

**Maharashtra State Board of Vocational Education Examination, Mumbai 400 051.**

1	Name of Course	Certificate Course in Consumer Electronic Technician									
2	Course code	830102									
3	Max no. of Students	25 Students									
4	Duration	2 year									
5	Course Type	Full Time									
6	No. of Days per week	6 days									
7	No. of hours per day	7 Hrs									
8	Space require	Theory Class Room – 200 sqft					Practical Lab – 1000 sqft				
9	Entry qualification	8 <sup>th</sup> Pass									
10	Objective of syllabus	To get knowledge of Electronic Materials & Devices, Basic Electronic, Consumer Electronic									
11	Employment opportunities	After completing the course, student may have Employment / Self Employment opportunity.									
12	Teachers Qualification	Diploma / Graduate in concern Field.									
13	Teaching Scheme –										
	Sr.	Subject	Subject Code	Clock Hours / Week					Total		
				Theory		Practical					
	1	Communication Skill English Or Marathi	80000001	2 Hrs		1 Hrs			3 Hrs		
	2	Elective – I	--	2 Hrs		1 Hrs			3 Hrs		
	3	Elective – II	--	2 Hrs		1 Hrs			3 Hrs		
	4	Electronic Materials & Devices	80301001	3 Hrs		8 Hrs			11 Hrs		
	5	Basic Electronics	80301002	3 Hrs		8 Hrs			11 Hrs		
	6	Consumer Electronic	80301004	3 Hrs		8 Hrs			11 Hrs		
	Total									42 Hrs	
14	Examination Scheme – Final Examination will be based on syllabus of both years.										
	Paper	Subject	Subject Code	Theory			Practical			Total	
				Duration	Max	Min	Duration	Max	Min	Max	Min
	1	Communication Skill English Or Marathi	80000001	3 Hrs	70	25	3 Hrs	30	15	100	40
	2	Elective – I	--	3 Hrs	70	25	3 Hrs	30	15	100	40
	3	Elective – II	--	3 Hrs	70	25	3 Hrs	30	15	100	40
	4	Electronic Materials & Devices	80301001	3 Hrs	100	35	3 Hrs	100	50	200	85
	5	Basic Electronics	80301002	3 Hrs	100	35	3 Hrs	100	50	200	85
	6	Consumer Electronic	80301004	3 Hrs	100	35	3 Hrs	100	50	200	85
	Total									900	375
15	Teachers – Three Teachers per batch for vocational component. For English, Elective-I & II guest faculty on clock hour basis.										
16	For Elective I – Student can choose any one subject Code Subject Name					For Elective II – Student can choose any one subject Code Subject Name					
	80000011	General Science				80000017	Computer Application				
	80000012	Home Science				80000018	Engineering Mathematics				
	80000013	Business Economics				80000019	Food Technology				
	80000014	Psychology				80000020	Business Studies				
	80000015	Entrepreneurship				80000021	Business Mathematics				
	80000016	Information Technology				80000022	Data Entry Operations				

# Communication Skill (संभाषण कौशल्य) Marathi - 1 st Year

Subject code :- 80000001

अ.क्र.	पाठ्यक्रम / व्यवसाय क्रमातील भाग	प्रात्यक्षिक
१	संभाषणात्मक कौशल्य तोंड ओळख	संभाषणात्मक कौशल्य तोंड ओळख
२	संभाषणात्मक कौशल्य आवश्यकता	संभाषणात्मक कौशल्य आवश्यकता
३	संभाषणाचे चक्र व त्यामधील ४ घटक	संभाषणाचे चक्र व त्यामधील ४ घटक
४	संभाषणाचे चक्र व त्यामधील ४ घटक	
५	पाठविणारा - संक्षिप्तता - स्वीकारणारा - विस्तार	
६	संभाषणाचे प्रकार	संभाषणाचे प्रकार
७	तोंडी	तोंडी
८	लेखी	लेखी
९	अव्यक्त	अव्यक्त
१०	औपचारिक	औपचारिक
११	अनौपचारिक	अनौपचारिक
१२	समानस्तरावरील	समानस्तरावरील
१३	ऊर्ध्वगामी	ऊर्ध्वगामी
१४	अधोगामी	अधोगामी
१५	कर्णात्मक	कर्णात्मक
१६	इतर प्रकार - देहबोली	
१७	वेळेच्या व्यवस्थापनाद्वारे	वेळेच्या व्यवस्थापनाद्वारे
१८	जागेच्या व्यवस्थापनाद्वारे	जागेच्या व्यवस्थापनाद्वारे
१९	स्पर्शाद्वारे	स्पर्शाद्वारे
२०	आवाजातील चढउताराद्वारे	आवाजातील चढउताराद्वारे
२१	जनावरांची / वाद्यांची नक्कल	जनावरांची / वाद्यांची नक्कल
२२	वेशभुषा / केशभुषाद्वारे व्यक्तीत्व	वेशभुषा / केशभुषाद्वारे व्यक्तीत्व
२३	मौनाचे प्रकार	मौनाचे प्रकार
२४	नैसर्गिक (स्वाभाविक)	नैसर्गिक (स्वाभाविक)
२५	स्निग्ध प्रतिसाद	स्निग्ध प्रतिसाद
२६	थंड प्रतिसाद	थंड प्रतिसाद
२७	अनिवार्य	
२८	मागणीवरून केलेला	
२९	"तुम्हीच" प्रवृत्ती	
३०	विक्रेत्याला आवश्यक अशी प्रवृत्ती	विक्रेत्याला आवश्यक अशी प्रवृत्ती
३१	अडथळे, तोंड ओळख उपाय	अडथळे, तोंड ओळख उपाय
३२	यांत्रिक अडथळे	यांत्रिक अडथळे
३३	शारीरीक अडथळे	शारीरीक अडथळे
३४	भाषा विषयक अडथळे	भाषा विषयक अडथळे
३५	सामाजिक, मानसिक अडथळे	सामाजिक, मानसिक अडथळे
३६	सामुहिकविषयक दूषित दृष्टीकोन अडथळे	सामुहिकविषयक दूषित दृष्टीकोन अडथळे
३७	अनावश्यक पुनरावृत्ती अडथळे	अनावश्यक पुनरावृत्ती अडथळे
३८	व्यवसायिक पत्रे	व्यवसायिक पत्रे
३९	व्यवसायिक पत्रे व त्यातील भाग	व्यवसायिक पत्रे व त्यातील भाग
४०	उदाहरणे	
४१	उदाहरणे	
४२	व्याकरण	व्याकरण
४३	नाम व त्याचे प्रकार	नाम व त्याचे प्रकार
४४	नाम व त्याचे प्रकार	नाम व त्याचे प्रकार
४५	क्रियापदे व त्याचे प्रकार	क्रियापदे व त्याचे प्रकार
४६	क्रियापदे व त्याचे प्रकार	क्रियापदे व त्याचे प्रकार

४७	पोटवाक्य	पोटवाक्य
४८	पोटवाक्य	पोटवाक्य
४९	विरुद्धार्थी शब्द	विरुद्धार्थी शब्द
५०	विरुद्धार्थी शब्द	विरुद्धार्थी शब्द
५१	समानार्थी शब्द	समानार्थी शब्द
५२	समानार्थी शब्द	समानार्थी शब्द

## Communication Skill (संभाषण कौशल्य) Marathi - 2 nd Year

**Subject code :- 80000001**

अ.क्र.	पाठ्यक्रम / व्यवसाय क्रमातील भाग	प्रात्यक्षिक
५३	कर्तरी व कर्मणी	कर्तरी व कर्मणी
५४	कर्तरी व कर्मणी	
५५	काळ व त्यांचे सर्व प्रकार	काळ व त्यांचे सर्व प्रकार
५६	काळ व त्यांचे सर्व प्रकार	
५७	काळ व त्यांचे सर्व प्रकार	
५८	काळ व त्यांचे सर्व प्रकार	
५९	काळ व त्यांचे सर्व प्रकार	
६०	शब्दयोगी अव्यय	शब्दयोगी अव्यय
६१	शब्दयोगी अव्यय	
६२	उपपद	उपपद
६३	सुधारण निर्धारण	सुधारण निर्धारण
६४	सुधारण निर्धारण	
६५	जोडवाक्ये	जोडवाक्ये
६६	जोडवाक्ये	
६७	म्हणी व वाक्यप्रचार	म्हणी व वाक्यप्रचार
६८	म्हणी व वाक्यप्रचार	
६९	म्हणी व वाक्यप्रचार	
७०	उद्गारवाचक	उद्गारवाचक
७१	अलंकार	अलंकार
७२	उपमा	उपमा
७३	उत्प्रेक्षा	उत्प्रेक्षा
७४	यमक	यमक
७५	मानवीकरण	मानवीकरण
७६	निर्जिवाशी संभाषण	निर्जिवाशी संभाषण
७७	पुनुरुक्ती	पुनुरुक्ती
७८	अतिशोक्ती	अतिशोक्ती
७९	विशेषण व प्रकार	विशेषण व प्रकार
८०	विशेषण व प्रकार	
८१	विशेषण व प्रकार	
८२	क्रियाविशेषण	क्रियाविशेषण
८३	क्रियाविशेषण	क्रियाविशेषण
८४	वाक्ये व प्रकार	वाक्ये व प्रकार
८५	वाक्ये व प्रकार	
८६	वाक्ये व प्रकार	
८७	वाक्ये व प्रकार	
८८	वाक्ये व प्रकार	
८९	वाक्ये व प्रकार	
९०	उलटक्रमाने देखील तशीच रचना	उलटक्रमाने देखील तशीच रचना
९१	उलटक्रमाने देखील तशीच रचना	

९२	संभाषणाचे कौशल्य	संभाषणाचे कौशल्य
९३	नोकरीसाठीचे अर्ज	नोकरीसाठीचे अर्ज
९४	नोकरीसाठीचे अर्ज	
९५	नोकरीसाठीचे अर्ज	
९६	जोडस्तंभ	जोडस्तंभ
९७	जोडस्तंभ	
९८	आलेख	आलेख
९९	आलेख	
१००	पाय आकृती	पाय आकृती
१०१	अहवाल व लेखन	अहवाल व लेखन
१०२	अहवाल व लेखन	
१०३	प्रत्यक्ष समूह चर्चा	प्रत्यक्ष समूह चर्चा
१०४	प्रत्यक्ष समूह चर्चा	

## Communication Skill (संभाषण कौशल्य) English - 1 st Year

Subject code :- 80000001

Sr. No	Theory	Practical
1	Introduction to Communication Skills	Practical on related topics
2	Necessity of Communication Skill	do
3	Communication cycle & its four factors	do
4	Communication cycle & its four factors	Do
5	Sender-encodes Receiver, Decodes	do
6	<b>Types of Communication</b>	Practical on related topics
7	Verbal	Do
8	Written	Do
9	Non- verbal	Do
10	Formal	Do
11	Informal	Do
12	Horizontal	Do
13	Upward	Do
14	Downward	Do
15	Diagonal	Do
16	<b>Other Types- Kinesics</b>	Practical on related topics
17	Chronemics	Do
18	Proxemics	Do
19	Haptics	Do
20	Paralanguage	Do
21	Vocalics	Do
22	Artefacts	Do
23	Types of Silence	Practical on related topics
24	Natural	Do
25	Warm	Do
26	Cold	Do
27	Compulsory	Do
28	Demanding	Do
29	<b>You Attitude</b>	Practical on related topics
30	Essential attitude for salesman	Do
31	<b>Barrier – Intro- Remedies</b>	Practical on related topics
32	Mech Barrier	Do
33	Physical Barrier	Do
34	Semantic Barrier	Do
35	Soci- Psycho Barrier	Do
36	Stereotype	Do
37	Jargon	Do
38	<b>Business letters</b>	Practical on related topics
39	It's terminology	Do
40	Examples	Do

41	Do	Do
42	Do	Do
43	<b>Grammar – Noun &amp; its types</b>	Practical on related topics
44	Do	Do
45	Verb & its types	Do
46	Do	Do
47	Clauses	Do
48	Do	Do
49	<b>Antonyms</b>	Practical on related topics
50	Do	Do
51	<b>Synonyms</b>	Practical on related topics
52	Do	Do

## Communication Skill (English) - 2 nd Year

**Subject code :- 80000001**

Sr. No	Theory	Practical
1	<b>Active &amp; Passive</b>	Practical on related topics
	Do	Do
	Types of tense	Do
	Do	Do
	Do	Do
	Do	Do
	Do	Do
	Preposition	Do
	Do	Do
	Article	Do
	Determiner & Modifier	Do
	Do	Do
	Sentence connectives	Do
	Do	Do
2	<b>Phrases</b>	Practical on related topics
	Idioms	Do
	Proverbs	Do
	Interjection	Do
3	<b>Figure of Speech</b>	Practical on related topics
	Similies	Do
	Metaphor	Do
	Alliteration	Do
	Personification	Do
	Apostrophs	Do
	Repetition	Do
	Hyperbole	Do
4	<b>Adjective</b>	Do
	Do	Practical on related topics
	Do	Do
	Adverb	Do
	Do	Do
	Types of sentences	Do
	Do	Do
	Do	Do
	Do	Do
	Do	Do
	Do	Do
	Do	Do
	Do	Do
	Palindrome	Do
	Do	Do
5	<b>Interacting skills</b>	Practical on related topics
	Applications for various posts	Do
	Various responding methods	Do

6	<b>Bardia</b>	Practical on related topics
	Do	Do
	Graph dia	Do
	Do	Do
	Pie Dia	Do
7	<b>Report writing</b>	Practical on related topics
	Do	Do
8	<b>Group Discussion</b>	Practical on related topics
	do	Do

# General Science

Subject Code :- 80000011

## General Science - First Year - Theory

<b>Chapter 1</b>	<b>Measurement in Science and Technology</b>	<b>a)</b>	Need for measurement.
		<b>b)</b>	Unit of measurement
		<b>c)</b>	System of units
		<b>d)</b>	S. I. units
		<b>e)</b>	Fundamental and derived units.
<b>Chapter 2</b>	<b>Motion and its description</b>	<b>a)</b>	Motion of an object
		<b>b)</b>	Distance travelled and displacement
		<b>c)</b>	Speed, velocity and acceleration
		<b>d)</b>	Uniform and non- uniform motion along a straight line
		<b>e)</b>	Graphical representation of motion . i) Distance time graph for uniform and uniformly accelerated motion. ii) Velocity time graph for uniform and uniformly accelerated motion iii) Equations of motion by graphical method. iv) Uniform circular motion
<b>Chapter 3</b>	<b>Force and Motion</b>	<b>a)</b>	Force and effect force (motion)
		<b>b)</b>	Balanced and unbalanced force
		<b>c)</b>	Types of Inertia i) at rest ii) of motion iii) of direction
		<b>d)</b>	Newton's laws of motion
		<b>e)</b>	Momentum and principle of conservation of momentum.
<b>Chapter 4</b>	<b>Gravitation</b>	<b>a)</b>	Gravitation
		<b>b)</b>	Universal law of gravitation
		<b>c)</b>	Force of gravitation of earth
		<b>d)</b>	Acceleration due to gravity
		<b>e)</b>	Value of 'g' on the surface of the earth
		<b>f)</b>	Variation of value of 'g' 1) With attitude 2) With depth 3) Due to shape of the earth
		<b>g)</b>	Mass and weight

		<b>h)</b>	Free fall
<b>Chapter 5</b>	<b>Work and Energy</b>	<b>a)</b>	Work and unit of work
		<b>b)</b>	Positive, negative and Zero work
		<b>c)</b>	Energy and unit of energy.
		<b>d)</b>	Different forms of energy. 1) Mechanical (K.E and P.E.) 2) Heat 3) Light 4) Electrical 5) Sound 6) Chemical 7) Nuclear
		<b>e)</b>	Law of conservation of energy 1) Freely Falling Body 2) Simple pendulum 3) Hydroelectric power station
<b>Chapter 6</b>	<b>Sound and Communication</b>	<b>a)</b>	Nature of Sound
		<b>b)</b>	Production of sound
		<b>c)</b>	Propagation of sound
		<b>d)</b>	Sound waves are longitudinal
		<b>e)</b>	Characteristics of sound waves
		<b>f)</b>	Speed of Sound
		<b>g)</b>	Reflection of Sound and echo
		<b>h)</b>	Frequency and range of hearing in humans
		<b>i)</b>	Ultrasound and sonar
		<b>j)</b>	Loudness, pitch and Timbre
		<b>k)</b>	Human ear
<b>Chapter 7</b>	<b>Light</b>	<b>a)</b>	Mirrors
		<b>b)</b>	Convergence and divergence of light
		<b>c)</b>	Images formed by a concave mirror
		<b>d)</b>	Lenses
		<b>e)</b>	Images formed by convex lens
		<b>f)</b>	Function of lens in human beings
		<b>g)</b>	Problems of vision and their remedies
		<b>h)</b>	Application of spherical mirrors and lenses
	<b>CHEMISTRY</b>		



