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2018

**II PUC
BIOLOGY**

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Latest Syllabus
(Issued by Department of PUE, Karnataka)
BLOW UP SYLLABUS
II PUC BIOLOGY - Code No. 36

Column1	Column2	Column3	Column4	Column42	Column5	Column6
SUBJECT	CLASS	CODE	DEPARTMENT OF PU EDUCATION		ACADEMIC PROGRAM FOR THE YEAR 2018-19	
BIOLOGY	PUC II	36	<i>PUC (4 THEORY + 2 PRACTICE HOURS A WEEK)</i>	PRACTICE SESSIONS	PRACTICALS (1 CLASS OF 2 HOURS DURATION PER WEEK PER BATCH)	
DAY	DATE	DAY				
DAY 1	02-May-18	WEDNESDAY	Unit VI - Reproduction Chapter -1 : Reproduction in Organisms (5 Hours) - Life span, Reproduction, Types of Reproduction, Asexual reproduction (Budding, Binary fission, Fragmentation)			
DAY 2	3-May-18	THURSDAY	Asexual reproduction - Encystation and sporulation, Vegetative propagation			
DAY 3	04-May-18	FRIDAY	Sexual Reproduction - Phases of life span, Oesstrus and menstrual cycles, Continuous and seasonal breeders, Pre-fertilization events, (Gametogenesis)			
DAY 4	5-May-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5 M of topics covered this week from question bank		
DAY 5	06-May-18	SUNDAY				
DAY 6	7-May-18	MONDAY	Pre-fertilisation events (Sexuality in organisms, Cell division during gamete formation, Gamete Transfer)			
DAY 7	08-May-18	TUESDAY	Fertilization (External and internal fertilizations, Parthenogenesis), Post-fertilization events (The zygote, Embryogenesis)			

DAY 8	9-May-18	WEDNESDAY	Chapter 2 : Sexual Reproduction in Flowering Plants (10 Hours) - Flower– A Fascinating Organ of Angiosperms, Pre-fertilization : Structures and Events – The stamen			
DAY 9	10-May-18	THURSDAY		Selected questions of 1M, 2M, 3M & 5 M of topics covered this week from question bank		
DAY 10	11-May-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5 M of topics covered this week from question bank		
DAY 11	12-May-18	SATURDAY	ASSEMBLY ELECTION			
DAY 12	13-May-18	SUNDAY				
DAY 13	14-May-18	MONDAY	Structure of microsporangium		To study the reproductive parts of commonly available flowers	
DAY 14	15-May-18	TUESDAY	Microsporogenesis, Pollen grain			
DAY 15	16-May-18	WEDNESDAY	Pistil, Megasporangium (Ovule)			
DAY 16	17-May-18	THURSDAY	Megasporogenesis, Female gametophyte (Embryo sac)			
DAY 17	18-May-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 18	19-May-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 19	20-May-18	SUNDAY				
DAY 20	21-May-18	MONDAY	Pollination - Kinds of pollination, Agents of pollination (Pollination by wind, Pollination by water		To Calculate percentage of pollen germination	
DAY 21	22-May-18	TUESDAY	Agents of pollination (Pollination by biotic agents), Outbreeding devices			
DAY 22	23-May-18	WEDNESDAY	Pollen-pistill interaction, Artificial hybridisation, Double fertilisation			
DAY 23	24-May-18	THURSDAY	Post-fertilisation - Structures & events (Endosperm, Embryo)			

DAY 24	25-May-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 25	26-May-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 26	27-May-18	SUNDAY				
DAY 27	28-May-18	MONDAY	Post-fertilisation (Seed), Apomixis and Polyembryony		To study pollen tube growth on stigma	
DAY 28	29-May-18	TUESDAY	Chapter 3 : Human Reproduction (9 Hours) - The male reproductive system			
DAY 29	30-May-18	WEDNESDAY	The female reproductive system			
DAY 30	31-May-18	THURSDAY	Mammary glands, Gametogenesis (Spermatogenesis)			
DAY 31	01-Jun-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 32	2-Jun-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 33	03-Jun-18	SUNDAY				
DAY 34	4-Jun-18	MONDAY	Structure of human sperm		Preparation and study of mitosis in onion root tip	
DAY 35	05-Jun-18	TUESDAY	Oogenesis, Graafian follicle			
DAY 36	6-Jun-18	WEDNESDAY	Menstrual cycle			
DAY 37	07-Jun-18	THURSDAY	Fertilisation and implantation			
DAY 38	8-Jun-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 39	09-Jun-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 40	10-Jun-18	SUNDAY				
DAY 41	11-Jun-18	MONDAY	Pregnancy and embryonic development		Staining of nuclei acid by acetocarmine	
DAY 42	12-Jun-18	TUESDAY	Parturition and lactation			

DAY 43	13-Jun-18	WEDNESDAY	Chapter 4 : Reproductive Health (5 Hours) - Reproductive Health – Problems and Strategies			
DAY 44	14-Jun-18	THURSDAY	Population explosion and Birth control - Natural methods of birth control			
DAY 45	15-Jun-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 46	16-Jun-18	SATURDAY	RAMZAN			
DAY 47	17-Jun-18	SUNDAY				
DAY 48	18-Jun-18	MONDAY	Birth control methods (Barrier method, Intra-uterine devices, Contraceptive pills, Surgical method)		To study the discrete stages of gametogenesis in mammalian testis and ovary	
DAY 49	19-Jun-18	TUESDAY	Medical termination of pregnancy, Sexually transmitted diseases			
DAY 50	20-Jun-18	WEDNESDAY	Infertility - Assisted reproductive technologies			
DAY 51	21-Jun-18	THURSDAY	Unit VII - Genetics and Evolution Chapter 5 : Principles of Inheritance and Variation (12 Hours) - Introduction, Mendel's laws of inheritance, Contrasting traits studied by Mendel in pea			
DAY 52	22-Jun-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 53	23-Jun-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 54	24-Jun-18	SUNDAY				
DAY 55	25-Jun-18	MONDAY	Inheritance of one gene, Law of dominance and Law of segregation		Study of stages of meiosis using permanent slides	
DAY 56	26-Jun-18	TUESDAY	Incomplete dominance			
DAY 57	27-Jun-18	WEDNESDAY	Co-dominance, Pleiotropy, Polygenic inheritance			
DAY 58	28-Jun-18	THURSDAY	Inheritance of two genes			
DAY 59	29-Jun-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		

