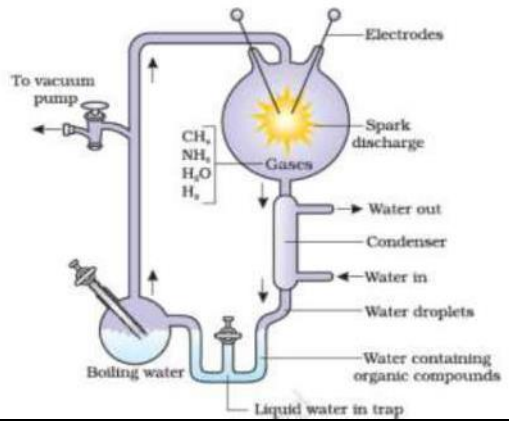
GOVERNMENT OF KARNATAKA
KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARDII P
U ANNUAL EXAMINATION – MARCH 2023
SCHEME OF EVALUATION

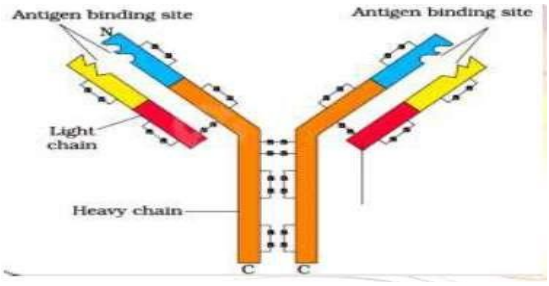
SUBJECT: BIOLOGY **SUBJECT CODE: 36**

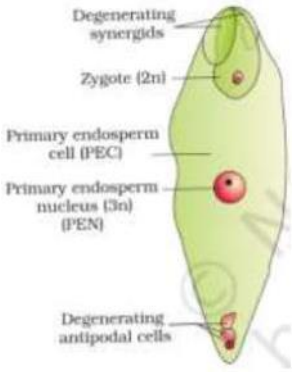
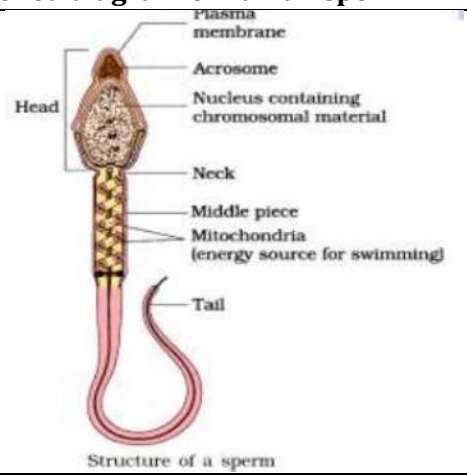
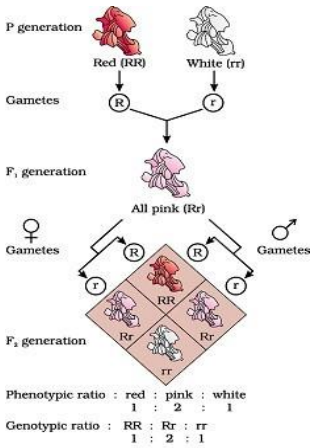
NOTE: 1. Unlabelled and incorrectly labelled diagrams attract any marks
2. Answers written in Kannada also should be evaluated

Question Number	KEY ANSWER / VALUE POINTS	Marks	Page. No. in Text Book
	PART - A		
I.	**Answer the correct alternative from the choices below:** **10 x 1 = 10**		
1.	**Which among these one is not a post-fertilization event?**	1	10
	a) Gametogenesis		
2.	**The most resistant organic material present on exine of pollen grains is**	1	23
	c) Sporopollenin		
3	**The first movements of the foetus are observed during which month of the pregnancy?**	1	54
	c) Fifth month		
4	**Tassels in Corncob represent**	1	29
	d) Stigma and style		
5	**Which of the following sexually transmitted diseases is not completely curable?**	1	63
	(c) Genital herpes		
	An example for non-medicated IUD is	1	60
6	b) Lippes loop		
7	Who noted that the behaviour of Chromosomes was parallel to the behaviour of genes?	1	81
	d) Walter Sutton & Theodore Boveri		
8	**The first genetic material could be**	1	104
	d) RNA		
9	**Which of the following is used as an Industrial pollution indicator?**	1	132
	b) Lichens		
10	**The disease Chikungunya is transmitted by**	1	150
	b) Aedes Mosquitoes		
11	**Sonalika and Kalyan Sona are varieties of**	1	173
	a) Wheat		
12	**Which one of the following alcoholic drinks is produced without distillation?**	1	182
	a) Wine		
13	**Plant cells bombarded with high velocity microparticles of gold or tungsten coated with DNA in a method known as**	1	201
	b) Biolistics		
14	**The commonly used vector for cloning genes in animals is**	1	200
	b) Disarmed retrovirus		
15	**According to Allen's rule the mammals from colder climates have**	1	226
	d) Shorter ears and shorter limbs		

