

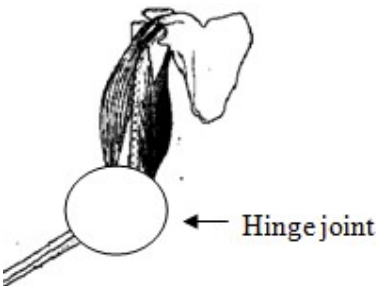
SMK Perempuan Perak

Marking Scheme

Trial Exam Bio SPM 2021

Paper 2

	Peraturan Permarkahan	Markah	Catatan				
1a)	X : Mitochondria Y : Nucleus	1 1					
b)	Respiration	1					
c)	To control all the activities of the cell // It carries genetic information or genes.	1					
d)	An animal cell because it does not have a cell wall	1 1	6m				
2a)i)	Third line of defence	1					
ii)	P : Artificial Passive immunity Q: Artificial Active immunity	1 1					
a)	P : antiserum is injected in the body to increase the concentration of antibodies to use as a treatment to recover from a serious illness/ immediate protection against diseases Q : a booster is needed to increase antibody production so that the concentration of antibodies is above the level of immunity to provide effective immunity in future.	1 1					
b)	Individual P has short term immunity where it provides immediate protection against diseases whereas individual Q has long –lasting immunity where it provide effective protection against certain diseases for long term	1	6m				
3a)	P : saturated fats Q : unsaturated fats	1 1					
b)	-M process is hydrolysis -triglyceride is breakdown by water - Water is used to break the bond between glycerols and fatty acids.	1 1 1					
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	<p>Lemak tepu/Saturated fats</p> <p>Asid lemak hanya mempunyai ikatan tunggal antara karbon <i>Fatty acids only have single bonds between carbon.</i></p> <p>Tidak membentuk ikatan kimia dengan atom hidrogen tambahan kerana semua ikatan antara atom karbon tepu. <i>Do not form chemical bonds with additional hydrogen atoms because all bonds between carbon atoms are saturated.</i></p> <p>Didapati dalam bentuk pepejal pada suhu bilik <i>Exist in solid form at room temperature.</i></p>	<p>Lemak Tak tepu/Unsaturated fats</p> <p>Asid lemak mempunyai sekurang-kurangnya satu ikatan ganda dua antara karbon <i>Fatty acids have at least one double bond between carbon.</i></p> <p>Ikatan ganda dua masih boleh menerima satu atau lebih atom hidrogen tambahan kerana atom karbon tidak tepu. <i>Double bonds can still receive one or more additional hydrogen atoms because carbon atoms are unsaturated.</i></p> <p>Didapati dalam bentuk cecair pada suhu bilik. <i>Exist in liquid form at room temperature</i></p>	1	1	
			1	1	7m
4a)i)	S		1		
ii)	1 region		1		
b)	- Involve in growing of organisms - Replication of cells in organisms		1		
c)	R, Q, S, P		1		
d)	Phase Q – chromosomes arrange in the metaphase plate Phase P –sister chromatids of each chromosomes separate at the centromere and move to opposite poles by shortening of the spindle fibres		1	1	7m
5a)	P : Scapula R : Ligament		1	1	
b)	Strong and elastic		1		
c)i)	Tendon		1		
ii)	The arm cannot bend		1		
d)			1		

	<p>1. biceps muscle contracts whereas triceps muscle relaxes at antagonistic action</p> <p>2. the lower arm moves up and arm bends at the elbow joint.</p> <p>3. The contraction of biceps muscles pulls the lower arm bones towards the shoulder</p>	<p>1</p> <p>1</p> <p>1</p> <p>Max 2</p>	8m
6a)	Diagram 6.1 : discontinuous variation Diagram 6.2 : continuous variation	<p>1</p> <p>1</p>	8m
b)	-Allows cross breeding among species to form new species -Ensures survival of the species when the environment changes	<p>1</p> <p>1</p>	
c)	P : Translocation Q : inversion	<p>1</p> <p>1</p>	
d)	Cigarettes contain carcinogenic substances that can cause DNA mutation that can cause deformities in foetus	<p>1</p> <p>1</p>	
7a)i)	P : <i>Rhizobium</i> sp. S : <i>Nitrobacter</i> sp.	<p>1</p> <p>1</p>	9m
ii)	Eubacteria	1	
b) i)	<p>P :</p> <ul style="list-style-type: none"> - Involve in nitrogen fixation - Fix nitrogen in the atmosphere and changes it to ammonium ions <p>S :</p> <ul style="list-style-type: none"> - Involve in nitrification -Convert nitrate ions to nitrate ions. 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>Max 2</p>	
c)i)	<p>Simbiosis/mutualism</p> <p>P / <i>Rhizobium</i> sp. convert nitrogen into ammonium ions / nitrate ion that used by leguminous plant</p> <p>Leguminous plant gives shelter and carbohydrate to P / <i>Rhizobium</i> sp</p>	<p>1</p> <p>1</p> <p>1 Max 2</p>	
ii)	-Activities of these bacteria become reduced / stopped -Because at lower pH bacteria become inactive or died	<p>1</p> <p>1</p>	
8a)i)	Oxygen	1	9m
ii)	to supply carbon dioxide	1	
iii)	increase the number of bulb/ decrease the distance of light sources/ increase the concentration of sodium hydrogen carbonate solution	<p>1</p> <p>1</p> <p>1 Max 1</p>	
b)i)	At P, low light intensity, the rate of photosynthesis is low when the light intensity increases, the rate of photosynthesis increases until point Q. aft point Q, when the light intensity increasem the rate of photosynthesis remains constant. carbon dioxide becomes the limiting factor	<p>1</p> <p>1</p> <p>1</p> <p>1 Max 2</p>	
ii)	The rate of photosynthesis will decrease enzymes are denatured at high temperature	<p>1</p> <p>1</p>	
c)	The rate of photosynthesis will decrease stomata are covered with wax	<p>1</p> <p>1</p> <p>1 Max 2</p>	

