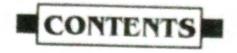
For 10+2 Students, Orrisa Based On Latest Syllabus



Ravindra Nath





Ch. No.

Chapter

Pages

FIRST YEAR

UNIT-I: LIFE AND CELL

1. THE PLANT WORLD	5-15
☐ What is Botany	5
☐ History of Plant Science	5
☐ Branches of Modern Botany	8
☐ Scope of Botany	9
Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	
Short Answer (One Tech. Word) Type—Questions-Answers	12-15
2. CELL: CELLULAR BASIS OF LIFE	16-55
☐ Introduction & Discovery of Cell	16
Cell Theory & Cell as the Basic Unit of Life	16
Unity and Diversity of Cells	17
Cellular Totipotency—Cell as a Self-Contained Unit	17
Cell Size, Shape and Number	17
Cell Types : Prokaryotic & Eukaryotic Cells	19
☐ Structural Organization of Cell	19
(A) The Cell Wall	19
(i) Plasmodesmata	20
(ii) Pits	20
(B) The Central Vacuole	21
(C) The Cytoplasm	22
() Membranes	23
(ii) Plastids (Including Chloroplast)	26

(iii) Mitochondria	
(iv) Endonles	28
(iv) Endoplasmic Reticulum (v) Ribosomes	29
doosomes	32
(vi) Golgi Bodies or Dictyosomes (Golgi Apparatus)	33
3 - Southes	34
(viii) Spherosomes	35
(ix) Peroxisomes	36
(x) Glyoxysomes	36
(xi) Lomasomes	36
(D) Nucleus	36
(E) CentrosomelCell Centre	38
(F) The Cytoskeleton-Microtubules; Cilia and Flagella;	
Microfilaments (Actin Filaments) and Intermediate Filaments	40
(G) Ergastic Substances (Cell Inclusions)	42
 Distinction between Plant and Animal Cell 	42
Origin and Evolution of Cell	42
Structural Differences between Eukaryotic and Prokaryotic cells	43
Important Questions for Revision; Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer	
(One Tech. Word) Type—Questions-Answers	45-55
UNIT-II : CHEMISTRY OF CELL ; COMPLEXITIES OF PLANT	LIFE
1. CHEMISTRY OF CELL	59-85
☐ Physical and Chemical Nature of Protoplasm	59
☐ Introduction	59
☐ Chemical Elements of Protoplasm	61
Principal Compounds of Cell	61
(a) Water	61
(b) Carbohydrates	61
(c) Fats, Oils and Lipids	65
(d) Amino Acids and Proteins	67
(e) Nucleic Acids—DNA & RNA	72
(i) Introduction	72
(ii) Occurrence and Nature of Nucleic Acids	72
(iii) Chemical Composition	72
(iv) Nucleosides, Nucleotides and Polynucleotides	73
(v) Structure of DNA (Watson and Crick Model)	75

(ve Biological Importance of DNA, Characteristics of Genetic	
Material & DNA as Genetic Material	77
(vii) Circular and Spherical DNA	77
(with Different Types of RNA and their Distinguishing Characte	rs 78
(ix) Basic Differences between DNA and RNA	79
☐ Important Questions for Revision (Long & Short Answer Type) :	
Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions—Answers	80—85
2. COMPLEXITIES OF PLANT LIFE—TISSUES AND TISSUE SYSTEM	s 86—103
☐ Introduction and Classification of Tissues	86
☐ Menstematic Tissues (Meristems)	87
☐ The Tissue System	90
☐ Important Questions for Revision (Long & Short Answer Type) :	
Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	
Short Answer (One Tech. Word) Type—Questions-Answers	97-103
3. ORGANOGRAPHY	104—137
Primary Internal Structure of Angiospermic Plants	104
(a) Primary Structure of Root	104
Primary Structure of Dicot Roots	104
Primary Structure of Monocot Roots	109
Differences between Dicot and Monocot Roots	111
(b) Primary Structure of Stem	113
Primary Structure of Dicot Stems	113
Primary Structure of Monocot Stems	120
Differences between Dicot and Monocot Stems	122
(c) Primary Structure of Leaf (Leaf Anatomy)	123
Anatomy of Dorsiventral or Bifacial Leaf	124
Anatomy of Isobilateral or Unifacial Leaf	125
Differences between the Internal Structure of Dicot and	
Monocot Leaves	126
☐ Secondary Growth in Stem	125
Steler and Extrasteler Secondary Growth in a Normal Dicotyledonous Stem	127
Cork Cambium or Phellogen and the Formation of Periderm	127
Lenticels	129
Annual or Growth Rings	129
Sap Wood and Heart Wood	130
Differences between Primary and Secondary Xylem	130
HOLOGO NECESTRA NO CONTRACTOR	