DAY 60	30-Jun-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 61	01-Jul-18	SUNDAY				
DAY 62	2-Jul-18	MONDAY	Inheritance of two genes (Continued), Law of independent assortment		To study and identify various stages of female gametophyte development in the ovary of a flower	
DAY 63	03-Jul-18	TUESDAY	Chromosomal theory of inheritance, Linkage & recombination			
DAY 64	4-Jul-18	WEDNESDAY	Sex determination - Early discoveries, Sex determination in grasshopper			
DAY 65	05-Jul-18	THURSDAY	Sex determination in humans, birds and honey bees			
DAY 66	6-Jul-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 67	07-Jul-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 68	8-Jul-18	SUNDAY				
DAY 69	09-Jul-18	MONDAY	Mutation, Genetic disorders - Pedigree analysis		To study the blastula stage of embryonic development in mammals with the help of permanent slide, chart, model or photograph	
DAY 70	10-Jul-18	TUESDAY	Mendelian disorders (Haemophilia, Colourblindness, Thalassemia)			
DAY 71	11-Jul-18	WEDNESDAY	Mendelian disorders (Sickle cell anaemia, Phenylketonuria), Chromosomal disorders (Down's syndrome, Klinefelter's syndrome, Turner's syndrome)			
DAY 72	12-Jul-18	THURSDAY	Chapter 6: Molecular Basis of Inheritance (12 Hours) - The DNA - Structure of polynucleotide chain			
DAY 73	13-Jul-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		

DAY 74	14-Jul-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 75	15-Jul-18	SUNDAY				
DAY 76	16-Jul-18	MONDAY	Packaging of DNA helix		To perform emasculation, bagging and tagging for controlled pollination	
DAY 77	17-Jul-18	TUESDAY	The Search for Genetic Material – Transforming principle, Biochemical characterisation of transforming principle			
DAY 78	18-Jul-18	WEDNESDAY	The genetic material is DNA (Hershey & Chase experiment), Properties of genetic material (DNA versus RNA), RNA World			
DAY 79	19-Jul-18	THURSDAY	1st Test			
DAY 80	20-Jul-18	FRIDAY	1st Test			1 TEST
DAY 81	21-Jul-18	SATURDAY	1st Test			
DAY 82	22-Jul-18	SUNDAY				
DAY 83	23-Jul-18	MONDAY	Replication – The experimental proof (Messelson and Stahl experiment)		To verify Mendel's law of segregation	
DAY 84	24-Jul-18	TUESDAY	The machinery and the enzymes, Transcription - Transcription unit			
DAY 85	25-Jul-18	WEDNESDAY	Transcription unit and the gene, Types of RNA and the process of transcription			
DAY 86	26-Jul-18	THURSDAY	Genetic Code – Mutations and genetic code, t-RNA – the adapter molecule			
DAY 87	27-Jul-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 88	28-Jul-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 89	29-Jul-18	SUNDAY				
DAY 90	30-Jul-18	MONDAY	Translation		To verify Mendel's law of independent assortment	
DAY 91	31-Jul-18	TUESDAY	Regulation of Gene Expression - The Lac-operon			

DAY 92	1-Aug-18	WEDNESDAY	Human Genome Project - Goals of HGP, Methodologies, Salient features of human genome			
DAY 93	02-Aug-18	THURSDAY	HGP (Applications and future challenges), DNA fingerprinting			
DAY 94	3-Aug-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 95	04-Aug-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 96	5-Aug-18	SUNDAY				
DAY 97	06-Aug-18	MONDAY	Ch 7 : Evolution (6 Hours) – Origin of Life, Evolution of Life Forms – A Theory, Big Bang theory, Panspermia, Theory of spontaneous generation, Biogenesis		Preparation and analysis of pedigree charts	
DAY 98	7-Aug-18	TUESDAY	Chemical evolution theory, Stanley Miller's experiment			
DAY 99	08-Aug-18	WEDNESDAY	What are the Evidences for Evolution ? – Paleontological evidence, Comparative anatomy and morphology, Embryological evidence for evolution, Biochemical evidence, Natural selection of dark winged moths after industrialization in England, Evolution by anthropogenic actions (Pesticide and herbicide resistant varieties, Antibiotic / drug resistant pathogens)			
DAY 100	9-Aug-18	THURSDAY	What is Adaptive Radiation ?, Biological Evolution			
DAY 101	10-Aug-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 102	11-Aug-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 103	12-Aug-18	SUNDAY				

DAY 104	13-Aug-18	MONDAY	Mechanism of Evolution, Hardy – Weinberg Principle : Gene flow (Gene migration), Genetic drift and Founder's effect, Sexual reproduction (Genetic recombination), Mutation, Natural selection		To study common disease causing organisms and the symptoms of the diseases	
DAY 105	14-Aug-18	TUESDAY	Brief Account of Evolution, Origin and Evolution of Man : Dryopithecus, Ramapithecus, Australopithecus, Homo habilis, Homo erectus, Neanderthal man, Homo sapiens			
DAY 106	15-Aug-18	WEDNESDAY	INDEPENDENCE DAY			
DAY 107	16-Aug-18	THURSDAY	Unit VIII - Biology In Human Welfare Chapter 8 : Human Health and Diseases (10 Hours) - Common diseases in humans – Health, Infectious and non-infectious diseases, Pathogen, Typhoid, Pneumonia, Common cold			
DAY 108	17-Aug-18	FRIDAY	Malaria, Amoebiasis, Ascariasis, Filariasis, Ringworm, Prevention and control measures			
DAY 109	18-Aug-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 110	19-Aug-18	SUNDAY				
DAY 111	20-Aug-18	MONDAY	Immunity – Innate immunity (Physical barriers, Physiological barriers, Cellular barriers, Cytokine barriers)		Study of homologous and analogous organs in plants and animals	
DAY 112	21-Aug-18	TUESDAY	Acquired immunity (Humoral immunity, Cell mediated immunity, Antibody structure)			
DAY 113	22-Aug-18	WEDNESDAY	BAKRID			
DAY 114	23-Aug-18	THURSDAY	Active and passive immunity, Vaccination and immunization, Allergies, Autoimmunity			
DAY 115	24-Aug-18	FRIDAY	Immune system of the body (Bone marrow, Thymus, Spleen, Lymphoid tissue)			

DAY 116	25-Aug-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 117	26-Aug-18	SUNDAY				
DAY 118	27-Aug-18	MONDAY	AIDS – Causes, HIV replication, Symptoms, Diagnostic test, Prevention of AIDS		To study the ecological adaptations in plants living in xeric and hydric conditions	
DAY 119	28-Aug-18	TUESDAY	Cancer – Definition, Types (Benign and malignant), Causes of cancer, Cancer detection and diagnosis, Treatment of cancer			
DAY 120	29-Aug-18	WEDNESDAY	Drugs and Alcohol Abuse – Opioids (including morphine structure), Cannabinoids (Including its structure), Cocaine, Hallucinogens, Sedatives, Smoking (Chemical composition and effects of tobacco smoke)			
DAY 121	30-Aug-18	THURSDAY	Adolescence and drug abuse, Addiction and Dependence (including withdrawal symptoms), Effects of drug / alcohol abuse, Prevention and Control			
DAY 122	31-Aug-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 123	01-Sep-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 124	2-Sep-18	SUNDAY				
DAY 125	03-Sep-18	MONDAY	Chapter 9 : Strategies for Enhancement in Food Production (9 Hours) – Animal Husbandry – Management of farms and farm animals (Dairy farm management, Poultry farm management)		To study the ecological adaptations in animals living in xeric and hydric conditions	
DAY 126	4-Sep-18	TUESDAY	Animal breeding (inbreeding, inbreeding depression, Outbreeding, Outcrossing)			
DAY 127	05-Sep-18	WEDNESDAY	Cross breeding, Inter-specific hybridization, Controlled breeding – Artificial insemination and MOET)			
DAY 128	6-Sep-18	THURSDAY	Bee-keeping, Fisheries			

