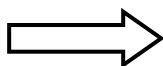


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Coimisiún na Scrúduithe Stáit State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2011

BIOLOGY – HIGHER LEVEL

THURSDAY, 16 JUNE – MORNING, 9.30 TO 12.30

Section A Answer any **five** questions from this section.
Each question carries 20 marks.
Write your answers in the spaces provided on **this examination paper**.

Section B Answer any **two** questions from this section.
Each question carries 30 marks.
Write your answers in the spaces provided on **this examination paper**.

Section C Answer any **four** questions from this section.
Each question carries 60 marks.
Write your answers in the **answer book**.

It is recommended that you spend not more than 30 minutes on Section A and 30 minutes on Section B, leaving 120 minutes for Section C.

You must return this examination paper with your answer book at the end of the examination.

Section A
Answer any five questions.
Write your answers in the spaces provided.

1. Answer **five** of the following:

- (a) Which food type may be identified in the laboratory by the use of Sudan III or brown paper?

- (b) Give one role for a **named** mineral in plants.

- (c) What colour indicates a strong positive result of the Fehling's or Benedict's test for reducing sugar?

- (d) Give a role of lipids in cells.

- (e) Give a role of water in the human body other than as a component of cytoplasm and body fluids.

- (f) How many common amino acids are found in proteins?

2. Use your knowledge of mitosis to answer the following questions:

- (a) What is the role of mitosis in single-celled organisms?

- (b) What medical term is used for the group of disorders in which certain cells lose normal control of mitosis?

- (c) Suggest a possible cause of one of the group of disorders referred to in (b).

- (d) Name the stage of mitosis in which the chromosomes are located at the equator of the cell and before they begin to separate.

- (e) To what are the chromosomes attached in the stage of mitosis referred to in (d)?

- (f) Towards the end of mitosis, in what type of cell does a cell plate form?

- (g) Give **one** way in which mitosis differs from meiosis.

1.		5(4) i.e. best FIVE answers from (a) – (f)	
	(a)	Fat (or oil or lipid)	
	(b)	Role matching named mineral	
	(c)	Orange or red	
	(d)	Component of membranes (or of named membrane) or storage or energy or solvent or reference to steroid or (formation of) phospholipid (or lipoprotein)	
	(e)	Solvent (or example of solvent) or reaction medium or transport or reactant (or example of reaction) or reference to temperature maintenance or reference to temperature regulation or lubrication qualified or protection qualified	
	(f)	20 (common amino acids)	

2.		6(3) + 2	
	(a)	Reproduction	
	(b)	Cancer	
	(c)	Named carcinogen	
	(d)	Metaphase	
	(e)	Spindle	
	(f)	Plant (cell) or named example	
	(g)	Two (daughter) cells or identical (daughter) cells or (daughter cells) same chromosome number (as mother cell) or can occur in haploid cells	

3. Choose suitable terms from the list below that most closely match each of the following descriptions:

population; producers; competition; predation; community; symbiosis; decomposers; parasitism

(a) A situation in which one organism lives on or in a second species, feeding on it and causing it harm.

(b) Organisms capable of making their own food.

(c) All the members of a species living in an area.

(d) Micro-organisms and other organisms that return nutrients to the environment by decay.

(e) A situation in which two organisms of different species live together and at least one benefits.

(f) A struggle between organisms for a scarce resource.

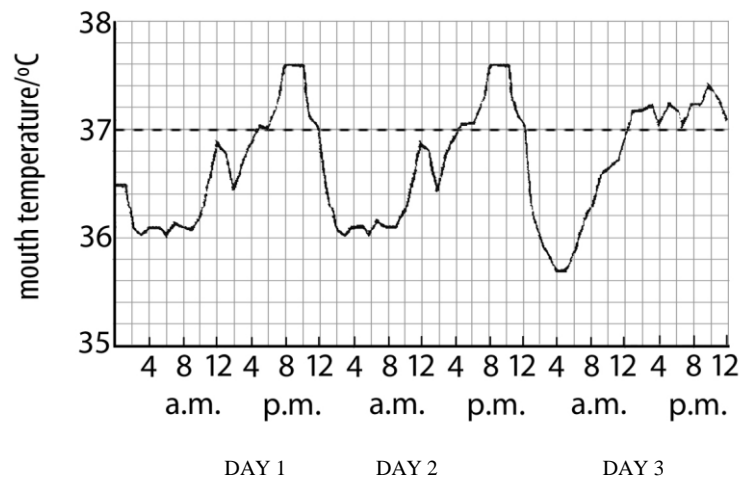
(g) One organism killing and eating another organism.