<b>Chapter 8</b>	<b>Matter in our Surrounding</b>	<b>a)</b>	Properties of matter
		<b>b)</b>	States of matter solid liquid and gases
		<b>c)</b>	Changes of States of matter
		<b>d)</b>	Evaporation condensation Sublimation
		<b>e)</b>	Kinetic molecular theory of matter
<b>Chapter 9</b>	<b>Atoms and Molecules</b>	<b>a)</b>	Definition
		<b>b)</b>	Fundamental nuclear particles i)Proton ii)Neutron iii)Electron
		<b>c)</b>	Atomic Number
		<b>d)</b>	Mass number
		<b>e)</b>	Electronic configuration
		<b>f)</b>	Charge of an atom
		<b>g)</b>	Molecular mass
		<b>h)</b>	Mole concept
		<b>i)</b>	Avogadro number
<b>Chapter 10</b>	<b>Atomic Structure</b>	<b>a)</b>	Dalton's atomic theory
		<b>b)</b>	J.J. Thomson's theory
		<b>c)</b>	Rutherford's atomic model
		<b>d)</b>	Neil Bohr's atomic model
		<b>e)</b>	Discovery of neutron
		<b>f)</b>	Distribution of electrons in orbits
		<b>g)</b>	Electronic configuration of elements
		<b>h)</b>	Isotopes
<b>Chapter 11</b>	<b>Acid, Base and Salts</b>	<b>a)</b>	Acid, Base
		<b>b)</b>	Properties of acid and base
		<b>c)</b>	pH scale and application
		<b>d)</b>	Indicators – Strength of acid and base
		<b>e)</b>	Classification of acids and bases i) based on strength of acid / bases ii) Basis of basicity of acid/bases
		<b>f)</b>	Acid base and their reactivity a) with metals b) with each other (neutralization)
		<b>g)</b>	Ionization of acids and bases
	<b>SALT</b>	<b>h)</b>	Classification of salts i) Normal ii) acid iii) basic

			iv) double v) mixed vi) Complex salts
		<b>i)</b>	Properties
		<b>j)</b>	Water of crystallization
		<b>k)</b>	saponification
<b>Chapter 12</b>	<b>Air and Water</b>	<b>a)</b>	Air
		<b>b)</b>	Earth's Atmosphere i) Troposphere ii) Stratosphere iii) mesosphere iv) Thermosphere
		<b>c)</b>	Composition of air
		<b>d)</b>	Role of air in burning
		<b>e)</b>	Air pollution
		<b>f)</b>	Respiration
		<b>g)</b>	Water cycle
		<b>h)</b>	Occurrence of water
		<b>i)</b>	Physical properties of water
		<b>j)</b>	Anomalous behaviour of water
		<b>k)</b>	Chemical properties of water
		<b>l)</b>	Importance of water i) Role of water in human body ii) Role of water in plants
		<b>m)</b>	Importance of Sea water i) Extraction of common salt from sea water ii) Sea provides the biggest habitat for living organisms
<b>Chapter 13</b>	<b>Classification of Living Organism</b>	<b>a)</b>	Species
		<b>b)</b>	Binomial nomenclature
		<b>c)</b>	Whittaker's five kingdom classification
		<b>d)</b>	Classification of plants
		<b>e)</b>	Traditional classification of animals

<b>Chapter 14</b>	<b>Buildings blocks of life-cell</b>	<b>a)</b>	What is cell ?
		<b>b)</b>	Discovery cell
		<b>c)</b>	Cell Theory
		<b>d)</b>	Morphology of cells
		<b>e)</b>	Structure of a cell 1) Cell membrane 2) Cell wall 3) Cell Organelles
		<b>f)</b>	Plant cell and Animal cell
		<b>g)</b>	Protoplasm
		<b>h)</b>	Prokaryotic and Eukaryotic cells
<b>Chapter 15</b>	<b>Team of wonders - Tissue</b>	<b>a)</b>	Tissue and organ system
		<b>b)</b>	Animal Tissues
		<b>c)</b>	Plant Tissues
<b>Chapter 16</b>	<b>Food Production</b>	<b>a)</b>	Green and white revolution
		<b>b)</b>	Better crop yields
		<b>c)</b>	Using better variety of seeds
		<b>d)</b>	Using better care of the crop plants Nutrients, Manures, fertilizers
		<b>e)</b>	Irrigation
		<b>f)</b>	Cropping patterns i)Protection of crops before and after harvesting ii)Biological control iii) Storage of food materials
		<b>g)</b>	Animal Husbandry i)Cattle farming ii)Poultry farming iii)Pisci culture iv)Bee-keeping or Apiculture
<b>Chapter 17</b>	<b>Health and Hygiene</b>	<b>a)</b>	Health
		<b>b)</b>	Interaction of health with personal, Social, economic and environmental issue
		<b>c)</b>	Community health
		<b>d)</b>	Factors essential for good health
		<b>e)</b>	Health economic and factors
		<b>f)</b>	Disease

			i)Symptoms and sign of disease ii)Types of diseases iii)Levels of cause of a disease iv)Means of spread of a disease v)Prevention of infection of disease vi)Some infectious disease a)Bacteria – TB, Typhoid b) Virus - Hepatitis, Rabies, AIDS, Poliomyelitis vii)Diarrhea
<b>Chapter 18</b>	<b>Hygiene</b>	<b>a)</b>	Simple personal hygiene
		<b>b)</b>	Social Hygiene and Sanitation
		<b>c)</b>	Housefly and its Controls
		<b>d)</b>	Mosquitoes
		<b>e)</b>	Cockroaches
		<b>f)</b>	Rat
		<b>g)</b>	Contamination of water and water borne disease
<b>Chapter 19</b>	<b>Natural Environment</b>	<b>a)</b>	A biotic Factors
		<b>b)</b>	Biotic Factors
		<b>c)</b>	Ecosystem
		<b>d)</b>	Interdependence – food chain

## General Science

### First Year - Practical

1	To Verify laws of reflection of sound.
2	To determine the melting point of ice and the boiling point of water.
3	To determine the density of a solid (denser than water) by using a spring balance and measuring cylinder.
4	To measure the temperature of hot water as it cools and plot a time-temperature graph.
5	To determine the total length of a) Concave mirror b) Convex lens by obtaining image of distant object.
6	To establish the relation between apparent loss in the weight of a solid when fully immersed in a) Tap water b) Concentrated salt water and the weight of the water displaced by it by taking at least two different solids.
7	To Find the PH of 1) Dilute HCL 2) Dilute NaoH Solution 3) Dilute Acetic Acid Solution 4) Lemon Juice 5) Water 6) Dilute Sodium Bicarbonate solution By using PH paper / Universal indicator.
8	To study the properties of acids and bases (HCL and NaoH) by their reaction with a) Litmus Solution (Red / Blue) b) Zinc metal c) Solid Sodium Carbonate
9	Detection of Gases $\rightarrow$ $O_2$ $H_2$ $CO_2$ $SO_2$ $Cl$ $HNO_3$ $HCL$ $H_2S$ $NO_2$ $NH_3$
10	Detection of Cations $[Na^+, NH_4^+]$ $\rightarrow$ Flame Test, Sodium Hydroxide Test, Ammonium Hydroxide Test.
11	Detection of Anion :- Carbonate ( $CO_3^{2-}$ ), Sulphite $S^{2-}$ , Sulphate $SO_4^{2-}$ , Sulphate $SO_3^{2-}$ , Sulphate $SO_4^{2-}$ Chloride $Cl^{-}$ , Nitrate $NO_3^{-}$
12	To prepare stained temporary mounts of onion peel and to record observations and draw labeled diagram.
13	1) To identify parenchyma and Sclerenchyma tissues in plants from prepared slides and draw their well labeled diagrams. 2) To identify striated muscles fibres and nerve cells in animal tissues from the prepared slides and draw their well labeled diagrams.
14	Test for Glucose.

# General Science

Subject Code :- 80000011

## General Science - Second Year - Theory

<b>Chapter 1</b>	<b>Sources of Energy</b>	<b>a)</b>	Energy
		<b>b)</b>	Fuels and Fossil Fuels
		<b>c)</b>	Sun as a sources of energy
		<b>d)</b>	Effect of use of conventional energy.
		<b>e)</b>	Nuclear Energy.
<b>Chapter 2</b>	<b>Electrical Energy</b>	<b>a)</b>	Electric Current
		<b>b)</b>	Electric potential and potential difference.
		<b>c)</b>	Resistance and Ohm's Law
		<b>d)</b>	Resistivity
		<b>e)</b>	Resistance in series and parallel
		<b>f)</b>	Heating effect of electric current
		<b>g)</b>	Power and unit of power
		<b>h)</b>	Commercial unit of energy
<b>Chapter 3</b>	<b>Magnetic Effect of Electric Current</b>	<b>a)</b>	Magnetic lines of force
		<b>b)</b>	Magnetic fields due to current carrying conductor
		<b>c)</b>	Right Hand Rule and Ampere's swimming Rule
		<b>d)</b>	Magnetic field due to i) Straight conductor ii) Circular Loop iii) Solenoid
		<b>e)</b>	Force on a current carrying conductor in a magnetic field + Fleming's left hand Rule.
		<b>f)</b>	Electric Motor
		<b>g)</b>	Electromagnetic induction - Right Hand Rule
		<b>h)</b>	Direct and Alternate current
		<b>i)</b>	Electric Generator i) AC Generator ii) DC Generator
		<b>j)</b>	Domestic Electric Circuit

<b>Chapter 4</b>	<b>Light</b>	<b>a)</b>	Refraction of Light
		<b>b)</b>	Law's of refraction
		<b>c)</b>	Twinkling of stars
		<b>d)</b>	Scattering of Light
		<b>e)</b>	Appreciation of refraction
		<b>f)</b>	Refraction index
		<b>g)</b>	Dispersion
<b>Chapter 5</b>	<b>Chemical Reaction and Equations</b>	<b>a)</b>	Chemical Equation
		<b>b)</b>	Balancing Chemical Equation
		<b>c)</b>	Types of Chemical Reactions i) Combination reactions ii) Decomposition reactions iii) Displacement reactions (Single and Double) iv) Precipitation reactions
		<b>d)</b>	Oxidation and reduction reactions
		<b>e)</b>	Neutralisation
		<b>f)</b>	Factors affecting Chemical reactions
		<b>g)</b>	Exothermic and Endothermic reactions
<b>Chapter 6</b>	<b>Periodic classification of elements</b>	<b>a)</b>	Periodic Classification and Elements a) Classification of Elements 1) By Antoine Lavoisier 2) By Dobereiner's Trials 3) By Newland's Law of Octaves 4) By Mendeleev's Periodic Table
		<b>b)</b>	Merits and Demerits of Mendeleev's Table.
		<b>c)</b>	Modern periodic Table 1) Organisation of the Modern Periodic Table 2) Group of Elements - IUPAC number of groups. 3) Periods of Elements - General Characteristic of period
		<b>d)</b>	Merits of Modern Periodic table over Mendeleev's Table.

<b>Chapter 7</b>	<b>Chemical Bonding</b>	<b>a)</b>	Theory of Chemical Bonding
		<b>b)</b>	Lewis Theory of Chemical Bonding
		<b>c)</b>	Chemical Bond
		<b>d)</b>	Formation of ion : Cation / anion Difference between atoms and ions
		<b>e)</b>	Types of Chemical Bond 1) Electrovalent bond and their formation. 2) Covalent bond and their formation.
		<b>f)</b>	Difference between electrovalent and Covalent bonds.
		<b>g)</b>	Coordinate Bond (lone pair effect)
		<b>h)</b>	Polar and Non Polar Covalent Bonds.
<b>Chapter 8</b>	<b>Metal and Non-metal</b>	<b>a)</b>	Physical and Chemical Properties of metal
		<b>b)</b>	Physical & { Properties of Non metal Chemical {
		<b>c)</b>	Occurrence of metals Free State / Combined State, Ore, Minerals
		<b>d)</b>	Metallurgy
		<b>e)</b>	Extraction of metals from their Ores a) Aluminum b) Copper c) Zinc d) Mercury e) Bauxite
		<b>f)</b>	Refining of metals
		<b>g)</b>	Corrosion of metals
		<b>h)</b>	Prevention of Corrosion
		<b>i)</b>	Uses of metals and non-metals
		<b>j)</b>	Noble metal
		<b>k)</b>	Alloys



<b>Chapter 9</b>	<b>Carbon and Carbon Compounds</b>	<b>a)</b>	Coal and Types of Coal.
		<b>b)</b>	Properties of Carbon
		<b>c)</b>	Allotropes of Carbon a) Crystalline b) Amorphous form
		<b>d)</b>	Hydrocarbon the fundamental organic compound
		<b>e)</b>	Saturated and Unsaturated hydro carbon
		<b>f)</b>	Catenation
		<b>g)</b>	Straight chain and branched chain Isomers and isomerism
		<b>h)</b>	Benzene
		<b>i)</b>	Functional Group in organic compound
		<b>j)</b>	Homologous Series
		<b>k)</b>	Nomenclature of organic compounds
	<b>Soap and Detergents</b>	<b>a)</b>	Chemical properties of Carbon Compounds 1) Combustion 2) Addition reaction 3) Substitution reaction
		<b>b)</b>	Some important Carbon Compounds 1) Ethanol 2) Ethanoic acid
<b>Chapter 10</b>	<b>Life Process</b>	<b>a)</b>	Life Process
		<b>b)</b>	Nutrition 1) Autotrophic Nutrition 2) Heterotrophic Nutrition 3) Nutrition in Human Beings 4) Nutrition in plants
		<b>c)</b>	Need for Nutrition
		<b>d)</b>	Energy for Life Process
		<b>e)</b>	Classes of Nutrients

<b>Chapter 11</b>	<b>Respiration</b>	<b>a)</b>	Need of respiration
		<b>b)</b>	Breathing or external respiration 1) Exchange of gases in animals and plants (aquatic and Terrestrial)
		<b>c)</b>	Respiratory tract. (Breathing Tract)
		<b>d)</b>	Respiratory Organs (Breathing Organs)
		<b>e)</b>	Mechanism of Breathing in human beings. 1) Inhalation 2) Exhalation
		<b>f)</b>	Cellular Respiration or Internal respiration
<b>Chapter 12</b>	<b>Transportation</b>	<b>a)</b>	Transportation in Human beings
		<b>b)</b>	Blood 1) Heart - The involuntary Pump Circulation of blood within the heart. 2) Network of tubes - The blood vessels. 3) Repair of damaged network - by the platelets Lymph
	<b>Transportation in Plants</b>	<b>a)</b>	Transport of water in plants 1) Root pressure 2) Transpiration pull
		<b>b)</b>	Transport of food and other substance
		<b>c)</b>	Excretion 1) What is excretion ? 2) Excretion in human beings 3) Excretion in Plants
<b>Chapter 13</b>	<b>Regulators of life – Control &amp; Coordinators</b>	<b>a)</b>	Coordination
		<b>b)</b>	Meaning
		<b>c)</b>	Coordination in plants 1) Movement in plants which are growth dependent 2) Growth independent
		<b>d)</b>	Coordination in human beings 1) Human nervous system

			2) Reflex action
		e)	Central nervous system (CNS)
		f)	Chemical Control
<b>Chapter 14</b>	<b>Reproduction</b>	a)	Reproduction
		b)	Modes of reproduction 1) Asexual 2) Sexual
		c)	Reproduction in human beings 1) Modes of asexual reproduction a) Binary Fission b) Multiple Fission c) Budding d) Fragmentation e) Regeneration f) Vegetative reproduction 1) Spore formation 2) Female reproduction system
		d)	Need for and methods of family planning g) Sexual reproduction 1) Meiosis 2) Fertilization
<b>Chapter 15</b>	<b>Mapping of Genes - Heredity</b>	a)	Inheritance
		b)	Heredity 1) Inherited traits. 2) Mendel's Laws of inheritance of traits 3) Mendel's monohybrid cross a) Parental Generation b) The first filical Generation a) Mendel's Dihybrid Cross 4) The second filical Generation a) Mendel's Dihybrid Cross Expression of Traits Determination of sex
<b>Chapter 16</b>	<b>Human Impact on Environment</b>	a)	Pollution
		b)	Global Warming
		c)	Waste Management.
		d)	Depletion of Natural resources.

