JSS COLLEGE OF ARTS, COMMERCE & SCIENCE

(An Autonomous College of University of Mysore)
Re-accredited by NAAC with 'A' grade
OOTY ROAD, MYSORE-570 025, KARNATAKA

ESTD-1964

SYLLABUS

B.Voc. (Food Processing & Engineering)

2019

DEPARTMENT OF FOOD PROCESSING & ENGINEERING

Scheme of Instruction								
General Education Component								
(L-Lecture; T-Tutorial; P-Practical/Practice) (1 Credit = 15 Hrs)								
Semesters	**Course Code**	**Title**	**L:T:P**	**Theory Hours**	**Tutorial Hours**	**Practical Hours**	**Total Hours**	**Total Credits**
Sem I	FPA 020	Communication Language Kannada	3:0:0	45	0	0	45	3
	FPA 510	Biochemistry-I	2:0:1	30	0	15	45	3
	FPA 520	Microbiology-I	2:0:1	30	0	15	45	3
	FPA 540	Computer Fundamentals & DOS	2:0:1	30	0	15	45	3
								12
Sem II	FPB540	Communication Language English	3:0:0	45	0	0	45	3
	FPB 510	Biochemistry-II	2:0:1	30	0	15	45	3
	FPB 520	Microbiology-II	2:0:1	30	0	15	45	3
	FPB 550	Computer C Programming	2:0:1	30	0	15	45	3
								12
Sem III	FPC 550	Indian Constitution	3:0:0	45	0	0	45	3
	FPD 580	Bio statistics	2:0:1	30	0	15	45	3
	FPC 510	Biochemistry-III	2:0:1	30	0	15	45	3
	FPC 520	Microbiology-III	2:0:1	30	0	15	45	3
								12
Sem IV	FPC 570	ICT	2:0:1	30	0	15	45	3
	FPD 510	Biochemistry-IV	2:0:1	30	0	15	45	3
	FPD 520	Microbiology-IV	2:0:1	30	0	15	45	3
	FPD 560	Environmental Studies	3:0:0	45	0	0	45	3
								12
Sem V	FPE 510	Biochemistry-V	4:0:2	60	0	30	90	6
	FPE 520	Microbiology-V	4:0:2	60	0	30	90	6
								12
Sem VI	FPF 510	Biochemistry-V	4:0:2	60	0	30	90	6
	FPF 520	Microbiology-V	4:0:2	60	0	30	90	6
								12

DEPARTMENT OF BIOCHEMISTRY
SCHEME OF INSTRUCTION

Scheme of Instruction For B.Voc- Food Processing and Engineering 2018-19									
General Education Component									
NSQF/ NVE QF Level	**Vocational Qualification**	**Semester**	**Title**	**L:T:P**	**Theory Hours**	**Tutorial Hours**	**Practical Hours**	**Total Hours**	**Credits**
Level- IV	**Diploma**	Semester- I	Biomolecule	2:0:1	30	0	15	45	3
Level- V		Semester-II	Enzymology and Bioenergetics	2:0:1	30	0	15	45	3
Level- VI	**Advanced Diploma**	Semester-III	Metabolism	2:0:1	30	0	15	45	3
		Semester-IV	Biochemical Techniques	2:0:1	30	0	15	45	3
Level- VII	**Degree**	Semester-V	Food and Nutrition	4:0:2	60	0	30	90	6
		Semester-VI	Applied Biochemistry	4:0:2	60	0	30	90	6

Scheme of assessment
General Education Component-Biochemistry

NSQF/ NVE QF Level	**Vocational Qualification**	**Semester**	**Title**		**Theory**			**Practical**				**Cs**
				Exam		**C-1**	**C-2**	**Exam**		**C-1**	**C-2**	
				Code	Marks	Marks	Marks	Code	Marks	Marks	Marks	
Level-IV	**Diploma**	Semester-I	Biomolecules	FPA510	70	10	10	FPA530	70	05	05	
Level-V		Semester-II	Enzymology and Bioenergetics	FPB510	70	10	10	FPB530	70	05	05	
Level-VI	**Advanced Diploma**	Semester-III	Metabolism	FPC510	70	10	10	FPC530	70	05	05	
		Semester-IV	Biochemical Techniques	FPD510	70	10	10	FPD530	70	05	05	
Level-VII	**Degree**	Semester-V	Food & Nutrition	FPE510	70	10	10	FPE530	70	05	05	
		Semester-VI	Applied Biochemistry	FPF510	70	10	10	FPF530	70	05	05	

SCHEME OF VALUATION FOR PRACTICAL EXAMINATION

- ✓ A candidate appearing for the first time should submit a duly signed and certified practical record
- ✓ Each candidate has to perform one experiment in the specified duration of three hours for ***FORTY FIVE*** **marks**
- ✓ Practical record has to be valued for ***TEN m*****arks** by examiners at the time of examination
- ✓ Viva-voce for ***FIFTEEN marks*** in practical is awarded by continuous assessment in the lab

Sl. No.	Component	Marks
1	Write up of the experiment	15
2	Conducting experiment	25
3	Result	05
4	Viva-voce	15
5	Practical record	10
	TOTAL	**70**

FPA510

SEMESTER I

Paper –I (30 hours -2 Credits)

BIOMOLECULES

Course Outcome:

After completion of the course a student is able to

1. CO1: Deliberate in depth nucleic acids.
2. CO2: Understand in details with examples Lipids.
3. CO3: Deliberate the classification and characteristics of amino acids.
4. CO4: Write down the classification and characteristics of carbohydrates.

SECTION-I : Amino Acids & Proteins: 09 hrs

5. Introduction to Bio-chemistry.
6. Definition, classification and biological functions of Amino acids and proteins.

7. **Amino Acids:** Common structural features. Stereoisomerism and RS system of designating optical isomers. Classification based on the nature of "R" groups. Amino acids present in proteins and non-protein amino acids. Specialized role of amino acids.Physical and Chemical properties of amino acids.Titration of amino acids.
8. **Proteins:** Levels of protein structure. Forces stabilising structure and shape of proteins. Native proteins and their conformations. Behavior of proteins in solutions. Salting in & salting out of proteins. Denaturation of proteins.

SECTION-II: Carbohydrates: 08 hrs

1. Definition, classification and biological functions of carbohydrates.
2. Monosaccharides-Fischer and Haworth structures of monosacharides,. Derivatives of monosaccharides (Sugar acids, deoxysugars, amino sugars and other derivatives of biological importance). Oligosaccharides (structure of maltose, lactose, sucrose, cellobiose, and trehalose).
3. Homo-and hetero-polysaccharides (structures of starch, inulin, glycogen, cellulose, chitin). Polysaccharides of bacterial cell well.

SECTION-III: Lipids
08 hrs

1. Definition and classification of lipids, fatty acids (saturated and unsaturated).Essential fatty acids. m. p., b. p. and their relation to molecular size. Fats as source of energy.Waxes.
2. Structures and functions of lipids :Triacylglycerols, phospholipids : lecithins (PhosphotidylCholines),
   cephalins (Phosphotidylethanolamines), Phosphatidylserines, phosphatidyl inositol, sphingomyelins,
   plasmalogens), cerebrosides, gangliosides.
3. Lipoproteins—Composition, classification and biological functions.Liposomes.
4. Prostaglandins, Leukotrienes, Thromboxanes and their importance.
5. Sources and biochemical functions of water & fat soluble vitamins.

SECTION-IV : Nucleic Acid
05 hrs

1. Nucleic Acids: Structure and properties of purine and pyrimidine bases. Nucleosides and nucleotides. Biologically important nucleotides. Double helical model of DNA. Denaturation of DNA. Physical and chemical properties of nucleic acids.

FPA530 PRACTICALS
(15 Hrs 1 Credits)

1. Qualitative tests for: (a) Carbohydrates. (b) Amino acids and proteins (c) Cholesterol and lipids

3 Hrs X 2

2. Estimation of amino acid by formal titration **3 Hrs**
3. Estimation of ascorbic acid by dye method. **3 Hrs**
4. Estimation of reducing sugars by DNS method **3 Hrs**

FPB510 **Semester II**

Paper II **(30 hours – 2 credits)**

ENZYMOLOGY AND BIOENERGETICS

Course Outcome:
After completion of the course a student is able to;

CO1: Write down in details with examples Enzyme Kinetics
CO2: Specify the classification and characteristics of Enzymes
CO3: Specify in depth Enzyme purification
CO4: Deliberate the details of bioenergetics

SECTION-I : Enzymology
08 hrs

Introduction to enzymes - General characteristics of enzymes. Prostheticgroup. Holoenzymes, apoenzyme and cofactors. Coenzymes and their biochemical

functions, assay of enzyme activity, units of enzyme activity. Active sites(s) of enzymes.IUB system of nomenclature and classification of enzymes.

Enzymes as catalysts. Theories of enzymes catalysis: Acidbase catalysis, covalent catalysis.

SECTION-II: Enzyme Purification : **08 hrs**

Need for purification. Preliminary fractionation procedures and precipitation techniques, Chromatography methods : Gel filteration, adsorption–, ion exchange– and affinity chromatography. Types of support materials.Selection of appropriate conditions and elution procedures.Criteria of enzyme purity.

SECTION-III : Enzyme Kinetics 09 hrs

Factors affecting velocity of enzyme catalysed reactions: Enzyme concentration, pH and temperature. Michaelis –Menten equation. Determination of Km and its significance.

Enzyme inhibition.Various types of enzyme inhibitions..Enzyme inhibitors and their importance.Allosteric enzymes and enzyme regulation.Isoenzymes and their clinical significance.

SECTION-IV: Bioenergetics 05 hrs

Biological systems and concept of free energy, Endergonic processes and role of ATP & other high energy compounds. Biological oxidations. Redox potential. Commercial importence of enzymes

FPB530 PRACTICALS (15 Hrs – 1 Credit)

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1. Assay of salivary amylase enzyme activity**.** **3 Hrs**
2. Effect of pH on enzyme activity**.** **3 Hrs**
3. Effect of temperature on enzyme activity **3 Hrs**
4. Effect of substrate concentration on enzyme activity and determination of Km and Vmax **3 Hrs**
5. Effect of activators (NaCl) on salivary enzyme activity **3 Hrs**

FPC510 Semester III

Paper – III (30 hours- 2 Credits)

METABOLISM

Course Outcome:

After completion of the course a student is able to;

CO1: Understand the details of NUCLEIC ACIDS metabolism
CO2: Identify the characteristics of lipid metabolism
CO3: Specify in details with examples protein metabolism
CO4: Understand the details of carbohydrate metabolism

SECTION-I

Carbohydrate Metabolism 08 hrs

Digestion, Absorption and transport of Carbohydrates, Metabolic Pathways, Glycolysis, Pentose Phosphate Pathway, Glucuronate and glyoxylate pathway, TCA

cycle, Glycogenolysis& Glycogenesis, Gluconeogenesis. Diseases associated with carbohydrate metabolism.