4. (a) (i) What is an *endotherm*? _____

(ii) What word is used to describe animals which are not endotherms?

(iii) Suggest an advantage of being an endotherm. _____

(b) The graph shows daily variations of human body temperature over three days.



(i) What is the maximum range of body temperature under normal conditions as shown in the graph?

(ii) At what time each day does body temperature drop to its lowest level? _____

(iii) Suggest a reason for the drop in temperature at the time referred to in (ii).

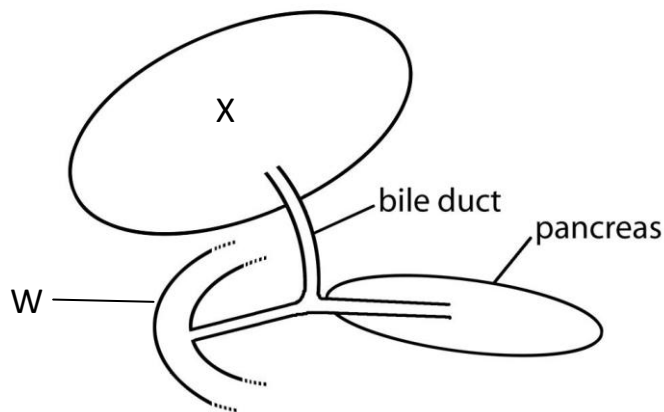
(iv) Children typically have higher body temperatures than adults. Suggest a reason for this.

3.		6(3) + 2	
	(a)	Parasitism	
	(b)	Producers	
	(c)	Population	
	(d)	Decomposers	
	(e)	Symbiosis	
	(f)	Competition	
	(g)	Predation	

4.			6 (3) + 2	
	(a)	(i)	(An animal that) produces its (or own or body) heat or (body) temperature independent of (temperature of) environment	
		(ii)	Ectotherms	
		(iii)	(Temperature always suitable) for good enzyme activity or maintains constant body temperature or activity independent of environmental temperature	
	(b)	(i)	35.7°C to 37.6°C or 1.9°C or 36°C to 37.6° or 1.6°C	
		(ii)	(Any quoted time from) 3 a.m. to 6 a.m. inclusive	
		(iii)	Low metabolism (or explained) or sleep (or inactivity)	
		(iv)	High metabolism or growing (or more cell division) or more active or more infections or teething	

5. (a) (i) What is meant by the term *digestion*? _____
- (ii) Why is digestion necessary? _____
- (iii) Distinguish between mechanical and chemical digestion by writing a sentence about each.

- (b) The diagram shows part of the human alimentary canal and associated structures.



- (i) What part of the alimentary canal is labelled W? _____
- (ii) The bile duct is connected to X. Name X. _____
- (iii) From which part of the alimentary canal does food arrive into W? _____
- (iv) State **one** digestive function of the pancreas. _____

6. Cellular respiration may occur in one stage or two stages.

- (a) Give **two** differences, other than location, between Stage 1 and Stage 2.

- (i) _____
- (ii) _____

- (b) Where in a cell does Stage 1 occur?

- (c) What term is used to describe respiration in which only Stage 1 occurs?

- (d) Name a chemical end product of the type of respiration referred to in (c).

- (e) In Stage 2 of respiration electrons pass along an electron transport chain, releasing energy. In what molecule is this energy stored in the cell?

- (f) To what are these electrons transferred at the end of the electron transport chain?

