

AGA KHAN UNIVERSITY EXAMINATION BOARD
SECONDARY SCHOOL CERTIFICATE
CLASS X
MODEL EXAMINATION PAPER 2023 AND ONWARDS
Biology Paper I

Time: 1 hour 10 minutes Marks: 40

INSTRUCTIONS

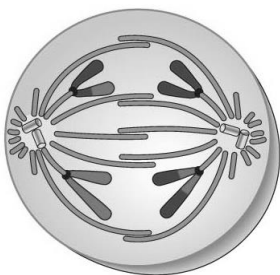
1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 40 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On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

Correct Way	Incorrect Ways
1 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D	1 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D
	2 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D
	3 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D
	4 <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D

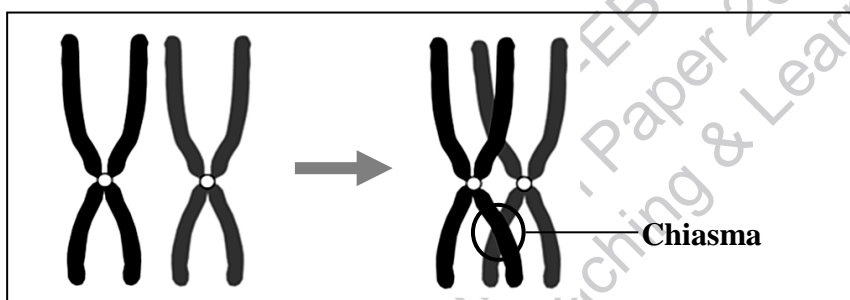
Candidate's Signature

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. In an animal cell, the phase of meiosis as illustrated in the given diagram is



- A. anaphase of meiosis I.
 B. telophase of meiosis I.
 C. anaphase of meiosis II.
 D. telophase of meiosis II.
2. The given diagram shows an event of meiosis.



In the given diagram, chiasma formation takes place between

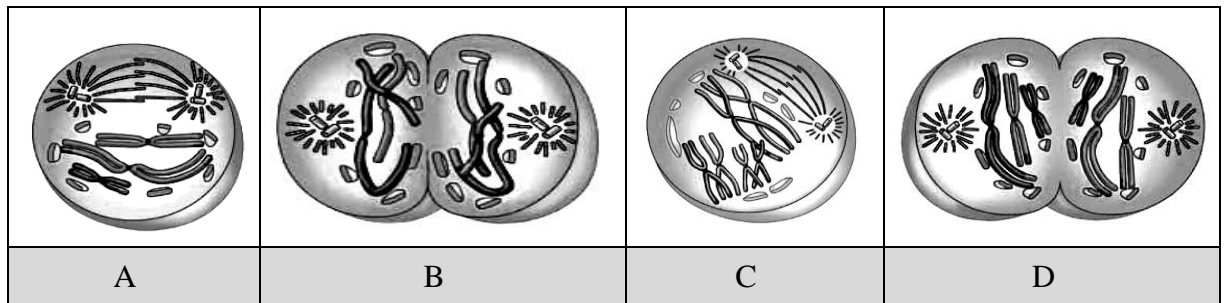
- A. sister chromatids.
 B. non-sister chromatids.
 C. unduplicated chromosomes.
 D. non-homologous chromosomes.
3. The table below shows the mass of DNA in some cells of the human body.

Cell Type	Mass of DNA in Cell (arbitrary unit)
Kidney	6.6
Liver	6.6
X	3.3

Cell **X** is MOST likely to be a

- A. skin cell.
 B. lung cell.
 C. nerve cell.
 D. sperm cell.

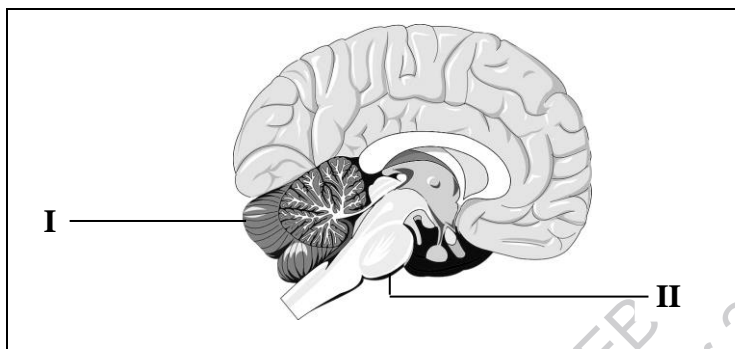
4. Which of the given diagrams represents prophase II of meiosis?



