INDIAN SCHOOL MUSCAT

FINAL TERM EXAMINATION

NOVEMBER 2018

SET B

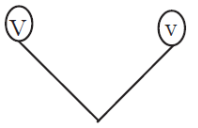
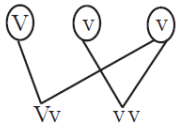
CLASS XII

Marking Scheme – BIOLOGY [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	Seed ferns OR Sweet potato tuners and potato tubers are analogous structures, evolved for the same function; analogous structures results from convergent evolution.	1
2.	Widal test	1
3.	Stanley Cohen & Boyer	1
4.	Organisms living closely related and in case if resources are limiting	1
5.	Soil already formed,spores,seeds remnants of vegetation OR The colloidal matter resistant to microbial action ,reservoir of nutrients,breaks down slowly	1
6.	Avoid multiple partners , early detection OR Foetal sex determination based on chromosomal pattern in the amniotic fluid surrounding the developing embryo , female foeticide 1x 2	2
7.	Method of analyzing inheritance of traits in humans. Study inheritance of diseases for genetic counselling	2
8.	Histamine acts as allergy-mediator which cause blood vessels to dilate. It is released by mast cells. Antihistamine steroids and adrenaline quickly reduce the symptoms of allergy 1+1=2	2
9.	Loss of unnecessary sense organs,presence of adhesive organs,suckers , loss of digestive system,high reproductive capacity OR Quality of light,photoperiod affect photosynthesis, affect reproductive, for agingactivities, ii)scavenging and predation 1+1	2
10.	Predator-prey/Predation between level (1) and (2); Producer-consumer between levels (3) and (4)	2
11.	(a) 1. Pre-reproductive pogulation 2. Reproductive population 3. Post-reproductive population (b) Expanding or growing population	2
12.	Reservoir in an ecosystem meets the deficit that arises due to the imbalance in the influx and efflux of nutrients. The two types of nutrient cycles are: (i) Gaseous cycle (ii) Sedimentary cycle	2
13.	(i) Oral contraceptive or pills are either progestogens or progestogen oestrogen combinations. They function as contraceptives by (a) inhibiting ovulation.	3

	(b) inhibiting implantation. (c) altering the quality of cervical mucus to prevent or stop the entry of sperms (ii)The oral contraceptive pills are to be taken daily for 21 days, preferably within the first five days of menstrual cycle. After the onset of menstruation cycle, i.e. 5-7 days, the process is to be repeated in the same pattern (again for 21 days). This schedule is to be followed till the women want to avoid conception	
14.	(a) Mutation arising due to change in a single base pair ofDNA , the defect is caused by the subsititution ofGlutamic acid (Glu) byValine (Val) at the sixth position of the beta globin chain of the haemoglobinmolecule. = 1 + 1 = 2 (b) Father - HbA HbS , Mother - HbA HbS = ½ + ½ (Both parents are heterozygous) OR Morgan's findings differ from Mendel's because of the phenomena of Linkage (genes present on the same chromosome) and Recombination; (½ x 2=1) Example and explanation 2 m	3
15.	(i) ATCGTACTA= 1 (ii) Through Hydrogen bonds , betweenAand T and C and Gon the two strands = ½ + ½ (iii) A= T andC º G ,Watson and Crick / Chargaff = ½ + ½	3
16.	DNA molecule is a better hereditary material as (i) It is more stable (due to presence of thymine and not uracil as in RNA) (ii) Less reactive than RNA (as RNA has 2' - OH making it more reactive) (iii) Being less reactive , DNA is not easily degradable (RNA being more reactive is easily degradable) (iv) Rate of mutation is slow (Rate of mutation in RNA is faster) Any three = 1 × 3 OR Splicing , Introns are removed and exons are joined = ½ × 2 Capping , Methyl guanosine triphosphate / mGPPP is added to the 5' end of hnRNA = ½ × 2 Tailing , Polyadenylate residues are added to 3'-end in a template independent manner = ½ × 2	3
17.	(i)Stabilisation It results in more number of individuals acquiring the mean character value, i.e. variation is much reduced. (ii) Directional change It results in more individuals acquiring value other than mean character value, i.e. the peak shift towards one direction. (iii) Disruption In this more individuals acquire peripheral character value at both ends of the distribution curve, i.e. two peaks are formed at periphery	3
18.	Apical/axillary meristem; remove meristem; grow in vitro 1x3= OR Inbreeding: Breeding between closely related individual within the same breed different for 4-6 generation Outbreeding: Breeding of unrelated animals either of same breeds or of different breeds or even species. Advantage of inbreeding— It help in accumulation of superior gene and elimination of less desirable gene. Inbreeding also increases homozygosity. Disadvantage of Inbreeding— Inbreeding reduces fertility and even productivity. This is called inbreeding depression. Advantages of outbreeding— It help overcoming inbreeding depression.	3