5.			6 (3) + 2	
	(a)	(i)	The breakdown of food	
		(ii)	For solubility or for absorption or for transport	
		(iii)	Mechanical: physical or grinding or cutting or churning or chewing or emulsifying Chemical: (action of) enzyme or named enzyme or (action of) acid or named acid	
	(b)	(i)	Duodenum or small intestine	
		(ii)	Gall bladder or liver	
		(iii)	Stomach	
		(iv)	(Produces) enzymes or named enzyme or neutralises (chyme)	

6.			6(3) + 2	
	(a)	(i), (ii)	Stage 1 does not require O ₂ or is anaerobic produces a small amount of energy (or ATP)	
	(b)		Cytoplasm or cytosol	
	(c)		Anaerobic or fermentation	
	(d)		Ethanol or lactic acid or CO ₂	
	(e)		ATP	
	(f)		Oxygen or H ⁺ (or protons)	

Section B

Answer any two questions.

Write your answers in the spaces provided.

Part (a) carries 6 marks and part (b) carries 24 marks in each question in this section.

7. (a) In relation to the scientific method, explain each of the following.

(i) Experiment. _____

(ii) Theory. _____

(b) Scientists investigated the effect of a certain mineral on the growth of wheat.

Use your knowledge of biology and laboratory procedures to answer the following questions.

(i) Suggest a reason why the seeds used were all taken from one parent plant.

(ii) The compost in which the wheat plants were grown was sterilised at the start of the investigation.

1. Suggest a way in which the scientists may have sterilised the compost.

2. State **one** reason why it was important to sterilise the compost.

(iii) Why did the scientists divide the young wheat plants into two equal groups?

(iv) During the investigation the scientists kept the two groups of plants under identical conditions. Why was this?

(v) Name **two** conditions you think the scientists would have kept constant during the investigation.

1. _____

2. _____

(vi) Why did the scientists repeat the investigation several times before publishing their results in a scientific journal?

[OVER]

7.	(a)	(i)	Test of hypothesis or test of prediction	3
		(ii)	Hypothesis (or explained) supported (by experiment)	3
	(b)	(i)	To minimise (genetic) variation	3
		(ii)	1. Heat (or method of heating) or named chemical or irradiation (or named) 2. To kill organisms or to prevent contamination or to eliminate competition or to eliminate disease or described	3 3
		(iii)	As control (or described)	3
		(iv)	To have only one variable (or explained)	3
		(v)	Temperature / Light / pH / CO ₂ / humidity / other minerals / H ₂ O Any 2	2(3)
		(vi)	To ensure (statistical) reliability	3

8. (a) State a use for each of the following in the biology laboratory:

(i) Buffer solution. _____

(ii) Biuret test. _____

(b) (i) In the course of your practical studies you used a solution of iodine in different investigations. State **two** different uses of the iodine solution.

Use 1. _____

Use 2. _____

(ii) State **two** different uses of a water bath in biological investigations.

Use 1. _____

Use 2. _____

(iii) In the course of your practical studies you found that heart rate and breathing rate increase with exercise.

Explain why this is the case.

(iv) In the course of your practical work you prepared a transverse section (T.S.) of a dicot stem for microscopic examination.

How did you prepare the T.S.?

8.	(a)	(i)	To keep pH constant	3
		(ii)	To detect presence of protein	3
	(b)	(i)	Starch detection (or use of) Examining cells (or described)	3 3
		(ii)	Keep temperature constant (or example) / to vary temperature (or example) / denaturing enzyme / heating Any 2	2(3)
		(iii)	More energy (required) / more oxygen (required) / more CO ₂ (produced) Any 2	2(3)
		(iv)	<i>Cutting:</i> Cut thin (section) or (cut) away (from self) or with scalpel (or blade or microtome) <i>Mounting:</i> placed onto slide with water or how cover slip applied	3 3

9. (a) (i) How are the two strands of a DNA molecule joined together? _____
- (ii) What is 'junk' DNA? _____
- (b) Answer the following questions by referring to the procedures that you used to isolate DNA from a plant tissue.
- (i) Having obtained a plant tissue e.g. onion,
1. What was the first procedure that you followed?

2. What was the reason for that procedure?

- (ii) Washing-up liquid is then used in the isolation. Give a reason for its use.

- (iii) Salt (sodium chloride) is also used in the isolation. Give a reason for its use.

- (iv) 1. What is a protease?