5. In a human nephron, the loop of Henle is adapted to
- create a gradient of increased osmolarity in the medulla.
 - transport maximum amount of filtrate to collecting duct.
 - secrete maximum number of hydrogen ions from blood.
 - reabsorb large number of glucose molecules from filtrate.
6. During the process of urine formation in humans, blood pressure plays an important role.
- This is because blood pressure helps to
- maintain salts in the filtrate.
 - form filtrate by the glomerulus.
 - secrete hydrogen ions in tubules.
 - reabsorb glucose in the loop of Henle.
7. In human nephron, the filtrate in the descending limb of loop of Henle becomes hypertonic because of the removal of
- hydrogen ions.
 - water molecules.
 - glucose molecules.
 - sodium chloride ions.
8. Lithotripsy is a procedure that breaks large kidney stones into smaller ones by using
- X-rays.
 - microwaves.
 - sound waves.
 - ultraviolet rays.
9. The similarity between the working of dialysis machine and human kidneys is that both
- reabsorb proteins into blood.
 - remove macromolecules from blood.
 - maintain the mineral balance in blood.
 - change oxygenated blood to deoxygenated blood.

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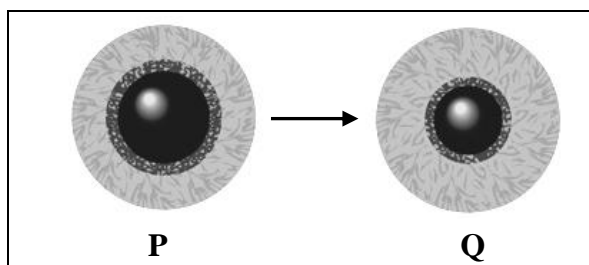
10. The response produced by hormones takes more time than nerve impulse because hormones
- are specific in their action.
 - are transported through blood.
 - contain small sized molecules.
 - are produced in small amounts.
11. The given diagram shows human brain.



The parts of brain represented by **I** and **II** are

	I	II
A	cerebellum	pons
B	cerebrum	pons
C	cerebellum	medulla oblongata
D	cerebrum	medulla oblongata

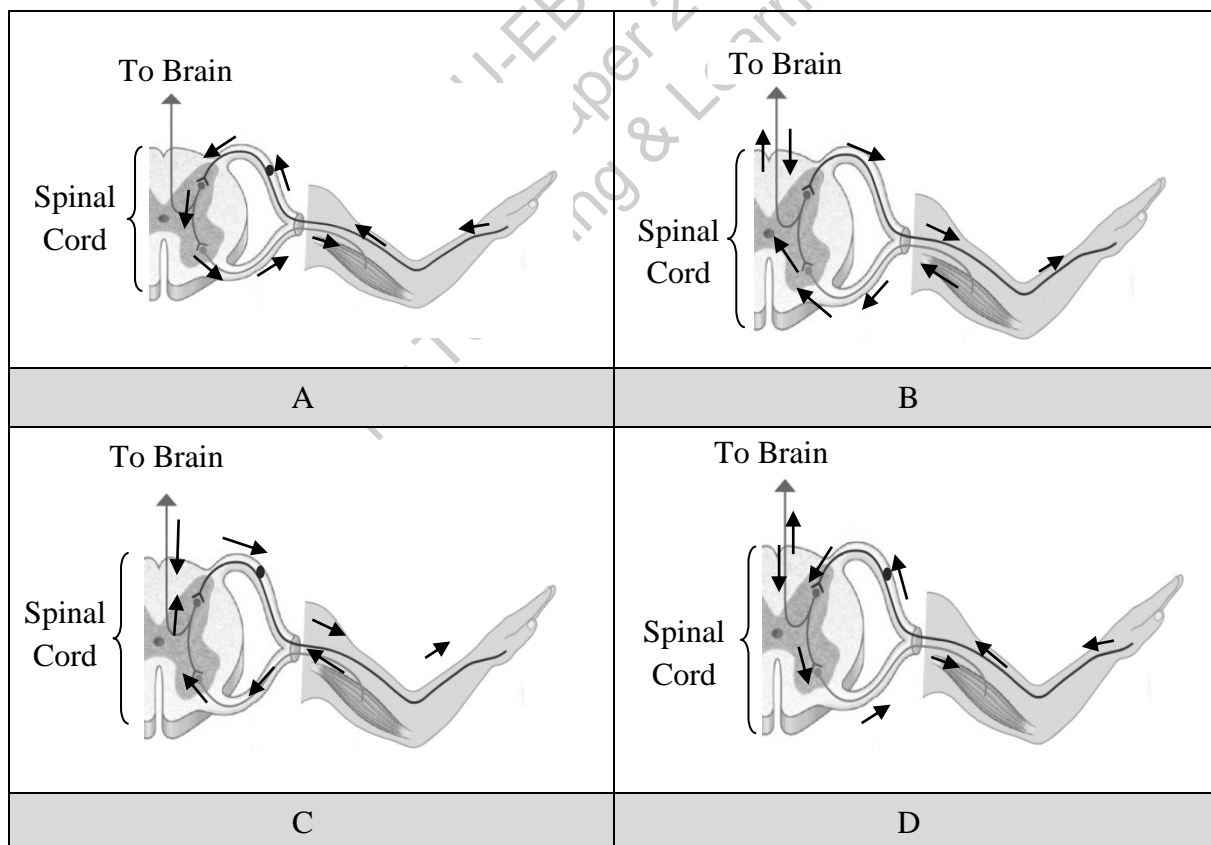
12. The given diagram shows change in the pupil of a person from state **P** to **Q**.