Important Questions for Revision (Long & Short Answer Type)	
	y
Multiple Choice, Fill-Up the Blanks, Materials Short Answer (One Tech. Word) Type—Questions, Answers	131-137
Short Answer (One Teen, Word)	
UNIT-III : MICROORGANISMS AND DIVERSITY OF PLA	AM I LIFE
1. GENERAL IDEA OF TWO AND FIVE KINGDOMS CLASSIFICATION	ON 141-144
1. GENERAL IDEA OF TWO AND FIVE	141
☐ Introduction	142
☐ Two Kingdoms Classification	143
☐ Five Kingdoms Classification by Whittaker	144
☐ Important Questions for Revision	
2. THE WORD OF MICROBES	145—158
☐ Viruses	145
☐ General Account	145
☐ Characteristic Features	145
☐ Viruses—Non-living or Living	145
☐ External Structure of Virus Particles (Including TMV)	146
Chemical Composition	147
☐ Shape of Virus Particle	148
Replication of Viruses	148
☐ Animal Virus—Pox Virus	149
Classification	149
☐ Transmission of Viruses	149
☐ Viral Vaccines for Prevention of Viral Diseases	150
☐ Plant Diseases caused by Viruses	151
☐ Symptoms of Viral Diseases	151
Control of Viral Diseases of Plants	151
☐ Bacteriophage	152-155
(i) Structure	152
(ii) Some Characteristic Features	153
(iii) Bacteriophages and Control of Bacterial Diseases	153
(iv) Replication (Life-Cycles)	153
(v) Biological Importance	153
Important Questions for Revision (Long & Short Answer Type): Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	155—158
Short Answer (One Tech. Word) Type—Questions-Answers	159-182
3. BACTERIA (SCHIZOMYCETES)	159
General Account	160
☐ Forms	.00

		No Bacteria	160
	Q	Gram-Positive and Gram-Negative Bacteria	161
		Structure of Eubacteria	163
	0	Reproduction	167
	a	Nutrition	169
	a	Respiration	169
	u	Classification	170
		Economic Importance (Harmful and Beneficial Activities)	171
		Cyanobacteria	173
	0	Mycoplasma	174
	0	Archaebacteria Type)	
		Important Questions for Revision (Long & Short Answer Type): Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	175—182
4.	DI	VERSITY OF PLANT LIFE : CONVENTIONAL AND MODERN	183-187
	CL	ASSIFICATION OF PLANT KINGDOM	183
		Introduction	183
	0	Conventional System of Classification of Plant Kingdom	184
	0	Modern System of Classification	
	O	Important Questions for Revision (Long & Short Answer Type);	186—187
		Multiple Choice-Questions-Answers	188-206
5.		GAE	188
		General Characteristic Features	188
	0	Habitats (Ecological Classification of Algae)	189
	0	Range of Form and Thallus Organization	191
	0	Pigments of Algae	191
	0	Food Reserves of Algae	
	0	Classification	
	0	Reproduction	196
	0	Economic Importance	200
	0	Structure and Life-cycle of Spirogyra	200
	0	Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	202-206
e	EVE	JNGI	207-224
0.	D	General Characteristics	207
	D	Occurrence	207
		Forms of Thallus	207
	n	Reproduction	209