2. Why is a protease necessary when isolating DNA?

- (v) The final stage of the isolation involves the use of freezer-cold ethanol.
1. Describe how it is used. _____
2. For what purpose is it used? _____

[OVER]

9.	(a)	(i)	Hydrogen bonds	3
		(ii)	Non-coding (or described)	3
	(b)	(i)	1. Chop 2. To disrupt structure (or described) or to increase surface area	3 3
		(ii)	To disrupt membranes	3
		(iii)	To clump the DNA (or described) or to protect DNA from other positive ions	3
		(iv)	1. An enzyme that digests protein 2. Because DNA is combined with protein	3 3
		(v)	1. Added down the side of the test tube or added slowly 2. To bring the DNA out of solution	3 3

Section C

Answer four questions.

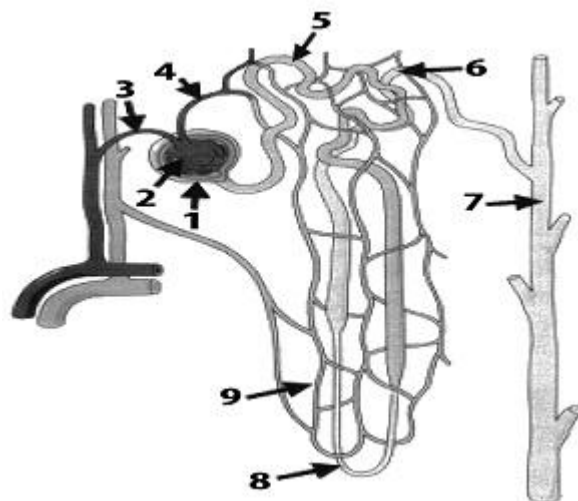
Write your answers in the answer book.

10. (a) (i) Distinguish between *contest competition* and *scramble competition* by writing a sentence about each. (9)
- (ii) Name a factor, other than competition, that controls wild populations. (9)
- (b) What deduction is it possible to make from each of the following observations?
- (i) In a particular area the population of a predator did not decline following a big reduction in the population of its main prey. (27)
- (ii) Mortality levels resulting from infection by a particular virus tend to decline over the years.
- (iii) Where some members of a species remain in the same general area throughout life and some members are migratory, mortality levels tend to be higher in the migratory part of the population.
- (iv) There is a greater variety of herbaceous (non woody) plants in areas where grazing species, such as rabbits, are more plentiful than in areas where grazing species are less plentiful.
- (v) In some species of migratory ducks in the northern hemisphere it is found that the wintering grounds of the males lie further south than those of the females. (27)
- (c) (i) In relation to a study of an ecosystem distinguish clearly between *qualitative* and *quantitative* surveys by writing a sentence about each. (24)
- (ii) How were you able to identify the different plants in the ecosystem that you investigated?
- (iii) Describe how you carried out a quantitative survey of the major plant species.
- (iv) Give **two** possible sources of error that may have arisen in the course of your survey. (24)
11. (a) (i) What do you understand by the term *adverse external environment*? (9)
- (ii) Give **two** ways in which plants protect themselves from adverse external environments. (9)
- (b) (i) Name the group of substances in plants which control responses to external stimuli. (27)
- (ii) 1. What name is given to the regions in plants in which these substances are produced?
2. Give locations for **two** of these regions.
- (iii) Most plant shoots are positively phototropic. Explain the underlined term.
- (iv) How does the plant benefit from this response?
- (v) Explain the mechanism of response by a plant to a **named** external stimulus. (27)
- (c) (i) What is a hormone? (24)
- (ii) State **two** ways in which hormones are similar to the group of substances referred to in (b)(i).
- (iii) 1. What is meant by *feedback* in relation to hormone action?
2. Give a brief account of the feedback mechanism for a **named** hormone.
- (iv) Describe **one** deficiency symptom of a **named** hormone. (24)