SECTION-II
Lipid Metabolism **08 hrs**

Digestion, absorption & Transport of Lipids, β-Oxidation of fatty acids. α and ω oxidation of fatty acids Degradation of triglycerides and phospholipids.Formation and utilization of ketone bodies.Biosynthesis of saturated fatty acids ,Biosynthesis of Cholesterol. Diseases associated with Lipid metabolism.

SECTION-III **08 hrs**
Protein Metabolism

Digestion, absorption & transport of Proteins, General Reactions of Amino Acids : Deamination, transamination and decarboxylation. Urea cycle and its significance. Ketogenic and glucogenic amino acids. Biosynthesis of amino acids (Phenyl alanine and Glutamic acid) and their degradation. Diseases associated with Proteins metabolism.

SECTION-IV **06 hrs**
Nucleic acid Metabolism

Degradation of purines and pyrimidines. Biosynthesis of purines, pyrimidines and nucleotides.
Catabolism of Heme & Formation of Bile pigments. Diseases associated with Nucleic acid metabolism.

FPC530 **PRACTICALS**
(15 Hrs = 1 Credits)

1.	Estimation of protein by Biuret method.	**3 Hrs**
2.	Estimation of Ca+ in serum.	**3 Hrs**
3.	Estimation of iron in drumstics	**3 Hrs**
4.	Estimation of creatinine in serum.	**3 Hrs**
5.	Estimation of uric acid in urine	**3 Hrs**

FPD510

Semester IV

Paper IV **(30 hours -2 Credits)**

BIOCHEMICAL TECHNIQUES

Course Outcome:
After completion of the course a student is able to;

CO1: Understand the details of NUCLEIC ACIDS metabolism

CO2: Identify the characteristics of lipid metabolism

CO3: Specify in details with examples protein metabolism

CO4: Understand the details of carbohydrate metabolism

SECTION-I **08 hrs**

Spectroscopic Techniques :

Beer-Lambert's Law. Light absorption and its transmittance. Determination and application of extinction coefficient. Principle and Applications of following spectroscopic techniques - U.V.-Visible, infra-red, Fluorescent emission and NMR spectroscopy.

SECTION-II **08 hrs**

Electrophoretic Techniques :

Principles and applications of the following electrophoresis techniques. Paper electrophoresis, PAGE, SDS- PAGE.

Centrifugation Techniques :

Principle of differential and density gradient centrifugation. Ultra centrifuge – construction and applications

SECTION-III

08 hrs

Chromatographic Techniques:

Principles of Adsorption and Partition chromatography. Techniques of ascending, descending, circular paper chromatography.

Thin Layer Chromatography-Technique and advantages over paper chromatography

Column chromatography – Principle and applications of Gel Filtration chromatography, ion – exchange chromatography.

SECTION-IV
06 hrs

Radio Isotopic Techniques :

Properties of radioactive emissions.Units of radioactivity. Isotopes and their applications in biological studies - ^{3}H, ^{14}C, ^{131}I, ^{60}CO, and ^{32}P. Techniques used to measure radioactivity- GM counter. Biological hazards of radiation and safety measures in handling radioisotopes.

FPD530 **PRACTICAL** **(15 Hrs = 1 Credits)**

1. Identification of amino acids by circular paper chromatography. **3 Hrs**
2. Identification of amino acids by asending Paper chromatography **3 Hrs**
3. Separation of phospholipids by thin layer chromatography. **3 Hrs**
4. Separation of leaf pigments by column chromatography. **3 Hrs**
5. Separation of proteins by PAGE. **3 Hrs**

FPE510 **Semester V**

Paper V (60 hours-4 Credits)

FOOD AND NUTRITION

Course Outcome:
After completion of the course a student is able to;

CO1: Understand the characteristics of Nutrition
CO2: .Identify the details of Dietary sources
CO3: .Understand in depth minerals
CO4: Identify in depth Digestion

SECTION-I **15 Hrs**

1. Introduction:

Concept of Nutrition, Calorific value of foods and its determination (Bomb calorimeter), different components of energy expenditure, measurement of energy expenditure by direct and indirect calorometric method (principles only) Energy expenditure at rest and work, respiratory quotient, Basal Metabolic Rate (BMR), determination of BMR by indirect calorimetric method, factors affecting BMR. Specific dynamic action of foods.

Proximate analysis of food samples:

Moisture, fiber, ash, proteins, carbohydrates, fats and their importance

Carbohydrates:

Dietary sources, dietary fibres and protein sparing action, glycemic index and its importance

Fats

Dietary sources, Visible and invisible fats, trans fats and its effects in fried foods

Water Metabolism

Distribution in the body, factors maintaining water balance and factors influencing water balance.

SECTION-II

15 Hrs

1. Proteins:

Dietary sources, nutritional classification, Nutritional value of proteins – PER, Digestive coefficient, NPU and Biological value of proteins (BV). Essential amino acids. Nitrogen balance, mutual supplementation of proteins, Malnutrition – Kwashiorkor and marasmus (causes, clinical signs with symptoms & treatment

Vitamins

Classification, example with structure, dietary sources, daily requirement, biological roles and deficiency disorders with symptoms– Thiamine, Riboflavin, Niacin, pantothenic acid, Pyridoxine, Biotin, Folic acid,.

SECTION – III

15 Hrs

Structures, dietary sources, daily requirement, biological roles and deficiency disorders with symptoms- Vitamin B12,C,A,D,E & K. Hypervitaminosis.

Minerals:

Dietary sources, physiological functions, deficiency disorders, absorption, balance and excretion of Macro nutrients- Ca, P, Na, K, Cl and Micronutrients – Fe, Zn, Cu, I &Mg

SECTION IV

15Hrs

Digestion:

Gastrointestinal tract secretions - Composition and functions of Saliva, gastric, bile, pancreatic and intestinal Juices. Appetite, gastrointestinal tract hormones.

Digestion, absorption and transport of carbohydrates, proteins and fats

Antinutritional factors: Sources and harmful effects of anti vitamins (e.g.: avidin, dicumarol), Protease inhibitors, oxalates and fitates. Natural toxicants, (e.g.:

Lathyrus sativa).Food adultrants- structure and harmfull effects of - Butter yellow, lead chromate and malachite green.

FPE530 **PRACTICAL**
(30 Hrs = 2 Credits)

1. Estimation of haemoglobin in blood. **3 Hrs**
2. Identification of Sugars in fruit juice using paper chromatography. **3 Hrs**
3. Determination of nature of inhibition of alkaline phosphatase by cysteine. **3 Hrs**
4. Determination of proteins by dye binding assay. **3 Hrs**
5. Proximate analysis of food samples- Moisture, fibre, protein fat and carbohydrate (by difference) (3 experiments) **3 HrsX3**
6. Detection of adulterants in food. **3 Hrs**
7. Estimation of Calcium in ragi. **3 Hrs**
8. Estimation of Vitamin – C in lemon or gooseberries by DPPH method. **3 Hrs**

FPF510 **Semester VI**

Paper– VI (60 hours -4 Credits)

APPLIED BIOCHEMISTRY

Course Outcome:

After completion of the course a student is able to;

CO1: Understand the details of DNA organization
CO2: Deliberate in depth DNA replication
CO3: Specify the details of immune system

CO4: Learn in depth biological membranes

SECTION-I

10 Hrs

DNA Organization: Structure of chromatin – Histones and Nucleosomes. Active and inactive chromatin. Compaction of Chromatin. Chromosomes, Structure of Genome in eukaryotes. Rearrangements in Genetic Material. Integration of Chromosomes with viruses. Transposition, Experimental proofs for DNA as genetic material.

SECTION-II

20 Hrs

DNA Replication : Semiconservative replication-proof. Molecular events and enzymes involved in DNA replication. DNA repair mechanisms. Mutations. RNA Synthesis : Initiation, elongation and termination during RNA synthesis. Transcription signals. Processing of RNA. Introns and Exons. Nucleases.

Genetic Code and Protein Biosynthesis : Characteristics of Genetic code, Deciphering of Genetic Code.

Initiation, elongation and termination of protein chains. Post translational modifications in proteins. Inhibitors of protein biosynthesis.

SECTION-III

15 Hrs

Definition of immune system and antigens. Cells involved in immune response. T-cell and B-cells,

Immunoglobulins, chemical structure of the Antibody molecule.Haptens and carrier molecules, cell mediated immune response. Complement system, activation and its role in defense.

Brief discussion of various immunological techniques; Precipitation reactions in gels Haemagglutination,

Immuno-fluorescence, radio-immunoassay (RIA), enzyme likedimmunoadsorbent assay (ELISA) and immunoblotting.

SECTION-IV

15 Hrs

Membranes : Structure and functions of biological membranes, various models of membrane structure.

Transport of solutes across membranes, Sodium pump.

Elementary aspects of the Molecular Biology of cancer and introduction to stem cells.Molecular basis of the Origin and Evolution of Life.

FPF530 **PRACTICALS**

(30 Hrs = 2 Credits)

1. Estimation of DNA by diphenylamine method. **3 Hrs**
2. Effect of temperature on the Viscosity of DNA using Oswald's viscometer. **3 Hrs**
3. Assays of SGPT and SGOT in serum. **3 Hrs X**
4. Extraction of RNA from yeast and its estimation by Orcinol method. **3 HrsX2**
5. Determination of total protein and A/G ratio in serum. **3 Hrs**
6. Estimation of serum phospholipids. **3 Hrs**
7. Immobilization of enzymes/ cells by entrapment in alginate gel. **3 Hrs**
8. Demonstration of ELISA. **3 Hrs**

Pattern of Question Paper for Boc Voc

Semester I to VI

Paper I to VI

Time : 2 Hrs 30 Min Max Marks 70

1. Answer all the questions in one sentence or a word

10 X 1 = 10

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------
a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

5. Answer any four of the following questions 4 X 5 = 20

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

6. Answer any four questions of the following

4 X 10 = 40

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

(Note- 10 Marks may be divided in to 6+4 or 5+5)

I SEMESTER PRACTICAL EXAMINATION

BIOMOLECULES

PRACTICAL I

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE :- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART

15 Marks

The candidate has to write principle and procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Estimation of amino acid by formal titration
2. Estimation of ascorbic acid by dye method.
3. Estimation of reducing sugars by DNS method

PART B

Qualitative Analysis of Biomolecules

30 Marks

Any one of the following substances may be given for identification

1 Carbohydrate – Glucose, Fructose, Galactose, Lactose, Maltose, Sucrose and Starch.

2 Amino acids – Arginine, Tryptophan, Tyrosine, Cystein, Histidine, phenyl alanine

3 Proteins- Albumin and casein.

PART C 15

Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPARIMENTAL RESULTS)

CLASS RECORDS :

i) For conducting and recording 5 experiments = 07 marks.

4 experiments = 06 marks

Less than 4 experiments = 04 marks

ii) For accuracy and neatness = 03 marks.

