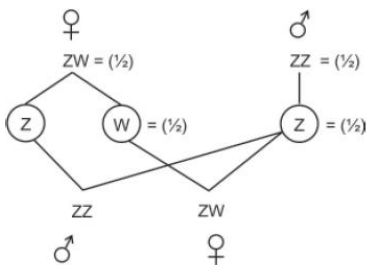**INDIAN SCHOOL MUSCAT**

FINAL TERM EXAMINATION

NOVEMBER 2018

SET C

CLASS XII

Marking Scheme – BIOLOGY [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	Big bang theory OR Adaptive radiation	1
2.	Penicilin	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	
10.	Rapid deforestation , massive burning of fossil fuel , have significantly increased the rate of release of carbon dioxide , polluting atmosphere , this greenhouse gas , contributes to global warming [for any two]	2
11.	Thorns of Acacia / Cactus are morphological means of defence against cows & goats - Plants produce & store chemicals that make herbivore sick when they are eaten inhibit feeding or digestion and disrupt its reproduction or even kill it- Calotropis produces highly poisonous cardiac glycosides so cows and goats can never browse on these plants / Chemical substances like nicotine / caffeine / defences / strychnine / opium are actually defences against grazers & browsers [for any two)	2
12.	(a) Grazing food chain starts from producers while detritus food chain starts from organic matter = 1 (b) Grazing food chain is the major conduit of energy flow in an ecosystem = 1	2

13.	Decline in death rate/ maternal mortality rate/ infant mortality rate	3
14.	(a) Dominant. ½ a mark (b) Autosomal. ½ a mark (c) Genotype of parents in generation I – Female – aa and Male – Aa. (½ + ½ mark each) Genotype of third child in generation II - Aa. Genotype of first grandchild in generation III - Aa. OR Dominance : one allele expresses itself in the hybrid heterozygous condition , other is suppressed Co dominance : both the alleles of a gene express in a heterozygous hybrid containing two dominant alleles. Incomplete dominance : Neither of the two alleles of a gene is completely dominant over the other in heterozygous condition , the hybrid is intermediate.	3
15.	In birds : Birds : female heterogamety / female produces (Z) type and (W) type of gametes = ½ Humans : male heterogamety / male produces (X) type and (Y) type of gametes = ½	3
16.	(a) VNTR - Variable Number of Tandem Repeat(s) = ½ - used as a probe (because of its high degree of polymorphism) = ½ (b) Forensic science / criminal investigation (any point related to forensic science) / determine population and genetic diversities / paternity testing / maternity testing / study of evolutionary biology (Any two) = 1 + 1 OR RNA polymerase - I , transcribes rRNAs (28S -18S and 5.8S) = ½ × 2 RNA polymerase - II , transcribes precursor of mRNA / hnRNA / heterogeneous RNA = ½ × 2 RNA polymerase - III , transcribes tRNA / 5sr RNA / snRNA = ½ × 2	3
17.	(i) In a closed flask containing NH3, CH4, H2 and Water Vapour to simulate primitive atmosphere (ii) Electric discharge to simulate on primitive earth (iii) Formation of compounds like amino acids from simple molecules like NH_3, CH_4, H_2 1x 3	3
18.	By screening germplasm for resistance sources , hybridisation of selected parents , selection and evaluation of the hybrids and testing and release of newvarieties // mutation breeding - it is possible to inducemutations artificially through use of chemicals or radiations (like gamma radiations) , and selecting and using the plants of desirable character as a source in breeding. // Selection amongst somaclonal	3

	variants /Genetic engineering - Any one explained = 2 (a) Himgiri= ½ (b) Pusa swarnim /Karan rai = ½ OR Out breeding – Breeding of unrelated animals (which may be between individual of same breed or between individuals of different species) = 1 Out crossing – (a kind of out breeding) Mating of animals within the same breed but having no common ancestors on either side of their pedigree upto 4 – 6 generations = 1 Cross breeding – (another type of out breeding) Superior males of one breed are mated with superior females of another breed = 1	
19.	(a) If the boy is suffering from Typhoid, then, the he should have sustained high fever (39° to 40°C), weakness, stomach pain, constipation and headache. So It cannot be typhoid. 1 mark (b) If the boy is suffering from Viral Fever he will suffer from high fever, joint pain, weakness, and headache, So It cannot be Viral Fever. 1 mark (c) If the boy is suffering from Malaria he should have high fever recurring with profuse sweating every three to four days associated with chills and headache. There is a possibility that he is suffering from Malaria because high fever associated with chills is possible with malaria. 1 mark	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	3
21.	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
22.	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	3
23.	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	3
24.	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
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) Drosophila melanogaster = 1 They observed that two genes (located closely on a chromosome) did not segregate independently of each other (F2 ratio deviated significantly from 9 : 3 : 3 : 1) = ½ Tightly linked genes tend to show fewer (lesser) recombinant frequency of parental traits / show higher (more) frequency of parental type = ½ Loosely linked genes show higher percentage (more) of recombinant frequency of parental traits / lower frequency percentage of parental type = ½ Genes present on same chromosome are said to be linked and the recombinant	5

	frequency depends on their relative distance on the chromosome = ½ (b) He used the frequency of recombination between gene pairs on the same chromosome, as a measure of the distance between genes and mapped their position on the chromosome = 1 + 1	
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 Breakdown of complexorganicmatterbydecomposers.a)Process-i)fragmentation 2 ½ ii)leachingiii)catabolism.Humificationandmineralization–humificationleadsto accumulationofdarkcoloursubstancecalledhumus.Mineralisationresultinreleaseof +2 ½ inorgranic substances a)climaticfactor– i)tempii)soilb)chemicalqualityofdetritus.Highertempandmoist condition – high rate of decomposition.Drysoil ,High temp–Lowrate	