

AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII EXAMINATION

APRIL/ MAY 2018

Biology Paper I

Time: 40 minutes Marks: 30

INSTRUCTIONS

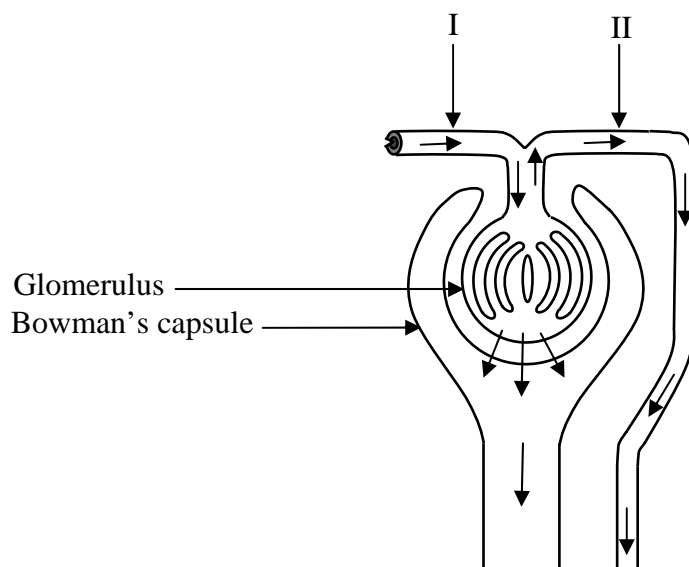
1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 30 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On 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. The given diagram shows some parts of a nephron in human kidney.



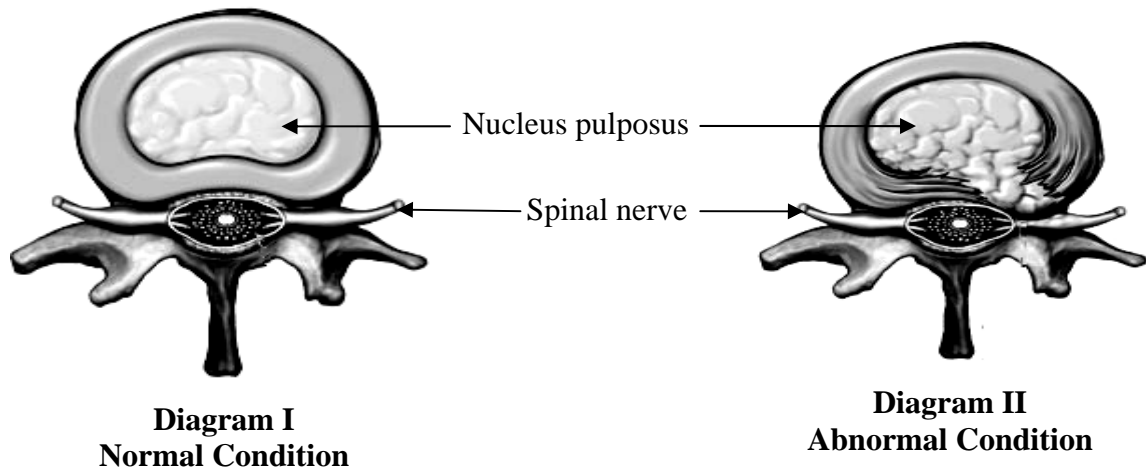
The molecule that is present in similar quantity in the both labelled parts, **I** and **II**, in the given diagram is

- urea.
 - protein.
 - glucose.
 - sodium chloride.
2. Which of the following shows the effects of increased ADH (Antidiuretic hormone) plasma concentration on the osmolarity of fluid in the peritubular capillaries and the volume of urine formation in human kidney nephron?

	Osmolarity of Fluid in Peritubular Capillaries	Volume of Urine
A	Decreases	Decreases
B	Increases	Increases
C	Increases	Decreases
D	Decreases	Increases

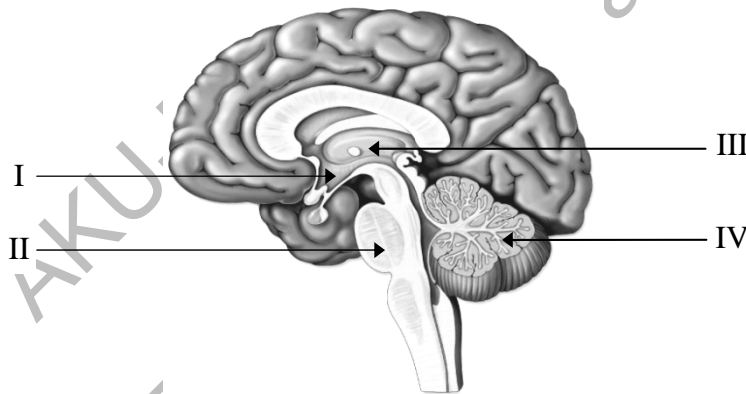
3. From the renal pelvis of a human kidney, urine moves to the urinary bladder. During this process
- more urea is added into urine.
 - surplus water is removed from urine.
 - excessive glucose is removed from urine.
 - the composition of urine remains unchanged.
4. The source of nutrition for the articular cartilage in the ball and socket joint is
- blood.
 - collagen.
 - synovial fluid.
 - synovial membrane.