10.	(a)	(i)	<i>Contest:</i> (Results in) winner takes all (of a limited resource) <i>Scramble:</i> (Results in) each gets some (of a limited resource)	3 3
		(ii)	disease or parasitism or predation or hunting or reference to other named environmental condition	3
	(b)	(i)	Different prey	3(7) + 2(3)
		(ii)	(Host) immunity develops or comment on natural selection (or described) or most virulent strains die off or vaccination	
		(iii)	Hazards encountered on migration (or particular example of a hazard)	
		(iv)	(Grazing results in) reduced competition (or described)	
		(v)	Accept any biological knowledge-based statement that would provide a plausible rationale for a differential migratory pattern	
	(c)	(i)	<i>Qualitative:</i> What is present <i>Quantitative:</i> How many present	3 3
		(ii)	Key(s) or illustrations	3
		(iii)	Quadrat / random / how random / count (or estimate) / many times / calculate (or record) Any 3 OR Transect / stations / intervals / count (or estimate) / how (counted) / result described Any 3	3(3)
		(iv)	Misidentification / non-random (quadrat distribution) / not enough times / unsuitable quadrat size / miscount (or miscalculation) Any 2	2(3)

11.	(a)	(i)	Surroundings that are harmful to organism(s)	3
		(ii)	Thick cuticle / changed transpiration (rate) / leaf fall / toxic parts / thorns / stings / dormancy / perennating organs / heat shock proteins Any 2	2(3)
	(b)	(i)	(Plant) growth regulators or auxins (or other named group)	3
		(ii)	1. Meristems 2. Root tip / shoot (or stem) tip / bud / embryo (or named part) / fruit / seed / between xylem and phloem (or vascular bundle) Any 2	3 2(3)
		(iii)	Growth towards light	3
		(iv)	Increased photosynthesis	3
		(v)	Named stimulus / diffusion of growth regulator / unequal distribution (of growth regulator) / one side grows faster / results in bending Any 3	3(3)
	(c)	(i)	A chemical messenger or product of endocrine (or ductless) gland	3
		(ii)	Produced in one location / acts in different location / prolonged effect Any 2	2(3)
		(iii)	1. When the level of a hormone (in the blood) controls (the production) of another (or itself) 2. Named hormone inhibits (or causes production of) a named hormone	3 3 3
		(iv)	One deficiency symptom of a named hormone	3

12. (a) (i) What is meant by the term *excretion*?
(ii) Mention **one** method of excretion in flowering plants. (9)
- (b) (i) Draw a large labelled diagram of a vertical section through a human kidney. Label the following parts of your diagram: cortex, medulla, pelvis.
(ii) Indicate clearly on your diagram where re-absorption takes place.
(iii) 1. Name the blood vessel that supplies blood to a kidney.
2. From which blood vessel does the blood vessel referred to in (iii)1 arise?
(iv) In which cavity of the body are the kidneys located?
(v) Name **one** substance, other than water, excreted in the urine.
(vi) Give a feature of the kidney which indicates that it is an exocrine gland. (27)



- (c) (i) The diagram above shows the structure of a nephron and its associated blood supply.
1. Name the parts numbered 1 to 6.
2. Indicate clearly by number where filtration takes place.
3. Name the hormone associated with changing the permeability of the structure at 7.
(ii) A sample of urine was found to contain protein.
1. Would you consider this to be normal?
2. Explain your answer.
(iii) A sample of urine was found to contain glucose.
1. Would you consider this to be normal?
2. Explain your answer. (24)