## General Science

### Second Year - Practical

1	To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence and interpret the results.
2	To study the dependence of current (I) on the potential difference (V) across a resistor and determine its resistance.
3	To determine the equivalent resistance of two resistors when connected in series.
4	To determine the equivalent resistance of two resistor when connected in parallel.
5	<p>To carry out the following chemical reactions and record observations. Also identify the type of reaction involved in each case.</p> <ul style="list-style-type: none"><li>a) Iron with copper sulphate solution in water.</li><li>b) Burning of magnesium in air.</li><li>c) Zinc with dilute sulphuric acid.</li><li>d) Heating of lead nitrate</li><li>e) Sodium sulphate with barium chloride in the form of their solutions of water.</li></ul>
6	To observe the action of Zn, Fe, Cu and Al metals on aqueous solutions of salts $\text{ZnSO}_4$ , $\text{FeSO}_4$ , $\text{CuSO}_4$ , $\text{Al}_2(\text{SO}_4)_3$
7	<p>To perform and observe the following reactions and classify them into :-</p> <ul style="list-style-type: none"><li>a) Combination reaction</li><li>b) Decomposition reaction</li><li>c) Displacement reaction</li><li>d) Double displacement reaction.</li><li>1) Action of water on quick lime</li><li>2) Action of heat on ferrous sulphate crystals.</li><li>3) Action of iron nails kept in copper sulphate</li><li>4) Reaction between sodium sulphate and barium</li></ul>
8	<p>To study the properties of acetic acid (Ethanoic Acid)</p> <p>1) Odour 2) Solubility in water 3) Effect in litmus 4) Reaction with Sodium bicarbonate.</p>
9	Test for a) Starch b) Protein c) Fats and Oils d) Minerals e) presence of water.
10	To show experimentally that $\text{CO}_2$ is given out during respiration.
11	To show experimentally that light is necessary for photosynthesis.
12	To study a) binary fission in 1) Amoeba cell 2) budding in Hydra with the help of prepared slides.
13	To prepare a temporary mount of leaf peel to show stomata.

## HOME SCIENCE

Subject Code :- 80000012

### Home Science - First Year - Theory

Sr.No.	Topic	Theory
1	<b>Introduction to Home Science</b>	Definition of Home Science. Nature & Scope of Home Science. Areas covered under Home Science. Career options in Home Science.
2	<b>Introduction to Food Science</b>	Definition of Food Science. Objectives of Food Science. Acceptability of Food. Meaning of food, Nutrient, Nutrition, Health. Functions of Food.
3	<b>Food Groups</b>	Basic five food groups and their contribution to diet. Definition of Balance diet. Factors to be considered while planning a balanced diet. Eating Healthy foods.
4	<b>Cooking of foods</b>	Aims and objectives of cooking food. Preliminary Treatment of foods. Methods of Cooking food by Moist heat, Dry heat, Oil or fat.
5	<b>Preservation of food</b>	Microwave Cooking Solar Cooking Infra red cooking. Definition of Food Preservation Methods of Food Preservation Long Term Methods Short Term Methods
6	<b>Resource Management</b>	Meaning and types of resources - Material, human and shared. Need to manage resources & Methods for maintenance. Fundamentals of Banking.
7	<b>Home Management</b>	Important role that management plays in smooth and efficient running of home. Components of Management. Planning, Organizing, Controlling Implementing and Evaluation Role of Decision making process in management. Meaning of work Simplification.
8	<b>Health and Environment</b>	Definition of Health, Environment, Sanitation. Types of Diseases - Communicable & Non Communicable diseases. Importance of Exercise for good health.
9	<b>Textiles and Clothing</b>	Types of fibres - Natural, Man-made Fabric construction - Basic procedure of yarn making. Effect of weaves on appearance durability and maintenance of Garment. Selection of clothes - Factors affecting selection. Storage and maintenance of clothes.

## Home Science - First Year - Practical

	Practical
<b>I</b>	Introduction to Laboratory Rules -  Personal Grooming, Collection of food stuffs and equipment, Preparation and Serving, Cleaning up. Basic equipments used in Laboratory.
<b>II</b>	Basic Terms used in Cooking.
<b>III</b>	Weighing and Measuring -  Measuring Techniques  Abbreviations used in weight & measures.  Weighing Equipment & its use.  Weighing Technique.
<b>IV</b>	To study the diet with regard to Basic Food Groups.
<b>V</b>	To Prepare atleast 5 dishes using basic methods of cooking.
<b>VI</b>	Simple home decoration-flower arrangement, colour wheel, colour combination, Value seals
<b>VII</b>	Opening of Bank account, filling of cheques, Deposit Slips, withdrawal Slips.
<b>VIII</b>	Basics of stitching – hemming, running stitch.
<b>IX</b>	Attaching Buttons and Hooks.
<b>X</b>	To identify fabrics by touching and feeling the texture.
<b>XI</b>	To record the steps in the process of management while arranging a family function

## HOME SCIENCE

Subject Code :- 80000012

### Home Science - Second Year - Theory

Sr.No.	Topic	Theory
1	Family	Meaning and importance of family classification of family changes in family pattern. As a result of urbanization, industrialization, globalization, and migration. Influence of religious institutions, Schools, Cultural belief and values position of child in family.
2	Growth and development (0-12 Yrs)	Concept of growth and development factors affecting growth and development Physical, Social – emotional, cognitive and Language development.
3	Growth and development in Adolescence	Physical development during teenage, Sex Education Influence of sports and exercise peer group. Role of Parents, Teachers, Society in development.
4	Safety at home	Prevention of falls, fire, poisoning, Suffocation, choking . Kitchen hygiene & safety.
5	Consumer Protection	PFA , FPO, Woolmark, Agmark ISI Study of nutritive value, weights, food additives, Manufacturing and expiry date on packaged goods.
6	Management of Time & Energy	Basic knowledge on time and energy management.
7	Financial Management	Importance of financial Planning. Warp of doing financial planning, Saving schemes.
8	Communication	Definition & Methods of Communication Effective Communication Business to Communication
9	Extension Education	Concept, Objectives, Characteristics of Extension Education. Difference between format education and Extension Education.

## Home Science - Second Year - Practical

	Practical
<b>1</b>	To prepare first-aid kit
<b>2</b>	To record and study the weekly spending plan of your family.
<b>3</b>	To prepare a label for a product with the quality marks
<b>4</b>	To survey home for safety hazards and suggest improvements
<b>5</b>	To wash and finish a Cotton Dupatta
<b>6</b>	To observe the communication skills of four children in the following age groups
<b>7</b>	To make a toy / game using household materials for children.
<b>8</b>	Make a poster on social problem.



## BUSINESS ECONOMICS

Subject Code :- 80000013

Business Economics - First Year - Theory & Practical

Theory		Practical
<b>Chapter - 1</b> <b><u>Understanding Economics</u></b> Definition & Meaning, Economics as a Social Science, Difference between Economics and Natural Science & Physical Science. Basic concepts used in economics : Human wants, Goods, Utility, Value, Price, Wealth, Capital etc.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	List some Natural Science. List the Social Science & Physical Science. Find out the names of the Economists Enlist some human wants. Find out the prices of consumer goods.
<b>Chapter - 2</b> <b><u>Nature of Economic Problem</u></b> Meaning of Economic Problem Human wants : Meaning, features Classification :- Necessaries, Comforts, Luxuries etc. Basic Reasons of Economic Problems.	<b>1</b> <b>2</b> <b>3</b>	Find out the economic problems in a family and Individual Level. Select some goods and classify them into necessities, economic comforts and Luxurious goods. Find out the problems at National and International Level.
<b>Chapter - 3</b> <b><u>Goods &amp; Services</u></b> Definition of goods, Classification of goods - Consumer and Capital goods, Durable & Non durable, free & economic goods, Transferrable & Non transferrable, Material & Non material goods, necessities, comforts & Luxurious goods. Services : Educational Services, Health Services, Hospitality Services, Transport & Communication Services	<b>1</b> <b>2</b> <b>3</b>	Prepare a chart on Classification of goods. Visit to a service industry. Find out the options available in Service Sector.
<b>Chapter - 4</b> <b><u>Wealth</u></b> Meaning & features of wealth, Classification of wealth : Personal Wealth, Public Wealth, National & International Wealth; Income, Saving and Investment.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	Enlist the personal wealth. Enlist the public wealth. Enlist the sources of Income. Name the saving schemes in Private & Govt. Sector. Find out investment options.
<b>Chapter - 5</b> <b><u>Capital</u></b> Definition, features & Classification of Capital. On the basis of ownership, Durability, Mobility & nature of capital. Capital formation process : Creation, Mobilization & Investment of saving.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	Prepare a chart on classification of Capital. Find out the reasons for savings. List some forced Saving. Find out some self employment options Investment through financial institutions : name the options.
<b>Chapter - 6</b> <b><u>Economic Development</u></b> Meaning of Growth & development Basic Economic Activities Indian Economy - Characteristics of Indian Economy. Transformation of village Economy to Global Economy. Effect of Industrialization & Globalization on Indian Economy.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	Enlist the basic Economic activities. Find out the different handicrafts produced in India. Find out Cottage Industries. Visit to a khadi & village Industry. Find out the Multinational brands of goods.

**BUSINESS ECONOMICS****Subject Code :- 80000013****Business Economics - Second Year - Theory & Practical**

<b>Theory</b>		<b>Practical</b>
<b>Chapter - 1</b> <b><u>Indian Economy</u></b> Nature of Indian Economy. Sectors of Indian Economy : Primary, Secondary, Tertiary (Service) ; Comparing the Sectors in India. Organized and Unorganized, Public & Private Sectors. Role of Agriculture & Industries in Indian Economy.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	Prepare a chart on different Sectors of Indian Economy. List the Organized and Unorganized activities. Visit to a farm house. Visit to a Cyber Café. Visit to a small scale industry.
<b>Chapter - 2</b> <b><u>Production</u></b> Definition of Production : Addition of Utility ; Four forms of Utility i.e. place, time, service & form utility. Factors of production : Land, Labour, Capital & Organization.	<b>1</b> <b>2</b> <b>3</b> <b>4</b>	Visit to Warehouse Prepare a chart on different organization structures. Visit to a Transport Agency. Interview with a entrepreneur.
<b>Chapter - 3</b> <b><u>Distribution</u></b> Meaning of Distribution. Functional Distribution of Income Land - Rent, Labour - wages Capital - Interest, entrepreneur – Profit Income : Nation Income, per Capital Income, GDP	<b>1</b> <b>2</b> <b>3</b> <b>4</b>	Enlist the different remuneration Scheme like wages, salary, bonus. Find out the interest rates form financial institutes. Prepare a list of qualities required for an entrepreneur. A chart on business organizations.
<b>Chapter - 4</b> <b><u>Demand &amp; Supply</u></b> Meaning, Definition of Demand Factors affecting demand. Individual & Market demand <b>Supply :</b> Meaning & Definition of Supply. Determinants of supply ; Public Distribution System (PDS) Utility as the Basis of demand : Meaning & Measurement of Utility, Types of Utility.	<b>1</b> <b>2</b> <b>3</b> <b>4</b>	Visit to a Fruit Stall to study the market demand. Prepare a provision list to study individual demand. Collection of data on prices of agricultural commodities for a week. Visit to Ration Shop.
<b>Chapter - 5</b> <b><u>Collection &amp; Presentation of Data</u></b> Meaning of Statistics, Characteristics of Statistics, Collection of Data : Primary & Secondary Data. Questionnaire Sample Survey & Census Survey. Presentation of data : Classification, Tables, Graphs etc.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	List the Sources of Data Collection. Preparation of a sample questionnaire Classification of data at class level - sex, location, Income etc. Use of Diagrams and Tables to present the Collected Data. Preparation a Pie Charts and Bar diagrams etc.
<b>Chapter - 6</b> <b><u>Recent Trends in Economics</u></b> New Economic Policy : Globalization, Liberalization & Privatization, E-commerce & its Components. Environment & Sustainable Development Meaning, Need, Challenges & support. Consumer Awareness : Causes of exploitation of consumer Consumer protection Act.	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>	Prepare a list of MNCS. Visit to a Private Insurance Company Visit to a Nature Park. Preparation of Compost pit at school level. Collection of advertisements on Consumer Awareness.

## Psychology – 1<sup>st</sup> Year

(Subject code : 80000014)

Chapter 1.	<b>History of Psychology</b> Introduction to Psychology. Psychologists at Work, Early psychological thought, A Science Evolves: The Past, the Present, and the Future. Research in Psychology. Neuroscience and Behavior, the Basic Elements of Behavior. The Nervous System and the Endocrine System: Communicating Within the Body, Psychological characteristics of the Brain.
Chapter 2.	<b>Sensation and Perception:</b> Sensing the World Around Us, Vision: Shedding Light on the Eye, Hearing and the Other Senses, Perceptual Organization: Constructing Our View of the World.
Chapter 3.	<b>States of Consciousness:</b> Sleep and Dreams, Hypnosis and Meditation, Drug Use: The Highs and Lows of Consciousness.
Chapter 4.	<b>Learning &amp; Thinking:</b> Classical Conditioning, Operant Conditioning, Cognitive Approaches to Learning, Thinking: Memory, Cognition, and Language, The Foundations of Memory, Recall and Forgetting, Thinking, Reasoning, and Problem Solving, Language.
Chapter 5.	<b>Motivation and Emotion:</b> Explaining Motivation, Human Needs and Motivation: Eat, Drink, and Be Daring, Understanding Emotional Experiences.
Chapter 6.	<b>Development:</b> Nature and Nurture, and Prenatal Development, Infancy and Childhood, Adolescence: Becoming an Adult, Adulthood.

## Psychology – 2<sup>nd</sup> Year

(Subject code : 80000014)

Chapter 1.	<b>Personality and Individual Differences:</b> Psychodynamic Approaches to Personality, Trait, Learning, Biological and Evolutionary, and Humanistic Approaches to Personality, Assessing Personality: Determining What Makes Us Distinctive, Intelligence ?
Chapter 2.	<b>Psychological Disorders:</b> Normal Versus Abnormal: Making a Distinction, The Major Psychological Disorders, Psychological Disorders in Perspective, Treatment of Psychological Disorders: Psychotherapy: Psychodynamic, Behavioral, and Cognitive Approaches to Treatment, Humanistic and Group Approaches to Treatment, Biomedical Therapy: Biological Approaches to Treatment.
Chapter 3.	<b>Social Psychology:</b> Attitudes and Social Cognition, Social Influence and Groups, Prejudice and Discrimination, Positive and Negative Social Behavior, Stress and Coping
Chapter 4.	<b>Applied Psychology</b> Psychological principles, Psychological theories, Application of psychological theories to overcome problems such as <u>mental health</u> , <u>business management</u> , <u>education</u> , <u>health</u> , <u>product design</u> , <u>ergonomics</u> , and <u>law</u> . Study of Applied psychology in the areas of <u>clinical psychology</u> , <u>counseling psychology</u> , <u>industrial and organizational psychology</u> , <u>occupational health psychology</u> , <u>human factors</u> , <u>forensic psychology</u> , <u>engineering psychology</u> , as well as many other areas such as <u>school psychology</u> , <u>sports psychology</u> and <u>community psychology</u> .
Chapter 5.	Introduction and brief concepts to different psychologies: Clinical psychology, Educational <u>psychology</u> , Forensic psychology and legal psychology, Health psychology, Human factors, <u>Industrial and organizational psychology</u> , Occupational health psychology, School <u>psychology</u> , Sport psychology (related to exercise psychology), Additional areas.