II.	**Fill in the blanks by choosing the appropriate word or words from those given below: 5 x 1 = 5** **(food web, standing state, Gause's- competitive exclusion principle, atmosphere, single base pair of DNA)**		
16	**Point mutation arises due to the change in _____** Single base pair of DNA	1	88
17	**_____ states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.** Gause's-competitive exclusion principle	1	235
18	**The amount of nutrient, such as carbon, nitrogen, phosphorus and calcium present in the soil at any given time is called as _____** Standing state	1	253
19	**The reservoir of gaseous type of nutrients cycle exist in the _____** Atmosphere	1	254
20	**The natural interconnection of food chains make it a _____** Food web	1	246
	PART - B		
III.	**Answer any five of the following question in 3-5 sentences each, wherever applicable: 5 x 2 = 10**		
21	**What are hermaphrodites? Mention one example.** Animals that possess both male and female reproductive organs are called hermaphrodite. E.g., Earth worm /Sponge / Tape worm/ Leech (any one example)	1 1	11
22	**Distinguish between Menstrual cycle and Oestrus cycle** The cyclical changes in the activities of ovaries and accessory ducts as well as hormones of primate is called menstrual cycle. The cyclical changes in the activities of ovaries and accessory ducts as well as hormones of non-primates is called oestrus cycle	1 1	9
23	**Mention the four symptoms of Down's syndrome** • Short statured with small round head • Furrowed tongue and partially open mouth • Palm is broad with characteristic palm crease • Physical, psychomotor and mental development is retarded (½ Mark each)	2	92
24	**Write the genotype of the parents when their children are with A, B, AB, O blood groups.** The genotype of the parents blood group is I^A i and I^B I /I^AI^O and I^BI^O	2	77
25	**Write the two basic amino acids residues which are rich in histones** • Lysine • Arginine (1 Mark each)	2	99
26	**Differentiate between Geitonogamy and Xenogamy** Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called geitonogamy Transfer of pollen grains from the anther to the stigma of a different plant of the same species	1 1	28
27	**Mention any two examples of evolution by anthropogenic action** • Industrial melanism • Overuse of herbicide and pesticide • Antibiotic or drug resistance in bacteria **(Any two 1 Mark each)**	2	132

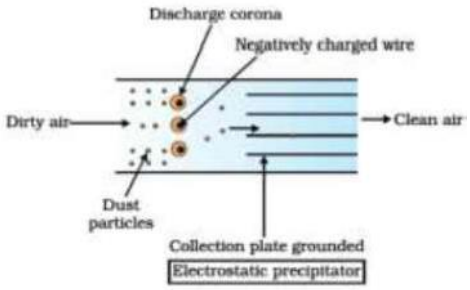
28	**The use of CNG is better than Petrol or Diesel. Give four reasons** • CNG burns most efficiently, unlike petrol or diesel, in the automobiles and very little of it is left unburnt • CNG is cheaper than petrol or diesel • CNG cannot be siphoned off by thieves • CNG cannot be adulterated like petrol or diesel **(½ Mark each)**	2	273
PART – C			
IV.	**Answer any five of the following question in 40 – 80 words each, wherever applicable:**		**5 x 3 = 15**
29	**a) Why is oxytocin necessary for Parturition?** **b) List any four hormones secreted by Placenta** a) Oxytocin acts on the uterine muscle and causes stronger uterine contractions, which in turn stimulates secretion of oxytocin, this leads to expulsion of the baby out of the uterus. (b) Hormones secreted by Placenta • Human Chorionic Gonadotropin /hCG • Human Placental Lactogen /hPL • Estrogen • Progestogens • Relaxin **(½ Mark each , Any Four)**	1 2	53
30	**What is infertility? Give reasons for infertility in humans** Couples who are unable to produce children in spite of unprotected sexual co-habitation. Reasons; • Physical • Congenital • Diseases • Drugs • Immunological • Psychological **(Any four ½ Mark each)**	1 2	63/64
31	**Mention any three applications of DNA finger printing technique** • In forensic science • In determining population diversities • Evolutionary biology • In determining genetic diversities **(Any three 1 Mark each)**	3	123
32	**Draw a neat labelled diagram of Miller's experiment**  	½ Mark For each labelling	128