	211
	212
	214
Classification	
Economic and Life-cycle of Yeast Short Answer & Very	220-224
☐ Classification ☐ Economic Importance ☐ Structure and Life-cycle of Yeast ☐ Structure and Life-cycle of Yeast ☐ Important Questions for Revision (Long & Short Answer & Very Multiple Choice, Fill-Up the Blanks, Match the Columns & Multiple Choice, Fill-Up the Blanks, Match Short Answer (One Tech. Word) Type—Questions—Answer	225-230
Important guestions the Blanks, Guestions word Type—Questions	225
Short Answer (One Tech. Word)	225
7. LICHENS	225
7. Introduction	226
Occurrence	227
Constitute .	22
Type].	
Reproduction (Long & Short Answer & Very	228-230
Reproduction Economic Importance Important Questions for Revision (Long & Short Answer Type): Important Questions for Revision (Long & Short Answer Type): Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Multiple Choice, Fill-Up the Blanks, Match the Columns Answers	231-243
Reproduction Economic Importance Economic Importance Important Questions for Revision (Long & Short Answer Type) Important Questions for Revision (Long & Short Answer Short Answer (Cone Tech. Word) Type—Questions—Answers Short Answer (One Tech. Word) Type—Questions—Answers	231
Situe	231
- TOPHY I DO	231
8. BRYOFIT Characteristics General Characteristics	234
Occurrence Size and Form	234
Life-Cycle	
Distinguishing Features Distinguishing Features Distinguishing Features	235
☐ Distinguishing Features ☐ Interrelationship with Algae and Pteridophyta	236
a at -ification	236
Gassincation Classincation Funaria—Morphology and Life-Cycle Gas Payision (Long & Short Answer Type);	
☐ Funaria—Morphology and Life-Cycle ☐ Important Questions for Revision (Long & Short Answer Type) ; ☐ Important Questions for Revision (Long & Short Answer Type) ;	
Important Questions for Revision (2008) Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions—Answers	239-243
	244-253
9. PTERIDOPHYTES General Account	244
경기를 보고 있다. 그 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들이 되었다. 나를 다 가장 하는 것이 없는 것이다. 나를 다 가장 하는 것이다. 나를 다 가장 하는 것이다.	244
☐ Form ☐ Permeduation	244
☐ Reproduction ☐ Affinities of Pteridophytes	245
☐ Dryopteris—Morphology and Life-Cycle	245
☐ Important Questions for Revision (Long & Short Answer Type);	
Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	
Short Answer (One Tech. Word) Type—Questions-Answers	248-253
10. GYMNOSPERMS	254-268
General Characteristics	254
☐ Habit	254
하다면서 되었다. 하나 아이들은 아이들은 얼마나 나는 사람들이 되었다.	

☐ Internal Structure	254
☐ Reproduction	254
Differences Between Gymnosperms and Angiosperms	255
Classification	255
☐ Economic Importance	256
☐ Cycas—Morphology and Life-Cycle	256
Important Questions for Revision (Long & Short Answer Type) ; Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions—Answers	263—268
UNIT-IV : MORPHOLOGY & TAXONOMY OF FLOWERING	PLANTS
1. MORPHOLOGY OF A TYPICAL ANGIOSPERMIC PLANT	271-275
☐ Introduction : What are Angiosperms ?	271
Morphological Description of a Typical Angiospermic Plant	272
(i) Vegetative Parts	272
1. Root System	273
2. Shoot System	273
3. Leaf	274
(ii) Reproductive Parts	274
1. Flower & Inflorescence	274
2. Fruit	274
3. Seed	275
☐ Important Questions for Revision (Long & Short Answer Type);	
Multiple Choice Questions-Answers	275
2. ROOT, STEM AND LEAVES	276-308
☐ I. Root	276
Introduction	276
Major Types of Roots	077
Pact Marphalagrand Zanations	070
Modifications of Roots	280
☐ II. Stem	286
Introduction	286
Functions of Stem	
Forms, Branching and Buds	286-288
Modifications of Stem	
III. Leaf	288
Forms and Functions of Leaf	295
Modifications of Leaves	295
	302

