

**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**HIGHER SECONDARY SCHOOL CERTIFICATE**

**CLASS XII EXAMINATION**

**APRIL/ MAY 2017**

**Biology Paper I**

**Time: 40 minutes    Marks: 30**

**INSTRUCTIONS**

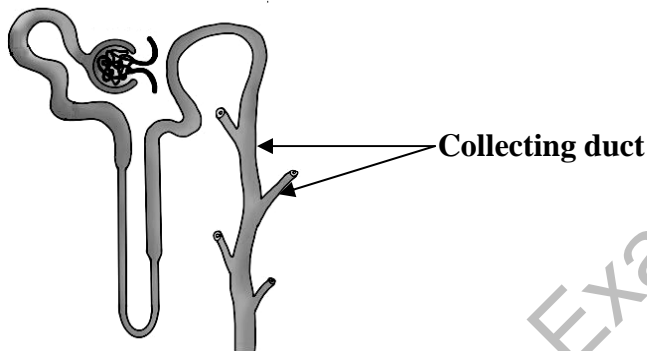
1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 30 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.

Correct Way				Incorrect Ways					
1	(A)	(B)	●	(D)	1	(A)	(B)	✓	(D)
					2	(A)	(B)	■	(D)
					3	(A)	(B)	✗	(D)
					4	(A)	(B)	⌢	(D)

**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.

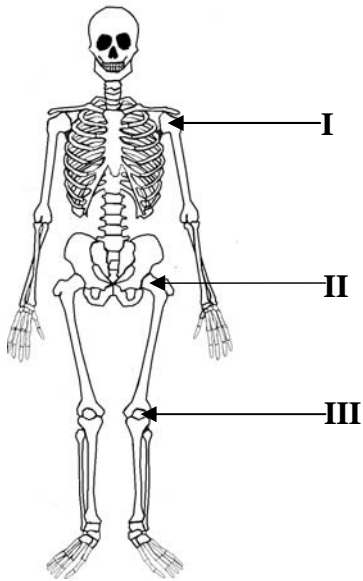
1. Osmoconformers are animals whose body fluids
  - A. always contain high water potential.
  - B. remain isotonic to the external environment.
  - C. are not affected by the external environment.
  - D. differ noticeably from the external environment.
2. Glomerular capillaries are unique among other capillaries present in the body because they are positioned between
  - A. venule and venule.
  - B. arteriole and venule.
  - C. arteriole and arteriole.
  - D. peritubular capillary and vasa recta.
3. A human nephron is shown in the given diagram.



The branch-like structure of the collecting duct in the given nephron suggests that

- A. a single nephron has a single collecting duct.
- B. a single nephron has multiple collecting ducts.
- C. several nephrons have multiple collecting ducts.
- D. several nephrons have a common collecting duct.

4. The diagram shows the skeleton of a human being with three joints labelled as **I**, **II** and **III**.



Which of the following statements is CORRECT with reference to the labelled joints?

- A. Joints **I** and **III** are examples of hinge joint.
  - B. Joint **II** allows movement in one direction only.
  - C. Joints **II** and **III** are examples of slightly moveable joints.
  - D. Joint **I** has two pairs of muscles perpendicular to each other.
5. Following structures are components of a skeletal muscle at macroscopic and microscopic levels.

- I. Muscle fibre
- II. Thick filament
- III. Myofibril

The CORRECT sequence of these components according to their size in ascending order is

- A. I, II, III
  - B. II, I, III
  - C. II, III, I
  - D. III, II, I
6. A farmer sprays a specific synthetic hormone to kill broad-leaved species of weeds in the lawn to save time and physical exertion.

Which hormone does the farmer use?

- A. Ethene
- B. Auxins
- C. Cytokinins
- D. Gibberelins

7. Nodes of Ranvier in the neurons are gaps between

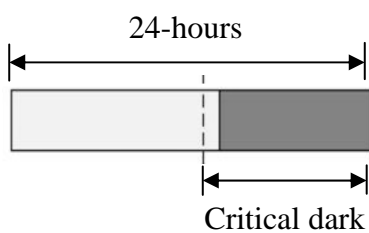
- A. axon terminals.
- B. myelin sheaths.
- C. axon and dendrites.
- D. dendrites and cell body.

8. Which of the following CORRECTLY represents the function of antidiuretic hormone (ADH) and its effect?

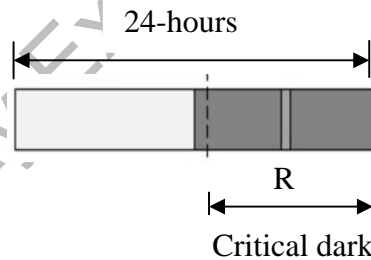
	ADH Secretion	Water Reabsorption	Urine Concentration
A	More	More	Concentrated
B	More	Less	Diluted
C	Less	More	Diluted
D	Less	Less	Concentrated

9. Cocklebur, a short day plant is exposed to different conditions of light.

Under which of the given conditions does cocklebur produce flowers?