PART A

Principle- 7 Marks

Procedure- 8 Marks

PART B

Qualitative Analysis of Biomolecules

1 Identification of the class of biomolecules 4 Marks

If carbohydrate is given

i) Reducing test(any two test) 7 Marks

ii) Classification test 6 Marks

iii) Distinguishing test (aldose or ketose) 6 Marks

iv) Preparation of osazone and identification 7 Marks

If amino acid or protein is given, following tests may be conducted

i) Precipitation test

ii) Xanthoproteic test

iii) Millons test

iv) Sakaguchi test

v) Lead acetate/Sodium nitroprusside test 5 x 6 = 30 Marks

PART C

Viva- Five questions 5 x 3 = 15 Marks

II SEMESTER PRACTICAL EXAMINATION

ENZYMOLOGY AND BIOENERGETICS

PRACTICAL II

SCHEME OF EXAMINATION

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE:- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART A 15 Marks

The candidate has to write procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Assay of salivary amylase enzyme activity**.**
2. Effect of pH on enzyme activity**.**
3. Effect of temperature on enzyme activity
4. Effect of substrate concentration on enzyme activity and determination of Km and V_{max}
5. Effect of activators (NaCl) on salivary enzyme activity

PART B 30 Marks

Any one of the following experiment may be set

1 Determination of specific activity of Salivary amylase by DNS.

2 Determination of pH optimum of Salivary amylase.

3 Determination of Km and Vmax of Salivary amylase.

4 Determination of initial velocity (time Kinetics) of Salivary amylase.

Note-

1. Specific activity:

i) Standard solution of reducing sugar must be supplied by the examiner.

ii) Concentration of protein in enzyme solution must be given to the students.

2. Optimum pH: buffer of 5 different values from 5 to 9 may be given (buffer solutions is to be

supplied named as A,B,C,D,E and asked to found out the buffer in which activity is maximum)

3. Optimum time: 10' , 20' , 30' , 40' and 50'range may be considered for the time kinetics.

4. Determination of Km and V_{max}: substrates of different concentration range such as 2, 5, 10, 15,

20 and 30 uMole maybe given (Standard graph of the substrate must be given).

PART C ` 15

Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPARIMENTAL RESULTS)

CLASS RECORDS:

i) For conducting and recording 5 experiments = 07 marks.

4 experiments = 06 marks

Less than 4 experiments = 04 marks

ii) For accuracy and neatness = 03 marks.

PART B

Distribution of marks for enzyme assay

1. Tabular column 5 Marks
2. For conduction of experiment 12 Marks
3. Graph 5 Marks
4. Calculation 4 Marks
5. Result 4 Marks

PART C

Viva- Five questions

5 x 3 = 15 Marks

III SEMESTER PRACTICAL EXAMINATION

METABOLISM

PRACTICAL III

SCHEME OF EXAMINATION

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE:- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART A 15 Marks

The candidate has to write procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Estimation of protein by Biuret method.
2. Estimation of Ca+ in serum.
3. Estimation of iron in drumstics
4. Estimation of creatinine in serum
5. Estimation of uric acid in urine

PART B 30 Marks

Any one of the following experiment may be set

1. Estimation of protein by Biuret method.
2. Estimation of Ca+ in serum.
3. Estimation of iron in drumstics
4. Estimation of creatinine in serum
5. Estimation of uric acid in urine

PART C 15 Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPERIMENTAL RESULTS)

CLASS RECORDS:
i) For conducting and recording 5 experiments = 07 marks.
4 experiments = 06 marks
Less than 4 experiments = 04 marks
ii) For accuracy and neatness = 03 marks.

PART A

Principle- 7 Marks

Procedure- 8 Marks

PART B

Assessment of experimental results for colorimetric estimation

Preparation standard and working solution - 5 Marks

Distribution of marks for assay

1. Tabular column 5 Marks
2. For conduction of experiment 5 Marks
3. Graph 5 Marks
4. Result
   - Up to 10% error 10 Marks
   - Up to 15% error 8 Marks
   - Up to 20% error 6 Marks
   - Any other value 4 Marks

Assessment of experimental results for Calcium estimation

Preparation of standard solution and calculation of the normality - 6 Marks

Discripancy	Standardization	Estimation
0.1 ml	10 Marks	10 Marks
0.2 ml	8 Marks	8 Marks
0.3 ml	6 Marks	6 Marks
Any other value	4 Marks	4 Marks
Calculation	2 Marks	2 Marks

PART C

Five questions
5x 3 = 15 Marks

IV SEMESTER PRACTICAL EXAMINATION
BIOCHEMICAL TECHNIQUES

PRACTICAL IV

SCHEME OF EXAMINATION

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE:- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART A 15 Marks

The candidate has to write procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Identification of amino acids by circular paper chromatography.
2. Identification of amino acids by ascending Paper chromatography
3. Separation of phospholipids by thin layer chromatography.
4. Separation of leaf pigments by column chromatography
5. Separation of proteins by PAGE

PART B 30 Marks

Any one of the following experiment may be set

1. Identification of amino acids by circular paper chromatography.
2. Identification of amino acids by ascending Paper chromatography
3. Separation of phospholipids by thin layer chromatography.
4. Separation of leaf pigments by column chromatography

PART C 15 Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPARIMENTAL RESULTS)

CLASS RECORDS:

i) For conducting and recording 5 experiments = 07 marks.

4 experiments = 06 marks

Less than 4 experiments = 04 marks

ii) For accuracy and neatness = 03 marks.

PART A

Principle- 7 Marks

Procedure- 8 Marks

PART B

1. Principle and Procedure writing.....12 marks

2. For development of Chromatogram..... 12 marks

3. For correct identification.....6marks

PART C

Viva- Five questions
5x 3 = 15 Marks

V SEMESTER PRACTICAL EXAMINATION

FOOD AND NUTRITION

PRACTICAL V

SCHEME OF EXAMINATION

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE:- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART A 15 Marks

The candidate has to write procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Identification of Sugars in fruit juice using paper chromatography.
2. Proximate analysis of food samples- Moisture, fibre, protein fat and carbohydrate (by difference) (3 experiments)
3. Detection of adulterants in food.

PART B 30 Marks

Any one of the following experiment may be set

1. Estimation of haemoglobin in blood.
2. Determination of nature of inhibition of alkaline phosphatase by cysteine.
3. Determination of proteins by dye binding assay.
4. Estimation of Calcium in ragi.
5. Estimation of Vitamin – C in lemon or gooseberries by DPPH method

.

PART C 15 Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPERIMENTAL RESULTS)

CLASS RECORDS:

i) For conducting and recording 5 experiments = 07 marks.
4 experiments = 06 marks
Less than 4 experiments = 04 marks

ii) For accuracy and neatness = 03 marks.

PART A

Principle- 7 Marks

Procedure- 8 Marks

PART B

Assessment of experimental results for colorimetric estimation

Preparation standard and working solution - 5 Marks

Distribution of marks for assay

1. Tabular column 5 Marks
2. For conduction of experiment 5 Marks
3. Graph 5 Marks
4. Result

Up to 10% error	10 Marks
Up to 15% error	8 Marks
Up to 20% error	6 Marks
Any other value	4 Marks

Assessment of experimental results for Calcium and vitamin C estimation

Preparation of standard solution and calculation of the normality - 6 Marks

Discripancy	Standardization	Estimation
0.1 ml	10 Marks	10 Marks
0.2 ml	8 Marks	8 Marks
0.3 ml	6 Marks	6 Marks
Any other value	4 Marks	4 Marks
Calculation	2 Marks	2 Marks

PART C

Viva- Five questions

5 x 3 = 15 Marks

VI SEMESTER PRACTICAL EXAMINATION

APPLIED BIOCHEMISTRY
PRACTICAL VI

SCHEME OF EXAMINATION

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE:- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

PART A

15 Marks

The candidate has to write procedure with tabular column for one experiment in the first 15 min. Then the examiner has to put his/her signature and value the paper at the end of the examination

1. Effect of temperature on the Viscosity of DNA using Oswald's viscometer.
2. Extraction of RNA from yeast.
3. Immobilization of enzymes/ cells by entrapment in alginate gel
4. Demonstration of ELISA

PART B

30 Marks

Any one of the following experiment may be set

1. Estimation of DNA by diphenylamine method.
2. Assays of SGPT and SGOT in serum.
3. Estimation RNA by Orcinol method.
4. Determination of total protein and A/G ratio in serum.
5. Estimation of serum phospholipids.
6.

PART C

15 Marks

Viva

SCHEME OF VALUATION

(ASSESMENT OF EXPARIMENTAL RESULTS)

CLASS RECORDS:

i) For conducting and recording 5 experiments = 07 marks.
4 experiments = 06 marks
Less than 4 experiments = 04 marks

ii) For accuracy and neatness = 03 marks.

PART A

Principle- 7 Marks

Procedure- 8 Marks

PART B

Assessment of experimental results for colorimetric estimation

Preparation standard and working solution - 5 Marks

Distribution of marks for assay

1. Tabular column 5 Marks
2. For conduction of experiment 5 Marks
3. Graph 5 Marks
4. Result

Up to 10% error	10 Marks
Up to 15% error	8 Marks
Up to 20% error	6 Marks
Any other value	4 Marks

PART C

Viva- Five questions

5 x 3 = 15 Marks

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3 Title - Fundamentals of general organic chemistry and biological chemistry, 4th edn, Author-Holum,J.R.(1990), Publication- Wiley International.

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21 Laboratory Techniques in Biochemistry and Molecular Biology – Work and work

22 Molecular Biology and Biotechnology – 3rd Edition Ed. J. M. Walker and E. B. Gingold - Published by The Royal Society of Chemistry

23 Biochemistry of Lipid and Membranes – D. E. Vance and J. E. Vance (Eds.)

24 Principles of Biochemistry – General Aspects. White, Handler and Smith

25 Basic Principles of Organic Chemistry – Roberts and Caserio

26 Genetics – Strickberges

27 Gene Expression – R. E. Glass – 1983

28 Microbial Genetics – D. Friefelder, 1997

29 Cell and Molecular Biology - R. Schlief – 1987

30 Genetics of Bacteria and their Viruses - W. Hayes.

31 The Molecular Biology of the cell – Alberts *et al*., 1983

32 Plant Molecular Biology – A practical Approach - C. H. Shaw

33 Bacterial Plasmids – P. Breda

34 Genetic Engineering, Vol. 1-4, Villiamson (Eds.)

35 Genetic Engineering, Vol. 1-7, Setlow and Bolander (Eds.)

36 Gene Cloning – Glover, 1984

37 Recombinant DNA - Watson *et al.,* 1983

38 Esssentials of Immunology – Roitt, I. M. , 1983

39 Monoclonal Antibodies – Priniciples and Practice - J. W. Goding, 1983

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41 Vaccines 86: New Approaches to immunisation – Brown, F., Chanak, R. M. and Lerner, R. A. ED. 1986

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43 Molecular Cell Biology – Darnell *et al*.