DAY 129	07-Sep-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 130	8-Sep-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 131	09-Sep-18	SUNDAY				
DAY 132	10-Sep-18	MONDAY	Mid term Exam			
DAY 133	11-Sep-18	TUESDAY	Mid term Exam			
DAY 134	12-Sep-18	WEDNESDAY	Mid term Exam			
DAY 135	13-Sep-18	THURSDAY	GANESH CHATURTHI			
DAY 136	14-Sep-18	FRIDAY	Mid term Exam			
DAY 137	15-Sep-18	SATURDAY	Mid term Exam			MID TERM
DAY 138	16-Sep-18	SUNDAY				
DAY 139	17-Sep-18	MONDAY	Mid term Exam			
DAY 140	18-Sep-18	TUESDAY	Mid term Exam			
DAY 141	19-Sep-18	WEDNESDAY	Mid term Exam			
DAY 142	20-Sep-18	THURSDAY	Mid term Exam			
DAY 143	21-Sep-18	FRIDAY	LAST DAY OF MOHARRUM			
DAY 144	22-Sep-18	SATURDAY	Plant Breeding – What is plant breeding (Steps in breeding to be explained)			
DAY 145	23-Sep-18	SUNDAY				
DAY 146	24-Sep-18	MONDAY	Green revolution – Wheat, Rice, Sugarcane and Millets		To determine the pH of different water and soil samples	
DAY 147	25-Sep-18	TUESDAY	Plant breeding for disease resistance (Methods of breeding for disease resistance – Selection Hybridization and Mutation with examples), Plant breeding for developing resistance to insect pests			
DAY 148	26-Sep-18	WEDNESDAY	Plant breeding for improving food quality (Biofortification) 9.3 Single Cell Protein			
DAY 149	27-Sep-18	THURSDAY	Tissue Culture – Totipotency, Explant, Micropropagation, Some clones, Meristem culture, Somatic hybridization, Somatic hybrids			

DAY 150	28-Sep-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 151	29-Sep-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 152	30-Sep-18	SUNDAY				
DAY 153	01-Oct-18	MONDAY	Chapter 10 : Microbes in Human Welfare (6 Hours) – Microbes in Household Products – Curds, Doughening, Toddy, Cheese, Microbes in industrial Products (Fermented beverages)		To study the texture of soil samples	
DAY 154	2-Oct-18	TUESDAY	MAHATHMA GANDHI JAYANTHI			
DAY 155	03-Oct-18	WEDNESDAY	Microbes in Industrial Products (Antibodies, Chemicals, Enzymes and other Bio-active molecules)			
DAY 156	4-Oct-18	THURSDAY	Microbes in Sewage Treatment – Primary treatment, Secondary treatment and BOD concept, Ganga Action Plan (To be mentioned), Yamuna Action Plan (To be mentioned)			
DAY 157	05-Oct-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 158	6-Oct-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 159	07-Oct-18	SUNDAY				
DAY 160	8-Oct-18	MONDAY	MAHALAYA AMMAVASYA			
DAY 161	09-Oct-18	TUESDAY	Microbes in Production of Biogas (Including a typical biogas plant)		To determine the water-holding capacity of soils	
DAY 162	10-Oct-18	WEDNESDAY	Microbes as Biocontrol Agents – Biological control of pests and disease			
DAY 163	11-Oct-18	THURSDAY	Microbes as Biofertilisers – Symbiotic and non-symbiotic bacteria, Mycorrhiza, Cyanobacteria			

DAY 164	12-Oct-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 165	13-Oct-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 166	14-Oct-18	SUNDAY				
DAY 167	15-Oct-18	MONDAY				
DAY 168	16-Oct-18	TUESDAY				
DAY 169	17-Oct-18	WEDNESDAY				
DAY 170	18-Oct-18	THURSDAY	MAHANAVAMI			
DAY 171	19-Oct-18	FRIDAY	VIJAYADASHMI			
DAY 172	20-Oct-18	SATURDAY				
DAY 173	21-Oct-18	SUNDAY				MID TERM
DAY 174	22-Oct-18	MONDAY				
DAY 175	23-Oct-18	TUESDAY				VACATION
DAY 176	24-Oct-18	WEDNESDAY	VALMIKI JAYANTHI			
DAY 177	25-Oct-18	THURSDAY				
DAY 178	26-Oct-18	FRIDAY				
DAY 179	27-Oct-18	SATURDAY				
DAY 180	28-Oct-18	SUNDAY				
DAY 181	29-Oct-18	MONDAY	UNIT IX - BIOTECHNOLOGY Chapter 11 : Biotechnology : principles and Processes (7 Hours) – Principles of Biotechnology - Introduction, Early discoveries		To study turbidity of water samples	
DAY 182	30-Oct-18	TUESDAY	Tools of Recombinant DNA Technology (Restriction enzymes)			
DAY 183	31-Oct-18	WEDNESDAY	Tools of Recombinant DNA Technology (Cloning vectors)			
DAY 184	1-Nov-18	THURSDAY	KANNADA RAJYOTHSAVA			
DAY 185	02-Nov-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		

DAY 186	3-Nov-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 187	04-Nov-18	SUNDAY				
DAY 188	5-Nov-18	MONDAY	Tools of Recombinant DNA Technology (Competent host for transformation with recombinant DNA)		To analyse living organisms in water samples	
DAY 189	06-Nov-18	TUESDAY	NARAKA CHATURDASHI			
DAY 190	7-Nov-18	WEDNESDAY	Processes of Recombinant DNA Technology (Isolation of the genetic material - DNA, Cutting of DNA at specific locations)			
DAY 191	08-Nov-18	THURSDAY	BALIPADYAMI DEEPAWALI			
DAY 192	9-Nov-18	FRIDAY	Processes of Recombination DNA Technology (Amplification of gene of interest using PCR, Insertion of recombinant DNA into the host cell/organism)			
DAY 193	10-Nov-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 194	11-Nov-18	SUNDAY				
DAY 195	12-Nov-18	MONDAY	Processes of Recombinant DNA Technology (Obtaining the foreign gene product, Downstream processing)		To study plant population density by quadrat method	
DAY 196	13-Nov-18	TUESDAY	Chapter 12 : Biotechnology and its Applications (5 Hours) – Biotechnological Applications in Agriculture (Benefits of GMOs, Bt cotton)			
DAY 197	14-Nov-18	WEDNESDAY	Biotechnological Applications in Agriculture (Pest resistant plants–RNA interference), Biotechnological Applications in Medicine (Genetically engineered insulin)			
DAY 198	15-Nov-18	THURSDAY	Biotechnological Applications in Medicine (Gene therapy, Molecular diagnosis)			