# Subject Name : ENTREPRENEURSHIP – 1<sup>st</sup> Year

(Subject code : 80000015)

Theory	Practical
<b>1.0. What is Entrepreneurship?</b> 1.1. Concept, Functions and need 1.2. Entrepreneurship: Characteristics and Competency 1.3. Relevance of Entrepreneurship to Society Economic Gain: generating National Wealth, creating Wage and Self -Employment, Micro, Small and Medium Enterprises. 1.4. Process of Entrepreneurship Development.	I. Study visit by students to any enterprise of own choice. With the help of a schedule/questionnaire the students will record observation regarding – the background of entrepreneur, reasons for selecting the entrepreneurial career, starting the enterprise, the type of enterprise, the process of setting this enterprise, products/services, production process, investment made and marketing practices followed, profit or loss, growth and development, problems faced, institutions/organizations which offer support and entrepreneur's level and type of satisfaction.
<b>2.0. Entrepreneurial Pursuits and Human Activities:</b> 2.1. Nature, Purpose and pattern of Human Activities: Economic and Non-Economic, Need for Innovation. 2.2. Rationale and Relationship of Entrepreneurial Pursuits and Human Activities.	II. Preparation of a report based on the observations made during study-visit to an enterprise.
<b>3.0. Entrepreneurial Values and Motivation</b> 3.1 Entrepreneurial Values, Attitude and Motivation- Meaning and concept. 3.2 Developing Entrepreneurial Motivation and Competency – concept and process of Achievement Motivation, Self-efficacy, Creativity, Risk Taking, Leadership, Communication and Influencing Ability and Planning Action. 3.3. Barriers to Entrepreneurship	
<b>4.0. Introduction to Market Dynamics</b> 4.1. Understanding a Market 4.2. Competitive Analysis of the Market 4.3. Patents, Trademarks and Copyright	
<b>5.0. Project Selection</b> 5.1. Product Identification 5.2. Project Study	

# ENTREPRENEURSHIP – 2<sup>nd</sup> Year

(Subject code : 80000015)

Theory	Practical
<b>1.0. Entrepreneurial Opportunities and Enterprise Creation</b> 1.1. Sensing Entrepreneurial Opportunities 1.2. Environment Scanning 1.3. Market Assessment 1.4. Identification of Entrepreneurial Opportunities 1.5. Selection of an Enterprise 1.6. Steps in setting up of an Enterprise	<b>Detailed Syllabus</b> <b>Discussion on Entrepreneurial Opportunities and Enterprise Creation</b>
<b>2.0. Enterprise Planning and Resourcing</b> 2.1. Business Planning – Preparation of a Project Report 2.2. Resource Assessment -Financial and Non – Financial. 2.3. Fixed and Working Capital Requirement, Funds, Flows, Profit Ratios, Break Even Analysis etc. 2.4. Mobilizing Resources – Sources and Means of Fund, Facilities and Technologies for starting an Enterprise.	<b>Practical's on Business Planning, Resource Assessment, Mobilizing Resources</b>
<b>3.0. Enterprise Management</b> 3.1. General management: Basic Management Functions. 3.2. Organizing/Production of goods and services – Quality, quantity and flow of inputs. 3.3. Managing Market: Meaning, Functions of Marketing, Marketing Mix: * Product * Price * Place * Promotion (advertising and sales promotion). 3.4. Managing Finance – Sources of Long Term and Short Term Finances, Determination of Cost, Income, Calculation of Profit/Loss. 3.5. Managing Growth and Sustenance -Affecting Change, Modernization, Expansion, Diversification and Substitution. 3.6. Entrepreneurial Discipline – Laws of Land, Ecology, Consumer's Concept, Adherence to Contract and Credits.	<b>Practical's on Basic Management Functions, Organizing/Production of goods and services, Managing Market, Managing Finance, Managing Growth and Sustenance, Entrepreneurial Discipline.</b>
<b>4.0. Industrial Relations and Personnel Management</b> 4.1. Meaning, Source of recruitment, Internal/External recruitment procedure 4.2. Incentives, appraisal and training, Industrial relations, Industrial disputes.	<b>Practical's on Industrial Relations and Personnel Management</b>
<b>5.0. Report Writing</b> 5.1. Guidelines 5.2. Model project reports	

# Information Technology – 1<sup>st</sup> year

(Subject code : 80000016)

Theory	Practical
<b>A] Computer Fundamental</b>	
<b>1] Fundamentals Of Computer</b> Introduction Components of PC The system Unit Front part of system Unit Back part of system Unit CPU Memory of computer Monitor Mouse, Keyboard Disk, Printer, Scanner, Modem, Video, Sound cards, Speakers	<b>List of Practical</b> 1. Working with Windows 7 desktop ,start icon, taskbar, Recycle Bin, My Computer icon ,The Recycle Bin and deleted files Creating shortcuts on the desktop 2. The Windows 7 accessories, WordPad – editing an existing document, Use of Paint – drawing tools The Calculator, Clock 3. The Windows Explorer window, concept of drives, folders and files? Folder selection techniques, Switching drives, Folder creation, Moving or copying files, Renaming, Deleting files ,and folders 4. Printing, Installing a printer driver, Setting up a printer, Default and installed printers, Controlling print queues, Viewing installed fonts, The clipboard and 'drag and drop', Basic clipboard concepts Linking vs. embedding,
<b>2] Introduction To Windows 7</b> Working with window Desktop Components of window Menu bar option Starting window Getting familiar with desktop Moving from one window to another Reverting windows to its previous size Opening task bar buttons into a windows Creating shortcut of program Quitting windows	5. Moving through a Word document menu bar and drop down menus toolbars 6. Entering text into a Word 2010 document, selection techniques Deleting text 7. Font formatting keyboard shortcuts 8. Paragraph formatting Bullets and numbering 9. Page formatting What is page formatting? Page margins Page size and orientation Page breaks, Headers and footers 10. Introducing tables and columns
<b>3] GUI Based Editing, Spreadsheets, Tables &amp; Presentation</b> Application Using MS Office 2010 & Open Office.Org Menus Opening, menus, Toolbars, standard toolbars, formatting toolbars & closing Quitting Document , Editing & designing your document Spreadsheets Working & Manipulating data with Excel Changing the layout Working with simple graphs Presentation Working With PowerPoint and Presentation	11. Printing within Word 2010 Print setup Printing options Print preview 12. Development of application using mail merge Mail merging addresses for envelopes Printing an addressed envelope and letter 13. Creating and using macros in a document 14. Creating and opening workbooks Entering data 15. Navigating in the worksheet Selecting items within Excel 2010 Inserting and deleting cells, rows and column Moving between worksheets, saving worksheet, workbook
<b>4] Introduction To Internet</b> What is Internet Equipment Required for Internet connection Sending &receiving Emails Browsing the WWW Creating own Email Account Internet chatting	16. Formatting and customizing data 17. Formulas, functions and named ranges 18. Creating, manipulating & changing the chart type 19. Printing, Page setup, Margins Sheet printing options, Printing a worksheet 20. * Preparing presentations with Microsoft Power Point. Slides and presentations, Opening an existing presentation , Saving a presentation

<p><b>5] Usage of Computer System in various Domains</b></p> <p>Computer application in Offices, books publication data analysis ,accounting , investment, inventory control, graphics, database management, Instrumentation, Airline and railway ticket reservation, robotics, artificial intelligence, military, banks, design and research work, real-time, point of sale terminals, financial transaction terminals.</p>	<p>21. Using the AutoContent wizard ,Starting the AutoContent wizard, Selecting a presentation type within the AutoContent wizard Presentation type Presentation titles, footers and slide number</p> <p>22. Creating a simple text slide, Selecting a slide layout</p> <p>Manipulating slide information within normal and outline view, Formatting and proofing text, Pictures and backgrounds, drawing toolbar, AutoShapes, Using clipart, Selecting objects, Grouping and un-grouping objects, The format painter</p> <p>23. Creating and running a slide show, Navigating through a slide show, Slide show transitions, Slide show timings. Animation effects</p> <p>24. Microsoft Internet Explorer 5 &amp; the Internet</p> <p>Connecting to the Internet The Internet Explorer program window, The on-line web tutorial Using hyper links, Responding to an email link on a web page</p> <p>25.Searching the Internet, Searching the web via Microsoft Internet Explorer, Searching the Internet using Web Crawler, Searching the Internet using Yahoo, Commonly used search engines</p>
<p><b>6] Information technology for benefits of community</b></p> <p>Impact of computer on society</p> <p>Social responsibilities</p> <p>Applications of IT</p> <p>Impact of IT</p> <p>Ethics and information technology</p> <p>Future with information technology</p>	<p>26. Favorites, security &amp; customizing Explorer Organizing Favorite web sites Customizing options – general, security, contents, connection, programs, advanced</p> <p>27. * Using the Address Book Adding a new contact</p> <p>Creating a mailing group, Addressing a message, Finding an e-mail address</p> <p>28. Using electronic mail, Starting Outlook Express</p> <p>Using the Outlook Express window, Changing the window layout, Reading file attachment, Taking action on message-deleting, forwarding, replying</p> <p>29. Email &amp; newsgroups, Creating and sending emails</p> <p>Attached files, Receiving emails, Locating and subscribing to newsgroups, Posting a message to a newsgroup</p> <p>30. Chatting on internet, Understating Microsoft chat environment, Chat toolbar</p>

## Information Technology – 2<sup>nd</sup> year

(Subject code : 80000016)

Theory	Practical
Visit to different sections of the Institute. Safety precautions, Electrical Safety. Demonstration and operation of Fire Extinguishers. Demonstration of Artificial Respiration	Familiarization with institute. Accidents, safety precautions, Electrical safety, types of fire extinguishers. Artificial Respiration. Data, Information, data types, physical & logical concepts of data.
<b>MS Access</b> Working with Access, files, records, creating files, records, creating table with different fields such as number, text, date/time etc. Entering data, modifying structure, modifying data in tables, forms, reports and queries. Hyper linking with Excel and Word Practicing data entry in Access	Concept of Database/relational database Management systems Records, fields, files, different types of fields Various types of database systems Introduction to various database languages such as dbase, FoxPro, Visual Basic, Oracle and SQL.
<b>Software Development and Programming Algorithms</b> <ul style="list-style-type: none"> <li>□ definitions and descriptions</li> <li>□ representing algorithms</li> <li>□ examples such as recipes, directions, appliance instructions.</li> </ul> <b>Control structures</b> <ul style="list-style-type: none"> <li>□ sequencing</li> <li>□ selection such as binary and case.</li> <li>□ repetition and/or iteration such as pre and post test</li> </ul> Desk checking  Sub-programs <ul style="list-style-type: none"> <li>□ purpose</li> <li>□ examples</li> </ul>	<ul style="list-style-type: none"> <li>□ define algorithms and describe examples in daily life</li> <li>□ represent algorithms by using either flowchart or pseudocode.</li> <li>□ explain the purpose of an algorithm when solving problems</li> <li>□ devise algorithms to solve everyday problems incorporating the use of control structures</li> <li>□ examine and analyse the existing code of a selected example and identify control structures.</li> <li>□ develop prototypes using basic control Structures.</li> <li>□ conduct a desk check on a selected algorithm</li> <li>□ modify an algorithm to produce the required output</li> <li>□ examine existing code and algorithms to identify the purpose of sub-programs for a range of examples.</li> </ul>
<b>Programming language</b> <ul style="list-style-type: none"> <li>□ function of programming language</li> <li>□ examples of a programming language</li> </ul>	<ul style="list-style-type: none"> <li>□ define and describe the function of a programming language</li> <li>□ convert algorithms into basic code using a given language syntax</li> </ul>
<b>Data structures</b> <ul style="list-style-type: none"> <li>□ record</li> <li>□ file</li> <li>□ array</li> </ul>	<ul style="list-style-type: none"> <li>□ examine data structures in existing code</li> <li>□ demonstrate the use of an array</li> <li>□ modify existing code to allow for changes to the array</li> </ul>



<b>Working with LAN</b> Basic operation of LAN. Data entry in other clients, data storing in different clients. Data shearing from server and other clients. Practicing data entry in networking	Networking concepts, LAN, WAN, their applications.
<b>Internet</b> Operations, browsing, downloading articles and other text, down loading pictures from internet, sending and receiving emails, sending and receiving attachments. Introduction to local Language software such as Algal, I-leap, Leap-office (Any one of this software) Practicing of Data entry in Hindi or any other local languages software	Internet, intranet, ISDN, Broad brand concepts and applications.  Local language software, concepts and applications.

### **List of Books**

#### **Computer Fundamental**

- 1] Vikas Gupta Comdex Computer Course Kit First Dreamtech
- 2] Henry Lucas Information Technology for management 7Th Tata Mc-Graw Hills
- 3] B.Ram Computer Fundamentals Architecture and Organisation Revised 3<sup>rd</sup> New Age International Publisher

### **List of Tools and Equipment**

#### **A] General Class room**

<b>Sr</b>	<b>Name of Item</b>	<b>No.</b>
1	Steel lockers 8 compartments with individual lockers (1980 x 910 x 480 mm)	4
2	Chair with writing pad	25
3	Steel almari with self 6.5' x 3' (18 gauge)	2
4	Steel table 4' x 3'	2
5	Teacher chair	2

#### **B] For Computer Fundamental and CAD Practical**

<b>Sr</b>	<b>Name of Item</b>	<b>No.</b>
1	Computer System P4 with accessories Complete with license OS. compatible for- to run AutoCAD 2010 and Windows 7 OS.	5+1
2	Plotter- HP Design Jet 500 latest model	1
3	Scanner	1
4	Computer table	5+2
5	Chair for computer	10+2
6	Laser Printer	1
7	M. S. Office Software	1

# Computer Applications– 1<sup>st</sup> year

(Subject code : 80000017)

Theory	Practical
<b>Detailed Syllabus :</b> <b>1.0. Introduction</b> 1.1. Basic Computer and its structural theory 1.2. Input devices 1.3. Output devices 1.4. Storage devices 1.5. Computer types and their applications 1.6. Computer Software/Hardware	<b>Detailed Syllabus</b> <b>1.0. Computer basics</b> 1.1. Identification of Keyboard, Printer, Monitor Scanner, Webcam, Microphone, Speaker 1.2. Sample collection of various type of storage devices, specifications and charts
<b>2.0. Operating systems</b> 2.1. Various types of Operating systems 2.2. Comparison between the different types of OS 2.3. Microsoft Disk Operating System, its nature and history. 2.4. Microsoft Windows, development & growth of MS Windows, features, merits and demerits of MS Windows. 2.5. MS Windows 7, features, merits & demerits 2.8. System requirements for various Operating Systems 2.9. Windows default icons and their applications	<b>2.0. Practice</b> 2.1. Practice of MS DOS commands 2.2. Installation of MS Windows 2.3. Practice on Add/Remove programs 2.4. Practice on My computer, Display properties, My documents, My Network places
<b>3.0. Microsoft Word</b> 3.1. Introduction to MS Office 3.2. MS Word applications 3.3. Creation of Document and file operations 3.4. Formatting features of document 3.5. Modification/ editing documents 3.6. Inserting images, files, tables, symbols and various attributes 3.7. Creating and formatting of tables 3.8. Mail merge 3.9. Page layout and design features 3.10. Spell & grammar check in documents 3.10. Print preview & printing of documents 3.11. Converting documents to PDF files.	<b>3.0. Documentation</b> 3.1. Create and save a document 3.2. Format the text with different font size, font styles 3.3. Setting up different page sizes, Orientation. 3.4. Making various type of documents like Bio Data, letters, project reports 3.5. Printing of documents
<b>4.0. Microsoft Excel</b> 4.1. Introduction to Excel and its applications 4.2. Features of MS Excel 4.3. Outline of Worksheet & Workbook 4.4. Data types 4.5. Study of various menus of MS Excel 4.6. Creation of worksheet, editing worksheets, save, copy & deleting worksheets. 4.7. Functions of MS Excel 4.8. Formulas of MS Excel. 4.9. Types of charts, creation of data Charts, editing and insertion of charts. 4.10. Sort facility 4.11. Interconnecting Charts 4.12. Page setup, printing worksheets, charts... etc. 4.13. Converting Worksheets to PDF files.	<b>4.0. Practice of Worksheets</b> 4.1. Create and save worksheets 4.2. Editing the worksheets 4.3. Formatting worksheets 4.4. Insert charts 4.5. Making worksheets using formulas & functions 4.6. Making worksheets & printing with different formatting effects 4.7. Making worksheets with images, numbers and print them