5. The given diagrams show cross sectional view of human vertebrae.



The deformity of skeleton depicted in diagram II is

- A. sciatica.
 - B. disc-slip.
 - C. osteoporosis.
 - D. osteoarthritis.
- 6.



The component(s) of limbic system in the given labelled diagram of human brain is/ are

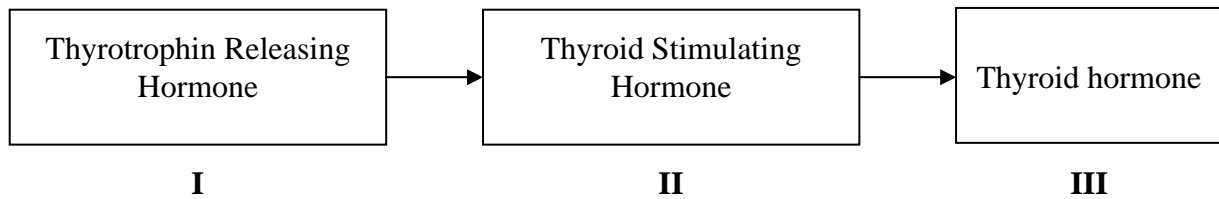
- A. I only
 - B. I and II
 - C. II and III
 - D. III and IV
7. A 50 years old patient showing symptoms of tremor, loss of motor movement and muscle rigidity is diagnosed with death of neurons in the midbrain which normally release dopamine.

The symptoms and diagnosis show that the patient is suffering from

- A. epilepsy.
- B. Graves' disease.
- C. Alzheimer's disease.
- D. Parkinson's diseases.

PLEASE TURN OVER THE PAGE

8. The given chart shows a hormone pathway.



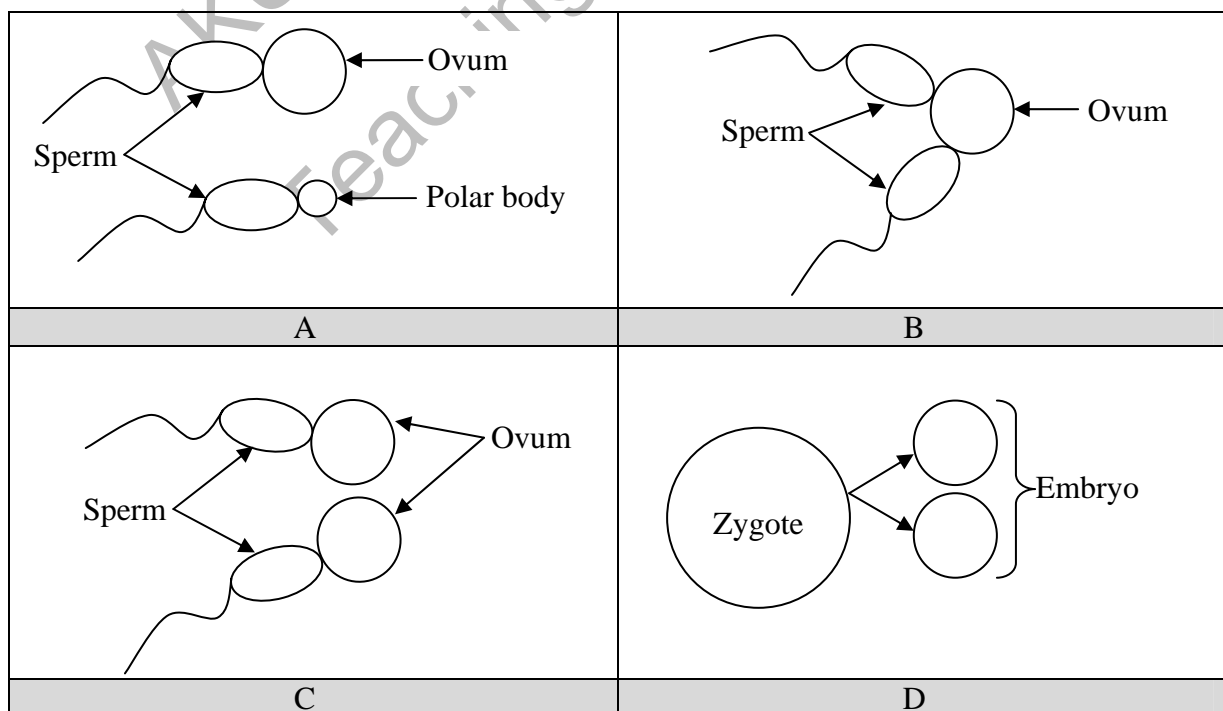
Which of the given hormone(s) act(s) as tropic hormone?