DAY 199	16-Nov-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 200	17-Nov-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 201	18-Nov-18	SUNDAY				
DAY 202	19-Nov-18	MONDAY	Transgenic Animals – Common reasons for producing transgenic animals		To study plant population frequency by quadrat method	
DAY 203	20-Nov-18	TUESDAY	Ethical Issues (With a note on biopiracy)			
DAY 204	21-Nov-18	WEDNESDAY	EID MILAD			
DAY 205	22-Nov-18	THURSDAY	UNIT X – ECOLOGY Chapter 13 : Organisms and Populations (7 Hours) - Organisms and its environment - Major abiotic factors (Temperature, Light, Water, Soil), Responses to abiotic factors (Regulate, Conform, Migrate, Suspend)			
DAY 206	23-Nov-18	FRIDAY	Adaptations			
DAY 207	24-Nov-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 208	25-Nov-18	SUNDAY				
DAY 209	26-Nov-18	MONDAY	KANAKADAS JAYANTHI			
DAY 210	27-Nov-18	TUESDAY	Populations – Population attributes (Birth rate, Death rate, Sex ration, Age sdistribution), Population density		to determine the amount of Suspended particulate Matter (SPM) in air at different sites in a city	
DAY 211	28-Nov-18	WEDNESDAY	Population growth (Natality, Mortality, Immigration, Emigration), Growth models (Exonential growth, Logistic growth)			
DAY 212	29-Nov-18	THURSDAY	Life history variations, Population Interactions (Predation)			
DAY 213	30-Nov-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		

DAY 214	1-Dec-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 215	02-Dec-18	SUNDAY				
DAY 216	3-Dec-18	MONDAY	Population Interactions (Competition, Parasitism)			
DAY 217	04-Dec-18	T U E S + C - 128DAY+C143	Population Interactions (Commensalism, Mutualism, Sexual deceit in Ophrys, Definition of amensalism)			
DAY 218	5-Dec-18	WEDNESDAY	Chapter 14 : Ecosystem (6½ Hours) - Ecosystem - Structure and function, Productivity			
DAY 219	06-Dec-18	THURSDAY	2nd Test			
DAY 220	7-Dec-18	FRIDAY	2nd Test			2 TEST
DAY 221	08-Dec-18	SATURDAY	2nd Test			
DAY 222	9-Dec-18	SUNDAY				
DAY 223	10-Dec-18	MONDAY	Decomposition			
DAY 224	11-Dec-18	TUESDAY	Energy flow – Producers, Consumers, Decomposers, Food chain (Grazing and Detritus food chains), Trophic levels, Food web, Standing crop)			
DAY 225	12-Dec-18	WEDNESDAY	Ecological pyramids – Erect and Inverted pyramids, Pyramids of number, energy and biomass)			
DAY 226	13-Dec-18	THURSDAY	Ecological succession – Pioneer species, Sere, Climax community, Primary succession, Secondary succession, Succession of plants (Hydrarch and Xerarch successions)			
DAY 227	14-Dec-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 228	15-Dec-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 229	16-Dec-18	SUNDAY				

DAY 230	17-Dec-18	MONDAY	Nutrient cycling – Ecosystem - Carbon cycle, Ecosystem-Phosphorus cycle			
DAY 231	18-Dec-18	TUESDAY	Ecosystem Services Chapter 15 : Biodiversity and Conservation (3½ Hours) - Biodiversity – Genetic diversity, Species diversity, Ecological diversity			
DAY 232	19-Dec-18	WEDNESDAY	How many species are there on earth and how many in India ?, Patterns of biodiversity (Latitudinal gradients, Species-Area relationships)			
DAY 233	20-Dec-18	THURSDAY	The importance of species diversity to the ecosystem, Loss of biodiversity, Causes of biodiversity losses (habitat loss and fragmentation, Over-exploitation, Alien species invasion, Co-extinction)			
DAY 234	21-Dec-18	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 235	22-Dec-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 236	23-Dec-18	SUNDAY				
DAY 237	24-Dec-18	MONDAY	Biodiversity conservation – Why should we conserve biodiversity ? (Narrowly utilitarian, Broadly utilitarian and Ethical reasons), How do we conserve biodiversity ? (Endemism, Biodiversity hotspots, In-situ conservation, Ex-situ conservation, Sacred groves, The Earth Summit)		Preparatory Practical Exam	
DAY 238	25-Dec-18	TUESDAY	CHRISTMAS			
DAY 239	26-Dec-18	WEDNESDAY	Chapter 16 : Environmental Issues (7 Hours) : Air pollution and its Control – Controlling vehicular air pollution : A case study of Delhi		Preparatory Practical Exam	

DAY 240	27-Dec-18	THURSDAY	Water pollution and its Control – Domestic sewage and industrial effluents, Algal bloom, BOD, Biomagnification, Eutrophication, Cultural / Accelerated eutrophication, A case study of Integrated waste water treatment		Preparatory Practical Exam	
DAY 241	28-Dec-18	FRIDAY	Solid Wastes – Municipal solid waste, e-wastes, Sanitary landfills, A case study of remedy for plastic waste (Polyblend)		Preparatory Practical Exam	
DAY 242	29-Dec-18	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank	Preparatory Practical Exam	
DAY 243	30-Dec-18	SUNDAY				
DAY 244	31-Dec-18	MONDAY	Agrochemicals and their Effects – A case study of organic farming, Radioactive wastes		Preparatory Practical Exam	
DAY 245	01-Jan-19	TUESDAY	Greenhouse Effect and Global Warming			
DAY 246	2-Jan-19	WEDNESDAY	Ozone Depletion in the Stratosphere – Montreal Protocol			
DAY 247	03-Jan-19	THURSDAY	Degradation by Improper Resource Utilization and Maintenance – Soil erosion and desertification, Water logging and soil salinity 16.9. Deforestation – Slash and burn agriculture (Jhum cultivation), Reforestation, A case study of people's participation in conservation of forests, Chipko movement, Joint Forest Management (JFM)			
DAY 248	4-Jan-19	FRIDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 249	05-Jan-19	SATURDAY		Selected questions of 1M, 2M, 3M & 5M of topics covered this week from question bank		
DAY 250	6-Jan-19	SUNDAY				

**SOLVED
PAPER**

**II PUC
March-2018**

**Biology
Subject Code
36(N/S)**

Time : 3 hrs 15 min

Max. Marks : 70

Instructions :

- (1) This question paper consists of four **Parts–A, B, C and D. Part – D** consists of two Sections. **Section – I** and **Section – II**.
- (2) All the parts are compulsory.
- (3) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks.