33	**a) Write the infectious forms of Plasmodium which enter human body through mosquito bite.** **b) Draw a neat labelled diagram of structure of an antibody molecule**		
	a) Sporozoites	1	147
	b) 	½ Mark for each labelling	151
34	**What is Poultry? Mention two important components of poultry farm Management.**		
	Poultry is the class of domesticated fowl (birds) used for food or for their eggs including, chicken and ducks, and sometimes turkey and geese. Important components of poultry farm management: • Selection of disease free and suitable breeds • Maintenance of proper and safe farm conditions • Providing proper feed and water • Maintenance of hygiene and health care **(Any two 1 Mark each)**	1 2	166
35	**What is Ecological Succession? Distinguish between Primary succession and Secondary succession**		
	The gradual and fairly predictable change in the species composition of a given area is called ecological succession • A process of succession that starts in an area where no living organisms are there, these could be areas where no living organisms ever existed, say bare rock is called primary succession • A process of succession that starts in areas that somehow, lost all the living organisms that existed there is termed secondary succession	1 1 1	250, 251
36	**a) Mention four "Evil Quartet", which cause deletion of biodiversity.** **b) Among vertebrates which group of animals has the highest number in global biodiversity?**		264, 265,
	a) Four "Evil Quartet" • Habitat loss and fragmentation • Over-exploitation • Alien species invasions • Co-extinctions b) Fishes	½ Mark for each 1	260

PART – D			
V. Answer any three of the following questions in about 200 – 250 words each, wherever applicable: 3 × 5 = 15			
37	**What is double fertilization? Describe fertilized embryo sac with a neat labelled diagram**		
	The phenomenon of two types of fusions i.e., syngamy and triple fusion that take place in an embryo sac of flowering plants is termed double fertilisation. Structure of fertilized embryo sac: • The fertilized embryo sac consist large primary endosperm cell consisting triploid primary endosperm nucleus. • It also consists of diploid zygote. • At chalazal end it consist degenerating antipodal cells and at micropylar end it has degenerating synergids. 	2 for explantation 2 for diagram	34
38	**Draw a neat labelled diagram of human sperm**  Structure of a sperm	½ Mark For each labelling 1 mark for Diagram	48
39	**What is incomplete dominance? Explain it with reference to flower colour in snapdragon.**		
	A phenomenon where both the alleles of a character express incompletely producing a new intermediate phenotype in the heterozygous condition is called incomplete or partial dominance or blended inheritance. Correns crossed homozygous red flowered plant (RR) with homozygous white flowered plant (rr), surprisingly in F_1 generation all hybrids were pink flowered plants (Rr).  The dominant allele 'R' was not completely dominant over the recessive allele 'r' and this made it possible to distinguish Rr as pink from RR (red) and rr (white) When F_1 pink flowering plants were self-crossed, the F_2 generation produce 25% red flowered plants, 50% pink flowered plants and 25% white flowered plants in 1:2:1 ratio. From the hybridisation results we can observe that F_2 phenotypic & genotypic ratio in incomplete dominance are same i.e., 1 : 2 : 1. 1 homozygous red, 2 heterozygous pink and 1 homozygous white. **(Note: Schematic representation can also be considered for Two Marks and Explanation for Two Marks)**	1 1 1 1 1	76

	Explain five benefits of creating Transgenic animals		
40	• **Normal physiology and development**: Transgenic animals can be specifically designed to allow the study of how genes are regulated, and how they affect the normal functions of the body and its development. • **Study of disease:** Many transgenic animals are designed to increase our understanding of how genes contribute to the development of disease. These are specially made to serve as models for human diseases so that investigation of new treatments for diseases is made possible. • **Biological products:** Transgenic animals that produce useful biological products can be created by the introduction of the portion of DNA (or genes) which codes for a particular product such as human protein used to treat emphysema (α-1- antitrypsin), phenylketonuria (PKU) and cystic fibrosis. human protein-enriched milk alpha-lactalbumin • **Vaccine safety:** Transgenic mice are being developed for use in testing the safety of vaccines before they are used on humans. Transgenic mice are being used to test the safety of the polio vaccine. • **Chemical safety testing:** This is known as toxicity/safety testing. The procedure is the same as that used for testing toxicity of drugs. Transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals. Toxicity testing in such animals will allow us to obtain results in less time. • **Note: Mentioning only value points without explanation ½ Mark each**	1 1 1 1 1	212, 213
41	**Name the disease caused by following organisms:** ***a) Entamoeba histolytica*** ***b) Epidermophyton*** ***c) Salmonella typhi*** ***d) Wuchereria malayi*** ***e) Plasmodium vivax***		148,149, 146,149, 147
	a) Amoebiasis/Amoebic dysentery b) Ringworm c) Typhoid d) Filariasis/Elephantiasis e) Malaria	1 1 1 1 1	
42	Name the technology that can successfully increase the herd size of cattle in a short time and explain the steps involved in this technology.		168-169
	Multiple Ovulation Embryo Transfer Technology (MOET) is one programme for herd improvement. • In this method, a cow is administered hormones, with FSH-like activity, to induce follicular maturation and super ovulation – instead of one egg, which they normally yield per cycle, they produce 6-8 eggs. • The animal is either mated with an elite bull or artificially inseminated. • The fertilised eggs at 8–32 cells stages, are recovered non-surgically and transferred to surrogate mothers. • The genetic mother is available for another round of super ovulation. • This technology has been demonstrated for cattle, sheep, rabbits, buffaloes, mares, etc. High milk-yielding breeds of females and high quality (lean meat with less lipid) meat-yielding bulls have been bred successfully to increase herd size in a short time.	1 1 ½ 1 ½ 1	