- A. I only
 B. I and II
 C. I and III
 D. II and III
9. Following are the structures of a plant.

- I. Leaves
 II. Embryo of the seed
 III. Shoot apex of a stem

The MOST sensitive structure(s) of a plant which receive(s) low temperature stimulus in the process of vernalisation is/ are

- A. I only
 B. II only
 C. I and II
 D. II and III
10. Which of the following illustrations represents the formation of fraternal twins?



11. The movement and re-arrangement of cells present in the epiblast of chick embryo results in the formation of
- somites.
 - coelom.
 - primitive gut.
 - primitive streak.

12. In the process of gastrulation, epiblast and hypoblast are formed due to the splitting of
- ectoderm.
 - endoderm.
 - mesoderm.
 - blastoderm.

13. Suppose the given nucleotide sequence is the genetic code on the deoxyribonucleic acid (DNA).

5' C T A A A T C G G T 3'

What would be the genetic code on the messenger ribonucleic acid (mRNA) when mRNA transcribed from the given strand?

5' G A U U U A G C C A 3'	3' G A U U U A G C C A 5'
A	B
5' G A T T T A G U U A 3'	3' G A T T T A G U U A 5'
C	D

14. Ahmed has been recently diagnosed with phenylketonuria.

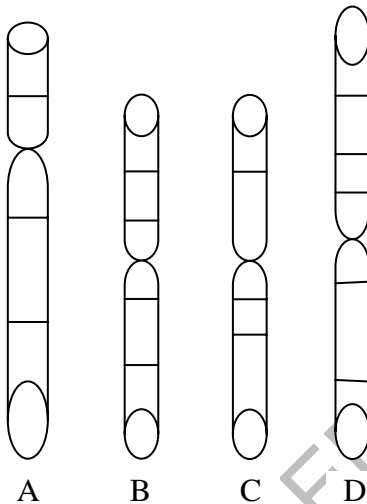
The nutrients that Ahmed should avoid in his diet would be

- glucose.
 - vitamins.
 - fatty acids.
 - amino acids.
15. A cell has 30 chromosomes in G₂ phase (pre-meiotic phase) of cell cycle. What would be the total number of chromosomes in the prophase I of the same cell?
- 15
 - 30
 - 60
 - 90

16. The given diagram represents a paternal chromosome in a somatic cell of a human being.

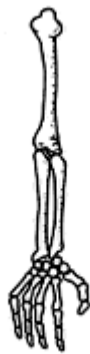


The maternal homologue of the given paternal chromosome would be



17. The genotype of parents for a trait that will result in the production of 100% heterozygous offspring would be
- A. dominant homozygote and recessive homozygote.
 - B. dominant heterozygote and recessive homozygote.
 - C. dominant homozygote and dominant heterozygote.
 - D. dominant heterozygote and dominant heterozygote.
18. The colour of seed in peas is controlled by two alleles, Y (yellow) and y (green). Yellow is dominant over green. The cross that will give a 1:1 phenotypic ratio among the offspring would be
- A. Yy with yy
 - B. Yy with Yy
 - C. YY with yy
 - D. Yy with YY

19. How many copies of double stranded DNA will be formed after performing 5 cycles of polymerase chain reaction that is started with one double stranded DNA molecule?
- 4
 - 8
 - 16
 - 32
20. Genetic counselling should be regarded as an integral part of the genetic testing process and should be strongly recommended in most genetic testing situations. The role of a genetic counsellor is to inform parents about the
- risks of appearance of disorders in the baby.
 - gender of the baby using ultrasound technique.
 - benefits of family planning for healthy parents.
 - nutritional requirements of the mother and baby.
21. The given diagrams show internal bone structure of different animals.



Arm of human beings



Wing of bat



Flipper of Whale

Which of the following is CORRECT about the evolutionary relationship among these animals?

	Structure	Type of Evolution
A	Analogous	Convergent
B	Analogous	Divergent
C	Homologous	Divergent
D	Homologous	Convergent

22. An example of a vestigial organ in men is
- coccyx.
 - clavicle.
 - pelvic bone.
 - pectoral girdle.

23. Artificial selection leads to

- A. the formation of new species.
- B. the development of resistance in bacteria.
- C. increased genetic diversity of a population.
- D. reduced proportion of heterozygotes in a population.

