

MARK SCHEME

TRIAL EXAM BIOLOGY S3 STPM 2020

SECTION A (MULTIPLE-CHOICE)

Answer key

Question Number	Key	Question Number	Key	Question Number	Key
1	A	6	A	11	D
2	C	7	B	12	D
3	A	8	C	13	C
4	C	9	B	14	D
5	A	10	B	15	B

SECTION B (STRUCTURE)

16.	(a)	(i)	<ul style="list-style-type: none"> • respiration / heat;
		(ii)	<ul style="list-style-type: none"> • decomposers / saprobionts / bacteria / fungi / micro-organisms;
	(b)	(i)	<ul style="list-style-type: none"> • = $\frac{20810}{1700000} \times 100\%$; • = 1.22%;
		(ii)	<ul style="list-style-type: none"> • = 20810 - 13192; • = 7618 kcal/m²/yr;
(c)	(i)	<ul style="list-style-type: none"> • 21; 	
	(ii)	<ul style="list-style-type: none"> • 5065; 	
17.	(a)	(i)	<ul style="list-style-type: none"> • W : Regulator (gene);
		(ii)	<ul style="list-style-type: none"> • X : Repressor (molecule);
		(iii)	<ul style="list-style-type: none"> • Y : Operator (gene);
		(iv)	<ul style="list-style-type: none"> • Z : Structural (gene);
(b)	<ul style="list-style-type: none"> • lactose; 		
(c)	<ul style="list-style-type: none"> • The genes would be constitutively expressed; • β-galactosidase would not be produced; <p>Any 1</p>		
(d)	<ul style="list-style-type: none"> • Transcription of structural genes occurs to produce mRNA // β-galactosidase enzyme is produced continuously with or without lactose; 		

SECTION C (ESSAY)

18.	(a)	(i)	<ol style="list-style-type: none"> 1. Sporophyte dominant generation 2. Have true roots, stems and leaves 3. Have xylem and phloem tissues / tracheids and sieve tube but no vessels and no companion cells 4. Produce heterosporous / megaspores (embryo sac) and microspores (pollen grain) 5. Reproductive organ called cone / no flower 6. Naked ovule / no ovary / ovule not protected by ovary 7. Seeds produce not protect by fruit 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max : 4</p>
		(ii)	<ol style="list-style-type: none"> 1. Asymmetry body 2. Body wall consist of two layers of cell //Inner layer lining by collar cells / choanocytes //Mesoglea contain amebocytes between the two layers 3. Single opening serving as anus and mouth // Single body cavity 4. Numerous pore / porocytes in body wall 5. Skeleton called spicules 6. Sessile 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max : 4</p>
		(b)	<ol style="list-style-type: none"> 1. Ex situ conservation 2. collect / take, plants / seeds, from the wild from many countries / international effort 3. (especially) from areas at risk from climate change / endangered species. 4. grow / plant, seeds / plants (in botanic gardens) to increase, plant / seed, number 5. maintain genetic diversity 6. cooperate with, governments / agencies / universities, for research 7. to conserve habitats / to restore habitats 8. to reintroduce species to wild /natural habitat 9. educate / raise awareness of public 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max : 7</p>
				Total : 15 M

(b)

1. Balance(d) polymorphism	1 Transient polymorphism
2. Two or more morphs coexist in a stable ratio (from generation to generation)	2. The favoured morph become dominant and the other are eliminated
3. Frequency of the two alleles are not change / are stable // maintenance of both two different alleles of a gene over time	3. Frequency of the two alleles changes / are not stable // the progressive replacement of one allele of a gene by another allele
4. Both alleles involved	4. One allele involved
5. Morphs in the population are not under strong selection pressure	5. Morphs in the population undergoing a strong selection pressure
6. Example : heterozygous advantage in sickle cell anemia in Africans	6. Example : Dark Peppered Moth

1 + Any 4
Max : 5

Total : 15 M