VI. Answer any two of the following questions in about 200 – 250 words each, wherever applicable: 2 × 5 = 10			
43	**Explain the role of microbes in industrial products.**		181, 183
	Production of microbial products useful to human beings on an industrial scale requires growing microbes in very large vessels called fermentors. *Aspergillus niger* - citric acid *Acetobacter aceti* - acetic acid *Clostridium butylicum* - butyric acid *Lactobacillus* -lactic acid. Yeast (*Saccharomyces cerevisiae*) - ethanol. *Penicillium notatum* – Penicillin *Streptococcus* - Streptokinase *Trichoderma polysporum* - Cyclosporin A *Monascus purpureus* - Statins **(Any Five - Microbes and its product – Each One Mark)**		
44	**a) Write any four tools used in recombinant DNA technology.** **b) Mention any two methods of introducing alien DNA into host cells.** **c) Name the stain used to visualize DNA fragments in Gel electrophoresis.**		195, 201, 198
	a) Tools used in recombinant technology: • Enzymes, • Vectors and the • Host organism • Bioreactors	2	
	b) Methods followed to introduce alien DNA into host cells: • Microinjection • Biolistic method/gene gun • Vector mediated • Heat Shock • Disarmed pathogen vectors **(Any two 1 Mark each)**	2 1	
	c) Ethidium bromide .		
45	**Describe Fredrick Griffith experiment to show transformation in Bacteria.**		100, 101
	• Mice infected with the S strain of Streptococcus pneumoniae (virulent) died from pneumonia infection but	½	
	• Mice infected with the R strain did not develop pneumonia and were alive.	½	
	• Mice infected with heat -killed S strain bacteria did not kill them and mice were alive.	½	
	• When he injected a mixture of heat-killed S strain and live R strain bacteria, the mice died. Moreover, he recovered living S bacteria from the dead mice.	1	
	• He concluded that the R strain bacteria had somehow been transformed by the heat-killed S strain bacteria.	1	
	• Some 'transforming principle', transferred from the heat-killed S strain, had enabled the R strain to synthesise a smooth polysaccharide coat and become virulent.	1	
	• This must be due to the transfer of the genetic material.	½	

46	**a) Mention any two mechanisms how human body compensates low oxygen availability at higher altitude.** **b) Write two suspended activities in animals against abiotic stresses with suitable examples.** **c) The Abingdon tortoise in Galapagos Islands became extinct after goats were introduced on the Island. Mention the type of interaction.**		
	a) The body compensates low oxygen availability by increasing red blood cell production, Decreasing the binding affinity of haemoglobin and by increasing breathing rate. b) * Bears going into hibernation during winter to escape in time. * Snails and fish go into aestivation to avoid summer–related problems- heat and desiccation. * Zooplanktons – Diapause. **(Any two 1 Mark each)** c) Competition/Competitive Exclusion.	1 1 1 1 1	226, 225, 234
	Write a brief account of electrostatic precipitator with a neat labelled diagram.		
47	• The electrostatic precipitator can remove over 99 per cent particulate matter present in the exhaust from a thermal power plant. • It has electrode wires that are maintained at several thousand volts, which produce a corona that releases electrons. • These electrons attach to dust particles giving them a net negative charge. • The collecting plates are grounded and attract the charged dust particles. • The velocity of air between the plates must be low enough to allow the dust to fall.  	3 Marks for Daigram ½ Mark for Each Labelling 2 Marks for Explanation.	271