PART - A

Answer the following questions in one word or in one sentence each :

10 × 1 = 10

1. What is Implantation?
2. Write the restriction site of EcoRI enzyme.
3. Define "Totipotency".
4. Mention the role of Methanobacterium in rumen of cattle.
5. What is Foetal Ejection Reflux?
6. Define "Saltation".
7. Name the type of antibodies produced during allergy.
8. What are Eurythermal organisms?
9. Define Biomagnification.
10. Write the name of toxic substance responsible for fever and chill in Malaria.

PART - B

Answer any five of the following questions in 3 to 5 sentences each, wherever applicable :

5 × 2 = 10

11. What are homogametes and heterogametes?
12. Mention any two examples of evolution by anthropogenic action.
13. Distinguish between homozygous and heterozygous plants.
14. What is Innate Immunity? Mention any two types of Innate immunity barriers.
15. Which are the Important components of Poultry Farm Management?
16. Write the methods to introduce alien DNA into Host cells.
17. Define Endemism. Name any two regions of accelerated habitat loss in India.
18. Invasion of alien animal species eliminates the native animal species – Give two examples.

PART - C

Answer any five of the following questions in about 40 to 80 words each, wherever applicable :

5 × 3 = 15

19. Mention the vegetative propagules of the following plants :
 - (a) Water Hyacinth 1
 - (b) Agave 1
 - (c) Banana 1
20. Draw a neat labelled diagram of T.S. of Young Anther.
21. Describe Haplodiploid sex determination system in Honey Bees.
22. State Hardy- Weinberg Principle of genetic equilibrium. Write any four factors affecting the equilibrium.
23. Write a short note on ecosystem services.
24. Sketch the diagrammatic representation of Replication of Retrovirus inside an animal cell.
25. What is Ecological succession? How Hydrarch succession is different from Xerarch succession?
26. Draw a neat labelled diagram of plasmid pBR322.

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PART - D**SECTION - I**

Answer any four of the following questions in about 200 to 250 words each, wherever applicable :

4 × 5 = 20

27. Draw and describe the structure of a matured embryo sac of angiosperms.
28. Draw a neat labelled, diagrammatic sectional view of female reproductive system.
29. Explain the inheritance of one gene with reference to stem height of Garden Pea Plant.
30. (a) What are the features of an ideal contraceptive? 2
(b) Mention the natural methods of contraception. 3
31. Explain the following terms :
 - (a) Inbreeding depression 1
 - (b) Inter specific hybridisation 1
 - (c) Biofortification 1
 - (d) Micropropagation 1
 - (e) Somaclones 1
32. Explain the regulation of Lac operon in absence and presence of Lactose as an Inducer.

SECTION - II

Answer any three of the following questions in about 200 to 250 words each, wherever applicable :

3 × 5 = 15

33. Oswald Avery and others have continued Griffith's transforming principle to prove DNA as genetic material-Substantiate.
34. Describe the role of Microbes in sewage treatment plant.
35. One of the applications of biotechnology is to get pest resistant plants – Justify the statement with reference to Bt. cotton.
36. (a) What are Ectoparasites and Endoparasites? 2
(b) List any three parasitic adaptations in animals. 3
37. Write a note on the following :
 - (a) Radio active wastes 3
 - (b) Joint forest management. 2

••

SOLUTIONS

As Per Scheme of Valuation

(Issued by Department of PUE, Karnataka)

PART - A

1. Blastocyst embedded in endometrium of uterus\attachment of blastocyst to uterus.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Implantation is the process in which blastocyst is embedded in endometrium of uterus/attachment of blastocyst to uterus.

2. 5'-GAATTC- 3' (or) 5'-GAATTC-3'
3'-CTTAAG-5'

1

3. Capacity to generate a whole plant from any cell/explant.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Totipotency is the ability of a cell or explant to divide and generate a whole plant or an organism. For *e.g.* Spores, zygote.

4. Helping in breaking down of cellulose.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Methanobacterium helps in digestion of cellulose and cellobiose into small chain fatty acids by the process of fermentation in the rumen of cattle.

5. The signals for parturition originates from fully developed foetus and the placenta which induce mild uterine contractions.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Foetal ejection reflex are mild uterine contractions generated by placenta when the foetus is fully developed, at the time of parturition.

6. Single step large mutation causing speciation.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Salutation is defined as single step large mutation which leads to speciation.

7. Ig E

[Scheme of Valuation, 2018] 1

Detailed Answer :

Antibody IgE is produced during Allergic reactions and helminthic reactions.

8. Organisms, tolerating and thriving in a wide range of temperature.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Eurythermal organisms are those organisms which can tolerate a wide range of temperature. Eg. Dog, Cat.

9. Increase in concentration of the toxicant at successive trophic levels.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Biomagnification is the term used for increase in concentration of the toxicant at successive trophic levels.

10. Haemozoin.

[Scheme of Valuation, 2018] 1

Detailed Answer :

Haemozoin is the toxin produced during Erythrocytic schizogony and ruptured RBC's.

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PART - B

11. • **Homogametes** : Two gametes similar in appearance. 1
 • **Heterogametes** : Gametes are of two different\distinct types\morphologically different types. 1
12. • Herbicide, pesticide resistant varieties.
 • Antibiotic\drug resistant organisms\cell.
 • White winged-dark winged\melanised moth.

(Any two)
 [Scheme of Valuation, 2018] 1 × 2

Detailed Answer :

- (i) Over use of weedicides and pesticides have resulted into evolution.
 (ii) Overuse of DDT, to kill mosquitoes had ultimately resulted into evolution of DDT resistant mosquito.
 (iii) Industrialisation, dark coloured moth able to hide them in dark background and white moth became vulnerable.

13.

Homozygous Plant	Heterozygous plant
Plants having identical pairs of alleles/allelic pair of genes/similar alleles.	Hybrid plants having alleles expressing contrasting traits/dissimilar alleles.

14. Non specific body defence present at the time of birth. Physical barriers, physiological barriers, cellular barriers, cytokine barriers.
 [Scheme of Valuation, 2018] 1+1

Detailed Answer :

Innate immunity is a type of immunity which is present right from the birth. It is also known as non-specific/ Natural immunity.

It includes Immunity Barrier's such as Physical, physiological, cellular, cytokine.

15. • Selection of disease free and suitable breed.
 • Proper and safe farm conditions.
 • Proper feed and water.
 • Hygiene and health care. ½ × 4
16. • Heat shock method.
 • Microinjection.
 • Biolistic / gene gun method.
 • Disarmed pathogen vectors. 2
17. Phenomenon of a species being confined to a particular area and not found anywhere else. 1
 • Western ghats and Srilanka.
 • Indo Burma region.
 • Himalaya.
 [Scheme of Valuation, 2018] 1

Detailed Answer :

Endemism is the ecological phenomenon of a species being confined to a defined geographical area and not found anywhere else. Eg. Western Ghats and Srilanka, Indo Burma region, Himalaya.