24. Asif finds different populations of animals like chinkara, blackbuck and the white footed fox in Thar Desert.

The animal population that would be considered while studying the autecology of Thar Desert is/ are

- A. chinkara only.
- B. chinkara and the blackbuck.
- C. white footed fox and blackbuck.
- D. chinkara, blackbuck and the white footed fox.

25. In the climax of a community

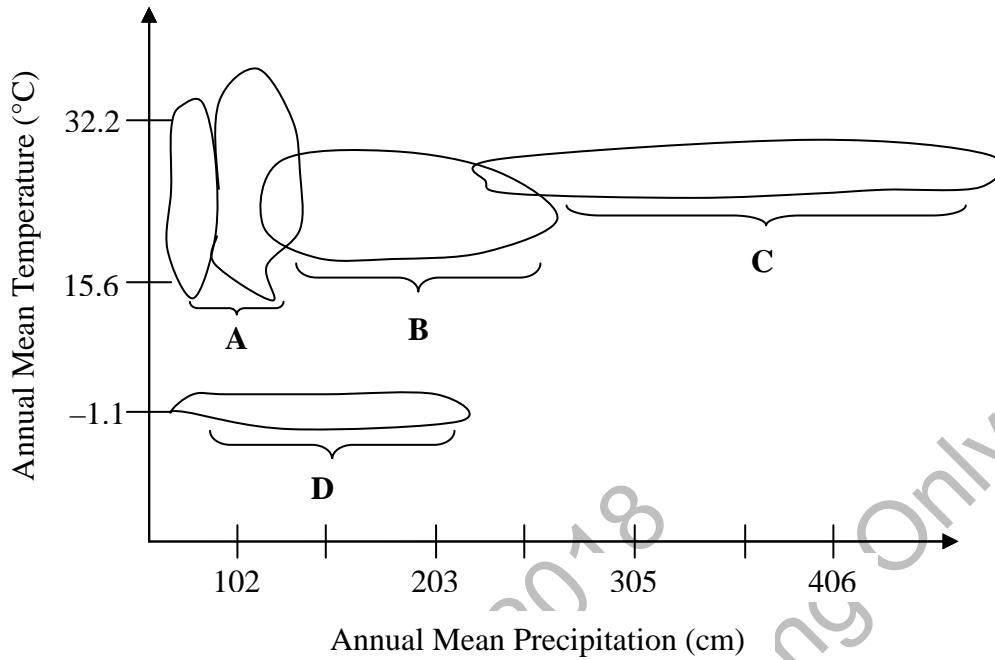
- A. woody plants would establish.
- B. primary producers belong to a single species.
- C. seasonal population changes are not observed.
- D. energy loss decreases from lower to higher trophic levels.

26. The lake ecosystem is divided into three main zones. Which of the following shows littoral zone?

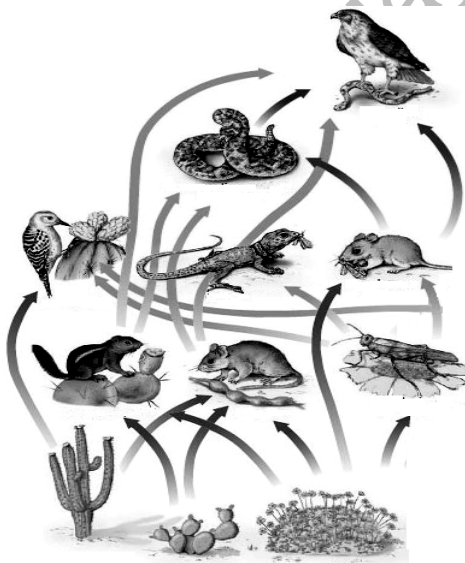
	Sunlight	Zooplanktons	Deep water
A	✓	✓	✓
B	✓	✓	✗
C	✗	✓	✓
D	✓	✗	✓

27. The given graph shows climate of different ecosystems of a continent.

Which option in the given graph depicts climate of tropical rainforest?



28.



The given food web is present in the ecosystem of the

- A. desert.
- B. grassland.
- C. tropical rainforest.
- D. tropical deciduous forest.

29. Which of the following is CORRECT about the impact of high population growth on agriculture?
- A. Greater farm size
 - B. Less diversity of crops
 - C. Less demand of inorganic fertilisers
 - D. Greater demand of advanced machinery
30. In an environment where sulphur dioxide and nitrous dioxide are present in excess, the pH level of the rain fall would be approximately
- A. 8.0
 - B. 7.5
 - C. 6.9
 - D. 4.0

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