentation.
- 5.2 Components of effective presentation (Body language, voice culture , rehearsal, etc)
- 5.3 Preparing for presentation.
- 5.4 Use of audio/video aids. (audio, video, transparency's, PowerPoint presentations, etc)
- 5.5 Performing presentation (Seminars, paper presentations, compering, etc)

## **Topic 6 GROUP DISCUSSION**

### **Specific Objectives**

- To understand the concept of group discussion
- To know the purpose of group discussion

### **Contents**

- 6.1 Group discussion concept and purpose
- 6.2 Method of conduction

### **Reference :**

1. Target setting and goal achievement (*Richard Hale and Peter Whitlam*) Kogan Page.
2. Successful Presentation Skills (*Andrew Bradbury*) The Sunday Times – Kogan
3. Effective Presentation (*Ros Jay and Antony Jay*) Pearson – Prentice Hall.
4. Handbook on Development of Life Skills (*Subject Experts – MSBTE*) MSBTE
5. Effective Communication and Soft Skills (*Nitin Bhatnagar and Mamta Bhatnagar*) Pearson
6. Business Communication and Soft Skills (*D. Sudha Rani*) Pearson.
7. Personality Development and Soft Skills (*Barak K Mitra*) Oxford University Press
8. Soft Skills for Managers (*Dr. T. Kalayani Chakravarti and Dr. Latha Chakravarti*) Biztantra



## Web Page Designing [WPD]

F.Y. Diploma : Sem. II

[CO/CM/IF/CD/CW]

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### EVALUATION SYSTEM

	Time	Marks
Theory Exam	–	–
Practical Exam	–	50@
Oral Exam	–	–
Term Work	–	–

@ - Internal Assessment

### SYLLABUS

#### Topic 1 INTRODUCTION TO WWW

##### Objectives

- To understand Browsers & Web Servers
- To understand structure of HTML document
- Information about Web Browsers, Web Servers and types of sites.
- Introduce Web page structure and basic structure tags: !DOCTYPE, HTML, HEAD, TITLE, BODY with attributes.

#### Topic 2 BLOCK LEVEL TAGS AND HORIZONTAL RULES

##### Objectives

- To understand basic tags used in HTML Document
- Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Address, HR tag.

#### Topic 3 TEXT LEVEL TAGS AND SPECIAL CHARACTERS

##### Objectives

- To understand tags & special character used in HTML Document
- Bold, Italic, Teletype, Underline, Strikethrough, Superscript, Subscript DIV tag

#### Topic 4 LISTS

##### Objectives

- To understand list types
- Ordered Lists, Unordered Lists, Definition Lists, Nested Lists.

#### Topic 5 URL AND ANCHOR TAG

##### Objectives

- To understand types of linking
- URL : Types of URLs, Absolute URLs, Relative URLs
- Anchor Tag: Linking various documents for internal and external links. Marquee Tag.

#### Topic 6 IMAGES, COLORS AND BACKGROUNDS

##### Objectives

- To understand Image formats
- IMG tag and different Image formats, colors and backgrounds.

**Topic 7 TABLE**

**Objectives**

- To understand different Table tags & attributes
- TABLE tag with attributes. TABLE, TR, TH, TD tags. border, cell spacing, cell padding, width, align, bgcolor attributes.

**Topic 8 FRAMES**

**Objectives**

- To understand Frame attributes
- Types of Frames with their attributes, Creating frames: FRAMESET tag – rows, cols attributes, FRAME tag –name, frame border, margin height, margin width, src, resize, scrolling attributes. Use of NOFRAMES tag, Frame targeting.

**Topic 9 FORMS**

**Objectives**

- To understand Forms attribute and methods.
- Creating basic form: FORM tag, action and method attributes.
- Form fields: Single line text field, password field, multiple line text area, radio buttons, and check boxes.
- Pull down menus: SELECT and OPTION tags.
- Buttons: submit, reset and generalized buttons.

**Topic 10 STYLE SHEETS**

**Objectives**

- To understand different Style Sheets Rule and types.
- Introduce Style Sheets with different types.
- Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style.
- Selectors: CLASS rules, ID rules.
- Style sheet properties: font, text, box, color and background properties.

**Topic 11 CLIENT SIDE SCRIPTING AND JAVA SCRIPT**

**Objectives**

- To understand about the client side Scripting.
- Embedding JavaScript in HTML document. Embed tag, Variables, Constants, Adding comments.
- Operators: Assignment, Arithmetic and Comparison operators.
- Control structures and looping: if, if..else, for, for..in, while, do..while, break and continue.
- Event handlers: onClick, onMouseOver, onMouseOut, onSubmit, onReset,

**Topic 12 ANIMATION**

**Objectives**

- To understand about the gif animator
- Creating a gif animation using gif animator.

- Controlling gif animation through internal setting of gif animator.
- Creating banner using gif animation.

### **Topic 13 PUTTING IT ALL TOGETHER: HOSTING THE WEBSITE**

#### **Objectives**

- To understand how to publish the websites
- Publishing the site, Outsourcing web hosting, Virtual Hosting

#### **Reference :**

1. HTML and XHTML –The complete reference (*Thomas Powell*) Tata McGraw Hill, New Delhi..
2. Learning Web Design (*Robbins*) O'Reilly.
3. SAMS Teach Yourself HTML & CSS in 24 Hours (*Dick Oliver*) Pearson Education Publication
4. HTML,XHTML and CSS (*Anne Bohem*) Murach's Publication
5. Web Sites : <http://www.w3schools.com/html>
6. Web Sites : <http://www.html.net/>
7. Web Sites : <http://www.2createawebsite.com>
8. Web Sites : <http://webdesign.about.com>