The state **Q** shows that the circular muscles of the iris have

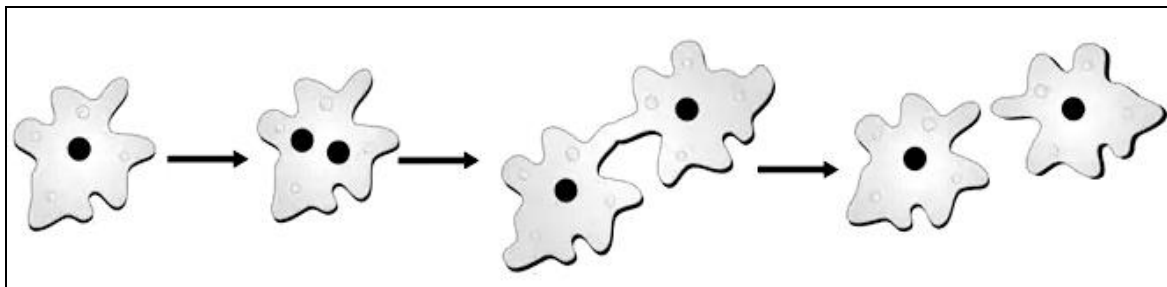
- relaxed as the person entered a poorly lit room.
- relaxed as the person entered a brightly lit room.
- contracted as the person entered a poorly lit room.
- contracted as the person entered a brightly lit room.

13. When Akram encounters a fighter bull, he experiences a sudden increase in his heartbeat. The increase in heartbeat would
- increase the rate of digestion.
 - decrease the air flow to his lungs.
 - convert maximum glucose to glycogen.
 - transfer glucose and oxygen to his muscles.
14. A motor neuron would transmit impulse from
- eye to skin.
 - eye to brain.
 - spinal cord to skin.
 - spinal cord to brain.
15. Which of the following diagrams shows the CORRECT pathway for a spinal reflex action when the hand of an individual is pricked by a needle?



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16. The given diagram represents reproduction in an organism.



