AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX

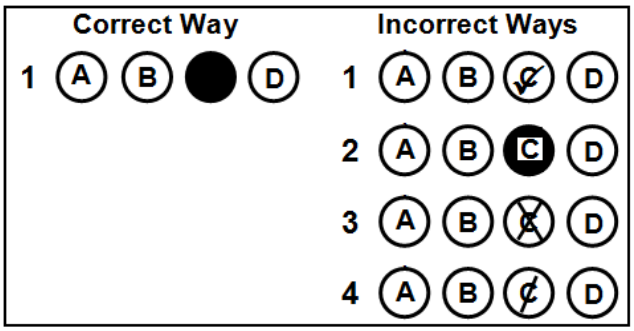
ANNUAL EXAMINATIONS (THEORY) 2025

Biology Paper I

Time: 1 hour 10 minutes Marks: 40

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 40 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On the answer grid, black out the circle for your choice with a pencil as shown below.



Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. The level of organisation of life to which deoxyribonucleic acid (DNA) belongs is

   A. tissue level.
   B. cellular level.
   C. organelle level.
   D. molecular level.

2. Consider the given image.

The given image depicts the relationship of biology with

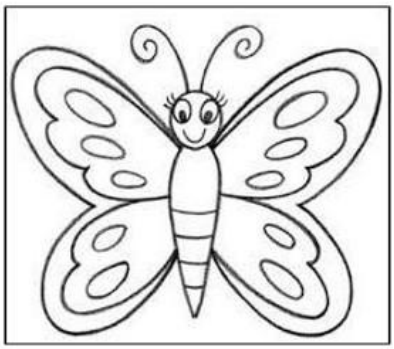
   A. chemistry.
   B. geography.
   C. economics.
   D. mathematics.

3. A student wants to perform Benedict's test to confirm the presence of glucose in the urine of diabetic patients. He uses the urine sample of 20 diabetic patients in the experimental group.

   To setup a control group for the above experiment, he/ she should mix and heat Benedict's reagent with

   A. patient's urine and glucose solution.
   B. healthy individual's urine.
   C. diabetic patient's urine.
   D. glucose solution.

4. A student is provided the given image of a butterfly to write qualitative and quantitative observations.



Which of the following observations is categorised as qualitative observations?

A. It has a pair of eyes.
B. It has a pair of antennae.
C. Its body has three segments.
D. Its wings have similar pattern.

5. The given table shows the biological classification of *Amanita*, a fungus, in the hierarchal order.

I	Fungi
II	Basidiomycota
III	Homobasidiomycetae
IV	Agaricales
V	Amanitaceae
VI	Amanita
VII	Amanita muscari

With reference to the given hierarchy, the level that represents the taxon, class, of *Amanita* is

A. II.
B. III.
C. IV
D. V.

6. All of the following are characteristics of viruses EXCEPT that they

A. have ribosomes.
B. are obligate parasites.
C. are sub-cellular particles.
D. require living cells to reproduce.

7. The hierarchical unit (taxon) of classification that LEAST likely helps to differentiate among vertebrates is

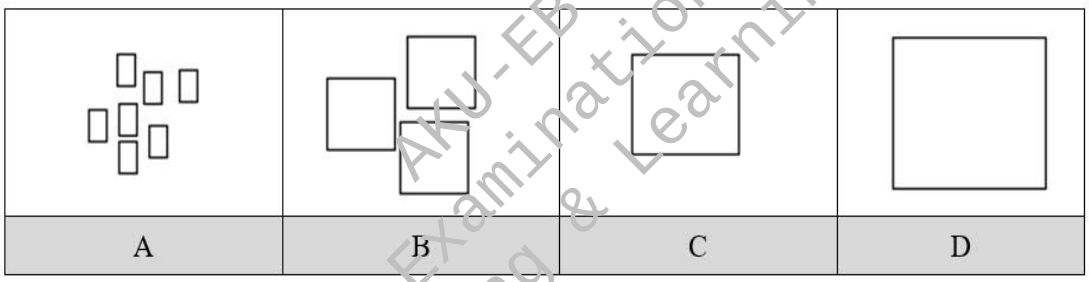
   A. order.
   B. genus.
   C. family.
   D. kingdom.

8. In contrast to jellyfish, sycon has

   A. soft body.
   B. porous body.
   C. numerous tentacles.
   D. umbrella-shaped body.

9. In the given table, different sizes of blocks represent the nutrients.

   Which of the following nutrients will be efficiently absorbed by the villi?



10. In living organisms, the structure of a specialised cell is determined by

    A. its location and function.
    B. its DNA content and size of nucleus.
    C. the number of amino acids in its cytoplasm.
    D. the orientation of phospholipids in its cell membrane.