Multiple Choice, Fill-Up the Blanks, Match the Colum Short Answer	HIS A VETU
Will Auswer (Une Tech. Word) Type—Questions-An	swers 305-30s
3. INFLORESCENCE	309-316
O Introduction	309
Racemose (Indeterminate) Inflorescence	309
Cymose Inflorescence	312
☐ Special Types of Inflorescence	313
Important Questions for Revision (Long and Short Ans	swer Type);
Multiple Choice : Fill-up the Blanks & Match the	
Columns—Questions-Answers	313-316
4. THE FLOWER (FLOWER A MODIFIED SHOOT)	317-327
☐ Introduction	317
☐ Flower and its Parts	317
(i) Receptacle or Thalamus	318
(ii) The Calvx	319
(iii) The Corolla	319
(iv) The Androecium	321
(v) The Gynoecium	323
☐ Flower—A Modified Shoot	324
Important Questions for Revision (Long & Short Answe Multiple Choice, Fill-Up the Blanks, Match the Column Short Answer (One Tech. Word) Type—Questions-Answer	s & Very
5. POLLINATION	328-337
☐ Introduction	328
☐ Self-Pollination	328
Cross-Pollination	328
☐ Advantages of Cross-Pollination	328
☐ Types of Cross-Pollination	328
☐ Contrivances for Self-Pollination	328
☐ Contrivances for Cross-Pollination	329
Modes of Cross-Pollination	329
☐ Modes of Self-Pollination	333
Important Questions for Revision (Long & Short Answer Multiple Choice, Fill-Up the Blanks, Match the Columns Short Answer (One Tech Word) Town	s & Verv
Short Answer (One Tech. Word) Type—Questions-Answ 6. FERTILIZATION	
General Account	338-349
Flower—The Organ of Sexual Reproduction	338 338
organ or ocausi reproduction	330

☐ Life-History of an Angiospermic Plant	
- Compiler of the Mal-	339
or copinell of the Famala of	339
Fertilization and Embryo Formation	341
- Double refullization and Triple to	341
evelopment of Endosperm and F	341
	341
Alternation of Generations	345
Important Questions for Revision (Long & Short Answer Type): Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers 7. FRUITS	346
7. FRUITS guestions-Answers	346-349
☐ Introduction	350-365
☐ Simple Fruits	350
(a) Dry Fruits	350
(b) Succulent Fruits (Fleshy Fruits)	350
- regregate Fruits	350
Composite Fruits	358
Edible Parts of Some Common Fruits	359
Comparison of Different Fruit Types	360
Important Questions for Revision; Multiple Choice, Fill-Up the	360
8. DISPERSAL OF SEEDS AND FRUITS	362-365
Introduction	366-372
Dispersal by Wind	366
Dispersal by Water	366
Dispersal by Animals	368
☐ Explosive Dispersal	368
Important Question of D	369
Important Questions for Revision (Long & Short Answer Type); Multiple Choice: Fill-up the Disc.	309
Questions-Answers	
9. PRINCIPLES AND UNITS OF CLASSIFICATION	369-372
Plant Nomenclature	373-381
Binomial Nomenclature	373
Taxonomic Units of Classification	373
Systems of Classification	374
Importance of Table 1	
Importance of Taxonomy	374
	378

Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	7
10. SOME IMPORTANT PLANT FAMILIES AND	378-381
THEIR ECONOMIC IMPORTANCE	382-404
How to Give Systematic (Taxonomic) Description of an	404
Angiospermic Plant	382
Floral Formula and Floral Diagram	384
☐ Malvaceae	387
☐ Fabaceae	388
☐ Caesalpiniaceae	390
☐ Mimosaceae	392
O Asteraceae	394
☐ Poaceae	398
Important Questions for Revision (Long & Short Answer Type) :	
Multiple Choice ; Fill-up the Blanks & Match the Columns—	
	401-404
Questions-Answers	
SECOND YEAR	
UNIT-I : GENETIC BASIS OF LIFE	
1. THE CHROMOSOME : STRUCTURE AND FUNCTION	409-416
Ch. F. J. Marking	409
Chromosome Number	409
☐ Chromosome Size	410
Chromosome Morphology	410
(f) Chromatid and Chromonema	410
(ii) Centromere	411 412
(iii) Telomere	412
(iv) Secondary Constriction, Satellite Chromosome, and	412
Nucleolar Chromosome	412
(v) Chromomere	412
☐ Extranuclear Chromosomes	412
Chemical Composition	413
Nucleosome Model of Chromatin Fibres Nucleosome Model of Chromatin Fibres Nucleosome Model of Chromatin Fibres	413
Differences Between Prokaryotic and Eukaryotic Chromosomes	413
Functions of Chromosomes	
Important Questions for Revision (Long & Short Answer Type): Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	414-416

	2.	CE	ELL REPRODUCTION		
		J	Introduction	417-	400
			Mitosis and Its Significance	***	417
		J	The Cell Cycle and Interphase		417
		-	Meiosis and its Significance		420
	1		Differences between Mitosis and Meiosis		421
	1	U	Variations in Mitosis		428
	1		Free Nuclear Division : Budding and Amitosis		429
	I		Portain Gilestiana ten n		429
			Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions—Answers		
3	3. (CO	NCEPT OF GENE	430-	-437
	- [1	Introduction	438-	-450
	[Mendel's Concept of Inheritance and Particulate Nature of Gene		438
	- (Gene—The Fundamental Unit of Heredity		438
	-		Nature of Gene		439
	Ţ		Chemical Nature of Gene—Genetic Information is Transmitted by		439
	Ţ		Bacterial Transformation	DNA	439
	[Bacterial Transduction—DNA-The Viral Infecting Agent		439
	Ę		Modern Concept of Gene		441
	Ę		One Gene—One Enzyme Hypothesis		441
	Ç		Functional Units of a Gene : Cistron, Recon and Muton		442
	Ę		Structural & Regulatory Genes		442
	(and the same of	Types of Genes		443
	Ç		Split Gene		443
	Ĺ		Replication of DNA (Gene)		443
	C		The Genetic Code		444
			Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very		445
1	r	D	Short Answer (One Tech. Word) Type—Questions-Answers	447-	-450
*			OTEIN SYNTHESIS (TRANSLATION OF GENETIC CODE) Introduction	451-	-457
	-	-			451
		in	Site of Protein Synthesis		451
	-	and a	Transcription from DNA to RNA		452
	-	mag.	Protein Biosynthesis (Translation of Genetic Code)		452
	-		Major Steps in Protein Biosynthesis		453
	•		Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	455-	-457
			어릴 것이 되는데 보고 있는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그를 하는데 보고 있다면 되었다. 그런데 그를 하는데 그렇게 되었다면 그를 다 되었다.		