A

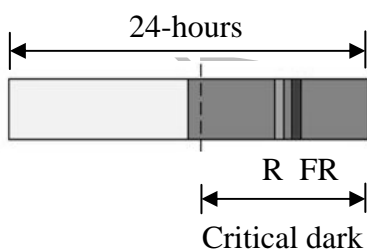


B

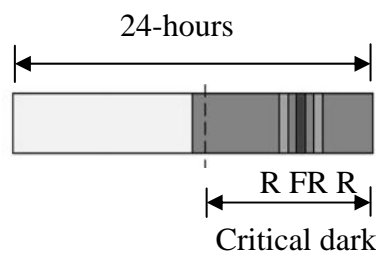
**Key:**

R = Red light

FR = Far red light



C



D

10. The structure that runs blood vessels between fetus and placenta is

- A. amnion.
- B. allantois.
- C. umbilical cord.
- D. chorionic membrane.

11. Open growth occurs in plants because meristematic tissues

- A. continuously replace themselves.
- B. are produced by all types of cells.
- C. for secondary growth are present in the shoot tips.
- D. for primary growth are present throughout the plant body.

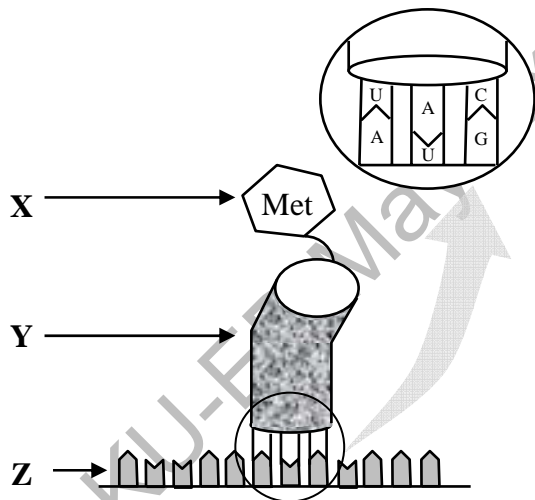
12.



The chromosome shown in the given diagram is classified as

- A. telocentric.
- B. acrocentric.
- C. metacentric.
- D. sub-metacentric.

13. The diagram shows a complex formed during translation.

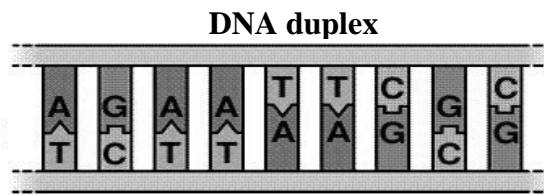


Which of the following is the CORRECT identification of **X**, **Y** and **Z**?

	<b>X</b>	<b>Y</b>	<b>Z</b>
A	Amino acid	Transfer RNA	Messenger RNA
B	Amino acid	Messenger RNA	Transfer RNA
C	Transfer RNA	Messenger RNA	Amino acid
D	Messenger RNA	Transfer RNA	Amino acid

14. The characteristic feature absent in amitosis that differentiates it from mitosis is
- A. DNA duplication.
  - B. spindle formation.
  - C. cytoplasmic division.
  - D. daughter cells production.
15. Cancerous cells lack the property of
- A. metastasis.
  - B. varied size.
  - C. rapid division.
  - D. differentiation.
16. Meiosis is a special type of cell division which involves two consecutive divisions after a single replication of DNA. During meiosis synapsis and bivalent formation occurs in
- A. zygotene.
  - B. leptotene.
  - C. diplotene.
  - D. pachytene.
17. When an axial purple pea flower crosses with a terminal white pea flower, the offspring produced are 50% heterozygous axial purple flowers and 50% heterozygous axial white flowers.
- (Note: Axial position and purple colour are completely dominant over terminal and white flowers.)
- The genotype of the axial purple parent pea plant would be
- A. AaPp
  - B. AaPP
  - C. AAPp
  - D. AAPP
18. Which of the following is an example of polygenic inheritance in human beings?
- A. Skin colour
  - B. Tongue rolling
  - C. Phenylketonuria
  - D. Colour blindness