11. In the human body, certain cells synthesise and secrete numerous proteins.

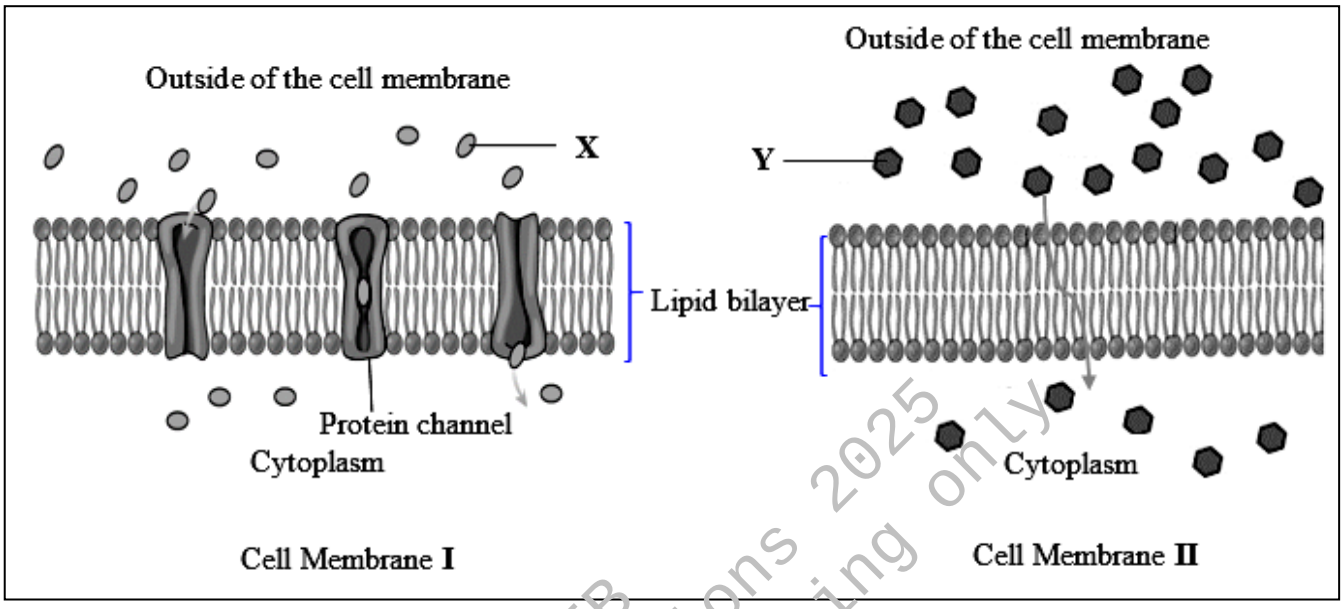
    Based on the given functions, this cell is expected to contain a large number of

    A. ribosomes and mitochondria.
    B. ribosomes and Golgi bodies.
    C. mitochondria and vacuoles.
    D. centrioles and vacuoles.

12. In a properly stained slide of epithelial cells of frog, the cell organelle that can be observed prominently under the light microscope is

    A. vacuole.
    B. nucleus.
    C. centriole.
    D. ribosome.

13. The given diagrammatic representations of fluid mosaic model of cell membrane **I** and **II** show the movement of **X** and **Y** ions/ molecules from outside of cell membrane into cytoplasm.



The option which CORRECTLY identifies **X** and **Y** is

	X	Y
A	oxygen molecule	potasium ion
B	water molecule	potasium ion
C	sodium ion	glucose molecule
D	glucose molecule	oxygen molecule

14. During the ripening of mangoes, the colour of the fruit wall changes from green to yellow.

This change in colour is due to the

A. conversion of starch into sucrose.
B. conversion of chromoplast into chloroplast.
C. activation of enzymes in the embryo of the seed.
D. presence of different pigments in the chromoplast.

15. In the light dependent reactions of photosynthesis, the source of electrons for NADPH (reduced nicotinamide adenine dinucleotide phosphate) is

A. ATP.
B. NAD.
C. water.
D. carbon dioxide.

16. A patient with high level of lactic acid in his body indicates

A. damaged villi.
B. liver dysfunction.
C. inactivation of digestive enzymes.
D. hypersensitive mucous secreting cells in stomach.

17. A scientist performs an experiment in a greenhouse to study the rate of photosynthesis in cucumber plants.

The given table shows the results of this investigation.