Theory	Practical
<b>5.0. MS Power point</b> 5.1. General Introduction 5.2. Features & Applications of MS Power point 5.3. Creating Presentations 5.4. Study of different layouts and making presentations using different layouts 5.5. Using different animation effects. 5.6. Add Audio/Voice and visual effects to slides. 5.5. Filtration 5.6. Converting presentations to PDF files. 5.7. Inserting images, symbols to slides	<b>5.0. Power Point practice</b> 5.1. Create Slides of different types 5.2. Running presentations 5.3. Add slide transition effects and run slide show 5.4. Make presentations with audio/visual effects. 5.5. Printing PPT files 5.6. Making PDF format of PPT files
<b>6.0. Networking &amp; Internet Utilities</b> 6.1. General Introduction of Computer Networking 6.2. Requirements/ Applications of Computer Networking 6.3. Layouts of Different Networks 6.4. Study of various Networking components 6.5. Limitations and merits of different topologies 6.6. Study of Server/client concept 6.7. Internet & its applications 6.8. Email and Chatting 6.9. E-trading concepts 6.10. Downloading files (Text and media files)	<b>6.0. Networking practice</b> 6.1. Identifying different network components 6.2. Collecting samples, charts, images of different networking components. 6.3. Installation of Network Interface card 6.4. Getting connected to Internet and accessing the internet 6.5. Creating personalized Email account 6.6. Chatting (Text and Voice chat) 6.7. Searching/surfing for the information in different sites. 6.8. Downloading

## Computer Applications – 2<sup>nd</sup> year

(Subject code : 80000017)

Theory	Practical
<b>Detailed Syllabus :</b> <b>1.0. Introduction MS Access</b> 1.1. Objects of learning MS Access 1.2. Applications of MS Access 1.3. Database and Database Management System 1.4. Elements of Database Management System 1.5. Types of Data Bases & the merits & demerits	<b>1.0. Study of overview of MS Access</b>  1.1. Accessing MS Access and its menus to get familiar with it
<b>2.0. Controlling Data Entry</b> 2.1. Restrict Data Entry using field properties 2.2. Establish a pattern for entering field values 2.3. Create a list of values for a field	<b>2.0. Creating Data Tables, Designing Fields and setting field properties</b>
<b>3.0. Joining Tables and creating Queries</b> 3.1. Create Query joins 3.2. Join unrelated tables 3.3. Relate data within a table 3.4. Set Select Query properties 3.5. Create Parameter Queries 3.6. Create Action Queries	<b>3.0. Creating Queries</b>
<b>4.0. Forms &amp; Reports</b> 4.1. Design a Form Layout 4.2. Enhance the appearance of a Form 4.3. Restrict Data entry in forms 4.4. Adding a command button to a Form 4.5. Create a Subform 4.6. Organize report information 4.7. Format the report 4.8. Set Report Control properties 4.9. Control Report pagination 4.10. Summarize Report information 4.11. Add a sub report to an existing report 4.12. Create a mailing label report	<b>4.0. Practicing Forms and Reports</b> 4.1. Creating different forms using different layouts 4.2. Data entry in to the forms 4.3. Creating different Reports using different layouts 4.4. Data formatting in to reports
<b>5.0. Sharing data across applications</b> 5.1. Import data in to Access 5.2. Export data from Access 5.3. Analyze Access data in Excel 5.4. Export Access data to a Text file 5.5. Merge Access data with a Word document	<b>5.0. Practice:</b> 5.1. Import Excel sheets in to Access 5.2. Import Tables in to Access 5.3. Export Access tables in to Excel format 5.4. Export Access data to a Text file 5.5. Merging data
<b>6.0. Study of Application packages</b> 6.1. Introduction to application oriented software packages 6.2. Study of Railway reservation Package 6.3. Study of different modules and menus available in online Railway Reservation Package	<b>6.0. Practice</b> 6.1. Collection of different trial packages 6.2. Visiting Organizations to collect different formats and procedures used in the system 6.3. Creating forms and Reports for the different packages using appropriate data bases

# Engineering Mathematics

Subject Code :- 80000018

## Engineering Mathematics - First Year - Theory

<b>Chapter 1</b>	<b>Number systems</b>	<b>1</b>	Introduction
		<b>2</b>	Irrational Numbers
		<b>3</b>	Real numbers and their decimal expansions.
		<b>4</b>	Representing real numbers on number line.
		<b>5</b>	Operations on real numbers.
<b>Chapter 2</b>	<b>Exponents and radicals</b>	<b>1</b>	Laws of Indices for real numbers.
<b>Chapter 3</b>	<b>Algebraic Expressions &amp; Polynomials</b>	<b>1</b>	Constants and variables
		<b>2</b>	Terms of algebraic expressions
		<b>3</b>	Operations on algebraic expressions
		<b>4</b>	Polynomials
		a)	Degree - of a Polynomial in one variable and more than one variable
		b)	Standard form of a polynomial in one variable.
		c)	Operations on Polynomials in one variable.
		d)	Coefficient form and Indix form of the polynomial.
		e)	Synthetic Division
		f)	Value of the polynomial at a point.
		g)	Zeroes of a polynomial.
		h)	Remainder theorem
		i)	Factor Theorem
<b>Chapter 4</b>	<b>Special Products and Factorization</b>	<b>1</b>	Products of algebraic expression.
		<b>2</b>	Factorization of algebraic expression
		<b>3</b>	Factorization of polynomials
		<b>4</b>	Algebraic Identities
<b>Chapter 5</b>	<b>Linear Equations</b>	<b>1</b>	Linear Equations in one variables
		<b>2</b>	Linear Equations in two variables
		<b>3</b>	Solution of linear equations in one variable.
		<b>4</b>	Solution of linear equation in two variables by different methods.
		<b>5</b>	Application of simultaneous linear equations.
		<b>6</b>	Graphical solution of linear equations in a) One variable b) Two variable
<b>Chapter 6</b>	<b>Percentage and application</b>	<b>1</b>	Introduction
		<b>2</b>	Discount
		<b>3</b>	Commission
		<b>4</b>	Simple interest

<b>Chapter 7</b>	<b>Lines and Angles</b>	<b>1</b>	Introduction
		<b>2</b>	Intersecting and non intersecting lines.
		<b>3</b>	Introduction - angles - Definition
		<b>4</b>	Parallel lines.
		<b>5</b>	Tests for parallel lines.
		<b>6</b>	Types of angles.
		<b>7</b>	Angle sum property of a triangle.
<b>Chapter 8</b>	<b>Congruence of Triangles</b>	<b>1</b>	Congruent figures
		<b>2</b>	One-One correspondence and congruence of Triangles.
		<b>3</b>	Tests of congruence.
		<b>4</b>	Application of congruence to different types of triangle. Eg. Perpendicular bisector theorem Isosceles triangle theorem etc.
<b>Chapter 9</b>	<b>Quadrilaterals</b>	<b>1</b>	Introduction
		<b>2</b>	Types of Quadrilaterals.
		<b>3</b>	Angle sum properties
		<b>4</b>	Properties of particular quadrilaterals.
		<b>5</b>	Mid point theorem
<b>Chapter 10</b>	<b>Circles</b>	<b>1</b>	Introduction – Terms and definition
		<b>2</b>	Types of Circle
		<b>3</b>	Circle and line in a plane
		<b>4</b>	Angle subtended by a chord.
		<b>5</b>	Circle through three points
		<b>6</b>	Angle subtended by an arc of a circle.
		<b>7</b>	Cyclic quadrilaterals
		<b>8</b>	Inscribed angle theorem
<b>Chapter 11</b>	<b>Constructions</b>	<b>1</b>	Basic constructions
		<b>2</b>	Constructions of Triangles
<b>Chapter 12</b>	<b>Coordinate Geometry</b>	<b>1</b>	Introduction
		<b>2</b>	Distance formula
		<b>3</b>	Sector formula
<b>Chapter 13</b>	<b>Perimeters and Areas of plane figures</b>	<b>1</b>	Perimeters of plane figures
		<b>2</b>	Areas of plane figures
		<b>3</b>	Length of the arc of a Circle
		<b>4</b>	Area of a sector of a Circle
<b>Chapter 14</b>	<b>Introduction to Trigonometry</b>	<b>1</b>	Introduction
		<b>2</b>	Trigonometric Ratios
<b>Chapter 15</b>	<b>Data and their representation</b>	<b>1</b>	Introduction
		<b>2</b>	Presentation of data
		1	Tabular column
		2	Bar diagram & their types
		3	Histogram
		4	Frequency polygon
		5	Frequency curve
		6	Pie diagram

## Engineering Mathematics - First Year - Practical

<b>Chapter 1</b>	Number Systems
<b>Chapter 2</b>	Exponents and Radicals
<b>Chapter 3</b>	Algebraic Expressions and Polynomials
<b>Chapter 4</b>	Special Products and Factorization
<b>Chapter 5</b>	Linear Equations
<b>Chapter 6</b>	Percentage and its Applications
<b>Chapter 7</b>	Lines and Angles
<b>Chapter 8</b>	Congruence of Triangles
<b>Chapter 9</b>	Quadrilaterals
<b>Chapter 10</b>	Circles
<b>Chapter 11</b>	Constructions
<b>Chapter 12</b>	Co-ordinate Geometry
<b>Chapter 13</b>	Perimeters and Area of Plane Figures
<b>Chapter 14</b>	Introduction to Trigonometry
<b>Chapter 15</b>	Data and Their Representation

# Engineering Mathematics

Subject Code :- 80000018

## Engineering Mathematics - Second Year - Theory

<b>Chapter 1</b>	<b>Quadratic Equations</b>	<b>1</b>	Introduction
		<b>2</b>	Roots of Quadratic Equations.
		<b>3</b>	Methods of solving quadratic equations. a) Factorization b) Completing the square c) Formula d) Determinants Cramer's Rule.
		<b>4</b>	Relation between roots and co-efficient of Quadratic Equations.
		<b>5</b>	Nature of roots
		<b>6</b>	Formation of quadratic equation.
		<b>7</b>	Equations reducible to quadratic form
		<b>8</b>	Word Problems.
<b>Chapter 2</b>	<b>Arithmetic Progressions</b>	<b>1</b>	Introduction
		<b>2</b>	General terms
		<b>3</b>	Sum of $n^{\text{th}}$ term
		<b>4</b>	Particular terms in A.P.
		<b>5</b>	Application of A.P. (Word Problems)
<b>Chapter 3</b>	<b>Installment Buying</b>	<b>1</b>	Compound Interest
		<b>2</b>	Sales tax & VAT
		<b>3</b>	Banking
		<b>4</b>	Shares & Dividends
		<b>5</b>	Personal income tax
<b>Chapter 4</b>	<b>Concurrent lines</b>	<b>1</b>	Introduction
		<b>2</b>	Criteria for concurrency
<b>Chapter 5</b>	<b>Similarity of triangles</b>	<b>1</b>	Introductions
		<b>2</b>	Properties of ratios of areas of two triangles
		<b>3</b>	Basic proportionality theorem



		<b>4</b>	Test of similarity of triangles
		<b>5</b>	Properties of similar triangles
		<b>6</b>	Area of similar triangles
		<b>7</b>	Similarity of right angled triangles
		<b>8</b>	Pythagoras theorem
		<b>9</b>	30-60-90 Theorem
		<b>10</b>	45-45-90 Theorem
		<b>11</b>	Apollonious Theorem
<b>Chapter 6</b>	<b>Secants, tangents and its properties</b>	<b>1</b>	Introduction
		<b>2</b>	Properties of Secants
		<b>3</b>	Properties of tangents
		<b>4</b>	Tangent secant theorem
<b>Chapter 7</b>	<b>Construction</b>	<b>1</b>	Construction of tangents to a circle.
		<b>2</b>	Construction of circumcircle of a Triangle
		<b>3</b>	Construction of incircle of a Triangle
		<b>4</b>	Construction of an arc inscribing on angle of a given measure.
<b>Chapter 8</b>	<b>Coordinate Geometry</b>	<b>1</b>	LOCUS
		<b>2</b>	Equations of a straight line
		<b>3</b>	Angle between 2 lines.
<b>Chapter 9</b>	<b>Surface area and volume of Solid</b>	<b>1</b>	Cuboids
	<b>Figure</b>	<b>2</b>	Cylinder
		<b>3</b>	Cone
		<b>4</b>	Sphere
		<b>5</b>	Hemisphere
		<b>6</b>	Euler's formula
		<b>7</b>	Frustum of cone
		<b>8</b>	Word Problems

<b>Chapter 10</b>	<b>Trigonometry ratios of some</b>	<b>1</b>	Trigonometric Identities
	<b>special Angles.</b>	<b>2</b>	Trigonometric ratios of complementary angles
		<b>3</b>	Heights and distances
<b>Chapter 11</b>	<b>Measures of Central Tendency</b>	<b>1</b>	Mean, Median & Mode of raw data.
		<b>2</b>	Mean, Median & Mode of ungrouped data.
		<b>3</b>	Mean, Median & Mode of grouped data.
		<b>4</b>	O Give curves & finding Median using these.
		<b>5</b>	Quartiles
<b>Chapter 12</b>	<b>Introduction to Probability</b>	<b>1</b>	Introduction to Terms & concept
		<b>2</b>	Types of events
		<b>3</b>	Probability of an event
		<b>4</b>	Properties of Probability
		<b>5</b>	Addition Theorem

### **Engineering Mathematics - Second Year - Practical**

<b>Chapter 1</b>	Quadratic Equations
<b>Chapter 2</b>	Arithmetic Progressions
<b>Chapter 3</b>	Installment Buying
<b>Chapter 4</b>	Concurrent Lines
<b>Chapter 5</b>	Similarity of Triangles
<b>Chapter 6</b>	Angles in a Circle and Cyclic Quadrilateral
<b>Chapter 7</b>	Secants, Tangents and their Properties
<b>Chapter 8</b>	Surface Area and Volume of Solid Figures
<b>Chapter 9</b>	Trigonometric Ratios of Some Special Angles
<b>Chapter 10</b>	Measures of Central Tendency
<b>Chapter 11</b>	Introduction to Probability

Subject Name - Food Technology - – 1 <sup>st</sup> Year (Subject code : 80000019)			
FOOD TECHNOLOGY - First Year – Theory & Practical			
Sr.No.	Topic	Theory	Practicals
1	<b>Importance of Food Preservation Technology</b>	Importance of Food Preservation Technology Common terms used in Food Processing	Identification of different food products available in market
2	<b>Categorisation of food</b>	Food groups on the basis of pH value, technology, physiology changed conditions	Categorise the food items based on properties
3	<b>Principles of food preservation</b>	Principle of preservation Different food Preservation techniques Drying/ Dehydration of fruits & vegetables Principle of food drying/dehydration General Process of fruit drying General Process of vegetable drying General methods of food drying dehydration, sun drying, mechanical drying etc. Types of dryers	
4	<b>Drying/ Dehydration of fruits &amp; vegetables</b>	Principle of food drying/dehydration General Process of fruit drying General Process of vegetable drying General methods of food drying dehydration, sun drying, mechanical drying etc. Types of dryers Quality characteristics of dried fruits and vegetables Treatments prior to drying	Using dryers dry fruits & vegetables Carry out treatment prior to drying
5	<b>•Pickles</b>	Principle of pickle production Theory of different types pickle production Fermented, oil, vinegar Pickles	Production of different types of pickles.
6	<b>Ketchup, Sauce, and chutney</b>	Different types of tomato products Preparation of tomato products. Principle and preparation methods of tomato ketchup, sauce, puree, paste, chutneys	Preparation of tomato ketchup, sauce, puree, paste, chutneys
7	<b>Canning fruits &amp; vegetables</b>	Canning process flow diagramme for fruits & vegetables Pretreatments. Canning machinery Knowledge of chemicals required Canning of fruits & vegetables	----