In the given case, the offspring lack genetic variation because they

- A. are limited in number.
 - B. are produced asexually.
 - C. are unicellular organisms.
 - D. contain a single chromosome.
17. During the process of spermatogenesis in male rabbit, a spermatogonium undergoes mitosis to produce
- A. sperms.
 - B. spermatids.
 - C. primary spermatocytes.
 - D. secondary spermatocytes.
18. Which of the following is CORRECT about external fertilisation in animals?
- A. Dry medium is a necessary condition.
 - B. Embryo is protected inside the parental body.
 - C. The process takes place in most of the mammals.
 - D. Gametes are released in the surrounding environment.
19. Double fertilisation in plants results in the formation of
- A. one haploid zygote.
 - B. two haploid zygotes.
 - C. one triploid endosperm.
 - D. two triploid endosperms.
20. Human immune deficiency virus (HIV) causes acquired immune deficiency syndrome (AIDS) in human beings by
- A. increasing the pH of blood.
 - B. attacking the white blood cells.
 - C. promoting uncontrol division of cells.
 - D. decreasing the elasticity of blood vessels.

21. The bone that belongs to the appendicular skeleton of human beings is

- A. femur.
- B. stapes.
- C. sternum.
- D. hyoid bone.

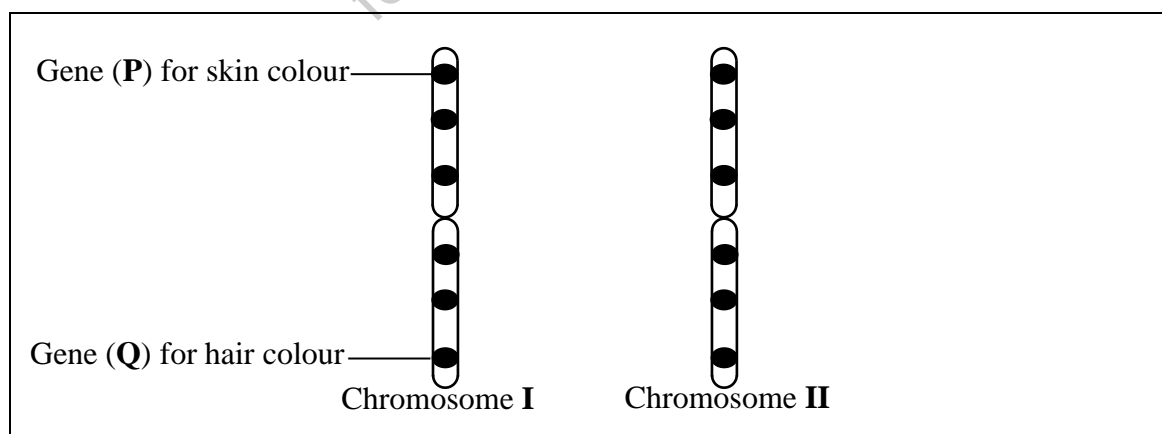
22. Which of the following is the condition of biceps during flexion and extension in the arm of human beings?

	The Condition of Biceps During	
	Flexion	Extension
A	Relaxed	Relaxed
B	Contracted	Relaxed
C	Relaxed	Contracted
D	Contracted	Contracted

23. Osteoporosis mostly occurs in elderly women due to the deficiency of

- A. thyroxin.
- B. oxytocin.
- C. oestrogen.
- D. calcitonin.

24. The given diagram shows genes on a pair of homologous chromosomes.



Allele for gene **P** on chromosome **II** of the given homologous pair could be

- A. P or p.
- B. P or q.
- C. P only.
- D. Q only.

25. Which of the following options exemplifies artificial selection?

- A. Grapes are bred to produce large berry size.
- B. Ladybirds are used to control aphids on crops.
- C. Bacteria develop strains that are resistant to antibiotics.
- D. Human gene is inserted into bacteria to produce insulin.