44 The Gene - Levine

45 Biostatistical Analysis – Zar, J. H. 1984

46 Statistics and Experimental Design – Clarke, G. M. 1980

47 Microbial Products, Biomass and Primary Product – Rehm, H. J. and Reed, G. Vol. 3

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Revised Scheme of Instruction For B.Voc- Food Processing and Engineering 2016-17									
General Education Component									
NSQF/ NVE QF Level	**Vocational Qualification**	**Semester**	**Title**	**L:T:P**	**Theory Hours**	**Tutorial Hours**	**Practical Hours**	**Total Hours**	**Credits**
Level- IV	**Diploma**	Semester-I	Fundamentals of	2:0:1	30	0	15	45	3

			Microbiology						
Level- V		Semester-II	Microbial Physiology And Metabolism	2:0:1	30	0	15	45	3
Level- VI	**Advanced Diploma**	Semester-III	Food Microbiology	2:0:1	30	0	15	45	3
		Semester-IV	Immunology	2:0:1	30	0	15	45	3
Level- VII	**Degree**	Semester-V	Pathogenic Microbiology	4:0:2	60	0	30	90	6
		Semester-VI	Medical Microbiology	4:0:2	60	0	30	90	6

DEPARTMENT OF MICROBIOLOGY

Paper code: FPA520 **MICROBIOLOGY** **30hours-2 Credits**

I B.Voc., I Semester

TITLE: FUNDAMENTALS OF MICROBIOLOGY

Course outcome:

After successful completion of this course students are able to:

CO1: Identify the characteristics of Prokaryotic and Eukaryotic Cell
CO2: Understand the details of Methods of Sterilization
CO3: Understand in details with examples Media and Pure Culture techniques
CO4: Specify in depth History of Microbiology

UNIT-I **10 Hrs**

1. History: Contributions of - Antony van Leeuwenhoek,Edward Jenner, Louis Pasteur, Robert Koch,Dmitry Iwanowski, Alexander Fleming (in brief).
   Development and scope of Microbiology. Branches of Microbiology.
2. Microscopy: Types of Microscope, Construction and working principle of bright field microscope. Dark field, fluorescence and phase contrast microscopy(application). Electron microscopy- Types, applications and their limitations.
3. Staining technique: Types of stains, Principle of Simple, negative and differential staining techniques (gram's staining).

UNIT-II 06**hrs**

Sterilization technique: Definition – Sterilization, disinfection, antiseptic, antibiosis, Fungicide, Bactericide.

A. Physical methods:

a) Heat – i) Dry heat – Hot air

ii) Moist heat method – Autoclave and Pressure cooker

b) Filtration–Types of filters: Membrane filter, Hepa filter (e.g., Laminar air flow)

c) Radiation methods – UV rays, Gamma rays and Cathode rays

B. Chemical method: Use and mode of action of- Alcohols, Aldehydes, Halogens and Phenols.

UNIT-III

06hrs

Media – Types, Pure culture and Cultural characteristics: Serial dilution, pure culture by isolation – Pour plate, Spread plate, Streak plate and Micromanipulator techniques . Colony characteristics – plate cultures/solid media and broth cultures/liquid media. Maintenance and Preservation of pure cultures – Sub culturing, overlaying with mineral oil, Refigeration (4^0C) Lyophilization and cryopreservation.

UNIT-IV **08hrs**

1. Comparative account of Prokaryotic and eukaryotic cell**.** Systems of classification: Haeckel's three-kingdom,Whittaker's five-kingdom and Cavalier-Smith's eight kingdom classification.
2. General characteristics of bacteria, fungi, actinomycete, virus, protozoa and algae. Organization of cell wall, cell membrane, flagella capsules and formation of spores in bacteria.
3. Bacteriophages : Morphology and multiplication(T-4 phage)

PRACTICALS **15 Hrs -1 Credit**

1. Staining and mounting of algae and fungi **3Hrs x1**
2. Simple,Negative and Gram's staining **3Hrs x1**

3. Preparation of culture media- Nutrient agar, PDA and NB **3Hrs x1**

4. Methods of obtaining pure cultures of microorganism-Spread plate, pour plate and streak plate and subculturing **3Hrs x1**

5. Isolation of microorganisms from soil by serial dilution technique (Bacteria and Fungi) **3Hrs x1**

Paper code: FPB520 MICROBIOLOGY 30hours-2 Credits

I B.Voc., II Semester

TITLE: MICROBIAL GROWTH AND METABOLISM

Enable the students to have sound knowledge about:

CO1. Understand in details with examples Microbial nutrition

CO2. Learn in details with examples Aerobic and anerobic respiration

CO3. Identify the characteristics of Microbial Growth

CO4. Understand the classification and characteristics of Microbial enzymes

UNIT: I 08Hrs

1**.** Major nutritional type of Microorganisms.

2**.** Nutritional requirements of Microorganisms. Elementary nutrients: Carbon, Nitrogen,

Sulphur, Oxygen and Energy sources, Vitamins and Growth factors.

3. Uptake of nutrients:Diffusion- Simple and Facilitated, Active transport(use of Proton motive force, ATP : ABC transporter)**,**Group translocation, Iron uptake.

UNIT: II 07Hrs

1. Definition, Growth rate and generation time. The growth curve in batch culture - Phases of growth and their significance.
2. Physical and chemical factors affecting growth-Temperature, pH, Oxygen and saline(water activity) Requirements. Measurement of growth by cell number (Haemocytometer) and cell mass (Turbidometer).

UNIT:III 05Hrs

Microbial Enzymes:Definition, Nomenclature, Classification, Properties, Mode and Mechanism of enzyme action, Factors effecting enzyme action. Cofactors and Coenzymes.

UNIT:IV 10Hrs

Aerobic respiration: Definition, Sugar degradation pathways - EMP, HMP and ED pathways. Ultra structure of Mitochondrion, Formation of acetyl CoA from pyruvate, TCA cycle, Electron transport system and Oxidative phosphorylation

Anaerobic respiration: Introduction, Anerobic respiration with special reference to dissimilatory Nitrate reduction. (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction) Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homofermentative and heterofermentative pathways).

PRACTICALS 15 hours– 01 Credit

1. Effect of temperature and pH on growth of bacteria. **3Hrs x1**

2. Acid and gas production from carbohydrates- Demonstration of fermentation of lactose

3Hrs x1

3. Turbidimetric/spectrophotometric monitoring of growth using liquid cultures **3Hrs x1**
4. Cell counting by Haemocytometer **3Hrs x1**
5. Starch hydrolysis **3Hrs x1**

Paper code: FPC520

MICROBIOLOGY 30hours-2 Credits

II B.Voc., III Semester

TITLE: FOOD MICROBIOLOGY

Enable the students to get sufficient knowledge about:

CO1 Learn in depth Contamination, Preservation and spoilage of food
CO2. Understand in details with examples Food borne intoxication and infection
CO3. Understand the details of Industrial Microbiology
CO4. Learn the details of Food safety and quality control
CO5. Specify the details of Methods of food preservations

UNIT:I

10Hrs

1. Introduction to Food Microbiology: Definition, Concept and Scope. Food as a substrate for microorganisms. .
2. Contamination, preservation and spoilage in various foods viz. – fruits and vegetables, canned foods, cereals and cereal product(cereal grains, flour, bread, pasta, macroni), sugars & sugars products (Honey, Candy), Meat (Fresh meat, fish), Milk and Milk products (cheese, butter).

UNIT:II **05Hrs**

1. Methods of food preservation: Physical method – high temperature, low temperature,
   canning. Drying – solar drying, drum drying, spray drying. Radiation.
   Chemical methods – chemical preservatives – salient features of the chemical preservatives (propionates, benzoate, sorbates, nitrates and nitrites, sulphur dioxide and
   sulphates, sugar and salt)

UNIT:III **05Hrs**

1. Food borne intoxication and infection:

Bacterial intoxication- Botulism,
Bacterial infection- Salmonellosis.
Mycotoxin – Origin, types and importance of toxins with reference to Aflatoxins.

2.. Food safety and quality control. –A brief account on FPO, HACCP, Food laws and
Food standards(in brief)

UNIT:IV **10Hrs**

1. Microorganisms of industrial importance. Biology of industrial microorganisms: Isolation, Screening, Improvement and Preservation.
2. Raw materials-Molasses, corn steep liquor, sulphite waste liquor and whey. Buffers,
   Precursors, Inhibitors and Antifoam agents.

3. Fermenters and fermentation process: Design, types and basic function of fermenters,
Fermentation process – Surface, Submerged and Solid state fermentation. Types-
Batch and Continuous fermentation.

4.Yeasts (Baker's) and its uses, Production of : Wine , Alcohol and lactic acid.

PRACTICALS **3hrsX5 practicals**

1. Isolation and identification of fungi from spoiled fruits and vegetables **3hrsx1**
2. Isolation and enumeration of bacteria from spoiled fruits and vegetables **3hrsx1**
3. Production of citric acid using *Aspergillus niger*. **3hrsx1**
4. Estimation of lactic acid in milk **3hrsx1**

5. Preparation of alcohol using jaggery or molasses. **3hrsx1**

Paper code: FPD520 **MICROBIOLOGY** **30hours-2 Credits**

II B.Voc., IV Semester

TITLE: IMMUNOLOGY

The course provides a solid foundation to understand:

CO1. Learn the details of Immune response
CO2. Specify the characteristics of Immunoprophylaxis
CO3.. Learn in depth Immunotechniques
CO4 .Identify in depth Antigen and antibody reactions
CO5 Understand the characteristics of Cells and organs of immune system

UNIT-I **10 hrs**

Introduction and history of Immunology,
Innate immunity- Physical Barriers, Biochemical, Cellular, Genetic factors, Body temperature, inflammation and fever
Acquired Immunity- Active & Passive Immunity,
Immune organs and cells: Primary lymphoid organs (Thymus, Bone marrow) & Secondary Lymphoid organs (Lymphnodes, Spleen and tonsils). Mucosa Associated Lymphoid tissue (MALT).
Immune cells- Role of immune cells. Stem cells. Lymphocytes-B lymphocytes-lymphocytes and Null cells. Types of T-cells. Macrophages: Types and function of macrophages.
Immune Response: Humoral Immune Response, Cell Mediated Immune response and Mechanism of AMI and CMI

UNIT-II **05 hrs**

Antigens: Nature and types.
Antibodies: Basic structure of immunoglobulin-IgG, Biological properties of immunoglobulins, Monoclonal antibodies. Function and type of antibodies.

UNIT-III **08 hrs**

Antigen- Antibody reactions: Salient features of Antigen-Antibody reaction. Precipitation reaction**:** Immunodiffusion test, Wasserman's test, RPR Test. Agglutination reaction: Blood grouping, Widal test. Complement fixation tests, Opsonization, Immunotechniques: ELISA

UNIT-IV **07 hrs**

Immunoprophylaxis: Types of vaccines- Live and Attenuated (Bacterial and Viral) and Toxoid with an example each. National Immunization program (Tabular form).

PRACTICALS **3hrsX5=15 practicals**

1. Demonstration of Immune organs (through photographs).
2. Demonstration of Immune cells in the smears prepared from Immune organs. (through photographs)
3. Agglutination- Blood Grouping test
4. Precipitation: Immunodiffusion test –ODD
5. Precipitation: Immunodiffusion test –RID

Paper code: FPE520 **MICROBIOLOGY** **60 hours -4 Credits**

III B.Voc., V Semester

TITLE: PATHOGENIC MICROBIOLOGY

The course provides a solid foundation to understand:

CO1 Understand the classification and characteristics of Bacterial Diseases
CO2 Identify the classification and characteristics of viral diseases
CO3 Understand in details with examples Human Mycotic infections
CO4 Learn the details of Parasitic infections

UNIT-I **20 Hrs**

Introduction to important diseases caused by Streptococcus, Pneumococcus, Neisseria, Corynebacterium, Bacillus, Clostridium, Enterobacteriaceae (Proteus, Shigella, Salmonella), Vibrio, Yersinia, Hemophilus, Mycobacterium, The operative pathogenic mechanisms, laboratory diagnosis, prevention and control of these diseases.