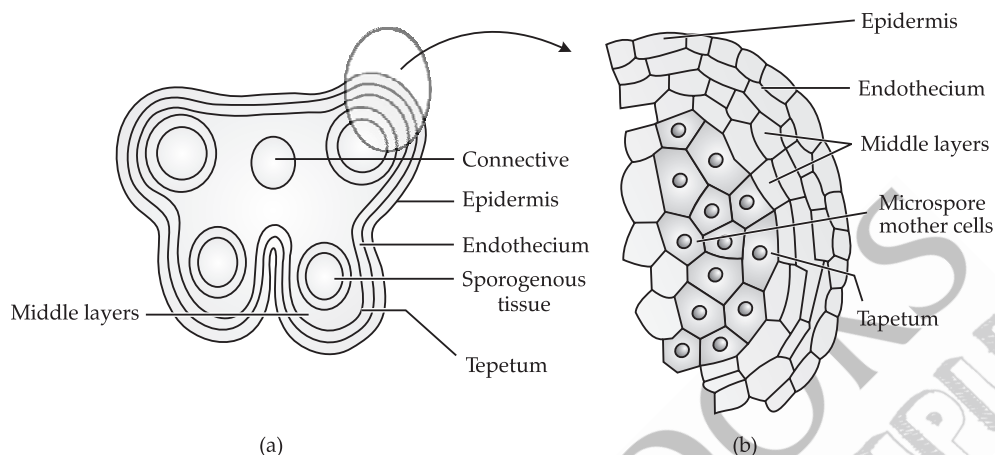
18. • Nile perch introduced into Lake Victoria in East Africa led extinction of more than 200 species of Cichlid fishes. 1
 • Illegal introduction of African Cat fish *Clarias gariepinus* for aqua culture threat to the indigenous Cat fishes of our rivers. 1

PART - C

19. (a) Water Hyacinth - Offset 1
 (b) Agave – Bulbil 1
 (c) Banana - Rhizome 1

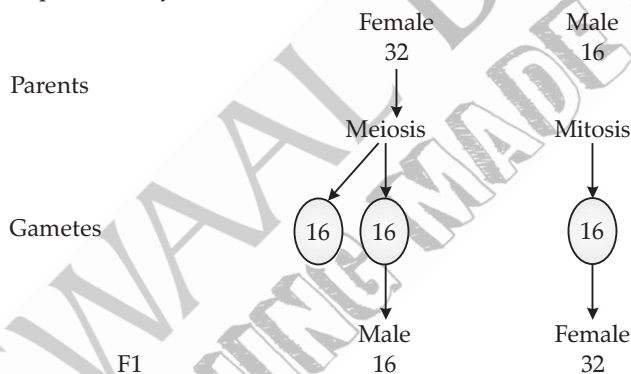
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20.



21. Offsprings formed from union of sperm and egg develops female or queen, unfertilised egg develops male (drones) by parthenogenesis. 3

Females are diploid having 32 chromosomes, produce eggs by meiosis. Whereas, males are haploid having 16 chromosomes, sperms are produced by mitosis. 1



22. Allele frequencies in a population are stable and constant from generation to generation. The gene pool (total number of genes and their alleles in a population) remains constant. 1
- [Scheme of Valuation, 2018] 1+2**

Detailed Answer :

The Hardy Weinberg Principle of genetic equilibrium states that "The relative frequencies of various kinds of genes in a large and randomly mating sexual panmictic population tend to remain constant from generation to generation in the absence of mutation, selection, and gene flow. This is called Hardy – Weinberg principle. Gene migration or Gene flow, genetic drift, mutation, genetic recombination, natural selection.

23. • Ecosystem services-healthy ecosystems are the base for a wide range of economic, environmental and aesthetic goods and services—healthy forest ecosystem purify air and water-mitigate droughts and floods-cycle nutrients-generate fertile soils.
- Provide wild life habitat, maintain biodiversity, pollinate crops.
- Provide storage site for carbon, aesthetic, cultural and spiritual values. **[Scheme of Valuation, 2018] 1+1+1**

Detailed Answer :

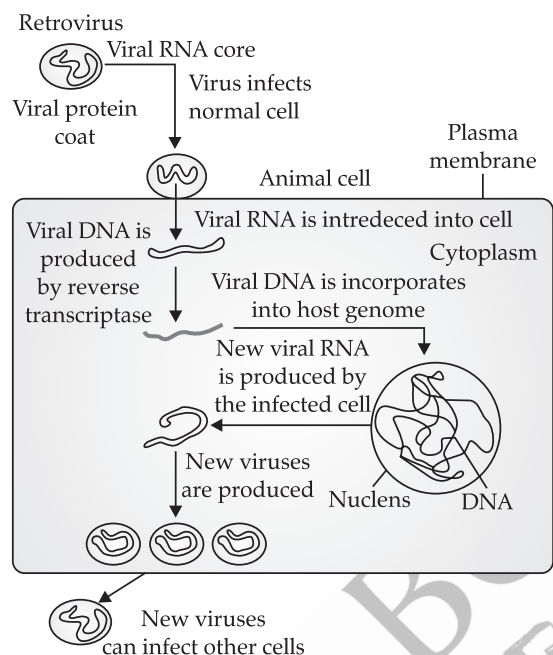
Ecosystem services or Healthy Ecosystems are the base for a wide range of economic, environmental and aesthetic goods. Healthy forest ecosystem helps in purification of air and water. It also maintains biodiversity and biomass, decomposition of wastes, increases soil fertility and vegetation generation.

It helps in pollination of crops along with seeds dispersal and natural vegetation, ground water recharge through wetlands.

It also helps in Green house mitigation and add aesthetic, cultural, and spiritual values. These services come from ecosystems made up of a combination of soil, animals, plants, water and air.

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24.



3

25. Ecological succession is the gradual and fairly predictable change in the species composition of a given area. 1

Hydrarch succession-takes place in wetter areas and successional series progress from hydric to mesic conditions. 1

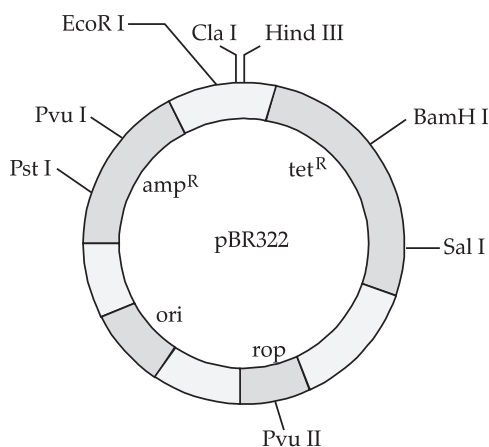
Xerarch succession takes place in dry areas and successional series progress from xeric to mesic conditions. 1

[Scheme of Valuation, 2018] 3

Detailed Answer :

	Hydrarch succession	Xerarch Succession
1.	Ecological succession that starts in water bodies and proceeds to mesic condition is called Hydrarch succession	Ecological succession that starts with bansen rocks condition and proceeds to mesic condition is called Xerarch succession
2.	Changes occurs as follows : Phytoplankton stage → submerged plant stage → submerged free floating plant stage → reed swamp stage → marsh meadow stage → shrub stage → forest (Climax Community)	Changes occurs as follows : Bare rock → lichen mass stage → annual herb stage → perennial herb stage → shrub stage → forest (Climax community)

26.