26. The number of different types of gametes formed from the genotype QqRr would be

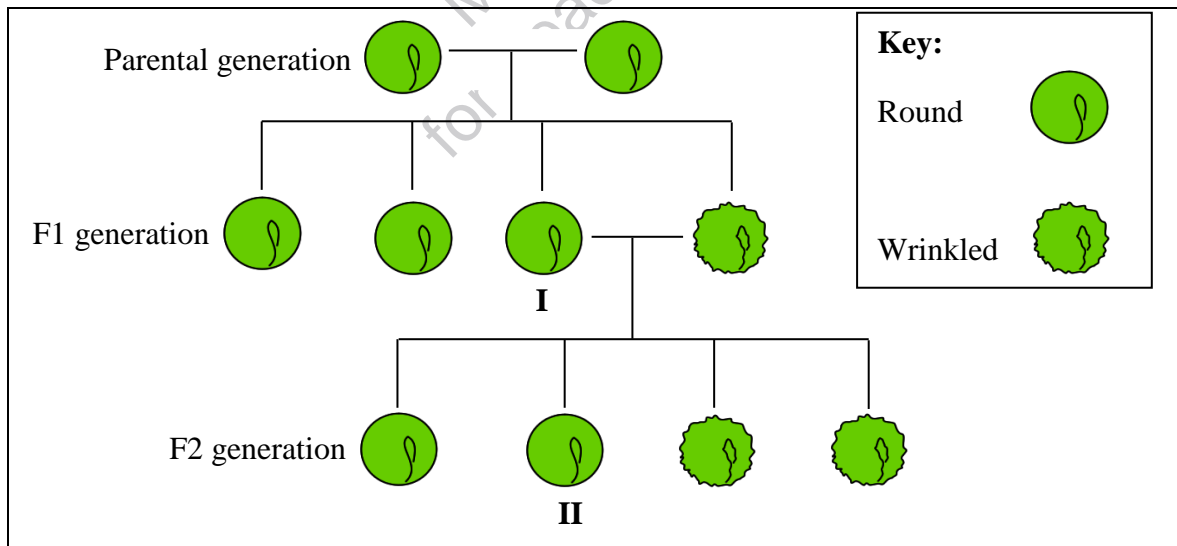
- A. 1
- B. 2
- C. 4
- D. 8

27. Red flower colour is completely dominant over white flower colour in a particular plant.

When a heterozygous red flower is crossed with a white flower, the possible percentage of offspring would be

- A. 100% red flowers.
- B. 75% red and 25% white flowers.
- C. 50% red and 50% white flowers.
- D. 25% red and 75% white flowers.

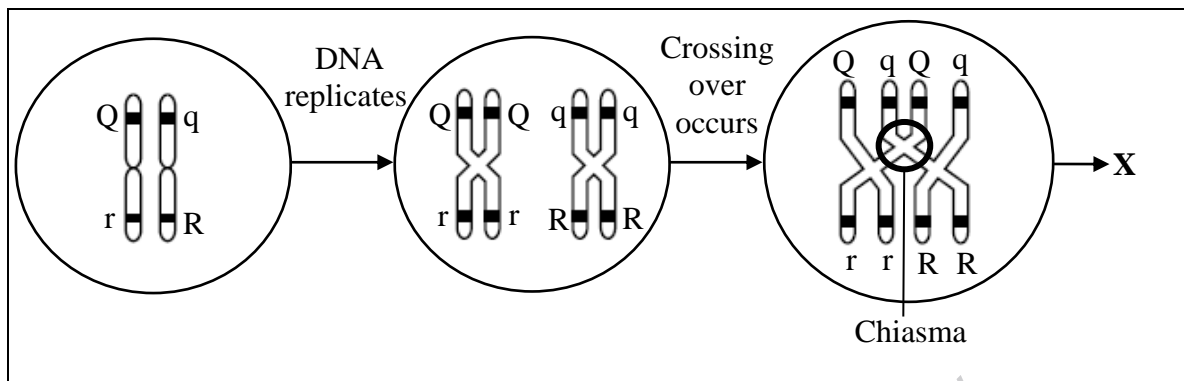
28. The given diagram shows a genetic cross between two round pea seeds.