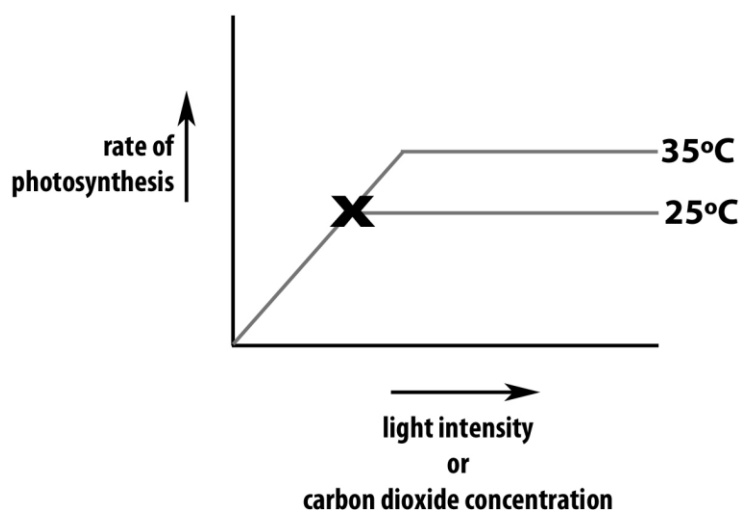
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12.	(a)	(i)	Eliminating waste Made in the body	3 3
		(ii)	Diffusion or leaf fall or transpiration or through lenticels (or through stomata)	3
	(b)	(i)	Diagram: Labels: <i>cortex, medulla, pelvis</i>	3, 0 3(2)
		(ii)	Position of reabsorption indicated	3
		(iii)	1. *Renal artery 2. *Aorta	3 3
		(iv)	*Abdominal (cavity) or *Abdomen	3
		(v)	Urea or salt or uric acid	3
		(vi)	Has ducts or does not produce hormones	3
	(c)	(i)	1. 1 = Bowman's capsule; 2 = glomerulus; 3 = afferent arteriole; 4 = efferent arteriole; 5 = proximal (convoluted) tubule; 6 = distal (convoluted) tubule; 2. *1 or *2 or *1 and 2* 3. Anti-diuretic hormone or ADH or vasopressin	6(1) 3 3
		(ii)	1. *No 2. Protein molecules too big (to pass into the filtrate) <i>Note: 'Yes' correctly qualified (e.g. low level or pregnancy) for 6m</i>	3 3
		(iii)	1. *No 2. Glucose (in the filtrate should have been) reabsorbed	3 3

13. (a) (i) What is meant by the term *evolution*?
(ii) Name either of the scientists responsible for the Theory of Natural Selection. (9)
- (b) In the antirrhinum (snapdragon) there is no dominance between the allele for red flower and the allele for white flower. Heterozygous individuals have pink flowers.
The allele for tall stem is dominant to the allele for short stem.
These pairs of alleles are located on different chromosome pairs.
(i) What is the significance of the fact that the two allele pairs are located on different chromosome pairs?
(ii) A plant which had pink flowers and was heterozygous in respect of stem height was crossed with one which had white flowers and a short stem.
1. Using suitable symbols determine the genotypes of all the possible offspring of this cross.
2. For each of your answers, state the phenotype that would result. (27)
- (c) Distinguish between the members of each of the following pairs of terms, by writing a sentence about **each** member of each pair.
(i) Gene and allele.
(ii) Homozygous and heterozygous.
(iii) Genotype and phenotype.
(iv) Linkage and sex linkage. (24)

13.	(a)	(i)	(Inheritable) change within a population (or species) / in response to change in the environment / by natural selection / over time <i>Any 2</i>				2(3)
		(ii)	Darwin or Wallace				3
	(b)	(i)	Independent assortment (or described) can occur or more variation (in offspring)				3
		(ii)	RrTt	Rrtt	rrTt	rrtt	
			OR				
			RWTt	RWtt	WWTt	WWtt	4(3)
			pink + tall	pink + short	white + tall	white + short	4(3)
			Phenotype must match a correct genotype				
			Each excess incorrect cancels a correct answer				
	(c)	(i)	<i>Gene:</i>	a section of DNA that codes for one polypeptide (or protein or trait) or unit of heredity			3
			<i>Allele:</i>	(an alternative) form of a gene			3
		(ii)	<i>Homozygous:</i>	identical alleles			3
			<i>Heterozygous:</i>	different alleles (of a gene)			3
		(iii)	<i>Genotype:</i>	genetic makeup or genes (alleles) present			3
			<i>Phenotype:</i>	the expression of the genotype (and environment) or physical makeup (or appearance)			3
		(iv)	<i>Linkage:</i>	genes on the same chromosome			3
			<i>Sex-linkage:</i>	(located) on sex-chromosome or on X-chromosome or on Y-chromosome			3

- (a) The graph shows the results of a classroom investigation into the factors affecting the rate of photosynthesis. The variable investigated was **either** light intensity **or** CO₂ concentration.