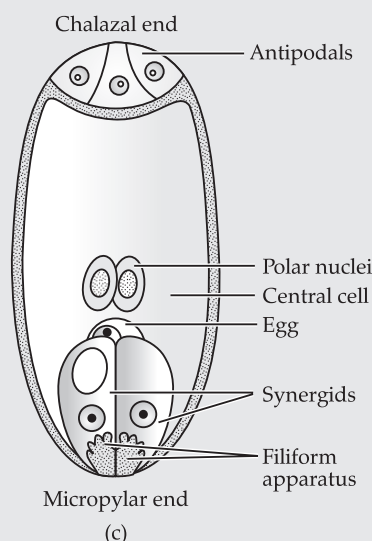


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2

PART - D**SECTION - I**

27.

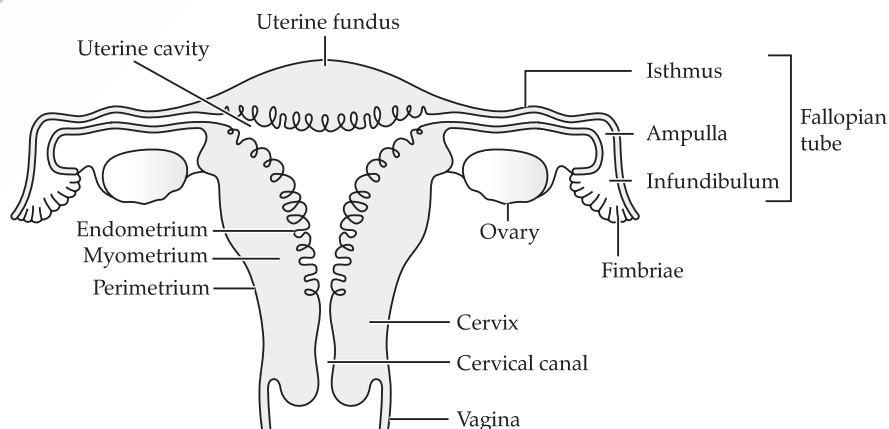
**Description of Embryo sac...**

- 3 cells grouped together at micropylar end constituting egg apparatus, 2 synergids and egg.
- Synergids having filiform apparatus guiding the entry of pollen tube into it.
- 3 cells at chalazal end-antipodals.
- Large central cell with 2 polar nuclei, 8 nucleated, 7 celled embryo sac.

[Scheme of Valuation, 2018] 3+2**Detailed Answer :**

- At the micropylar end, three nuclei differentiate into two synergids and one egg cell. Together they are known as egg apparatus.
- The synergids have special cellular thickenings at the micropylar tip. These are together called the filiform apparatus. It helps to guide the pollen tubes into the synergid.
- Similarly, at the chalazal end, three out of the four nuclei differentiate as antipodal cells.
- The remaining two cells (of the micropylar end and the chalazal end) move towards the center and are known as polar nuclei, which are situated in a large central cell.
- Hence, at maturity, a typical mature angiosperm embryo sac (the female gametophyte) appears as a 7-celled structure, though it has 8-nucleate.

28.



5

29. Mendel crossed a true breeding tall pea plant with a true breeding dwarf plant. All the offspring in F-1 generation were tall indicating that tallness is dominant over dwarf.

 $\frac{1}{2}$

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He allowed F-1 tall plants for self pollination. In F-2 both tall and dwarf plants were produced in the ratio 3 : 1. ½

Re-appearance of dwarf character in F-2 generation indicates that alleles for tallness and dwarf character have segregated during gamete formation. ½

Parents phenotype-Pure Tall X Pure Dwarf ½

Genotypes TT tt

Gametes



F1 hybrid

Tt - All tall

F1 Selfed

Tt x Tt



F-2

	T	t
T	TT Tall	Tt Tall
t	Tt Tall	tt Dwarf

Genotypic ratio TT : Tt : tt
1 : 2 : 1

Phenotypic ratio : Tall : Dwarf
3 : 1

(Detailed explanation with genotypic and phenotypic ratios 5 marks)

30. (a) • User friendly.
• Easily available.
• Effective and reversible with no or less side effects.
• Should not interfere with sexual desire and sexual act of user.
- (b) • Periodic abstinence.
• Withdrawal method/coitus interruptus
• Lactational amenorrhea

½ mark each (2)

1 mark each (3)

31. (a) **Inbreeding depression** : Continued inbreeding especially close inbreeding reduces fertility and productivity is called inbreeding depression. 1
- (b) **Interspecific hybridisation** : Male and female animals of two different related species are mated to combine desirable features. 1
- (c) **Biofortification** : Breeding crops with higher levels of vitamins and minerals or higher protein and healthier fats to improve public health. 1
- (d) **Micropropagation** : Method of producing thousands of plants through tissue culture. 1
- (e) **Somaclones** : Plants grown from micro-propagation which are genetically identical to the original plant from which they were grown. 1

[Scheme of Valuation, 2018] 5

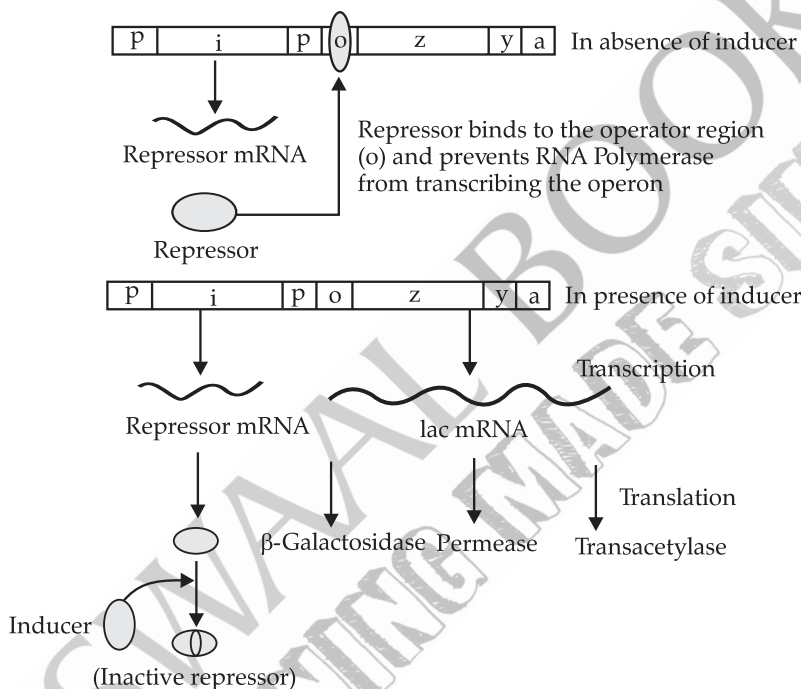
Detailed Answer :

- (a) **Inbreeding depression** : Continued inbreeding leads to reduced fertility and even productivity which is known as inbreeding depression. In this condition, the selected animals of the breeding population should be mated with superior animals of the same breed.