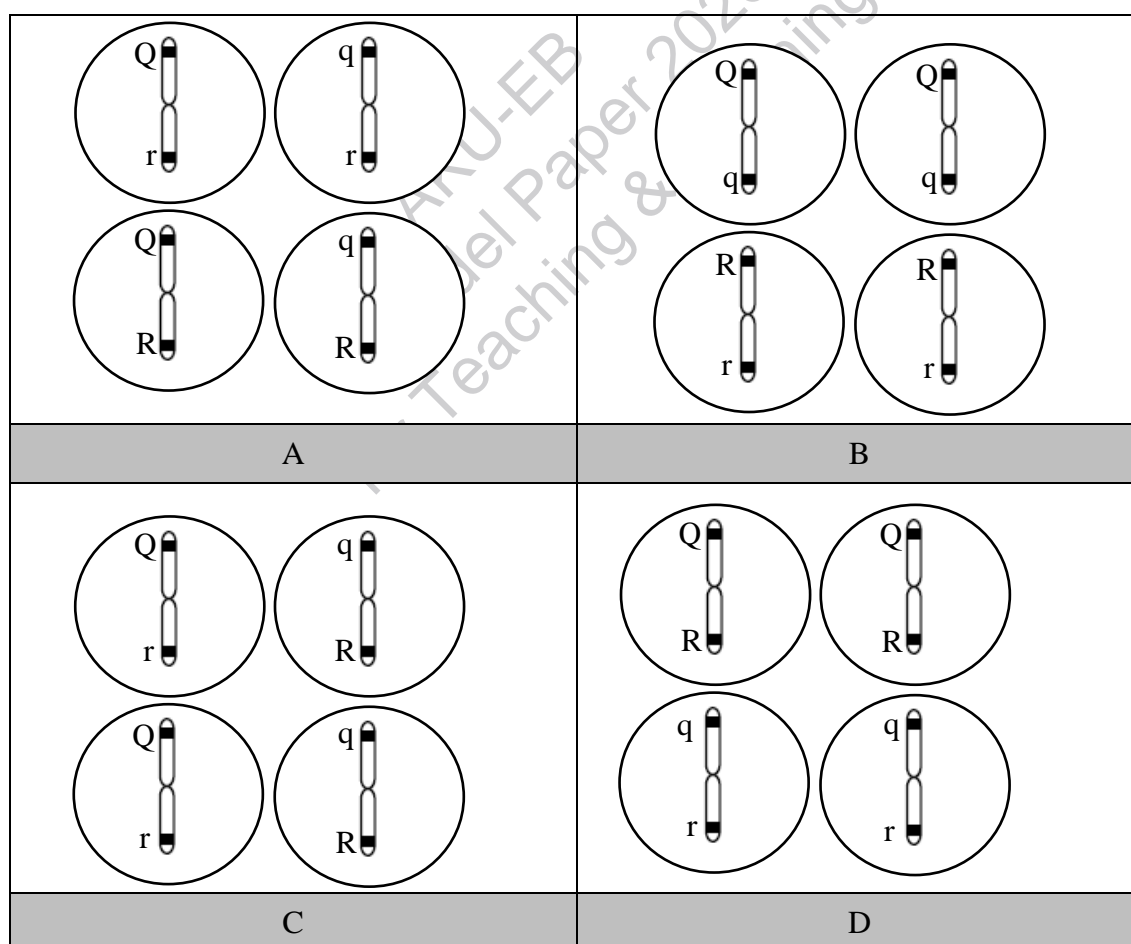
The genotypes of seed I and II would be

	Genotype of I	Genotype of II
A	homozygous	homozygous
B	homozygous	heterozygous
C	heterozygous	homozygous
D	heterozygous	heterozygous

29. The given diagram illustrates the Mendel's law of independent assortment.



After the completion of meiosis, the types of gametes formed at X would be

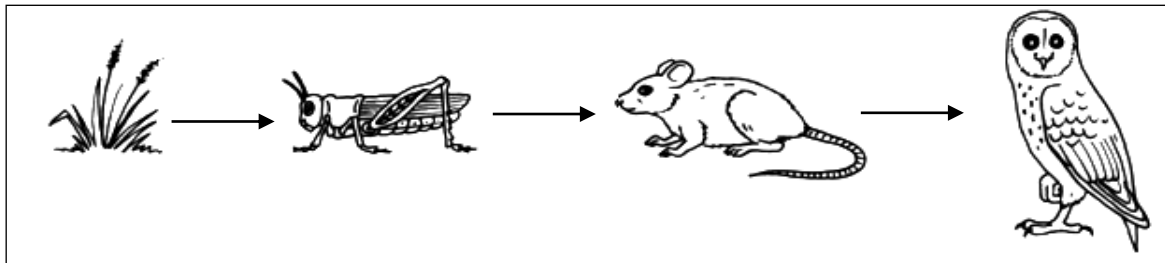


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30. The function of fungi in an ecosystem is to

- A. provide oxygen gas to producers.
- B. return nutrients to the environment.
- C. increase complexity of food chains.
- D. decrease competition among consumers.