5.	RI	EGULATION OF GENE EXPRESSION	458-462
	Q	Introduction	458
	0	Gene Expression in Prokaryotes	458
		The Operon Model: Negative Control of Lac Operon	458
		(i) Repressible System	460
		(ii) Inducible System	460
200	0	Tryptophan Operon (A Repressible System)	460
	u	Important Questions for Revision (Long & Short Answer Type):
		Multiple Choice : Fill-up the Blanks & Match the Columns—	
		Questions-Answers	461-462
		UNIT-II : PHYSIOLOGICAL PROCESSES IN PLA	NTS
1.	PL	ANT AND WATER: PHENOMENA RELATED TO	465-478
1.10	PL	ANT-WATER RELATIONSHIP	465
	0	Introduction	465
		Diffusion	466
		Osmosis	472
Di A		Plasmolysis	473
		The Concept of Water & Solute Potential	473
		Imbibition (Chart Answer Type):	470
	0	Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	
		Short Answer (One Tech. Word) Type—Questions-Answers	474—478
2.	W	ATER ABSORPTION	479-489
-	0	Role of Water in the Physiology of Plants	479
		The Soil Water	480
		Availability of Soil Water to Plants	481
5		Organs of Water Absorption	481
		Mechanism of Water Absorption by Roots	482
A Comment		Factors Affecting Water Absorption	484
	0	Absorption of Water through Leaves	485
	0	Special Methods of Water Absorption	485
	0	Water Flow in Apoplast and Symplast	485
	J	Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech, Word) Type	
3,	TR	Short Answer (One Tech. Word) Type—Questions—Answers ANSLOCATION OF WATER (ASCENT OF SAP)	486-489
		introduction (ASCENT OF SAP)	490-497
		경우 : 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	490

☐ Xylem as Path of Water Conduction	
Theories to Account for the Mechanism of Ascent of Sap	490
(i) Vital Force Theories	490
(ii) Root Pressure Theory	491
(iii) Physical Force Theories	491
(Cohesion of Water and Transpiration Pull Theory)	
Important Questions for Revision (Long & Short Answer Type) :	492
the Column of th	
This wer (One rech. Word) Type—Questions—Answers	101 100
4. TRANSPIRATION AND GUTTATION (LOSS OF WATER BY PLANT	S) 498-512
	498
Mechanism of Transpiration from Leaves	499
Stomatal Transpiration Mechanism of St	499
Mechanism of Stomatal Opening and Closing Sugar-Starch Interconnection	501
Start Interconversion Theory	501
Transport and its Accumulation Theory	503
Scotoactive Stomata (Stomatal Opening in Succulent Plants)	503
Antitranspirants : Environmental Control of Stomatal Movement	&
Role of Abscisic Acid (ABA) as Antitranspirant	504
Periodicity of Opening and Closing of Stomata	504
Factors Affecting Opening and Closing of Stomata	505
Significance of Transpiration in Plant Life—	
"Transpiration As A Necessary Evil".	505
Factors Affecting Rate of Transpiration	506
Distinction Between Transpiration and Evaporation	507
Guttation	507
Important Questions for Revision (Long & Short Answer Type):	301
and the Choice, I'm Up the blanks Match the Cal	
Short Answer (One Tech. Word) Type—Questions-Answers 5. MINERAL NUTRITION	508-512
	513-528
☐ Mineral Nutrition	513
Essential Major Elements (Macro Nutrients)	515
Essential Trace Elements (Micro Nutrients)	516
Non-Essential Elements	
Toxic Effects of Mineral Elements	517
Deficiency Symptoms	517
Mode of Utilization of Mineral Elements in Plants	517
Application of Fertilizers and Manures	519
	519