UNIT-II **15 Hrs**

Morphology, pathogenesis, life cycle, laboratory diagnosis, prevention and control of viral diseases viz. Rabies, Polio, Small pox, Herpes, Measles, Influenza and AIDS.

UNIT-III **15 Hrs**

Introduction to Human mycotic infections viz Cryptococcosis, Dermatophytosis, Blastomycosis, Opportunisitc Mycosis; Candidiasis and Aspergillosis.

UNIT-IV **10 Hrs**

Life cycle, pathogenic, mechanisms and control of parasitic infections viz. amoebiasis, Kala-azar, toxoplasmosis, ascariasis, filarasis, hook worm infections.

PRACTICALS **3 hrsX10 practicals**

1- 4. Identification of both gram positive and gram negative microorganisms on the basis of :
   (i) Morphology.
   (ii) Bio-chemical characteristics.
   (iii) Serological reactions.

5.Stainings – Alberts, ZNCF.

6-7. Demonstration of pathogens (Viruses, fungi, parasites) through photographs/ permanent mounted slides.

8-9. Demonstration of cysts/ovas of protozoa/Helminths through photographs.

10. Isolation of dermatophytes from human skin.

Paper code: FPF520 **MICROBIOLOGY** **60 hours -4 Credits**

III B.Voc., VI Semester

TITLE: MEDICAL MICROBIOLOGY

Course outcome

On successful completion of this course the student will gain knowledge about:

CO1. Understand in depth Terminology of infectious diseases
CO2. Specify in details with examples Emerging and re-emerging infectious diseases
CO3. Understand the classification and characteristics of Antimicrobial drugs
CO4. Identify the characteristics of Microbial virulence
CO5 Learn the details of Microbial adherence

UNIT-I 15 Hrs

Brief introduction to terminology of Infectious diseases, Frequency of disease- morbidity and mortality rate. Characteristics of infectious disease.
Infections – Classification, sources, mode of transmission and types of infections.
Disease cycle –Sources, reservoirs, carriers and transmission of pathogen. Emerging (HIV/AIDS, Avian influenza) and re-emerging (Tuberculosis, Malaria) Infectious diseases, Global travel & Health considerations.

UNIT-II 15 Hrs

Normal flora of human body –Resident flora and transient flora. Beneficial and harmful effect of Normal Flora. Distribution and occurrence of Normal Flora of Skin, Eye, Respiratory Tract, Mouth, Intestinal Tract & Genitourinary Tract. Germfree and Gnotobiotic Life.

UNIT-III 10 Hrs

Host pathogen interaction –Factors predisposing to microbial pathogenicity- Virulence, Exaltation and attenuation. Determinants of virulence-transmissibility, adhesion, invasiveness, toxigenicity-exotoxins and endotoxins. Avoidance of host defence mechanism.

UNIT-IV 20 Hrs

Development of chemotherapy, General characteristics of antimicrobial drugs, Determining level of antimicrobial activity, Mechanism of action of antimicrobial agents, factors influencing the effectiveness of antimicrobial drugs, Antibacterial drugs viz Sulfonamides,Streptomycin, Quinolones, Penicillins, Cephalosporins, Tetracyclines, Erythromycin, Chloramphenicol, Drug Resistance, Antifungal and Antiviral drugs.

PRACTICALS : 10X3Hrs 30 Hrs -2 Credits

1. Sterilization – Introduction to autoclave, hot air oven, filter sterilization.
2. Microbial flora off mouth-teeth crevices
3. Estimation of urine bacteria by calibrated loop method-Direct streak method.
4. Normal flora of human skin
5. Antibiotic sensitivity test
6. Streptomycin resistant mutant strain isolation by gradient plate technique
7. Identification of enteric pathogens using triple sugar iron agar medium
8. Determination of susceptibility to dental caries by synder test
9. Evaluation of antiseptics by filter paper disk method
10. Study of antimicrobial drugs as per theory syllabus.

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PATTERN OF QUESTION PAPER FOR B.VOC
SUBJECT: MICROBIOLOGY
(THEORY:I SEMESTER TO VI SEMESTER)

Time: 3hours Max marks: 70

I. Define/Explain any ten in one/two sentences: 3X10=30
(Twelve questions to be given and ten to be answered)
1
2
3
4
5
6
7
8
9
10
11
12

II Answer any FOUR of the following: 4X4=16
(Six questions to be given and four to be answered)-short answer type

13
14
15
16
17
18

III (Three essay type questions- with all internal choices) 8X3=24
19
20
21

Test+ Assessment (C-1+C-2) = 30 (15+15)

SCHEME OF PRACTICAL EXAMINATION

I B.Voc., I SEMESTER: PRACTICAL- I
Time: 3hours
Max marks: 70

I. Write critical notes on **A, B** and **C** 5X3=15
(Stains, Media, Pure culture plates) as per syllabus

II. Stain the given material Dby…….method. Write the principle, procedure and leave the preparation for evaluation.
(Simple staining/Gram-staining/Wet mounting of Algae and fungi/Negative staining)
(Preparation-10marks; Principle and Procedure-10 marks) 20

III Demonstrate/ Perform the experiment E giving the principle and procedure. Record the result. 25
(Demonstration- 10 marks; principle-5mark; procedure-5marks; result-05)
(Serial dilution/ Pour plate/Spread plate/Streak plate/subculturing)

IV. Record. 10

……

SCHEME OF PRACTICAL EXAMINATION
I B.Voc.,II SEMESTER: PRACTICAL- II
Microbial physiology and Metabolism
Time: 3hours
Max marks: 70

I. Write critical notes on **A, B** and **C** 5X3=15
(Haemocytometer, Effect of temperature and pH, Acid and gas production from carbohydrates, Turbidimetry/spectrophotometry, Starch hydrolysis.)

II. Demonstrate/ Perform the experiment **A** giving the principle and procedure. Record the result. 20
(Cell counting by Haemocytometer)
(Preparation-10marks; Principle and Procedure-10 marks)

III Demonstrate/ Perform the experiment **A** giving the principle and procedure. Record the result. 25
(Demonstration- 10 marks; principle-5mark; procedure-5marks; result-05)
(Acid and gas production from carbohydrates, Starch hydrolysis ,Effect of temperature and

pH)

IV. Record.

10

SCHEME OF PRACTICAL EXAMINATION
II B.Voc., III Semester
FOOD MICROBIOLOGY

Time: 3hours.
Max.marks:70

I. Demonstrate / Perform the experiment **A**, giving principle and procedure. Record and interpret the result.

(Demonstration -10marks; principle-5marks;procedure-3marks;results and interpretation-2marks).

(Isolation of microorganisms from spoiled vegetables/spoiled fruits).

25

II. Conduct the test for **B**. Write the principle and procedure. Record and interpret the results.

(Demonstration -10 marks; principle-5marks; procedure-3marks; results and interpretation-2marks). (Estimation of lactic acid in milk,Estimation of citric acid)

20

III. Write critical notes on **C, D** and **E**. (Identification -1mark; critical comments-1marks).

(Citric acid production, Estimation of lactic acid in milk,alcohol from jaggarey)

5X3=15

IV Record

10

.....

SCHEME OF PRACTICAL EXAMINATION
II B.Voc., IV Semester
IMMUNOLOGY

Time:3hours
Max.marks:70

I. Demonstrate / Perform the experiment **A**, giving principle and procedure. Record and interpret the result.

(Demonstration -10marks; principle-5marks;procedure-5marks;results and interpretation-5marks).

(Determination of blood group and Rh factor /Demonstration of RID ,ODD). 25

II. Demonstrate the experiment **B.** write the principle and procedure. Record and interpret the results.

(Demonstration -10marks; principle-5marks;procedure-3marks;results and interpretation-2marks).

(Blood grouping, ODD, RID) 20

III. Write critical notes on **C, D**, and **E**. (Identification -1mark; critical comments-1marks)

(Immune organs and immune cells) as per syllabus 5x3=15

IV Record 10

SCHEME OF PRACTICAL EXAMINATION
III B.Voc., V Semester
PATHOGENIC MICROBIOLOGY

Time:3hours
Max.marks:70

I. Demonstrate / Perform the experiment **A**, giving principle and procedure. Record and interpret the result.

(Demonstration -10marks; principle-5marks; procedure-5marks;results and interpretation-5marks).

(Serological test, Biochemical test). 25

II. Stain the given material Dby.....method. Write the principle, procedure and leave the preparation for evaluation.

(Morphology- Simple staining/Gram-staining/Negative staining)

(Preparation-10marks; Principle and Procedure-10 marks) 20

III. Write critical notes on **C, D**, and **E**. (Identification -1mark; critical comments-1marks)

(pathogens ,cysts,ovas of protozoa/helminths) as per syllabus 5x3=15

IV. Record 10

.....

SCHEME OF PRACTICAL EXAMINATION
III B.Voc.,VI Semester
PATHOGENIC MICROBIOLOGY

Time:3hours
Max.marks:70

I. Demonstrate / Perform the experiment **A**, giving principle and procedure.Record and interpret the result.

(Demonstration -10marks; principle-5marks;procedure-5marks;results and interpretation-5marks).

(Normal flora of skin, Antibiotic sensitivity test, Microbial flora off mouth-teeth crevices, Estimation of urine bacteria by calibrated loop method-Direct streak method, Evaluation of antiseptics by filter paper disk method, Determination of susceptibility to dental caries by synder test, TSIA test). 25

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II. Demonstrate the experiment **B.** write the principle and procedure. Record and interpret the results.

(Demonstration -10marks; principle-5marks;procedure-3marks;results and interpretation-2marks).

(Streptomycin resistant mutant strain isolation by gradient plate technique, Antibiotic sensitivity test,estimation of urine bacteria by calibrated loop method, Normal flora of skin, Antibiotic sensitivity test, Microbial flora off mouth-teeth crevices,TSIA test). 20

III. Write critical notes on **C, D**, and **E**. (Identification -1mark; critical comments-1marks)
(Results of Streptomycin resistant mutant strain isolation by gradient plate technique,Antibiotic sensitivity test,estimation of urine bacteria by calibrated loop method ,Normal flora of skin,mouth-teeth autoclave, hot air oven, filter sterilization, Antibiotics as per syllabus,TSIA test,Instruments)
5x3=15

IV .Report
10

DEPARTMENT OF COMPUTER SCIENCE
SEMESTER I
FPA 540 COMPUTER SCIENCE

PAPER - I

COMPUTER FUNDAMENTALS & DOS

(2 hrs theory / week)
30 hours - 2 Credits

CO1.Deliberate the classification and characteristics of DOS Commands
CO2.Specify the classification and characteristics of analog and digital computer
CO3.Understand in details with application, if applicable, types of computer
CO4 Identify the classification and characteristics of types of memory
CO5 Identify the characteristics of OCR
CO6 Learn the classification and characteristics of OUTPUT Devices

SECTION- I
15 Hours

Introduction

Computer, Characteristic of Computer, History of Computer, Generation of Computers, Components of Computer and Applications of Computers.