19. The given diagram shows a fragment of DNA.



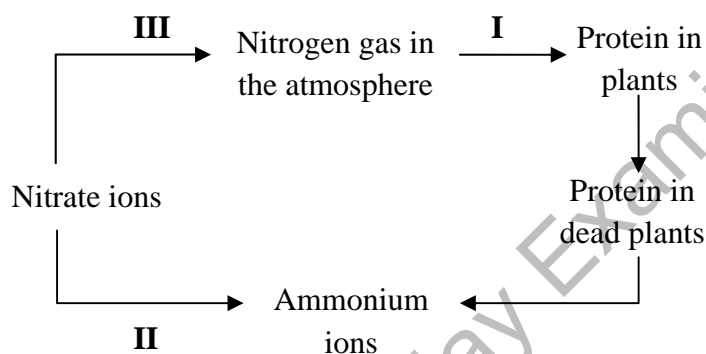
The 'palindromic sequence' in the given fragment of DNA is

- A.     A     G     A     A  
          T     C     T     T
- B.     A     A     T     T  
          T     T     A     A
- C.     T     C     G     C  
          A     G     C     G
- D.     T     T     C     G  
          A     A     G     C
20. The enzyme used to make a copy of DNA from messenger RNA in the laboratory is
- A.     DNA ligase.  
B.     Taq polymerase.  
C.     reverse transcriptase.  
D.     restriction endonuclease.
21. The process of protein synthesis is the same in all animals. The evidence of evolution that supports this concept is
- A.     homology.  
B.     embryology.  
C.     biogeography.  
D.     molecular biology.
22. According to the Hardy-Weinberg law, the expression representing the frequency of heterozygous genotype is
- A.      $p^2$   
B.      $q^2$   
C.      $2pq$   
D.      $2p^2q^2$

23. The loss of a gene from a small population is known as
- genetic drift.
  - gene mutation.
  - random mating.
  - non-random mating.
24. During a research, a student collects some soil samples from different places and examines their organic content, texture and pH.

Which of the following factors is he/ she studying in this research?

- Biotic
  - Edaphic
  - Climatic
  - Topographic
25. Which types of bacteria are involved in steps **I**, **II** and **III**?



	Nitrifying Bacteria	Denitrifying Bacteria	Nitrogen Fixing Bacteria
A	I	II	III
B	II	III	I
C	III	I	II
D	III	II	I

26. Which of the following are known as environmental buffers?
- Forests
  - Oceans
  - Deserts
  - Mountains

27. Which of the following is CORRECT about the nature of the given diseases?

	Pathogenic	Nutritional
A	Cretinism	Alzheimer
B	Gonorrhoea	Beri beri
C	Malaria	Haemophilia
D	Arteriosclerosis	Goitre

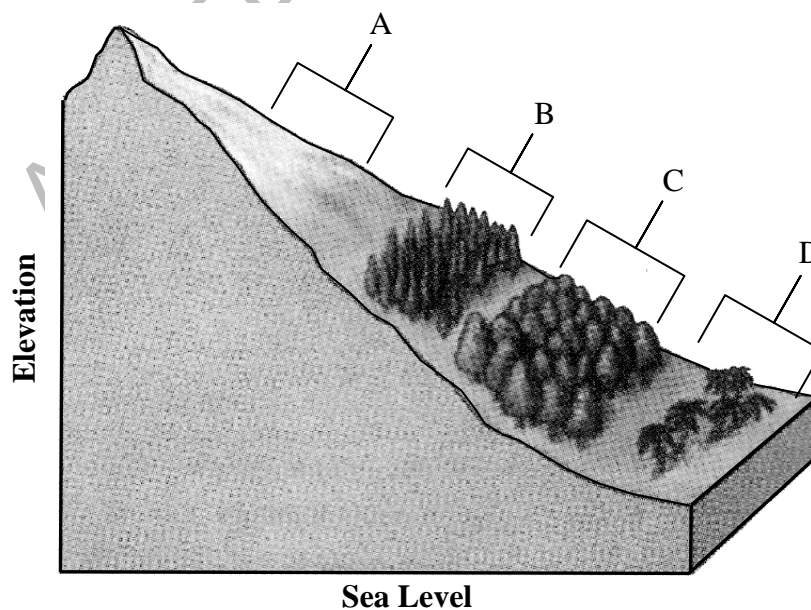
28. Soil moisture is limited in the grassland ecosystem because of

	Precipitation	Evaporation
A	low	high
B	low	low
C	high	low
D	high	high

29. The ecosystem that is highly productive when used for agricultural purposes is

- A. tundra.
- B. grassland.
- C. coniferous alpine forest.
- D. temperate deciduous forest.

30. Which of the labelled parts in the given diagram depicts tundra ecosystem?



END OF PAPER

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