<b>8</b>	<b>Jam, jelly and Marmalade</b>	Principle of jam and jelly preparation Flow diagram for preparation of jam and jellies. Test of pectin for jam and jelly preparation	Preparation of seasonal fruits Preparation of different fruit jams like, mango, apple, pineapple, banana, amla, guava, papaya, mixed fruit etc Preparation of jelly from fruits like, apple, guava, jackfruit etc. Preparation of jam and jelly marmalades Testing of pectin in fruits Testing of end point in jam and jelly
<b>9</b>	<b>Fruit preserves, glazed fruits, fruit bar and toffees</b>	Principle and methods for production of glazed fruits, candy, fruit bar and toffees	Preparation of glazed fruits, candy, fruit bar and toffees.
	<b>Vinegar Production</b>	Principle of vinegar production. Different types of vinegars. Factors involving good quality vinegar.	-----
<b>10</b>	<b>Wastes Utilization from fruit and vegetables</b>	Wastes from fruits and vegetables. Processing techniques for proper utilization of wastes from fruits and vegetables.	Preparation of products from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches
<b>11</b>	<b>Quality Control</b>	Quality factors in fruit and vegetable processing & preservation	Tests for quality Evaluation
<b>12</b>	<b>Nutritional qualities and composition of fruits and vegetables</b>	Analytical methods for evaluation of chemical and nutritional composition of fruits and vegetables	Analysis of fruits and vegetables for their quality.
<b>13</b>	<b>Storage and Packaging for Fruits &amp; Vegetables.</b>	Need and importance of storage and packaging Methods Storage techniques for fruits, vegetables and grains Cold storage, refrigeration Packaging materials used Selection of appropriate packing methods	Pack the given food products and seal
<b>14</b>	<b>Bakery and confectionery in food industry</b>	Importance of bakery and confectionery in food industry Industrially important cereals	

15	<b>Bakery Products</b> •Flour  •Bread  •Biscuit and cookies	Different industrially important bakery products. Flours for the bakery products Quality of flour for the production of bakery items. Principle involved for bread production Different types of breads and their uses Ingredients used in bread production  Basic method of biscuit production. Ingredients for biscuit production. Machinery involved in biscuit production Factors affecting the quality of product	Production of quality flour for bread, biscuit and cakes Production of plain, fermented, malt, rye flour Flour, fat, bakers yeast, sugar and salt, I.S.I. standards for flour, fat, Baker's yeast.  Use of different food machinery for bread production Production of plain bread, fermented bread, protein rich bread and special breads Production of different types of popular biscuits. Production of different types of specialized biscuits. Production of different types of other products like cookies, crackers
16	<b>Cake</b>	Methods for the production of cakes Ingredients for cake production Machinery involved in cake production Factors affecting the Quality	Production of different types of popular cakes Production of different types of specialized cakes
17	<b>Starch</b>	Availability of starch in different cereals Extraction of starch Different products of grain starch	Preparation of corn starch, starch biscuits, Namkins, snacks
18	<b>Quality Standards</b>	Quality standards and evaluation of product	Testing of raw material and product for their quality.
19	<b>Primary processing equipment</b>	Equipment used e.g. flour mill, mixer, molding machines, oven balance, packing machines Location of faults Safety	-----
20	<b>Storage and Packaging of Bakery product</b>	Need and importance of storage and packaging for bakery items Methods of storage & packaging	Pack the given food products and seal
21	<b>Dairy industry</b>	Importance of dairy industry Introduction to operation flood (white revolution)	
22	<b>Milk</b>  •Processing of	Property of milk Quality of raw milk Products made from the milk Introduction to different dairy products useful for marketing. Principle of milk processing  Method of production of	Testing of milk for its quality Primary processing of market milk. Storage of milk

	<p>Milk</p> <p>•Dairy Products</p> <p>•Ghee</p> <p>•Butter</p> <p>•Dairy sweets</p> <p>•Ice-cream</p> <p>•Other Dairy products</p>	<p>pasteurized milk Standard, toned, double toned flavoured milks. Ingredients of special milks, fermented milk</p> <p>Preparation methods of Cheese, Chhana, Mawa, Preparation methods of Dahi, Srikhand, Cream, buttermilk</p> <p>Different methods of Ghee production Quality of ghee</p> <p>Method of butter production Quality of butter</p> <p>Preparation methods of different dairy based sweets Storage of sweets. Principle of ice-cream production Method of ice-cream production Quality of ice cream Different types of ice creams Different dairy products like dried milk, condensed milk</p>	<p>-----</p> <p>-----</p> <p>Preparation of Cheese, Chhana, Mawa,/</p> <p>Preparation of Dahi, Srikhand, Ghee, Cream, buttermilk etc.</p> <p>Production of Ghee by different methods</p> <p>Preparation of butter. Test of quality of butter</p> <p>Preparation of different dairy based sweets.</p> <p>Preparation of ice cream. Quality evaluation of ice cream Storage of ice-cream</p>
23	<b>Processing equipment</b>	<p>Equipment used e.g. Cream Separator, deep fridge, cheese vat, pasteurizer, kettle, butter churner, boiler,(optionally mini dairy plant) Maintenance of equipment Safety Handling of equipment Safely.</p>	<p>Fault identification and removal of faults Safe operation</p>
24	<b>Storage and Packaging for Dairy Product</b>	<p>Need and importance of storage and packaging Methods</p>	<p>-----</p>

<b>Subject Name - Food Technology - – 2<sup>nd</sup> Year</b> <b>(Subject code : 80000019)</b>			
<b>FOOD TECHNOLOGY - Second Year – Theory &amp; Practical</b>			
<b>Sr.No.</b>	<b>Topic</b>	<b>Theory</b>	<b>Practical</b>
<b>1</b>	<b>Agro processing industry</b>	Introduction of agro processing industry Scope of agro processed products for entrepreneurship	Conducting survey of the different agro products from the market
<b>2</b>	<b>Machinery in Agro processing</b>	Different machines used in agro processing industry Working principles, cost and capacity of machines in agro processing industry	Visit to nearest agro processing industry and introduction to agro Processing Machinery.
<b>3</b>	<b>Cereal grains, wheat</b>	Different grains suitable for agro processing Primary processing of wheat Cleaning, grading, milling Standards for the wheat flour Production of different wheat product	Cleaning, grading and other pre-processing activities Production of whole wheat flour Production of Suji, Maida, Dalia Packaging and labeling the product
<b>4</b>	<b>Dal (Pulse) Milling</b>	Principle of dal milling Pulses suitable for milling Different Methods of dal milling Dal mills Pre-treatment in dal milling Waste utilization	Pre-treatment in dal milling like cleaning, grading, soaking, drying Milling pulses for production of dal, e.g. pigeon pea, green gram, Bengal gram Packaging and uses of wastes from dal mill
<b>5</b>	<b>Packaged whole grains</b>	Suitablility of whole grains for marketing Production of packed whole grains Packaging, labeling, storage and marketing of whole grains	Production of packed whole grains like Bengal gram, black gram, green gram, groundnut
<b>6</b>	<b>Spice Grinding</b>	Spices suitable for grinding Principle and method of spice grinding Machinery used for spice grinding Ensuring good quality product	Procurement and Pre-processing of spices, cleaning, grading, destoning Working with machinery for spice grinding Production of spice powders from, coriander, black peeper, red chilly, turmeric Packaging of whole spice grains for marketing

7	<b>Oil Milling</b>	Methods of oil milling Different types of oil expellers Oilseeds, properties and suitability Process flow chart for oil Milling Filtration and packaging	-----
8	<b>Rice Milling</b>	Properties of paddy for rice milling Process of rice milling Hullers	Processing of paddy for rice
9	<b>Groundnut decorticators</b>	Different groundnut decorticators Decortication, cleaning, grading and packaging	Working with groundnut decorticators for production of decorticated groundnut
10	<b>Quality</b>	Quality standards for packed processed products	Development of good quality package and testing of the quality with market survey and demand
11	<b>Processing Equipments</b>	Equipment used e.g. Flour mill, Mini grain mill, pulverizer, hammer mill, Flour separator, Dal Mill, Packing machine (Heat sealing machine), Balance Maintenance of equipment Safety	-----
12	<b>Food beverage</b>	Importance of food beverages for entrepreneurship Scope of food beverages	-----
13	<b>Introduction to different food beverage</b>  •Raw material  •Synthetic soft drinks	Types of beverages Need of particular beverage Classification of Beverages  Raw materials used for beverages PFA- standards for food Beverages  Synthetic soft drinks Process of manufacture of soft drinks Quality of water for soft drinks Food additives used in soft drinks  Quality control in a soft	Selection of ingredients for soft drink production Preparation of different soft drinks Packaging of the soft drinks (Bottling, polu pouches, pepsi type, can) Quality testing in soft Drinks Production of juices



	<p>•Fruit Beverages</p> <p>•Miscellaneous Beverage</p>	<p>drink manufacturing industry</p> <p>Introduction to different fruits juices</p> <p>Principle and methods.</p> <p>Machinery involved in different fruits juice extraction</p> <p>Ready-To-Serve (RTS) fruit beverages,</p> <p>Squash, fruit juice, nectar concentrate, syrup, sherbets</p> <p>Process of manufacture</p> <p>Quality control in Beverage industry.</p> <p>FPO standards for fruit Beverages.</p> <p>Beverage from other materials, grains</p> <p>Malt, vegetable (tomato), herbs &amp; medicinal plants</p>	<p>from fruits</p> <p>Production of Ready-To-Serve (RTS) fruit beverages,</p> <p>Production of squash, fruit juice, nectar, concentrate</p> <p>Quality testing of beverage</p> <p>Fruits used : mango, orange, papaya, lemon, jamun</p> <p>-----</p>
14	<b>Mineral water</b>	<p>Principle and method for production of mineral water</p> <p>Quality standard (BIS) of water.</p> <p>Different types of water, RO, UV, Ozonated</p>	Visit to nearest mineral water bottling plant.
15	<b>Soda water</b>	<p>Principle and Method of soda water production</p> <p>Quality standards for soda water</p>	-----
16	<b>Fermented beverages</b>	<p>Principle and methods.</p> <p>Raw material</p> <p>Fermentation Storage</p>	-----
17	<b>Primary processing machinery</b>	<p>Equipment used e.g. Juice extractor, pulper, fermenter, vinegar generator, crown corking machine, bottle filling machine, Soda water machine, basket press, filter press</p> <p>Maintenance of machines</p> <p>Safety</p>	-----
18	<b>Meat</b>	<p>Importance of meat processing for entrepreneurship</p> <p>Scope of meat processing industry</p>	
	•Meat Processing	<p>Methods of meat processing.</p> <p>Post mortem changes</p>	<p>Meat processing : cutting (carcassing), cleaning, storage, sanitation</p> <p>Handling and practice on</p>

		during meat processing. Quality of meat Canning, pickling, preservation of meat.	meal processing equipment safely Practical on canning, pickling, preservation of meat
<b>19</b>	<b>Fish Processing</b>	Principle and methods of fish processing Quality of fish suitable for processing Dehydration, canning, pickling of fish, Fishmeal protein, fishmeal powder	Experiment on fish quality for processing Production of Dehydrated canned, pickled fish, Fish meal protein, fish meal powder
<b>20</b>	<b>Poultry</b> •Egg       •Poultry proces sing	Importance of egg production Storage and preservation methods of egg Production methods of egg albumin, powder and other useful products from egg Quality of egg and products Pickling, canning of egg Methods of chicken processing	Chicken processing Quality testing of chicken meat Preparation of processed product from chicken e.g. Sausages, pickle, dried chicken
<b>21</b>	<b>Soya Products</b>	Details of soya product Processing methods of soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand,namkins	Preparationof soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand, namkins
<b>22</b>	<b>Papad</b>	Raw material for papad production Method of preparation of different types of papad Packaging and quality of papad	Preparation of ingredients for papad production Preparation of different types of papad
<b>23</b>	<b>Sprouted Grains</b>	Importance of sprouted/germinated foods Material selection for sprouting Methods for preparation of germinated grains Requirements for sprouting grains Individual and mixed sprouted grains	Selection of raw material for Preparation of sprouting Preparation of individual sprouted grains, pulsed, groundnut, wheat, alfa etc. Preparation of mixed sprouted grains Package development and marketing of sprouted grains
<b>24</b>	<b>Medicinal and herbal Products</b>	Importance of medicinal and herbal products Processing methods of medicinal and herbal products	-----

<b>25</b>	<b>Natural colour and flavour and food additives</b>	Different species for colour and flavor production Colours and flavours used in food industry Methods of production of natural colour and flavours Production method of other food additives	-----
<b>26</b>	<b>Food additives</b>	Use of different food additives for preservation	Food preservation using natural and chemical additives Value addition with chemicals and additives
<b>27</b>	<b>Primary processing machinery</b>	Equipment used e.g. Meat mincer, cutting machine, canning unit, packaging machine Soya plant, papad press, etc. Seed germinator, refrigerator, etc. Location of faults Safety Handling and practice on the equipment	-----
<b>28</b>	<b>Marketing</b>	Market survey procedures Strategies for marketing Methods of marketing feedback Cost analysis & attractive packaging Advertising	Contact customers Estimate requirements Collect feedback Workout cost of product & competition

**Trainee Kit and Equipments for Food Technology**  
**Trainees Kit**

Sl. No.	Item/ Specification	Quantity proposed for one batch
1.	Hand operated moisture meter (to be shared)	04
2.	Litmus papers	16
3.	Product catalogue of different product	As required
4.	Hand sealing machine (to be shared)	04
5.	Bottle cap tightening machine (to be shared)	04
6.	Hand operated plastic packaging machine (to be shared)	04
7.	Food colour packets	As required
8.	Preservatives packets	As required
9.	Spring balance (to be shared)	04
10.	Fruit knife (to be shared)	08
11.	Spoons (different sizes)	16 sets
12.	Measuring glass (to be shared)	08
13.	Hand gloves	16
14.	Apron	16
15.	Cap	16
16.	Boots	16
17.	Hand bag big size	16

### Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity proposed for one batch
1.	Cabinet dryer (Electrical)	01
2.	SS trays	As required
3.	Lemon squeezer	06
4.	Bottle washer	02
5.	Crown corking machine (Hand operated/ pedal operated)	01
6.	Baby Fruit pulper	02
7.	Mixer-grinder/Food processors	04
8.	Water purifier	02
9.	Sulfuring chamber	01
10.	Blancher cum sterilizer	01
11.	Oven : 5 KW,	01
12.	Hand / table model refractometer : Abbes type, 0-32; 28-70. 58-90 of 0-100 (Bench type)	02
13.	Storage Bins of different capacity :	As required
14.	Electronic balance	01
15.	Electric oven : For moisture determination, 0-250 °C, digital display, 2'X2'X2'	02
16.	Moisture box : Aluminum, 100 g capacity cylindrical	02
17.	Vinegar generator :	01
18.	Fermenter :	01
19.	Vegetable slicing machine	01
20.	Automatic pouch machine/ filler sealer machine : including a batch coding, perforation and notching unit	01
21.	Pulping machine for fruits and vegetables	01
22.	Fruit mill Junior Model, 0.5 Ton/h with 1 hp motor.	01

Sl. No.	Item/ Specification	Quantity proposed for a batch of 16 trainees
23.	<b>Gel meter .</b>	01
24.	<b>Auto clave</b> : For Sterilization of cans,	01
25.	<b>Vacuum pan</b>	01
26.	<b>Vernier Caliper</b> : 15 cm. 0.01 mm LC	04
27.	<b>Screw Gauge</b> : Micrometer, 0.001 mm LC, 10 cm cap	04
28.	<b>Steel Scale</b> : 12 “ standard steel	04
29.	<b>Steel tape</b> : Scales 1 meter, and of 50 ft	04
30.	<b>Weight box</b> : For balances	01
31.	<b>Cutting equipments</b> : Different knives, Cutters for fruits / Vegetables	04 sets
32.	<b>Sinks</b> : standard size	02
33.	<b>Hot plate</b> : Electrical 2 KW	02
34.	<b>Pickle Mixer</b> : Rotatory type, Contact Parts of SS	02
35.	<b>Heat sealing machine</b> : Hand / pedal operated	01
36.	<b>Tank SS</b> : 50 liters capacity, cylindrical with cap	01
37.	<b>Syrup tanks</b> : 50, 100 lit capacity SS	01
38.	<b>Pressure cooker</b> : 5 Kg and 10 Kg SS	01 each
39.	<b>Liquid filling machine</b> : 200 ml, 500 ml, 1000 ml. Manual	01 each
40.	<b>SS Filter</b> : Sieve type cloth filter, hydraulic,	01
41.	<b>Sugar coating pan</b> : SS, Revolving type with speed control,	01
42.	<b>Bottle opener</b> : Heavy duty, Stainless Steel	04
43.	<b>Burette</b> : 50 ml digital Automatic/ ordinary glass	06
44.	<b>Pipette</b> : 5-50 ml capacities	06
45.	<b>Lab glass wares</b> : Different sizes and types	As required
46.	<b>Working tables</b> : Stainless Steel Size 6’ X 3’	01