Key Factors of Computers: Hardware, Software - types of Software (Application and system), forms of software (firmware, shareware, freeware), Translator - Assembler, Compiler and Interpreters. Computer Application – Business, Scientific, Entertainment and educational.

Classification of Computers

Mode of operations – Analog, Digital and hybrid Computers.

Size and capabilities – Micro, Mini, Main frame and Super computer.

Memory Units

Primary memory - RAM, ROM, PROM, EPROM, EEPROM, Flash memory, cache memory.

Secondary memory – Magnetic disk (Hard disk, Floppy disk, Zip disk, Jaz disk, Super disk), Optical disk (CD, CD – R, CD – RW, DVD).

Computer peripherals devices and interfaces

Input devices – Working principle of Keyboard and mouse, Functional capabilities of Scanner, Digital Camera, OMR, OCR, touch pad, touch screen. Output Devices – Monitor, Printer, Plotter and projector.

Programming Languages

Machine, Assembly language and High Level Language.

Information System

Data and Information, types of information, what is an information System, Types of Information Systems — System development life cycle.

SECTION- II
15 Hours

Operating System And The User Interface

Operating System– Functions, services, Types-Batch, Single, Multiprogramming, and Multiprocessing.

Operating System – the user interface –running programs –managing hardware – enchaining the operating system with utility software- typical operating systems in use

Computers and Communication

Single user, multi-user, workstation, and client server systems. Computer networks, Types of Network LAN, WAN, Internet, Internet applications, WWW, Email, FTP, web browsers (Internet explorer, Google Chrome, Mozilla).

Disk Operating System (Dos)

Introduction, History & version of DOS. DOS basics – physical structures of disk, drive, Name, FAT, File & Directory structure and Naming Rules, Booting Process, DOS System files, role of config.sys file.

DOS Commands

Internal – DIR, MD, CD, RD, COPY, DEL REN, VOL, DATE, TIME, CLS, PATH, TYPE etc.

External – CHKDSK, XCOPY, PRINT, DISK COPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS, WILD CARD Characters etc.

Executable V/S Non executable Files in DOS.

Text Books:

- Peter Norton's 'Introduction to Computers', Second Edition, TMH
- Computer Fundamentals – P K Sinha, BPB

Reference Books :

- Introduction to Computers – N Subramanian, TMH
- Understanding Computers – R Rajagopalan. TMH
- Computers Today – Donald Sanders, MGH

Practical

(1Hour per week X 15 Weeks = 15 Hours)

Experiments are based on topics mention in the Paper designed by concerned Faculty

SEMESTER II
COMPUTER SCIENCE

PAPER – II

FPB 550 **PROGRAMMING IN C**

(2 hrs theory / week) **30 hours - 2 Credits**

CO1. Write down in details with application, if applicable, HISTORY OF C
CO2.Identify in depth PROBLEM SOLVING TECHNIQUES
CO3.Understand in details with examples STRUCTURES
CO4. Identify the characteristics of ARRAYS
CO5 Understand in details with examples FUNCTIONS
CO6 Understand the characteristics of STRINGS

SECTION-I
15 Hours

PROBLEM SOLVING TECHNIQUES

Problem Definition, Problem Analysis, Design of problem solutions and use of design tools, Algorithm, Flowcharts, Coding, Testing, Debugging, Program documentation.

INTRODUCTION TO C LANGUAGE

History Features and Applications of 'C ',Structure of C Program.

PROGRAMMING PRELIMINARIES

Character set, definitions and declarations of identifiers, Variables,Escape Sequence Characters.
Constants, Keywords, Data types with examples.

OPERATORS AND EXPRESSIONS

Various operators and expressions, Operator precedence with example programs.

INPUT-OUTPUT STATEMENTS

Various types of standard input output statements, standard mathematical functions, with example programs.

SECTION - II
15 Hours

CONTROL STRUCTURES

Decision makes and branching statements, Decisions making and looping statements, break statement, continue statement and goto statement with example programs.

ARRAYS

Definitions and need of arrays, 1-d and 2-d arrays with example programs, introduction to multidimensional arrays.

STRING HANDLING

Declarations, Initialization, reading and writing of strings, operations and string functions with example programs, array of pointers to strings.

FUNCTIONS

Definitions and need of functions. Library functions, user defined functions in detail, function declaration and prototypes call by value, call by reference and functions and arrays, recursion, storage classes with example program.

STRUCTURE

Definition of structure, Array in Structures, Structure with Array, Difference between array and structure

TEXT BOOKS:

- Programming with ANSI C by: E. Balagurusamy

REFERENCE BOOKS :

- Let us C - Yashwanth kanetkar
- Computer concepts and C programming by - P. B. Kotur
- The Complete Reference C by Herbert Schildt

Practical

(1Hour per week X 15 Weeks = 15 Hours)

Experiments are based on topics mention in the Paper designed by concerned Faculty

Sl. No	Semester	Paper	Marks for theory	Marks for internal assessment		Total
1	I	COMPUTER FUNDAMENTALS & DOS	70	C1 = 15 C2 = 15	30	100
2	II	PROGRAMMING IN C	70	C1 = 15 C2 = 15	30	100

Scheme of Examination

Distribution of Internal assessment

1) **CLASS TEST (C1) -15 MARKS.**
2) **CLASS TEST (C2) -15 MARKS.**

} **= 30 marks**

Scheme of Practical Examination

Sl. No	Semester	Paper	Marks for Practical	Marks for Record	Marks for Viva	Total
1	I	COMPUTER FUNDAMENTALS & DOS	60	05	05	70
2	II	PROGRAMMING IN C	60	05	05	70

Pattern of Question Paper for B.Voc.
Semester I
COMPUTER SCIENCE

Time : 2 Hrs 30 Min Max Marks 70

1. Answer all the questions in one sentence or a word
5X 1 = 5

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

2. Tick the correct answer 5 X 1 = 5

f. ----------
g. ----------
h. ----------
i. ----------
j. ----------

3. State whether the following statements are true or false 5 X 1 = 5

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

4. Fill in the blanks with suitable answers 5 X 1 = 5

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

5. Answer any ten of the following questions 10 X 3 = 30

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------
f. ----------
g. ----------

h. ----------
i. ----------
j. ----------
k. ----------
l. ----------

6. Answer any four questions of the following
4 X 5 = 20

a. ----------
b. ----------
c. ----------
d. ----------
e. ----------

Pattern of Question Paper for B.Voc.
Semester II
COMPUTER SCIENCE

Time : 2 Hrs 30 Min Max Marks 70

1. Answer all the questions in one sentence or a word
10X 1 = 10

f. ----------
g. ----------
h. ----------
i. ----------
j. ----------
k. ----------
l. ----------
m. ----------
n. ----------
o. ----------

5. Answer any four of the following questions 4
X 5 = 20

f. ----------
g. ----------
h. ----------
i. ----------
j. ----------

6. Answer any four questions of the following
4 X 10 = 40

f. ----------
g. ----------

h. ----------
i. ----------
j. ----------
k. (Note- 10 Marks may be divided in to 6+4 or 5+5

FPA 020

I Semester

B.Voc. Programme

Language kannada

Credits.3(45 hours)

¸Á»vÀå WÀlPÀ

12 UÀAmÉUÀ¼ÀÄ

Course Outcome:

After completion of the course, the students are able to:

CO1. Deliberate in depth Putta Vidhave

CO2. Learn the details of Rangoli

CO3. Specify in depth Mumbai Jathaka

CO4. Learn in details with examples Mahiti Tantradnyan

CO5. Understand in details with examples Mudanambikegala Bedinali

1. PÁªÀå

1. AiÀiÁªÀ PÁ®zÀ ±Á¸ÀÛçªÉÃ£ÀÄ ºÉÃ½zÀgÉÃ£ÀÄ? - PÀÄªÉA¥ÀÄ
2. ¥ÀÄlÖ «zsÀªÉ - ¨ÉÃAzÉæ
3. gÀAUÉÆÃ° - ¥ÀÄw£À
4. ªÀÄÄA¨ÉÊ eÁvÀPÀ – fJ¸ïJ¸ï
5. CqÀÄUÉ ªÀÄ£ÉAiÀÄ ºÀÄqÀÄV - ªÉÊzÉÃ»
6. £À£Àß d£ÀUÀ¼ÀÄ -¹zÀÞ°AUÀAiÀÄå

2. UÀzÀå 12 UÀAmÉUÀ¼ÀÄ

1. ¤gÀAvÀgÀ ¤ÃjUÁV ¤AvÀ¯ÉèÃ Nl -£ÁUÉÃ±ï ºÉUÀqÉ
2. ªÀiÁ»w vÀAvÀæeÁÕ£À : MAzÀÄ ¸ÀÆÜ® £ÉÆÃl – f.J£ï. £ÀgÀ¹AºÀªÀÄÆwð
3. ªÀÄÆqsÀ£ÀA©PÉUÀ¼À ©Ãr£À°è - ¨sÀÄªÀ£ÉÃ±Àéj ºÉUÀqÉ
4. ¨ÉÃqÀzÀ CwyUÀ¼ÀÄ - J J£ï ªÀÄÆwðgÁAiÀÄgÀÄ

¨sÁµÁ WÀlPÀ

3. DqÀ½vÀ ªÀÄvÀÄÛ ªÁtÂdÀå PÀ£ÀßqÀ 21 UÀAmÉUÀ¼ÀÄ

1. DqÀ½vÀ ¨sÁµÉAiÀiÁV PÀ£ÀßqÀ ¸ÀégÀÆ¥À ªÀÄvÀÄÛ ®PÀët
2. ¸ÀPÁðj ¥ÀvÀæ ¸ÀégÀÆ¥À – C¢üPÀÈvÀ eÁÕ¥À£À ªÀÄvÀÄÛ ¸ÀÄvÉÆÛÃ¯É
3. ««zsÀ jÃwAiÀÄ CfðUÀ¼ÀÄ - gÀeÉ, ªÉÃvÀ£À, §rÛ, ¥ÀzÉÆÃ£Àßw EvÀgÉ
4. ªÁtÂdå PÀ£ÀßqÀzÀ ¸ÀégÀÆ¥À ªÀÄvÀÄÛ ®PÀët
5. ªÁtÂdå ¥ÀvÀæzÀ ««zsÀ CAUÀUÀ¼ÀÄ
   ªÁtÂdå ¥ÀvÀæUÀ¼ÀÄ- «ZÁgÀuÁ ¥ÀvÀæ, DzÉÃ±À ¥ÀvÀæ, GzÀj¥ÀvÀæ, ªÀ¸ÀÆ° ¥ÀvÀæ, ¥ÀjZÀAiÀÄ ¥ÀvÀæ, ¥ÀgÁªÀÄ±Àð£À ¥ÀvÀæ, ªÀåªÀºÁgÉÆÃfÓÃªÀ£À ¥ÀvÀæ, ¥Àj¥ÀvÀæ