31. In the given food chain, the trophic level that contains the largest biomass is



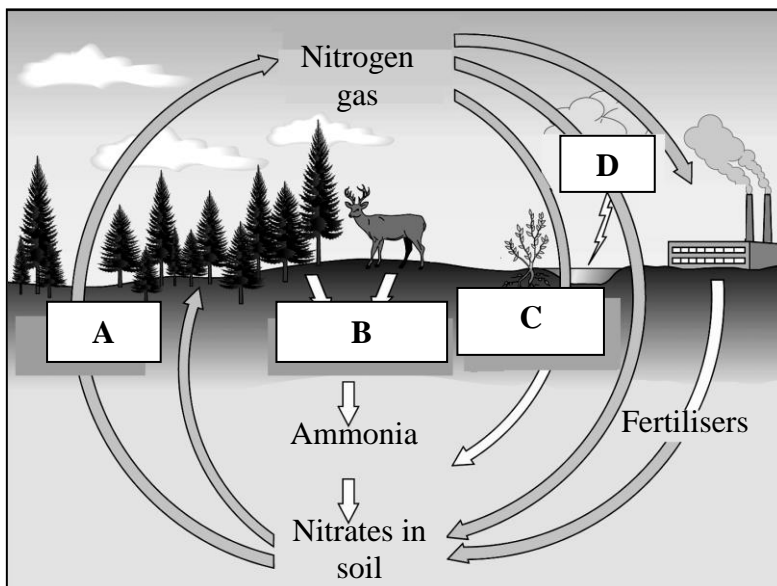
- A. rat.
- B. owl.
- C. grass.
- D. grasshopper.

32. Barnacles are a type of sea animals that attach to whales. Barnacles cannot move on their own; therefore, they use the whale to move around and find locations for food.

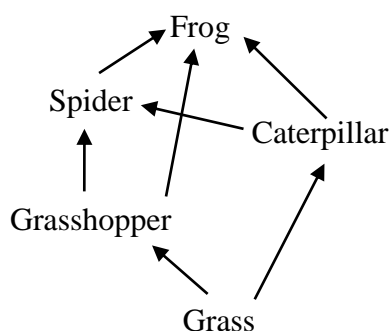
The type of animal association that BEST fits in the given situation is

- A. predation.
- B. parasitism.
- C. mutualism.
- D. commensalism.

33. Which of the following events of nitrogen cycle decreases soil fertility by depleting nitrogen from it?



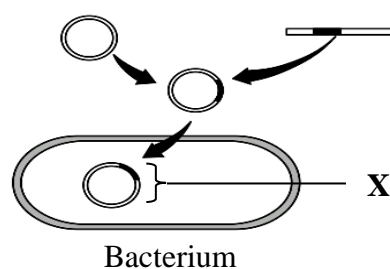
34. Which of the following animals fall in the category of both secondary and tertiary consumers in the given food web?



- A. Frog
B. Spider
C. Caterpillar
D. Grasshopper
35. Interferons are special proteins, produced by human cells, that
- A. reduce pain.
B. cure thalassemia.
C. dissolve blood clots.
D. limit the spread of viral infections.
36. The reactant and products of alcoholic fermentation by yeast are

	Reactant	Products
A	sugar	alcohol and carbon dioxide
B	sugar	alcohol and water
C	alcohol	sugar and water
D	alcohol	carbon dioxide and water

37. The given diagram shows some steps of gene transplantation.



The DNA labelled as X in the given diagram represents a

- A. plasmid DNA.
B. genomic DNA.
C. replicated DNA.
D. recombinant DNA.

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38. Which of the following CORRECTLY matches the drug with its source?

	Drug	Source of Drug
A	Streptomycin	Microorganism
B	Morphine	Animal
C	Penicillin	Plant
D	Aspirin	Mineral

39. Which of the following drugs are prescribed to relieve pain?

- A. Antibiotics and heroin
- B. Caffeine and antibiotics
- C. Anaesthetics and caffeine
- D. Anaesthetics and analgesics

40. Bacteriostatic antibiotics work BEST by

- A. killing bacteria.
- B. inhibiting the growth of bacteria.
- C. developing resistance in bacteria.
- D. producing immunity against bacteria.

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