	prevent carbon dioxide from diffusing into the leaf/ prevent gaseous exchange																																												
9a)i)	1. Respiratory system of organism X is a tracheal system 2. There is a small hole in the thorax and abdomen of the insect which is a spiracle. 3. Spiracle allows air to enter the trachea system. 4. The trachea branched to form a finer channel called the tracheal. 5. The large number of tracheal provides a large amount of surface area for gas exchange. 6. The trachea wall is thin and damp for efficient gas exchange.	1 1 1 1 1 1	6m																																										
ii)	1. During breathing in, the abdominal muscles relax. 2. Air pressure in the trachea decreases and air enters the trachea through the spiracles. 3. while breathing out, the abdominal muscles contract. 4. Air pressure in the trachea increases and thus forces the air out through spiracles.	1 1 1 1	4m																																										
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10a)	P1: P is mouth, Q is duodenum and R is ileum	1																																											

	P2: Bread contains carbohydrates	1	
	P3: In mouth /P, bread is chewed to break it up into smaller pieces to increase the surface area forenzyme action.	1	
	P4: Bread is mixed with saliva which is secreted by thesalivary glands.	1	
	P5: Saliva contain (salivary) amylase	1	
	P6 : Which hydrolyses starch into maltose	1	
	P7: In duodenum / Q, the pancreatic juice (secreted by the pancreas) contains amylase, (trypsin and lipase)	1	
	P8: (Pancreatic) amylase acts on starch to hydrolyse it to maltose	1	
	P9: In ileum /R, intestinal juice contains maltase, (sucrose, lactase and erepsin)	1	
	P10: Maltase hydrolyse maltose into glucose	1	
	P11: Sucrase hydrolyses sucrose into glucose and fructose	1	
	P12: Lactase hydrolyses lactose into glucose and galactose	1	10m
b)i)	Total energy intake = (500 x 18) + (200 x 8) + (200 x 11) + (150 X 4) + (180X 4)// = (5 x 1800) + (2 x 800) + (2 x 1100) + (1.5 X 400) + (1.8X 400) = 14 120 kJ	1	2m
ii)	F: Energy intake is more than the daily requirement <u>Consequences of consuming diet:</u> P1: Rice contain carbohydrate P2: Excess intake of carbohydrate will lead obesity // Excess carbohydrate will stored as fat P3: Fried chicken contain a lot of fat P4: Increases the level of cholesterol in blood P5: Cholesterol will be deposited on the wall of arteries // Artherosclerosis /cardiovascular diseases occurs P6: Fried potato contain high (fats) and salts P7: Excess salts will lead to high blood pressure /hypertension P8: Soft drink contains high sugar P9: High intake of sugar will lead to diabetes P10: Snack contains preservatives / artificial colouring / artificial flavour	1 1 1 1 1 1 1 1 1 1 1 1 1	1 Any 5

	P11 : Lead to cancer		
iii)	<u>Recommendation to improve her daily diet:</u> R1: Reduce the intake of rice // Replace with healthy type of rice / parboiled rice / basmathi rice / brown rice R2: Replace fried chicken with steamed / roasted chicken // Cook with air fryer R3: Replace soft drink with fruit juice / mineral water R4: Replace fried potato with boiled / grilled potato R5: Replace snack with vegetable salad / fruit salad	1 1 1 1 1	Any 2 1F+5P+2R 8m
11a)	P1: Compost is a mixture of (decayed) of an organic matter/ domestic waste/ food waste P2 : that has been decomposed in a process called decomposition by microorganisms P3: as (good) fertilizer for plants P4: Enriches soil/ adds nutrients into the soil / repair damaged soil using chemical fertilisers P5: Reduces the need for chemical fertilizers/ contains no chemicals. P6: Does not contain any harmful substances P7: Increases the production of fungi and beneficial bacteria in the soil. P8 : Reduces landfill waste. P9: Helps to reduce the formation of a greenhouse gases in the atmosphere. P10: No air pollution/ water pollution/ soil pollution. P11: Reduces soil erosion P12: Safe to use and has no side effects when used too much. P13: 100% natural fertiliser. P14: Suitable for all types of plants.	1 1 1 1 1 1 1 1 1 1 1 1 1 1	Any 10 10m
b)i)	P1- banana in situation Y will ripe first P2- matured banana will release ethylene gas P3- ethylene release will trap in the container P4- ethylene gas will stimulate/enhance/induce the ripening of banana P5- ripening of banana will be faster	1 1 1 1 1	Max : 4m
ii)	G1- produce more product G2- Increase nutritional value of crops/ produce quality fruit/ bigger fruit	1 1	

G3- resistant to diseases/ changes of temperature/ pests	1	
G4-reduce the usage of pesticides	1	
G5-can keep longer the fruit/ fruit mature faster	1	
G6- increase the income	1	
G7- Overcome worldwide food shortage byproducing high quality transgenic crops	1	
G8-Reduce cost of food production	1	
B1- threaten the survival of natural species/ extinct of species	1	
B2- the foreigngene in GMF may be transferred to humans in food chain	1	
B3- disrupt the equilibrium of nature	1	
B4-May have adverse effects on human healthand genetic material	1	
		3G+3B Max : 6m