In your answer book, indicate clearly which factor you choose to address and answer the following questions:

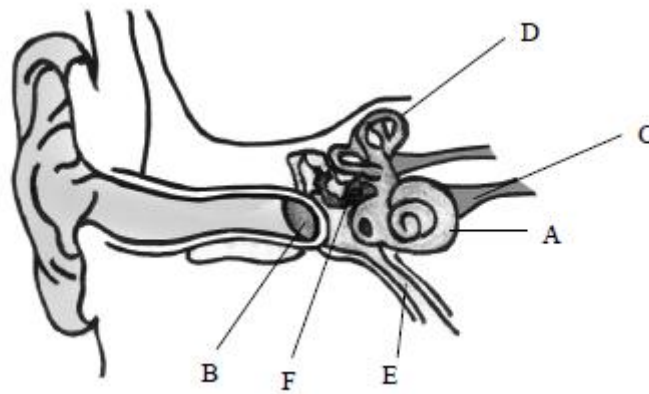
- (i) Suggest a suitable plant for such an investigation.
- (ii) How was the rate of photosynthesis measured?
- (iii) Name a factor that must be kept constant during this investigation.
- (iv) Explain how you would keep constant the factor referred to in (iii).
- (v) Why is it necessary to keep that factor constant?
- (vi) 1. What happens to the rate of photosynthesis at X when the investigation is
 A. carried out at 25°C?
 B. carried out at 35°C?
 2. Give a reason for **each** answer.
- (b) (i) What is meant by the term *metabolism*?
- (ii) “Enzymes are essential for metabolism”. Explain why this statement is true.
- (iii) In **each** of the following cases state whether the process is anabolic or catabolic.
- Protein synthesis.
 - Conversion of ADP to ATP.
 - Reactions in which product molecules are larger than substrate molecules.
- (iv) State **one** way by which an enzyme may be denatured.
- (v) Give **two** features of a denatured enzyme.
- (vi) Apart from carbon, hydrogen and oxygen, there is one other element always present in the building blocks of enzymes. Name that element.
- (c) (i) State the precise location of the cell membrane in plant cells.
- (ii) With what type of cell do you associate membrane-bound organelles?
- (iii) What corresponding term is used to describe bacterial cells?
- (iv) The cell membrane is described as being *selectively permeable*. What does this mean?
- (v) Why is diffusion alternatively known as *passive transport*?
- (vi) Osmosis may be described as “a special case of diffusion”. Explain why.
- (vii) Describe, with the aid of a labelled diagram, how you demonstrated osmosis in the laboratory.
- (viii) Name the structure by which *Amoeba* gets rid of excess water that has entered by osmosis.

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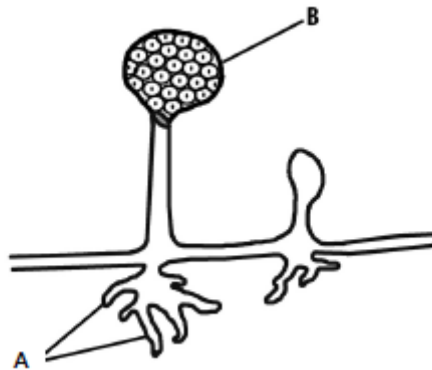
14.		Any two of (a), (b), (c)		(30, 30)
14.	(a)	(i)	Aquatic plant or named (e.g. Elodea)	3
		(ii)	Counted bubbles (or measured volume) / per unit time OR datalogging / named sensor (or mention of time)	2(3)
		(iii)	Light (<i>if CO₂ addressed</i>) or CO ₂ (<i>if light addressed</i>) or temperature	3
		(iv)	Fixed lamp distance (or wattage) or NaHCO ₃ or water bath (or described)	3
		(v)	To ensure that any change is not due to that factor	3
		1.	A It does not increase any further or levels off	3
			B It increases or does not level off	3
		2.	A Temperature is limiting or photosynthesis can not go any faster (at that temperature)	3
			B Temperature is not limiting or increased temperature allows greater rate	3