7 34	그들은 사용하다 경에 이렇게 나왔다면 하는 이렇게 하는 하는 것이 하는 것이 하나 없어요.		
- IVI	Passing La Viere La V		521
(4	r assive ion Uptake		521
(11)	Active Ion Uptake (Salt Accumulation)		522
U M	echanism of Carrier-Mediated Active Ion Uptake		522
In M	inportant Questions for Revision (Long & Short Answer Type); bultiple Choice, Fill-Up the Blanks, Match the Columns & Very hort Answer (One Tech. Word) Type—Questions-Answers	524-	-528
6. GRO	WTH AND DEVELOPMENT	529_	
97780a	haracteristics of Plant Growth		529
White San	he Grand Period of Growth		529
proting .			530
0 6	actors Affecting Plant Growth mportant Questions for Revision (Long & Short Answer Type);		
— 11	Austrials Chairm Fill and the Plante & Match the Columns—		
	Multiple Choice : Fill-up the Blanks & Match the Columns—	532-	534
	Questions-Answers	535-	
	OWTH REGULATORS (PLANT-HORMONES)		535
green.	introduction of Growth Regulators (Plant Hormones)		535
William Committee	The Hormone Concept		536
	Auxins		
Marrie .	Physiological Roles of Auxins		536
	Applications of Auxins		536
	Gibberellins		540
	Cytokinins	5	542
	Growth Inhibitors : (A) Abscisic Acid (ABA) ; (B) Ethylene		543
	Hormonal Interrelationships and the Growth and Development of	Plant 5	545
I I	Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions—Answers	E 4.7 . F	
8. SEE	D GERMINATION AND DORMANCY	547—5	
O Se		551—5	
O Se	red Structure	5	551
prony	od Storage in the Seeds	5	552
	d Germination	5	52
at Texas		5	52
D Phys	ditions Required for Seed Germination	5	54
dust	siological Events and Mobilization of Food Reserves		
	ng Germination	5	55
Deed Deed	Dormancy and its Release	5	56
- Role (of Phytochrome in Seed Germination	5	58

Important Questions for 5	
Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions A	
Short Answer (One Tech Word) To the Columns & Very	
9. PHOTOPERIODISM, FLOWERING AND VERNALIS	559-561
Periodisin	562-567
☐ Critical Photoperiod	562
☐ Induction Period	563
Theory of Photoperiodic Action	563
Role of Phytochrome in Flowering	563
☐ Vernalization	563
Perception of Vernalization	564
Important Questions for Revision (Lange Cl.	565
Volte Iccli. Wold Ivne—Questions Angues	566-567
10. SENESCENCE, ABSCISSION AND DEATH	568-573
- introduction	. 568
Juvenility D. V.	568
U Maturity	569
Senescence (Ageing)	569
Control of Senescence Process in Plants	569
☐ Death	570
Abscission	570
Role of Ethylene in Senescence and Abscission	570
Important Questions for Revision (Long & Short Answer Type);	
Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	
Short Answer (One Tech. Word) Type—Questions-Answers 11. MOVEMENTS IN PLANTS	571-573
	574—583
☐ Introduction	574
☐ Movements of Locomotion	575
Movements of Curvature (Including Phototropism and Geotropism	
☐ Distinction Between Tactic, Tropistic and Nastic Movements	580
Important Questions for Revision (Long & Short Answer Type);	
Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	581-583
onor miswer (One reen, word) type guestions miswers	000
UNIT-III : BIOCHEMISTRY AND BIOTECHNOLOGY	1
1. ENZYMES	587-601
☐ Introduction	587
Chemical and IBU Classification of Enzymes	588

D. Lacobia of December 19 19 19 19	589
Location of Enzymes in Plant Cells	303
☐ Chemical Structure of Enzymes (General Structure ; Prosthetic Groups ; Holoenzymes ; Activators ; Cofactors or Coenzymes)	590
☐ Properties of Enzymes	591
Machanism of Farmers Astron (A Look and Key)	592
(ii) Active Site Model of Enzyme Action : Induced-fit Hypothesis	594
☐ Regulation of Enzyme Activity	595
☐ Factors Affecting Enzyme Reactions	597
Competitive and Non-Competitive Inhibitors	337
Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers	597—601 602—631
2. PHOTOSYNTHESIS	602
☐ Introduction	602
☐ Historical Background	604
Evidence for the Existence of Light and Dark Reactions	605
☐ Bacterial Photosynthesis	605
☐ Functional Relationship Between Light and Dark Reactions	605
☐ The Variety of Photosynthetic Organisms	606
☐ The Pigments of Photosynthesis	607, 608
Absorption Spectrum and Action Spectrum	608
☐ The Chloroplast	608
The Photosynthetic Process Ca Photosynthetic Pathway	616
- 4 motody numeric rational	617
CAM Photosynthesis Differences between Coand C. Plants	
Differences between C ₃ and C ₄ Plants Factors Affecting Photographesis	620
☐ Factors Affecting Photosynthesis ☐ Photorespiration and C ₂ Cycle	619
☐ Summary	620
☐ Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very	622
Short Answer (One Tech. Word) Type—Questions-Answers	623-631
CONCEPTS OF BIOTECHNOLOGY	632-638
☐ Introduction	632
☐ Biotechnology—An Interdisciplinary Science	632
Scope and Importance	632
Biotechnology In Fermentation	632
Biotechnology and Vaccines	633