Sl. No.	Item/ Specification		Quantity proposed for a batch of 16 trainees
47.	<b>Improved stoves</b> : Made of MS with proper safety Measures		02
48.	<b>Stainless steel/ Aluminum pots</b> : Different Capacities		As required
49.	<b>Stainless steel knives</b> : 12-15 cm blade		As required
50.	<b>Spoons</b> : Stainless steel, various shapes and sizes		As required
51.	<b>Household sieves</b> : Stainless steel		As required
52.	<b>Wooden spoons</b> : Different sizes		As required
53.	<b>Hand operated pulp extractor</b> : Made of stainless steel		01
54.	<b>Solar dryer (cabinet type)</b> : Complete with solar box, Size approx 6' X 3'		01
55	Electrical Oven		01
56	Wooden Spatula		12
57	Bread Cutting Machine		01
58	<b>Pipette</b> : 5-50 ml capacities, glass		04
59	<b>Burette</b> : 50 ml digital Automatic/ ordinary glass		06
60	<b>Plate pasteurizer</b>		01
61	<b>Butter churner</b>		01
62	<b>Boiler</b>		01
63	<b>Deep fridge</b>		01
64	<b>Mini grain mill</b> : Power operated, 01 HP 20 Kg/hr		01
65	<b>Flour mill/ mini grain mill</b> : Standard size		01

## **Subject Name - Business Studies - – 1<sup>st</sup> Year**

**(Subject code : 80000020)**

### **Theory & Practical**

1. Commerce
  - a) Meaning of Commerce
  - b) Evolution of Commerce
  
2. Trade & Aids to trade
  - a) Meaning of Trade
  - b) Meaning of Aids to Trade
  - c) Types of Transaction (Barter, Cash, Credit)
  
3. Internal Trade
  - a) Wholesale Trade (Advantage & Disadvantage)
  - b) Retail Trade (Advantage & Disadvantage)
  
4. External Trade
  - a) Import
  - b) Export

} Meaning , Feature, Distinguished
  
5. Business Services I
  - a) Transport (Roadways, Railways, Airways, Seaways)
  - b) Communication (New sources “Email”)
  - c) Warehousing (Types & Features)
  
6. Business Services II
  - a) Banking (Types & Function)
  - b) Insurance (Life, Marine, Fire)
  - c) Advertising



**Subject Name - Business Studies - – 2 nd Year**

**(Subject code : 80000020)**

**Theory & Practical**

1. Nature & Scope of Business
  - a) Concept & Characteristic
  - b) Distinguished Between Business & Profession
2. Forms of Business I
  - a) Sole Trader (Feature, Merit, Demerit)
  - b) Partnership Firm (Feature, Types, Demerit)
  - c) Joint Hindu Family (Feature)
3. Forms of Business II
  - a) Co-operative Societies
  - b) Joint Stock Co. (Public & Private Sector)
4. Small Scale Business
5. Large Scale Business
6. Introduction of International Business

## **Subject Name : Business Mathematics – 1<sup>st</sup> Year**

**(Subject code : 80000021)**

### **FIRST YEAR – Business Mathematics.**

- I. Logarithms
  - a. Introduction to logarithms
  - b. Laws of Logarithms
2. Trigonometric ratios
  - a. Angles and its measurements
  - b. Trigonometric ratios
  - c. Fundamental identities
  - d. Examples based on fundamental identities.
  - e. Properties of a Triangle.
3. Plane co-ordinate Geometry
  - a. Line.
4. Commercial Arithmetic
  - a. Profit, Loss & Discount.
  - b. Compound Interest.
5. Pure Arithmetic's
  - a. Rational & irrational numbers.
6. Mensuration
  - a. Perimeter and area of plane figures.
  - b. Solids (Area and Perimeter)
7. Quadratic Equations
  - a. Nature and Roots of quadratic equation
  - b. Formation of quadratic equations
  - c. sum and product of roots of quadratic equations.
8. Random Variable and Probability Distribution
  - a. Definition and types of random variable
  - b. Probability distribution of random variable.
9. Permutation and combination.
  - a. Permutations
  - b. combinations
10. Moments, Skewness, Kurtosis
  - a. Moments.
  - b. Skewness
  - c. Kurtosis.
11. Statistics
  - a. Statistics
  - b. Mean and median (for ungrouped data only)

## **Subject Name : Business Mathematics - 2<sup>ND</sup> Year**

**(Subject code : 80000021)**

### **SECOND YEAR – Business Mathematics**

1. Matrices
  - a. Definition and types matrices.
  - b. Inverse of matrix
  - c. Solutions of equations.
2. Regression Analysis
  - a. Introduction
  - b. Tabulation of data.
  - c. Graphs and diagrams, scatter diagrams, histograms, bar charts... etc.
3. Plane co-ordinate geometry
  - a. Locus and its constructions
4. Discrete probability distribution
  - a. Binomial distribution
  - b. Poisson distribution
5. Spread sheets
  - a. Introduction of spread sheets
  - b. Features and functions of spread sheet software.
6. Statistics
  - a. Graphical representation(Histogram and Ogives)
  - b. Measurement of central tendency.
7. Index numbers
  - a. Introduction
  - b. Types of index numbers
  - c. Construction of index numbers.
8. Derivatives
  - a. Maxima and minima
  - b. Increasing and decreasing functions.
9. Differentiation
  - a. Definition of derivative
  - b. Derivative of first principle, composite functions, inverse function and parametric functions.
  - c. Second order derivatives.
10. Mathematical Logic
  - a. Logical connectives and equivalences
  - b. Venn diagram
11. Commercial arithmetic
  - a. Compound interest (With and without using formula)
  - b. Sales tax and value added tax

Commission brokerage and insurance

# Data Entry Operator – 1<sup>st</sup> Year

(Subject code : 80000022)

Data Entry Operator – Theory	Data Entry Operator – Practical
Visit to different sections of the Institute. Safety precautions, Electrical Safety. Demonstration and operation of Fire Extinguishers. Demonstration of Artificial Respiration	Familiarization with institute. Accidents, safety precautions, Electrical safety, types of fire extinguishers. Artificial Respiration. Data, Information, data types, physical & logical concepts of data.
<b>1] Fundamentals Of Computer</b> Introduction Components of PC The system Unit Front part of system Unit Back part of system Unit CPU Memory of computer Monitor Mouse, Keyboard Disk, Printer, Scanner, Modem, Video, Sound cards, Speakers	<b>List of Practical</b> 1. Working with Windows 7 desktop ,start icon, taskbar, Recycle Bin, My Computer icon ,The Recycle Bin and deleted files Creating shortcuts on the desktop 2. The Windows 7 accessories, WordPad – editing an existing document, Use of Paint – drawing tools The Calculator, Clock 3. The Windows Explorer window, concept of drives, folders and files? Folder selection techniques, Switching drives, Folder creation, Moving or copying files, Renaming, Deleting files ,and folders 4. Printing, Installing a printer driver, Setting up a printer, Default and installed printers, Controlling print queues, Viewing installed fonts, The clipboard and 'drag and drop', Basic clipboard concepts Linking vs. embedding,
<b>MS Office 2010- Word, Excel, Power Point 2010</b> Application Using MS Office 2010 & Open Office.Org Menus Opening, menus, Toolbars, standard toolbars, formatting toolbars & closing Quitting Document , Editing & designing your document Spreadsheets Working & Manipulating data with Excel Changing the layout Working with simple graphs Presentation Working With PowerPoint and Presentation	1 Printing within Word 2010 Print setup Printing options Print preview 2. Development of application using mail merge Mail merging addresses for envelopes Printing an addressed envelope and letter 3. Creating and using macros in a document 4. Creating and opening workbooks Entering data 5. Navigating in the worksheet Selecting items within Excel 2010 Inserting and deleting cells, rows and column Moving between worksheets, saving worksheet, workbook
<b>MS Access</b> Working with Access, files, records, creating files, records, creating table with different fields such as number, text, date/time etc. Entering data, modifying structure, modifying data in tables, forms, reports and queries. Hyper linking with Excel and Word Practicing data entry in Access	Concept of Database/relational database management systems Records, fields, files, different types of fields Various types of database systems Introduction to various database languages such as dbase, FoxPro, Visual Basic, Oracle and SQL.

<p><b>PageMaker</b></p> <p>Working with tool bar Setting defaults</p> <p>Opening, saving and closing publications</p> <p>Inserting and removing pages Flowing text, resizing the object Adjusting graphics or text objects, select multiple elements, selecting elements behind the others, mask and group, unmask and ungroup. Constrain move vertically/horizontally Paste items, editing objects, rotating text box Layout window, viewing pages, changing previous and next pages, zooming and hyperlinks</p>	<p>PageMaker – introduction to various versions, concepts and application</p>
<p>Font style, size, case, subscript and Superscript Special characters, bullets, page numbering Spacing of character, line, word and paragraph, breaking and non breaking Text editing – selecting word, paragraph and a range of text indenting/Tabs Find and change dialogue box Text recomposition Compress paint, JPG and GIF files Pallet controls, colour pallets, styles pallet and master pages pallet Removing master page objects from pages, control pallets Making tables, editing data in tables. Filing, stroking, frames, arranging, text wrapping, grouping and ungrouping, locking and unlocking, mask/unmask image, polygon setting, rounded corners.</p>	<p>Application of PageMaker</p>

## Data Entry Operator – 2<sup>nd</sup> Year

(Subject code : 80000022)

Theory	Practical
<b>Tally</b>  Entering vouchers, creating ledgers, maintaining cash books, bank books, preparation of trial balance & balance sheet and budget estimates Practicing any one of Financial Accounting Software such as Talley, Ace or Ex Engine Learning keyboard short cuts.	Introduction of Accounting, vouchers, ledger, bank books, cash books, trial balance and balance sheets, golden rules of accountancy. Introduction to Financial accounting Software such as Talley, Ace, Ex engine (Any one of these software)
<b>Working with LAN</b> Basic operation of LAN. Data entry in other clients, data storing in different clients. Data shearing from server and other clients. Practicing data entry in networking	Networking concepts, LAN, WAN, their applications.
<b>Internet</b> Operations, browsing, downloading articles and other text, down loading pictures from internet, sending and receiving emails, sending and receiving attachments. Introduction to local Language software such as Algal, I-leap, Chalontika, Leap-office (Any one of this software) Practicing of Data entry in Hindi or any other local languages software.	Internet, intranet, ISDN, Broad brand concepts and applications.  Local language software, concepts and applications.
<b>Adobe Photoshop</b> basic training including various editing features, Scanning images, importing, Exporting, Adjusting image using brightness, Contrast, hue, saturation, size, piexel, etc. Adding various effects to image using layer, action etc.	Practical on Photoshop

Software required :- M. S. Office 2010 complete,  
Adobe Pagemaker 6.5, Adobe Photoshop 7, Talley 7.2 each one.

**Theory I - Electronic Materials & Device - 1 st Year**  
**Subject Code :- 80301001**

**1. Introduction**

- 1.1 Basic Concepts of Electricity
- 1.2 Sources of voltage
- 1.3 Ohm's law
- 1.4 Resistance Networks
- 1.5 Safety precautions
- 1.6 Network theorems

**2. Electrostatics**

- 2.1 Basic concepts
- 2.2 Capacitor theory

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**3. Magnetism**

- 3.1 Basic concepts

**4. Electro magnetism**

- 4.1 Basics of Electromagnetism
- 4.2 Inductance

**5. Alternating voltage and current**

- 5.1 A.C. fundamentals
- 5.2 Resonance

**6. Study of electric components**

- 6.1 Resistors
- 6.2 Capacitors
- 6.3 Inductors
- 6.4 Transformers
- 6.5 Relays
- 6.6 Switches
- 6.7 Accessories for Basic circuit Assembly
- 6.8 Loudspeaker and Microphone

**7. Meters**

**8. Soldering Technique**

## **Practical - I - Electronic Materials & Devices - 1 st Year**

**Subject Code :- 80301001**

### **Practical**

1. Safety precautions to be observed while working with electronic equipments and systems
2. Drawing electrical symbols as per ISI specifications
3. Drawing an electrical circuit with various components
4. Study of AC and DC sources (power suppliers) available in the laboratory with their specifications.
5. Identification of various materials tools and devices
6. Familiarization of ammeter, voltmeter, multimeter (analog, digital) and understanding their specifications.
7. Verification of Ohm's law, using resistors in series and in parallel.
8. Identifying different cables.
9. Identifying different connectors.
10. Study of different cables and connectors.
11. Study of RELAYS verifying conditions, such as normally 'on' and 'off' etc.
12. Testing a transformer, continuity, installation and turn ratio
13. Study of different types of microphones and loud speakers. Replacement of cone in loud speaker.
14. Preparation of loudspeaker enclosure using cross over network
15. Use of PMMC movement to construct multi range ammeter
16. Use of PMMC movement to construct multi range voltmeter
17. Measurement of electrical power consumption in simple AC/DC circuit by VI method.
18. Verification of KCL and KVL (Kirchhoff's Laws)
19. Measurement of input and output resistance of power supply and verification of maximum power transfer theorem.
20. Study of different cells and batteries used in different electronic systems including EPS/UPS.

## **Theory - I - Electronic Materials & Device - 2<sup>nd</sup> Year**

**Subject Code :- 80301001**

### **1. Number systems and Boolean algebra**

- 1.1 Types of number systems.
- 1.2 Binary Codes
- 1.3 Binary Arithmetic

### **2. Logic Gates**

- 2.1 Basic Logic Operations
- 2.2 Logic Gates
- 2.3 Boolean Algebra
- 2.4 Derived Gates
- 2.5 Arithmetic Circuits

### **3. Digital Logic Families**

- 3.1 Types
- 3.2 CMOS ICs



#### **4. Combinational Logic Circuits**

##### **4.1 Multiplexer (MUX)**

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##### **4.2 De multiplexer (DEMUX)**

##### **4.3 Decoder**

##### **4.4 Encoder**

#### **5. Sequential Logic circuits**

##### **5.1 Flip Flops**

##### **5.2 Registers**

##### **5.3 Counters**

#### **6. Operational Amplifiers (Op-Amps)**

##### **6.1 Introduction**

##### **6.2 Op-Amp Parameters**

##### **6.3 Linear Applications of Op-Amp**

##### **6.4 Non Linear Applications of Op-Amp**

#### **7. A/D and D/A Converter**

##### **7.1 D/A Converter**

##### **7.2 A/D converter**

### **Practical - I - Electronic Materials & Devices - 2 nd Year**

**Subject Code :- 80301001**

#### **Practical**

1. Study of inverting and non-inverting amplifier using op- Amp
2. Study of Op-Amp as an inverting adder
3. Converting Binary to decimal, octal and hexadecimal and vice versa
4. Addition and Subtraction of Binary numbers
5. Study of NOT, OR, NOR, NAND and AND gates using ICs
6. Study of XOR and XNOR gates using ICs (Verification or truth table)
7. Prove De Morgan's Theorem using gates
8. Study of NOR and NAND gates as universal building blocks
9. Constructing RS Flip-Flop using NAND and NOR gates
10. Constructing logic circuit as per the given logical equation
11. Verification of truth table for Half and Full adder
12. Study of R.S. and J.K. Flip-Flops
13. Study of Multiplexers using IC 74153
14. Study of De multiplexers using IC 74139
15. Study of decade counter using 7490
16. Study of encoder using IC 74147
17. Study of decoder using IC 7447/7448
18. Study of 4 bit binary Adder using IC 7483
19. Study of Op-Amp as Comparator
20. Study of D/A converter using R- 2R ladder of Op-Amp.