14.	(b)	(i)	(All) the chemical reactions in living cells	3
		(ii)	(Enzymes) are catalysts (Enzymes) control rate of (metabolic) reactions	3 3
		(iii)	1. *Anabolic 2. *Anabolic 3. *Anabolic	3(3)
		(iv)	High temperature or high (or low) pH or agitation (or described) or high salinity or alcohol	3
		(v)	Changed structure Loss of function	3 3
		(vi)	Nitrogen	3

14.	(c)	(i)	Immediately inside the cell wall	3
		(ii)	*Eukaryotic	3
		(iii)	*Prokaryotic	3
		(iv)	Only some substances are allowed through	3
		(v)	No (or little) energy (or ATP) required	3
		(vi)	Movement of water or (osmosis) requires a membrane	3
		(vii)	<i>Diagram:</i> container + 2 solutions separated by a membrane	(3,0)
		(vii)	<i>Labels:</i> membrane or plant tissue / solution 1 indicated / solution 2 indicated	3(1)
			<i>Result:</i> Shown in diagram or stated	3
		(viii)	Contractile vacuole	3



- (a) (i) The diagram above shows the internal structure of the human ear.
1. Name the structures labelled A, B, C.
 2. Give the functions of parts D and E.
 3. Which letters denote the parts of the ear in which nerve impulses are generated?
- (ii) In what part of *the eye* are nerve impulses generated?
- (iii) Suggest **one** way by which the ear may be protected.
- (iv) Explain how a corrective measure for a **named** defect of hearing **or** vision works.
- (b) (i) Name the tissue in plant stems through which water rises to the leaves.
- (ii) Give **one** way in which this tissue is adapted for the transport of water.
- (iii) Give a precise location of this tissue in the stem.
- (iv) State another function of the tissue referred to in (i).
- (v) The cohesion-tension model of transport attempts to explain water movement in plants against a particular force. Name this force.
- (vi) Describe the principal features of the cohesion-tension model.
- (vii) Name the two scientists mainly associated with the cohesion-tension model of transport.
- (c) The diagram below shows part of the mycelium of the fungus *Rhizopus*.



- (i) Give the name **and** state a function of the part labelled A.
- (ii) Name part B **and** explain why the reproduction associated with it is asexual.
- (iii) The nutrition of *Rhizopus* is described as being *saprophytic*.
1. What does the term *saprophytic* mean?
 2. Explain the importance of saprophytic nutrition in the overall scheme of nature.
- (iv) Saprophytic nutrition is a form of *heterotrophic* nutrition.
What does the term *heterotrophic* mean?
- (v) Name another form of nutrition employed by some fungi.
- (vi) Give **two** examples of harmful members of the kingdom Fungi.

15.			Any two of (a), (b), (c)	(30, 30)
15.	(a)	(i)	1. A = cochlea	2
			B = eardrum	2
			C = auditory nerve	2
			2. Function of: D = posture or balance	3
			E = pressure equalisation	3
			3. A	3
			D	3
		(ii)	Retina or named part of retina	3
		(iii)	Skull (or bone) or wax or wear ear protection or avoid noisy environments	3
		(iv)	Named defect	3
			Corrective measure or how this works to correct named defect	3

15.	(b)	(i)	*Xylem	3
		(ii)	Narrow or lignified (or rigid) or continuous lumen or wettable	3
		(iii)	In vascular bundles or next to phloem	3
		(iv)	Support or other transport function	3
		(v)	*Gravity	3
		(vi)	Water (molecules) stick together / (due to) H-bonding / continuous chain (of water molecules) / water tends to adhere to xylem walls / transpiration (or water loss) 'pulls' (the column of) water up Any 3	3(3)
		(vii)	*Dixon	3
			*Joly	3

15	(c)	(i)	A = rhizoids	3
			Function = digestion or secretion or absorption or anchorage	3
		(ii)	B = sporangium (<i>Reproduction is asexual because</i>) (the spores all develop from) one parent or no gametes involved	3
		(iii)	1. Feeding on dead matter	3
			2. Breakdown of dead matter or breakdown of organic matter or recycling	3
		(iv)	Obtains food from other organisms or does not make its own food	3
		(v)	Parasitic	3
		(vi)	Any two correct	2(3)

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