Percentage (%) Concentration of Carbon dioxide in the Air	Rate of Photosynthesis (arbitrary units)
0.00	0
0.02	5
0.04	16
0.06	19
0.08	20
0.10	20
0.12	20

The range of carbon dioxide concentrations between which the rate of photosynthesis changes the MOST is

A. 0.00% and 0.02%
B. 0.02% and 0.04%
C. 0.04% and 0.06%
D. 0.06% and 0.08%

18. The part of chloroplast that contains the enzymes required for carbon fixation is

A. stroma.
B. granum.
C. thylakoid lumen.
D. thylakoid membrane.

19. In a plant cell, the major sites for ATP synthesis driven by the electron transport chain are

    I. cristae of the mitochondria
    II. thylakoid of the chloroplast
    III. stroma of chloroplast
    IV. mitochondrial matrix

    A. I and II.
    B. I and IV.
    C. II and III.
    D. III and IV.

20. The function of NADPH (reduced nicotinamide adenine dinucleotide phosphate) in photosynthesis is to

    A. facilitate the breakdown of water molecules.
    B. excite the electrons of chlorophyll molecules.
    C. carry the electrons from light reactions to Calvin cycle.
    D. help in the absorption of sunlight by chloroplast during light reactions.

21. All of the following characteristics of alveoli help lungs in the diffusion of gases EXCEPT

    A. large surface area.
    B. continuous blood flow.
    C. moistened inner lining.
    D. drum shaped epithelial cells.

22. A person is showing the following symptoms of a respiratory disorder.

    - High fever
    - Cough with sputum
    - Lungs filled with pus

    Which of the following disorders is the person suffering from?

    A. Asthma
    B. Pneumonia
    C. Lung cancer
    D. Emphysema

23. In the human respiratory system, the structure which connects the pharynx with the trachea is

    A. larynx.
    B. bronchi.
    C. esophagus.
    D. pyloric sphincter.

24. Carbon monoxide present in cigarette smoke is harmful to human health because it

A. increases allergies.
B. destroys cilia in trachea.
C. binds with haemoglobin.
D. increases secretion of mucus.

25. During breathing, the relaxation of the diaphragm causes a/ an

A. increase in the volume of thoracic cavity.
B. decrease in the pressure of thoracic cavity.
C. expulsion of air from lungs into the atmosphere.
D. inflation of lungs to receive air from atmosphere.

26. In the cells of human body, enzymes continuously convert toxic chemicals into harmless products to prevent the accumulation of toxic chemicals.

This process occurs efficiently inside the cells because enzymes

A. work best in neutral pH.
B. have higher reaction rate.
C. are required in less amounts.
D. are sensitive to changing conditions.

27. The process which exemplifies anabolism is

A. glycolysis.
B. hydrolysis.
C. emulsification.
D. photosynthesis.

28. A group of students investigated the action of amylase enzyme on starch solution at constant temperature (37 °C) in four test tubes (**I**, **II**, **III** and **IV**) having different pH values.

The test tube having optimum pH is

	Test Tube	**pH of the Solution**	**Time Taken for the Complete Breakdown of Starch (seconds)**
A	I	4	310
B	II	5	240
C	III	6	120
D	IV	7	60

29. In plants, the macronutrient that is required for opening and closing of stomata is

A. carbon.
B. nitrogen.
C. potassium.
D. magnesium.

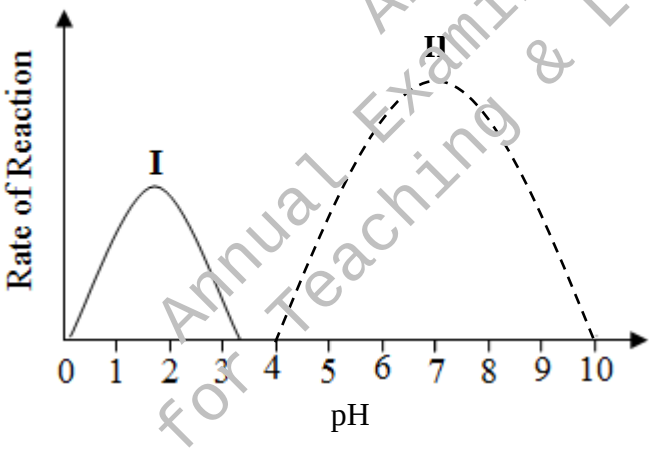
30. A person suffers from the following disorders due to long term consumption of unbalanced diet.

- Constipation
- Haemorrhoids
- Irritable bowel syndrome

Based on the given disorders, the nutrient that is deficient in his/ her diet is

A. fat.
B. fibre.
C. protein.
D. carbohydrate.

31. The given graph shows the optimum rate of reaction of enzymes **(I** and **II)** at different pH in the human digestive system.



The CORRECT option that identifies the parts of digestive system where enzymes **I** and **II** work is

	Enzyme I	**Enzyme II**
A	stomach	mouth
B	mouth	duodenum
C	duodenum	stomach
D	duodenum	mouth

32. Blood diagnostic test of a patient revealed excessive concentrations of amylase and lipase enzymes. Based on the result of blood test, the doctor diagnoses the malfunctioning of a digestive organ that secrete these enzymes.