	Disadvantages of outbreeding—introduction of undesirable character/there is no surity of desired outcome.	
19.	(a) (i)Wuchereria , (ii) Microsporum / Epidermophyton/ Trichophyton (iii)Entamoeba (b) Proper disposal of waste/periodic cleaning/disinfection of water reservoirs, etc/standard practices of hygiene in public catering/eliminate vectors and their breeding placec(any three) (½ x 6=3)	3
20.	Inducing mutations artificially through use of chemicals or radiations (like gamma radiations), and selecting and using the plants that have the desirable character as a source in breeding – this process is called mutation breeding. In mung bean, resistance to yellow mosaic virus and powdery mildew 2 m Resistance to yellow mosaic virus in bhindi (Abelmoschus esculentus) was transferred from a wild species and resulted in a new variety of A. esculentus called Parbhani kranti. 1m	3
21.	a) The DNA fragments resolve according to their size through sieving effect provided by the agarose gel. Hence, the smaller the fragment size, the farther it moves. 1 mark b) The given agarose gel electrophoresis shows migration of undigested DNA fragments in lane 1 and digested set of DNA fragments in lane 2 to 4. 1 mark c) The separated DNA fragments can be visualized only after staining the DNA with a compound known as ethidium bromide followed by exposure to UV radiation. 1 mark	3
22.	Making recombinant protein on a large scale Simple – stirred tank bioreactor Foam braker/impeller/stirrer/pH control/motor/agitator system/O2 delivery system/temperature control system/sampling ports(any two) (1+1+1/2+1/2=3)	3
23.	The Ministry of Environment and Forests. The objective of Ganga Action Plan and Yamuna Action Plan is to save these rivers from pollution. It was proposed to build a large number of sewage treatment plants. So that only treated sewage may be discharged into these rivers1+1+1=3	3
24.	Peramanent cure ,Bone marrow transplantation and enzyme replacement therapy,introducing cDNA of a functional ADA using retrovirus into the stem cells/early embryonic stages 1+1+1	3
25.	The arrangement where a (Polycistronic) structural gene is regulated by a common promoter and regulatory genes = 1 Lactose acts as inducer , binds with repressor protein , RNA polymerase freely moves over the structural genes , transcribes lac mRNA , which in turn produce enzymes - transacetylase, permease , ß-galactosidase (by lac z) , responsible for digestion of lactose = ½ × 8 OR (a) It could be homozygous dominant, heterozygous dominant = ½ + ½ (b) By test cross = ½ frequency depends on their relative distance on the chromosome = ½	5

	If parent homozygous : VV × vv = ½ (violet) (white)  = ½ Vv = ½ (all violet) If parent heterozygous Vv × vv = ½ (violet) (white)  = ½ Vv vv (violet) (white) 50% : 50% = ½ = ½	
26.	i. Collection of variability / germplasm collection, collection and preservation of all different wild varieties, species, and relatives of cultivated species / entire collection of plants. = ½+½ ii. Evaluation and selection of parents, to identify plant with desirable combination of character / purelines are created. = ½ + ½ iii. Cross hydridization among selected parents, cross hybridizing the two parents to produce hybrids. = ½+½ iv. Selection and testing of superior recombinants, selection among the progeny of the hybrids that have desired character combinations, superior to both the parents / self pollinated for several generations. = ½+½ v. Testing, release and commercialisation of new cultivars, newly selected lines are evaluated for yield / other agronomic traits of quality / disease resistance in research feels followed by testing the material in farmers fields. = ½+½OR i) (a) Aspergillus niger - Citric Acid , natural preservative / flavouring agent = ½ + ½ (b) Trichoderma polysporum - Cyclosporin A , immunosuppressive agent = ½ + ½ (c) Monascus purpureus - Statin , blood cholesterol lowering agent = ½ + ½ ii) 'Roquefort cheese' are ripened by growing a specific fungi on them, which gives them a particular flavour.	5
27.	(i) Regulate - Maintain constant internal temperature / osmotic concentration /homeostasis = ½ e.g. birds / mammals = ½ (ii) Conform - Do not maintain constant internal temperature / osmotic concentration / No homeostasis = ½ e.g. any one example of animal other than birds and mammals = ½ (iii) Migrate - Temporary movement of organisms from the stressful of habitats to hospitable areas and return when stressful period is over = ½ e.g. birds from Siberia / or any other correct example = ½ (iv) Suspend - Reducing / minimising the metabolic activities during unfavourable conditions = ½ e.g. Polar bear / amphibian / snails / fish / any other example of animals = ½ (b) Death rate = 0.1 8/80 , individuals per butterfly per week = ½ + ½	

	OR Sea - Inverted , because biomass of fish /other aquatic animals exceeds that of phytoplanktons // small standing crop of phytoplankton supports large standing crop of zooplankton = ½ + 1 Forest - Upright , because biomass of producers exceeds that of herbivores / carnivores // allows the sharp decrease in biomass at higher trophic levels = ½ + 1 Diagram – 3 marks	