6. UÀtPÀzÀ°è PÀ£ÀßqÀ – PÀ£ÀßqÀzÀ CAvÀeÁð® vÁtUÀ¼ÀÄ- £ÀÄr, §gÀºÀ-¥Áj¨sÁ¶PÀ ¥ÀzÀUÀ¼ÀÄ
7. ¨sÁµÁAvÀgÀ : ¸ÀégÀÆ¥À ªÀÄvÀÄÛ ®PÀët- PÀ£ÀßqÀ¢AzÀ EAVè¶UÉ-EAVè¶¤AzÀ PÀ£ÀßqÀPÉÌ

¥ÀgÁªÀÄ±Àð£À UÀæAxÀUÀ¼ÀÄ

1. ¸ÀªÀÄUÀæPÁªÀå - f J¸ï ²ªÀgÀÄzÀæ¥Àà
2. ©AzÀÄ ©A¢UÉ - ªÉÊzÉÃ»
3. ¥ÀQëPÁ² - PÀÄªÉA¥ÀÄ
4. ¸ÀªÀÄUÀæPÁªÀå - ¨ÉÃAzÉæ
5. ±ÀvÀÄæ«®èzÀ ¸ÀªÀÄgÀ - £ÁUÉÃ±ïºÉUÉØ
6. ªÁåªÀºÁjPÀ PÀ£ÀßqÀ - JZï J¸ï PÉ
7. DqÀ½vÀPÀ£ÀßqÀ gÀAeÉÃgÀ - qÁ C±ÉÆÃPïPÀÄªÀiÁgï ªÀÄvÀÄÛ EvÀgÀgÀÄ
8. PÀbÉÃj PÉÊ¦r CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ - PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ
9. ¯ÉÃR£ÀPÀ¯É - J¸ï ¥ÀæºÁèzÀgÁªï
10. DqÀ½vÀ¨sÁµÉ PÉ®ªÀÅ «ªÀgÀUÀ¼ÀÄ - ¥ÀæzsÁ£À UÀÄgÀÄzÀvÀÛ

B.Voc Programme

Language kannada

I Semester

¥Àæ±Éß¥ÀwæPÉ ¸ÀégÀÆ¥À

3.00 UÀAmÉUÀ¼ÀÄ 70 CAPÀUÀ¼ÀÄ

«¨sÁUÀ-1

1. ¨sÁªÁxÀð §gÉ¬Äj : 1óó*5=5
   C)
   CxÀªÁ
   D)
2. ¸ÀAzÀ¨sÀð ¸À»vÀ «ªÀj¹ 1óó*5=5
   C)
   CxÀªÁ
   D)

3. PÉ¼ÀV£À ¥Àæ±ÉßUÉ GvÀÛj¹:

1*10=10

C)

CxÀªÁ

D)

«¨sÁUÀ-2

5. PÉ¼ÀV£À ¥Àæ±ÉßUÉ GvÀÛj¹:

1óó*10=10

C)

CxÀªÁ

D)

5. PÉ¼ÀV£À ¥Àæ±ÉßUÉ GvÀÛj¹:

1*10=10

C)

CxÀªÁ

D)

«¨sÁUÀ-3

6. LzÀPÉÌ n¥ÀàtÂ §gÉ¬Äj: 3*5=15

C)

CxÀªÁ

D)

7. PÉ¼ÀV£À ¥Àæ±ÉßUÉ GvÀÛj¹: 1*10=10

C)

CxÀªÁ

D)

9. PÀ£ÀßqÀPÉÌ ¨sÁµÁAvÀj¹: 1*5=5

10. EAVè¶UÉ ¨sÁµÁAvÀj¹: 1*5=5

FPB540

B.Voc. - II Semester
Communicative English

No. of Credits : 3 No. of Instruction hrs : 3 / Week(45 hrs)

Course Outcome:
After completion of the course, the students are able to:
CO1. Deliberate in details with examples Voice
CO2. Specify in details with examples Articles
CO3. Learn in depth Speech
CO4. Deliberate the details of Writing Skills
CO5. Learn in depth Speaking Skills

AIMS: 1) To familiarize students to basic English
2) To enable them to develop listening & speaking skills

OBJECTIVES: Students should be able to ___

1) Write English without grammatical errors
2) Speak English Language effectively and accurately
3) Listen and understand public announcements and news on TV & Radio

Module – 1 Grammar

	Marks	**Hrs/ Week**

1.	Subject and Verb Agreement	5	6
2.	Voice	5	5
3.	Articles	5	3
4.	Speech	5	6
5.	Question tag	5	5
6.	Framing of Questions	5	Q=05

Module – 2 Writing Skills

1.	Letter Writing Letter of Application/Letter of Grievances/Resume Preparation	10	4
2.	Comprehension	10	3
3.	Essay Writing	10	3

Module – 3 Speaking Skills

1.	Greeting		
2.	Requesting		
3.	Enquiring		
4.	Explaining	10	Q=05
5.	Reporting		
6.	Permission		
7.	Thanking		
		70	**45**

PAPER CODE **:FPB540**

B.Voc II SEMESTER

COMMUNICATIVE ENGLISH

MODEL QUESTION PAPER

TIME: 3 Hrs **MAX MARKS: 70**

Instructions to students: All sections are compulsory.

SECTION A

I Fill in the blanks with correct form of verbs:

5 X 1 = 05

a) Slow and Steady _____ the race.(to win)
b) Christians _____ to church on Sundays. (to go)
c) They have _____ the work. (to complete)
d) He _____ absent yesterday. (to be)
e) We _____ learning grammar now. (to be)

II Change the voice of the following sentences:

5 X 1 = 05

a) He is writing a poem.
b) We have won the match.
c) The poet took the second road.
d) A song will be sung by her.
e) Close the door.

III Fill in the blanks with suitable article:

5 X 1 = 05

a) My father is _____ MLA.
b) _____ earth moves round the sun.
c) The poet rejected ____ first road.
d) The Nyle is _____ long river.
e) Brutus was _____ honest man.

IV Change the speech of the following: 5 X 1 = 05

a) The King said to people," I am happy to be here".
b) Mother said to the child," Don't go near water".
c) Raju asked Rosie who she was.
d) Velan said to Venu," Why are you crying?"
e) The lady told the writer that he was very humorous.

V Add question tag to the following: 5 X 1 = 05

a) He is a good singer.
b) The poet observed the daffodils.
c) Behrman saves the life of Johnsy.
d) English is not a difficult language.
e) India has won the second test.

VI Frame questions so as to get the underlined words as answers:

5 X 1 = 05

a) <u>Shakespeare</u> wrote 'Macbeth'
b) Rama killed <u>Ravana</u>.
c) He goes to college <u>by car.</u>
d) The College starts <u>at 10.30 am</u>
e) <u>Lear's</u> daughters were selfish.

SECTION B

VII Letter Writing:

10 X 1 = 10

a) **Write a letter of application to the post of a Computer Programmer at SkillTec Ltd. Mysuru**

OR

b) **Prepare your resume.**

VIII Read the following essay carefully and answer the questions set on it: 5 X 2 =10

I was wrong to think that city life is altogether unhealthy. Perhaps it was so at one time, now a days with proper roads, pavements and drainage systems, sickness is kept at bay. Cities are planned in such a way as to provide open space with parks and playgrounds for the benefit of the dwellers.

Even when sickness does strike, there are doctors and hospitals near at hand. This is not the case in the country where people frequently suffer and sometimes die for want of medical facilities.

1) What does the writer think of the city life?
2) What causes sickness?
3) Where do you find doctors and hospitals in plenty?
4) How does the passage distinguish between city and country life?
5) Give a suitable title to the passage.

IX Write an essay on one of the following:

10 X 1 = 10

a) Use and abuse of social media.
b) Role of students in nation building
c) Afforestation?

X Answer the following: 5 X 2 = 10

1. Write an imaginary conversation between a customer and Bank Manager regarding opening an account.
2. Write a dialogue between two friends who meet after a long time.

B.Voc. II SEMESTER
COMMUNICATIVE ENGLISH
QUESTION PAPER SCHEME

TIME: 3 Hrs MAX MARKS: 70

Instructions to Students: All sections are compulsory.

SECTION A

I Fill in the blanks with correct form of verbs

5 X 1 = 05

a)

b)
c)
d)
e)

II Change the voice of the following sentences
5 X 1 = 05

a)
b)
c)
d)
e)

III Fill in the blanks with suitable article
5 X 1 = 05

a)
b)
c)
d)
e)

IV Change the speech of the following
5 X 1 = 05

a)
b)
c)
d)
e)

V Add question tag to the following
5 X 1 = 05

a)
b)
c)
d)
e)

VI Frame questions so as to get the underlined words as answers
5 X 1 = 05

a)
b)
c)
d)
e)

SECTION B

VII 10 X 1 = 10

1. Write a letter of application

OR

2. Prepare a Resume.

VIII Read the following essay carefully and answer the questions. 10 X 1 = 10

a)
b)
c)
d)
e)

IX Write an essay on one of the following: 10 X 1 = 10

a)
b)
c)

X Answer the following :(Dialogue writing) 5 X 2 = 10

1)
2)

FPC 550 **INDIAN CONSTITUTION**

COMMON PAPER TO ALL DEGREE CLASSES (FOR B.Voc. 45 HOURS 3/WEEK)

70 MARKS

Course Outcome:

After completion of the course, the students are able to:

CO1. Learn the details of Features of Indian Constitution

CO2. Understand the details of Fundamentals Rights

CO3. Identify the details of Role of Prime Minister

CO4. Learn the details of Power and Functions of Lok Sabha

CO5. Specify the details of Power and Functions of Chief Minister

UNIT I

08 hrs

a) Preamble of the Indian Constitution
b) Salient features of Indian Constitution

UNIT II

10 hrs

a) Fundamental Rights
b) Fundamental Duties
c) Directive principles of State Policy

UNIT III

14 hrs

a) President – Election Method, Powers and Functions
b) The Role of the Prime Minister
c) The Parliament – Structure, Power and Functions(Lok Sabha and Rajya Sabha)
d) Supreme Court – Organization and Jurisdiction

UNIT IV

13 hrs

a) The Role of Governor in the Administration of State
b) Powers and Functions of the Chief Minister
c) Composition , Powers and Functions of both the Houses of State Legislature
d) High Court – Organization and Jurisdiction

TEXT BOOKS

- An introduction to the Constitution of India by M V Pylee
- Introduction to the Constitution of India by D D Basu

- Understanding the Constitution of India by Dr. H M Rajashekar
- Indian Constitution by Sommanna, Brahamananda, H B Mallikarjuna swamy,
- Indian Constitution by H T Ramakrishana, Rajiv

FPC 570 **B.Voc. Semester – III**

Information Communication Technology

CO1 Learn the methods of beneficiary identification and challenges to ensure aid reaches rightful beneficiaries

CO2 Role of Technology framework, mapping, web portals in movement of aid.