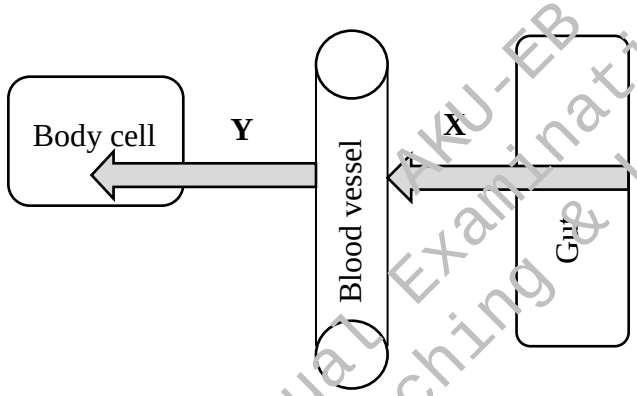
This digestive organ is identified as

A. liver.
B. pancreas.
C. esophagus.
D. large intestine.

33. The nutrient ion deficiency that decreases the overall protein content of a plant is

A. zinc.
B. nitrate.
C. copper.
D. magnesium.

34. The given schematic diagram represents processes **X** and **Y** in the human digestive system.



The processes **X** and **Y** are identified as

	X	**Y**
A	digestion	assimilation
B	absorption	emulsification
C	digestion	emulsification
D	absorption	assimilation

35. The concentration of ions inside the root hair cells is normally greater than that of the soil.

The transportation method used by the root hair cells to absorb further ions from the soil is

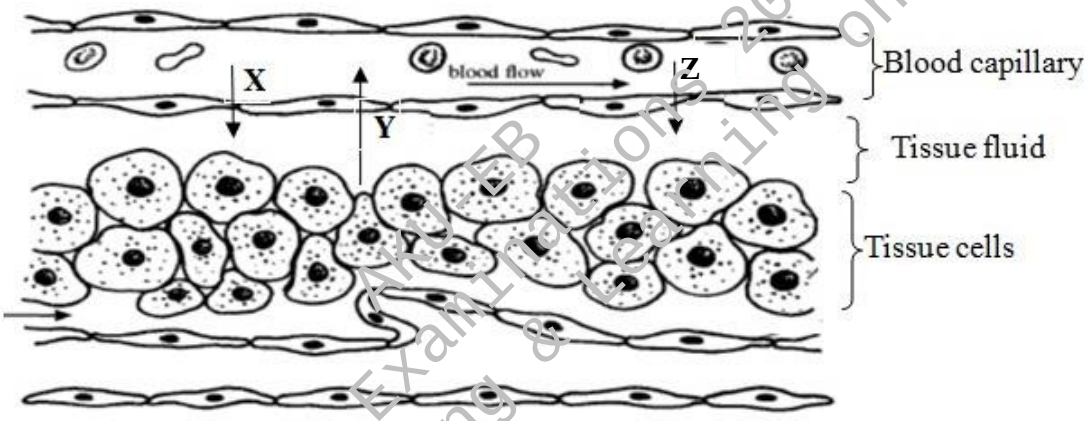
A. endosmosis.
B. active transport.
C. simple diffusion.
D. facilitated diffusion.

36. Saima, who has blood group B, needs blood.

People with which of the following blood groups can donate blood to Saima?

	Blood Group A	Blood Group B	Blood Group AB	Blood Group O
A	Yes	No	Yes	No
B	Yes	No	No	Yes
C	No	Yes	Yes	No
D	No	Yes	No	Yes

37. The given diagram represents the transfer of materials between blood capillary and tissue fluid.



The option which CORRECTLY identifies **X**, **Y** and **Z** is

	X	Y	Z
A	white blood cells	waste materials	glucose
B	waste materials	white blood cells	glucose
C	glucose	waste materials	red blood cells
D	glucose	red blood cells	waste materials

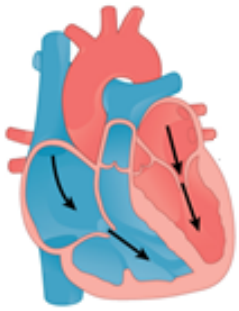
38. In plants, the rate of transpiration increases when the relative atmospheric humidity and temperature is

	Relative Atmospheric Humidity	Atmospheric Temperature
A	high	low
B	low	high
C	high	high
D	low	low

39. The mammalian heart chamber which initially receives blood from pulmonary circulation is the

A. left atrium.
B. right atrium.
C. left ventricle.
D. right ventricle.

40. The given diagram shows one of the phases of the cardiac cycle.



The events that simultaneously occur in the given phase are

I. atrial and ventricular muscles are relaxed.
II. aortic and pulmonary semilunar valves are closed.
III. atrial muscles are contracted and ventricular muscles are relaxed.
IV. aortic semilunar valves are closed and pulmonary semilunar valves are open.

A. I and II.
B. I and IV.
C. II and III.
D. III and IV.

END OF PAPER

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