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- (b) **Interspecific hybridisation** : In interspecific hybridization, male and female animals of two different species are mated. The progeny obtained from such a mating are usually different from both the parental species.
- (c) **Biofortification** : Breeding crops with higher levels of vitamins and minerals or higher protein and healthier fats to improve public health. **1**
- (d) **Micropropagation** : Micropropagation is the tissue culture technique used for rapid vegetative multiplication of ornamental plants and fruit trees by using small sized explants. Because of the minute type of propagules in the culture, the propagation techniques is named as micropropagation.
- (e) **Somaclones** : The genetically identical plants developed from any part of a plant by tissue culture/ micropropagation are called soma clones. The member of a single soma clone have the same genotype. This micropropagation is also known as soma clonal propagation.

32.



2

In absence of inducer-lactose:

- Repressor protein is produced from lac-i gene binds to operator region of the operon and prevents RNA polymerase from transcribing the operon. **1**
- Switch off-structural genes Lac-z, Lac-y, and Lac-a-no transcription and donot produce any enzymes. $\frac{1}{2}$

In presence of Inducer –lactose:

- Repressor protein produced by i-gene binds to inducer and inactivated by interaction with the inducer. **1**
- RNA Polymerase enzyme binds to promoter region and transcribes structural genes Lac-z, Lac-y and Lac-a. $\frac{1}{2}$

(Diagrammatic sketches with proper labellings—02 marks)

SECTION - II

33. Griffith- Experiments –rough and smooth strains of
- Streptococcus pneumoniae*

- S-strain— injected to mice—mice die **1**
- R-strain— injected to mice —mice live **1**
- Heat killed S-strain injected to mice did not kill them **1**
- Heat killed S-strain mixed with R-strain injected to mice, they died **1**
- R strain of bacteria transformed by heat killed S-strain, become virulent but biochemical nature of genetic material not defined –some transforming principle transferred from heat killed S strain. **1**
- Oswald Avery and others worked to determine biochemical nature of transforming principle.

Proteins, DNA, RNA from heat killed S cells-purified-discovered that DNA alone from S bacteria cells caused R bacteria to become transformed. **1**

Protein digesting proteases, RNA digesting RNases did not cause transformation. Transforming substance was not protein or RNA. DNase did inhibit transformation. Suggested that DNA caused transformation and DNA is the hereditary material. **1**

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34. After the primary treatment in the plant, effluent is taken for secondary treatment or biological treatment. Effluent is constantly agitated mechanically, air pumped into it. It allows vigorous growth of aerobic microbes into flocs. Microbes use organic matter to reduce BOD. 1
Effluent passed into settling tank where bacterial flocs allowed to sediment which is called activated sludge. 1
Small part of activated sludge pumped back into aeration tank to serve as inoculum and the remaining part is pumped into large tanks called anaerobic sludge digester. 1
Other kinds of anaerobically grown bacteria, digest the bacteria and the fungi in sludge. Bacteria produce mixture of gases, methane, hydrogen sulphide and carbon dioxide. 1
35. • Some strains of *Bacillus thuringiensis* produce protein crystals, (insecticidal protein) that kill insects- Lepidopterans, Coleopterans and Dipterans. Protein crystals are formed during certain phase of their growth. 1
• The "cry" gene, Cry IAC and Cry IIAb from *B. thuringiensis* coding for the toxins are transferred to cotton plants. Proteins encoded by these genes control the cotton bollworms. 1
• Bt cotton plants express the Bt toxin gene by producing toxin that provides insect resistance. 1
• Bt toxin protein exists as an inactive prototoxins –insect ingest the inactive toxin, converts to active toxin at alkaline pH of gut of insect which solubilise the crystals. 1
• Toxin binds to surface of midgut epithelial cells create pores that cause cell swelling and lysis and eventually cause death of insect. 1
36. (a) • **Ectoparasites** : Parasites feed on the external surface of the host organisms. 1
• **Endoparasites** : Parasites that live inside the host body at different sites (liver, kidney, lungs, red blood cells etc). 1
(b) • Loss of unnecessary sense organs
• Presence of adhesive organs/suckers to cling to host
• Loss of digestive system
• High reproductive capacity.
• Complex life cycle involving one or two intermediate hosts, vectors to facilitate parasitisation of its primary host.

Any three -1 mark for each

37. (a) **Radioactive wastes.**

- Radioactive wastes-use of nuclear energy has 2 serious inherent problems-accidental leakage (Three Mile Island and Chernobyl incidents) and safe disposal of radioactive wastes. 1
- Radioactive wastes are damaging organism, causing mutations at high rate, high doses radiation lethal, lower doses creates disorders like cancer. Extremely potent pollutant-has to be dealt with caution. 1
- Storage of Nuclear wastes after pre treatment should be done in suitably shielded containers buried deep within rocks 500 m deep below the earth surface. 1

(b) **Joint Forest management.**

- After realising the significant participation of local communities to protect and manage forest. (Govt. of India in 1980 introduced this concept). 1
- People of local communities get benefits of various forest products-fruits, gums, rubber, medicines for their services to the forest. 1

[Scheme of Valuation, 2018] 2

Detailed Answer :

- (a) **Radioactive Wastes** : Radioactive wastes are generated during the process of generating nuclear energy from radioactive materials. Nuclear waste is rich in radioactive material that generates large quantities of ionizing radiations such as gamma rays. These rays cause mutation in organisms, which often results in skin cancer. At high dosage, these rays can be lethal.
Safe disposal of radioactive wastes is a big challenge. It is recommended that nuclear wastes should be stored after pre-treatment in suitable containers, which should then be buried in rocks.
- (b) **Joint Forest Management** : Realizing the significance of participation by local communities, the Government of India in 1980s has introduced the concept of Joint Forest Management (JFM) so as to work closely with the local communities for protecting and managing forests. In return for their services to the forest, the communities get benefit of various forest products (e.g., fruits, gum, rubber, medicine, etc.), and thus the forest can be conserved in a sustainable manner.

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