Important Questions for Revision (Long & Short Answer Type);	
Multiple Choice : Fill-up the Blanks & Match the Columns—	
Questions-Answers	
4. GENETIC ENGINEERING	637-638
DNA Recombinant Technology	639-643
Clones and Cloning	639
☐ Gene Library	640
☐ Transgenic Plants	640
☐ Applications of Genetic Engineering	641
Important Questions for Revision (I s c)	642
Short Answer (One Tech. Word) Type—Questions-Answers	640 640
UNIT-IV : ENVIRONMENT	642-643
UNIT-IV : ENVIRONMENT, AGROBOTANY & FOREST	RY
1. ENVIRONMENTAL BIOLOGY : BIOTIC COMMUNITY	647-658
Biotic Community	647
Population Ecology	648
(i) Characteristics of Population	648
(ii) Population Density	649
(iii) Carrying Capacity Habitat and Facility	649
Habitat and Ecological Niche	
Ecotype, Ecad and Ecocline Dynamics of Plant C	649
Dynamics of Plant Community and Species Interactions Changes in a Community Plant	650
O o Committee Diam Diam C	651
Important Questions for Revision (Long & Short Answer Type); Multiple Choice, Fill-Up the Blanks, Match the Columns & Very Short Answer (One Tech. Word) Type—Questions-Answers 2. ECOLOGICAL ADAPTATIONS	652
2. ECOLOGICAL ADAPTATIONS	655-658
Adaptations of Hydrophytes	659-672
(a) Submerged Hydrophytes	659
(b) Free-floating Hydrophytes	659
(c) Amphibious Plante	661
Adaptations of Xerophytes	663
Ephemeral Annuals	664
Succulent Perennials	666
(d) Non-succulent Perennials	
- Pottant Questions 6	666
Important Questions for Revision (Long & Short Answer Type) : Questions-Answers Guestions-Answers	667

3. ACRICIA TOTAL	\$ ₄ .
3. AGRICULTURAL CROPS	673-677
Some Important crops	673
(i) Rice	673
(ii) Mung (Green Gram)	674
(iii) Ground Nut	674
(iv) Jute	674
☐ Important Questions for Revision (Long & Short Answer	r Type) ;
Multiple Choice ; Fill-up the Blanks & Match the Colum	ins-
Questions-Answers	675-677
4. AREAS OF GENETIC DIVERSITY, PLANT INTRODUCTIO	N,
CONSERVATION OF GERMPLASM & CROP IMPROVEME	
Areas of Genetic Diversity and Plant Introduction	678
Germplasm or Genetic Conservation	679
☐ New Crops	680
☐ Crop Improvement	680
☐ Important Questions for Revision (Long & Short Answer	Type);
Multiple Choice ; Fill-up the Blanks & Match the Colum	
Questions-Answers	683—684
5. FORESTRY	685690
☐ Forest Wealth—Forests and Forest Resources	685
☐ Importance and Minor and Major Products of Forests	686
☐ Deforestation	687
☐ Conservation of Forests	
☐ Important Questions for Revision (Long & Short Answer	688
Multiple Choice ; Fill-up the Blanks & Match the Colum	Type);
Questions-Answers	
	689—690
ANNEXURES	691—726
☐ Symbols and Abbreviations	
Some Important and Landmark Researches and	693—695
Works in the Field of Botany	
Detailed Glossary of Took	696-698
Detailed Glossary of Technical Terms Sample Examination D	699-724
Sample Examination Paper	725—726