CO3 Express role of ICT in emergencies - Need of inputs to plan food assistance during emergencies

CO4 Identify in depth Role of ERP for food processing and engineering manufacturing organisations and usage of software

CO5 Deliberate in details the role of Mobile technology and handheld devices/web portals to facilitate food assistance

CO6 Define Humanitarian supply chain management and role of people, organisation, in movement of aid from supplier to affected people

Sl. no.	Information Communication Technology	Hrs
1	The humanitarian supply chain – Definition, system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer	5
2	Technology framework – Front-end services, Middleware services and Infrastructure services: Supporting the food assistance supply chain; Mapping technologies; Web portals	5
3	Mobile technologies - Combining hand-held and wireless communications technologies	5
4	Beneficiary identification - Challenges in food assistance to ensure that assistance goes to the right beneficiaries	5
5	ICT in emergencies – Requirement inputs of Food assistance	5

	interventions during emergencies	
6	Linking the humanitarian supply chain - Ways in which WFP uses technology and technological techniques to fulfill its role as the provider of food assistance in development and emergencies	5

Sl. no.	Practical	Hrs
1.	Identification of software related to Food Processing and Engineering	3
2.	Practicing the use of software	6
3.	Requirement development for Food Processing Software	6

MODEL QUESTION PAPER

CODE NO: **FPC 570**
Semester - III

INFORMATION AND COMMUNICATION TECHNOLOGY

TIME: 3 hrs **Max marks: 70**

Instructions: Draw neat and labeled diagram wherever necessary.

PART-A

I Write short notes for the following(any 5): **(5x2=10)**

1 ----------
2 ----------
3 ----------
4 ----------
5 ----------
6 ----------

PART-B

II Answer any 4 of the following: (4x5=20)

1 ----------
2 ----------
3 ----------
4 ----------
5 ----------

PART –C

III Answer any 4 of the following: (4x10=40)
IV

1 ----------
2 ----------
3 ----------
4 ----------
5 ----------

III SEMESTER PRACTICAL EXAMINATION

INFORMATION AND COMMUNICATION TECHNOLOGY

PRACTICAL

SCHEME OF EXAMINATION

DURATION: 3 Hours

Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE :- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

1. Identification of software related to Food Processing and Engineering.
2. Practicing the use of software.
3. Requirement development for Food Processing Software.

FPD 560 **DEPARTMENT OF ENVIRONMENTAL STUDIES**

(3 Hrs Theory / week)

3 Credits (45 Hrs)

Environmental Studies (One-Semester Compulsory Core Module for B.Voc. Programmes)

Course Outcome:

After completion of the course, the students are able to:

CO1. Deliberate the details of Components of environment
CO2. Specify the details of Ecology and Ecosystems
CO3. Identify in details with examples Natural resources
CO4. Learn the details of Biodiversity
CO5. Specify in details with examples Environmental pollution
CO6. Identify the details of Environmental issues and policies

Unit 1: Environment and natural systems

4 hrs

- Introduction to Environment and Environmental Studies
- Definition and Components of Environment, Relationship between the different components of Environment
- Man and Environment relationship
- Impact of technology on Environment, Environmental Degradation
- Multidisciplinary nature of the Environment studies

- Its scope and importance in the present day Education System

UNIT 2: Ecology and Ecosystems: 7 hrs

- Introduction: Ecology- Objectives and Classification
- Concept of an ecosystem- structure and functions of ecosystem
- Components of ecosystem- Producers, Consumers, Decomposers
- Bio-Geo- Chemical Cycles- Hydrologic Cycle, Carbon cycle, Energy Flow in Ecosystem, Food Chains, Food webs ,Ecological Pyramids
- Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem, Estuarine Ecosystem**.**

Unit 3: Natural Resources 7 hrs

Renewable and Non-renewable resources, exploitation and conservation,

- Water resources: Surface and Ground water sources, Indian and Global scenario.
  Land as a resource, land use change and land degradation
- Forest resources: Definition and Classification of Forests
  Ecological and Economic importance and benefits of forest, Indian scenario,
  Deforestation: causes and effects, case studies remedial measures
- Food resources: Sources of food, Global and Indian food demand scenario,
  Limits of food production, Environmental effects of Agriculture
- Energy resources: Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies
- Mineral resources: Definition and Classification of minerals, mining issues Case studies.
- Role of individual in conservation of natural resources.

Unit 4 : Biodiversity and its Conservation 6 hrs

- Biodiversity : Definition, Levels of biological diversity : genetic, species and ecosystem diversity
- Biogeographic zones of India
- Hot spots of biodiversity
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational values
- Biodiversity patterns
- India as a mega-biodiversity nation
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions.

- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT 5: Environmental pollution:
9 hrs

- Types of Environmental Pollution:
- Water Pollution: Introduction – Water Quality Standards, Sources of Water Pollution: Industrial Agricultural, Municipal; Classification of water pollutants, Effects of water pollutants, Eutrophication.
- b) Marine pollution: Causes, effects and control.
- c) Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like PM, SO2, NOX, Natural & Anthropogenic Sources, Effects of common air pollutants
- d) Soil Pollution: causes, effects and control.
- e) Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects
- f) Thermal Pollution: Causes, effects and control.
- g) Nuclear hazards and human health risks.
- Solid waste management: Control measures of urban and industrial waste.
- Role of individual in the prevention of pollution, Pollution case studies.

UNIT 6: Sustainable development and Environmental issues and Policies.
7 hrs

- Sustainable development: Meaning, changes in resource utilization, urbanization.
- Water conservation: watershed management and Rain water harvesting.
- Environmental issues: Climate change, global warming, acid rain, ozone layer depletion.
- Disaster management: floods, drought,earthquake, cyclones and landslides.
- Wasteland reclamation.
- Environment Protection Act: Air, Water, Wildlife (Prevention and Control of Pollution)
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation.
- Environment: rights and duties**.**

Unit 7 : Human Population and the Environment
5 hrs

- Population growth, Explosion, demographic variation among nations.
- Family welfare Program.
- Environment, human health and welfare; infectious and lifestyle diseases in contemporary world.
- Value Education: Environmental ethics.

- HIV/AIDS
- Women and Child welfare.
- Role of information technology in Environment and human health

Unit 8: Field visit
5 hrs

- Field work Visit to an area to document environmental assets :river/ forest/ grassland/ hill/ mountain
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
- Visit to the solid waste treatment plant and water treatment plant.
- Video: The one degree • (Equal to 5 lectures)

REFERENCE BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha Second edition, 2013 Publisher: Universities Press (India) Private Ltd, Hyderabad.
2. Basics of Environmental Studies by Prof Dr N S Varandani, 2013 Publisher: LAP -Lambert Academic Publishing, Germany
3. Environmental Studies by Anindita Basak, 2009 Publisher: Drling Kindersley(India)Pvt. Ltd Pearson
4. Textbook of Environmental Studies by Deeksha Dave & S S Kateva , Cengage Publishers.
5. Environmental Sciences by Daniel B Botkin & Edward A Keller Publisher: John Wiley & Sons.
6. Environmental Studies by R. Rajagopalan, Oxford University Press
7. Environmental Studies by Benny Joseph, TMH publishers
8. Environmental Studies by Dr. Suresh K Dhameja, 2007 Published by : S K Kataria & Sons New Delhi
9. Basics of Environmental Studies by U K Khare, 2011 Published by Tata McGraw Hill.
10. Environmental Studies by N.Arumugam & V.Kumaresan, saras publication.

Scheme of Examination

ENVIRONMENTAL STUDIES (ONE-SEMESTER COMPULSORY CORE MODULE FOR B.VOC PROGRAMMES)

Scheme of examination

Question paper pattern

Sl.no	Types of questions	Marks	No. of questions	Total marks
1	Short notes	**2**	**5**	**10**
2	Medium type	**5**	**4**	**20**
3	Long answers	**10**	**4**	**40**
			Total	**70 marks**

Distribution of Internal assessment

3) **ASSIGNMENT/SEMINAR-15 MARKS.**
4) **CLASS TEST-15 MARKS.**

MODEL QUESTION PAPER
CODE NO:FPD 560COMMON TO EVEN SEMESTER
ENVIRONMENTAL STUDIES

TIME: 3 hrs **Max marks: 70**

Instructions: Draw neat and labeled diagram wherever necessary.

PART-A

I. Write short notes for the following(any 5): **(5x2=10)**

1. ----------
2. ----------
3. ----------

4. ----------
5. ----------
6. ----------

PART-B

II. Answer any 4 of the following:
(4x5=20)

1. ----------
2. ----------
3. ----------
4. ----------
5. ----------

PART –C

III. Answer any 4 of the following:
(4x10=40)

1. ----------
2. ----------
3. ----------
4. ----------
5. ----------

FPD 580 **B.Voc. Semester - IV**

Biostatistics

CO1 Understand the benefits and Implementation of Z-test, t-test, ANOVA, Chi-square test in data evaluation

CO2 Identify the characteristics of Application of Standard deviation, mean deviation, standard error, coefficient of variation and other concepts in market data analysis

CO3 Deliberate the classification and characteristics of Statistial concepts like Data structure, sampling methods, data collection and analysis, graphical representation

CO4 Understanding the Measure of Central Tendency

CO5 Brief knowledge about Types of distribution of data -Normal, Binomial, Poisson

CO6 Identify the classification and characteristics of Regression estimate and correlation coefficient

CO7 Identify the details of Experimental designs and data transformation

Sl. no.	Biostatistics	Hrs
1.	Statistical concepts: Data structure, sampling methods, collection, classification and tabulation of data, graphical and diagrammatic representation, histogram, frequency polygon, frequency curve, bar graph, pie chart etc.	4
2.	Measure of Central Frequency: Mean, median, mode.	2
3.	Measure of dispersion of data: Range, semi-interquartile range, mean deviation, standard deviation, standard error, coefficient of variation, confidence limits.	5
4.	Types of distribution of data: Normal, Binomial, Poisson.	7
5.	Z-test, t-test, ANOVA, multiple comparisons, LSD and DMRT, Chi-square test.	4
6.	Regression estimate, correlation coefficient.	4
7.	Experimental designs, data transformation.	4

Sl. no.	Practical	Hrs
1.	Analytical Problems / calculations	15

MODEL QUESTION PAPER

Semester-IV

CODE NO:FPD 580

BIOSTATISTICS

TIME: 3 hrs **Max marks: 70**

Instructions: Draw neat and labeled diagram wherever necessary.

PART-A

IV. Write short notes for the following(any 5): (5x2=10)

7. ----------
8. ----------
9. ----------
10. ----------
11. ----------
12. ----------

PART-B

V. Answer any 4 of the following: (4x5=20)

6. ----------
7. ----------
8. ----------
9. ----------
10. ----------

PART –C

VI. Answer any 4 of the following: (4x10=40)
VII.

6. ----------
7. ----------
8. ----------
9. ----------
10. ----------

IV SEMESTER PRACTICAL EXAMINATION

BIOSTATISTICS

PRACTICAL

SCHEME OF EXAMINATION

DURATION: 3 Hours
Maximum Marks: 70

Practical proper: 60

Record marks: 10

NOTE :- Candidates are required to submit the records duly signed by the teacher-in charge and certified by the Head of the Department

4. Analytical Problems / calculations.