## Theory – II - Basic Electronics - 1<sup>st</sup> Year

**Subject Code :- 80301002**

1. Introduction of training & institute, Familiarization with the institute, type of work & responsibility of trainees, syllabus, safety precautions, elementary first aid, and symbols related to the theory Hand- Tools & equipments identification, Introduction to Tools & Soldering Techniques, SMT Technology, uses and maintenance
2. Introduction to electricity, batteries, voltage, current, resistance & power ohm's law. Alternating current A. C. induced voltage, current. Direct current simple lead cell, lead acid accumulator, battery charger, Battery is an electric.
3. RESISTORS: - Construction of carbon resistor wire wound resistors, wire wound resistors potentiometer, thermostat, series & parallel connection of resistors colour code of resistors, unit for resistance.
4. Capacitors :- what is capacity & capacitance parallel & series connection of capacitor in electric circuit unit of capacitor different, types of capacitor variable & fixed value trimmers, mica ceramic, paper polyester electrolytic etc value of capacitor
5. Inductor & transformer-coil concept, mutual induction series & parallel connection of inductors Types of coils, air core, Iron core, Powdered iron core etc. unit for inductance Transformers, turns ratio types of transformer, step-up & step down transformer, power transformer etc.

## Practical - II - Basic Electronics - 1<sup>st</sup> Year

**Subject Code :- 80301002**

Basic Electronics	
1.	Introduction to work- shop & equipments care. Introduction to electricity supply system. Uses of Tools, measuring instruments soldering & disordering.
2.	Identification of conductors, insulator voltage, current power.
3.	Test measure of A. C. Voltage current...
4.	Test of measure of D. C. Voltage and current.
5.	To study differ. Types of resistors. Colour code reading value of resistors calculation of series & parallel resistance Testing of resistance by multimeter.
6.	Checking of capacitor, testing by multimeter.
7.	Function and uses of capacitor.

## Theory – II - Basic Electronics - 2<sup>nd</sup> Year

**Subject Code :- 80301002**

1. Simple Meters: - Moving coil meter voltmeter, ammeter, ohm meter, multimeter (Moving coil and digital).
2. Semiconductor: - difference between semiconductor & conductor, Germanium & Silicon. Type semiconductor 'P' type & 'N' type semiconductor, P.N. junction diode, junction diode types of diodes, Zener diode, LED etc.
3. Transistor: - PNP and NPN transistor pin configuration, CB, CE, CC connection function of transistor Heat sink, use of heat sink. P C B (printed circuit Board).
4. Rectifiers, filters, Regulated power supply with Zener diode, transistors and regulator IC's 741, 7806, 7906, 7812, 7912, etc.
5. Op-Amp - Introduction, applications, construction, comparators.
6. Single phase and three phase system, Different types of inverter, UPS, Working principle, specifications, explanation with the help of block diagram, basic principle of working of power switches, testing methods, discussions of various faults, diagnosing methods, rectifying common faults.
7. Amplifier: - Range of audio amplifier frequency use of amplifier, types of amplifier transistor as an amplifier, coupling of amplifier pre-amplifier.
8. AF power amplifier: - Use of transformer matching, push-pull amp. Transformer less amplifier, differential amplifier, feedback circuit.
9. What is IC? Use of IC's in Home Theater, IC based AF power amplifiers with different no's IC's.
10. Transducer  
Microphones, Loudspeakers, Photocell, Laser diodes, Telephone.

## **Practical - II - Basic Electronics - 2<sup>nd</sup> Year**

**Subject Code :- 80301002**

<b>Basic Electronics</b>	
1.	Checking of coil by multi meter.
2.	Checking of differ. Type of transformer hot checking & cold checking To sturdy their uses.
3.	Operation, Rules and use of multimeter, voltmeter, ammeter.
4.	Testing of P N junction diode by multimeter Identify their poles (A & K.)
5.	Transistor testing by multimeter Identification of lead, Build a c B, CC & C E circuits. Design the PCB.
6.	Assembled various rectifier circuits with R.C. & L. C. filter CKT. Voltage doublers circuit.
7.	POWER SUPPLY - Build Zener diode regulator circuit Build a transistor regulator circuit Build a regulator circuit Build a regulator IC power supply.

LIST OF TOOLS AND EQUIPMENT :-

<b>SR. NO.</b>	<b>DESCRIPTION OF TOOLS EQUIPMENT.</b>
1	Combination pliers 15 cm insulated.
2	Long none pliers 15 cm insulated.
3	Diagonal cutter 15 cm insulated.
4	Tweezers 10 cm insulated.
5	Heat sink pliers.
6	Neon tester 250 V
7	Knob screw driver 10 cm.
8	Screw driver set of 6 Taparia No.
9	Philips alignment kit.
10	Wire stripper.
11	Disordering Pump & soldering irons.(25 W)

## WORKSHOP TOOLS & EQUIPMENTS

1	First aid kit.
2	Work benches 120X 400 X 75 cm.
3	Rubber gloves pair.
4	Stared rule 300 mm.
5	Scriber 15 cms.
6	Centre punch 10 cm.
7	Hammer cross peen 110 gm with handle.
8	Hammer ball peen 220 gm
9	Spanners double ended 6 mm to 20 mm by 1.6 mm.
10	Hack-saw 300 mm fix with handle.
11	Instrument files set of 1-12 piece.
12	Vice bench 10 cm jaws.
13	Tape & Die set 0 to 10 mm.

### • REFERENCE BOOKS :-

1. Elementary electronics - engineering by M. L. Gupta New Heights Publications.
2. A textbook on Radio & Television.  
By Dr. N. C. Goyal & S. K. Mukherjee.  
Khanna publications.
3. Basic electronics.  
By, Bernard Grob.  
McGraw-Hill publications.
4. Electronics and Radio Engineering.  
By, M. L. Gupta.  
Dhanpat Raj & Sons.
5. Transistor data book.
6. I C data book.

## Theory III - Consumer Electronics - 1 st Year

**Subject Code :- 80301004**

Theory	Practical
<p>Introduction, Importance of maintenance, Common faults on electrical side as well as mechanical side, Method of removing the faults &amp; Importance of preventive maintenance.</p> <ul style="list-style-type: none"> <li>Types of conductors, their properties and use in electricity, Types of insulators, their properties and use in electricity.</li> <li>Uses of common instruments like Voltmeter, Amp Meter, Multimeter, Cable fault locator, Growler, etc.</li> </ul> <p><b>Audio System</b></p> <p>1.1 Microphones: construction, working principles and applications of microphones, their types viz: a) Carbon b) moving coil, c) velocity, d) crystal, e) condenser, e) cordless etc.</p> <p>1.2 Loud Speaker: Direct radiating, horn loaded woofer, tweeter, mid range, multi-speaker system, baffles and enclosures.</p> <p>1.3 Sound recording on magnetic tape, its principles, block diagram, and tape transport mechanism</p> <p>1.4 Digital sound recording on tape and disc</p> <p>1.5 CD system, Hi-Fi system, pre-amplifier, amplifier and equalizer system, stereo amplifiers</p>	<p>Method of dismantling of electrical appliances like Mixture, Grinder, Blender, Oven, Heaters, Heat Convector, Microwave, Geyser, Toaster, Iron (Thermostatic &amp; cord less), Washing Machines(semi auto matic &amp; fully automatic)Vacuum Cleaner, Dish Washer, Fan &amp; Micro Wave, etc.</p> <p>1. To plot the frequency response of a microphone</p> <p>2. To plot the frequency response of a loud speaker</p>
<p><b>Television</b></p> <p>2.1 Monochrome TV Communication:</p> <ul style="list-style-type: none"> <li>Elements of TV communication system.</li> <li>Scanning- its need for picture transmission.</li> <li>Need for synchronizing and blanking pulses.</li> <li>Progressive scanning- Gross structure filters, interlaced scanning, resolution and band width requirement, tonal gradation.</li> <li>Composite Video signal (CVS) at the end of even and odd fields. equalizing pulses and their need</li> <li>Monochrome picture tube – construction and working, comparison of magnetic and electric deflection of beam.</li> <li>Construction and working of camera tube: vidicon and plumbicon, Block diagram of TV camera and the transmitter chain.</li> <li>Block diagram of a TV receiver: function of each block and waveform at the input and output of each block.</li> <li>Frequency range of various VHF bands and channels used in India. Major specification of the CCIR.</li> </ul> <p>2.2 Concept of positive and negative modulation VSB Transmission Turner</p> <ul style="list-style-type: none"> <li>Typical circuits of scanning and EHT stages of TV receiver, keyed AGC, function and location of brightness contrast V-hold, H-hold of centering control.</li> <li>Identification of faulty stage by analyzing the</li> </ul>	<p>3. Demonstration of a tape-transport mechanism</p> <p>4. Trouble shooting of tape-recorder system</p> <p>5. To observe the wave forms and voltage B/W and colour T.V receiver.</p>

<p>symptoms and basic idea of a few important faults and there remedies</p> <p>2.3 Colour Schemes</p> <ul style="list-style-type: none"> <li>- Introduction to PAL, NTSC, SECAM systems, advertisement and disadvantages block diagram of video camera and its explanation</li> <li>- Construction and working principles of trinitran and PIL types of colour picture tubes.</li> <li>- Concept of convergence, purity of beam shifting</li> <li>- Block diagram of PAL TV receiver, explanation and working</li> </ul>	
<p>3. <b>Colour TV</b></p> <ul style="list-style-type: none"> <li>- Primary colours, tristimulus values, trichromatic coefficients, concepts of additive and subtracting mixing of colours, concepts of luminance, Hue and Saturation, Representation of a colour in colour triangle, non spectral colour, visibility curve</li> <li>- Compatibility of colour TV system with monochrome system. Block diagram of colour TV camera, Basic colour TV system-NTSC, SECAM, and PAL their advantages and disadvantages.</li> <li>- Construction and working principles of trinitron and PIL types of colour picture tubes. Concept of convergence, purity, beam shifting</li> <li>- Need for luminance signal and band sharing by colour signals, subcarriers frequency, colour difference signal and its need, synchronous quadratic modulation and representation of a colour by a vector, burst signal and its need, chrominance signal.</li> <li>- Block diagram of PAL TV receiver, explanation and working</li> </ul>	<p>6. Fault finding of colour T.V</p> <p>7. Trouble shooting of C.D. Player</p>

## Theory III - Consumer Electronics - 2<sup>nd</sup> Year

**Subject Code :- 80301004**

Theory	Practical
<b>Cable Television</b> Block diagram and principles of working of cable TV and DTH, cable TV using internet.	Study of a TV cable network system through internet
<b>VCR, VCD and DVD</b> Principle of video recording on magnetic tapes, block diagram of VCR, VHS tape transport mechanism.	8. Demonstration of DVD Player.
<b>Video Camera</b> Study of VCD and DVD	9. Demonstration and study to VCD especially its transport mechanism
<ul style="list-style-type: none"> <li>Study of winding Principles, construction, fault finding, replacement of               <ul style="list-style-type: none"> <li>a) Toaster</li> <li>b) Iron</li> <li>c) Washing Machines</li> <li>d) Vacuum Cleaner</li> <li>e) Dish Washer</li> <li>f) Fan</li> <li>g) Mixer &amp; Grinder</li> <li>h) Blender</li> <li>i) Oven</li> <li>j) Heater</li> <li>k) Convector</li> <li>l) Micro Wave oven</li> <li>m) Geyser</li> <li>n) Water lifting pump.</li> <li>o) Automatic water level controller</li> <li>p) Desert cooler.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Method of testing the insulation resistance.</li> <li>Methods of checking the condition of appliances.</li> <li>Testing and repairing of protective device.</li> <li>Test and repairing of controlling device.</li> <li>Method of locating the faults in appliance i.e. open circuit, short circuit, earth leakage, etc.</li> <li>Overhauling, Oiling and greasing the rotating parts of the appliances and their replacement.</li> </ul>
Study of thermostatic switches. Precautions to be observed while checking the appliances, Checking the condition of mechanical parts and their replacement, Balancing the rotating parts( magnetically and mechanically).	Method of increasing the insulation resistance. <ul style="list-style-type: none"> <li>Method of baking the varnishing.</li> <li>Testing the armature (Growler test).</li> <li>Study of MCB, ELCB and Earth leakage circuit breaker</li> </ul>

### Reference Book

1. Colour Television-principles & practice R.R Gulati by Wiley Eastern Limited, New Delhi
2. Complete Satellite & cable Television R.R Gulati New age International Publisher
3. Colour Television Servicing by RC Vijay BPB Publication, New Delhi
4. Colour Television & Video Technology by A.K. Maini CSB Publishers
5. VCR-principles, maintenance & repair by S.P. Sharma, Tata Mc Graw Hill, New Delhi
6. Colour TV by A.Dhake
7. Service Manuals, BPB Publication, New Delhi
8. Principles of Communication Engineering by DR Arora, Ishan Publications, Ambala
9. Communication Engineering by A Kumar
10. Principles of Communication Engineering by Manoj Kumar, Satya Prakashan, New Delhi
12. Principles of Communication Engineering by Anokh Singh, S.Chand & Co., New Delhi



## LIST OF TOOLS & EQUIPMENTS

### (A) TRAINEES TOOL KIT

Sr. No.	Name of Items
1.	Measuring Tape Steel 100cm
2.	Rule Steel 300cm
3.	Screw Driver heavy duty 200mm insulated thick stem
4.	Screw Driver heavy duty 250mm with insulated thick stem handle
5.	Plier Insulated combination 200 mm
6.	Knife double blade electrician 100mm
7.	Pincer 150mm
8.	Scriber 150mm x 4mm
9.	Punch center 150mm x 8mm
10.	Hammer ball pien 0.75kg with handle
11.	Hammer cross pien 115gms with handle
12.	Saw Tenon 250mm
13.	Firmer chisel wood 12mm
14.	Gimlet 6mm
15.	Bradawl 100mm
16.	Wire stripper 150 mm
25.	Heat sink plier
TRAINEE'S PERSONAL TOOL KIT	
1	Voltage sensor (pencil type)/ Electronic Tester
2.	Screw Driver Kit ( Set of six blades with common insulated handle with neon tester )
3.	<b>Plier insulated 150 mm</b>
4	Multimeter
5.	Soldering iron,15W,230 V(temperature controlled)

## List of Tools & Equipments of Workshop

S.No.	Name of Item	Quantity
1.	Screw Driver 100 mm with handle	4 Nos.
2.	Screw driver kit (set of six blades with common insulated handle)	4 Nos.
3.	Screw Driver 150 mm with insulated handle	4 Nos.
4.	Plier insulated 200 mm	4 Nos.
5.	Plier round nose 100 mm	4 Nos.
6.	Tweezer 100 mm	4 Nos.
7.	Wire striper 200 mm	4 Nos.
8.	Soldering iron 25 watt , 65 watt ,250 watt	2 Nos.Each.
9.	Desoldering pump.	2 Nos.
10.	Soldering gun	2 Nos.
11.	Soldering iron 250 watt.	2 Nos.
12.	Drill machine electric portable 0 to 6mm capacity	1 No.
13.	Allen Key	1 set.
14.	Oil cane 0.12 liter	4 Nos.
15.	Grease gun (small size).	1 No.
16.	Grinder Bench Motorised	1 No.
17.	Hammer hard plastic with handle	2 Nos.
18.	Hammer Ball Pein 0.4 Kg.	4 Nos.
19.	Spanner Kit (Double ended).	1 set.
20.	Hacksaw frame 300mm	4 Nos.
21.	Hacksaw frame 200mm	4 Nos.
22.	Snip straight 150mm	4 Nos.
23.	Drill SS twist block (2 mm – 8 mm)	1 set.
24.	File flat 200mm smooth	2 Nos.
25.	File round 200mm 2 <sup>nd</sup> cut	2 Nos.
26.	File half round 250mm.	2 Nos.
27.	File triangular 150mm	2 Nos.
28.	Vice hand 50mm jaw	4 Nos.
29.	Vice table 150 mm jaw	2 Nos.
30.	Pipe cutter to cut 5cm dia.	2 Nos.
31.	Crimping Tool	2 Nos.
32.	Multi meter (digital)	2 Nos.
33.	Ammeter AC, 0 –1 A .	1 No.
34.	Ammeter M.I. 0 – 5 – 10 – 15 A	2 Nos.
35.	Voltmeter M.I. 0 – 150 – 300 – 600 V	2 Nos.
36.	Wheat stone measuring Bridge ( complete with	1 No.
37.	galvanometer and Battery )	1 No.
38.	Meggar 500 V	1 No.
39.	Watt meter single phase 1 KW	1 set.
40.	BA taps and Dies 0-2-4-6-8 sizes	1 No.
41.	Variable Auto Transformer	1 No.
42.	Mixture Grinder	1 No.
43.	Oven Thermostatic type.	1 No.
44.	Heat convector	1 No.
45.	Microwave Oven	1 No.
46.	Electric Iron (Automatic)	

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