



BIOLOGY

BOOKS - HT Olympiad Previous Year Paper

NSO QUESTION PAPER 2016 SET A

Science

1. Refer to the given table and select the incorrect statement regarding organelles X

and Y.

Cell organelle	Function
X	Helps in intracellular digestion and autophagy
Y	Modifies, sorts and packages the materials coming from ER

- A. Organelle X arises from joint activity of endoplasmic reticulum and organelle Y
- B. The membrane and hydrolytic enzymes of X are synthesized in Y.
- C. Organelle X is abundant in leucocytes and macrophages whereas it is absent in mammalian red blood corpuscles.

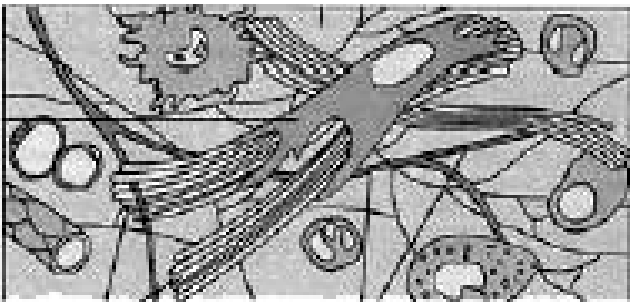
D. If organelle Y is absent in tadpole of frog then it will never metamorphose into an adult frog.

Answer: B



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2. Shown below is the diagrammatic representation of an animal tissue, X.



Tissue X

Which of the following holds true regarding this tissue?

- A. Tissue X is abundantly present in fat bodies of frog and blubber of whale.
- B. Tissue X is a type of dense connective tissue.

C. Tissue X fills the spaces inside many organs and is commonly called packaging tissue of body.

D. Tissue X is very strong and non-flexible vertebrate tissue.

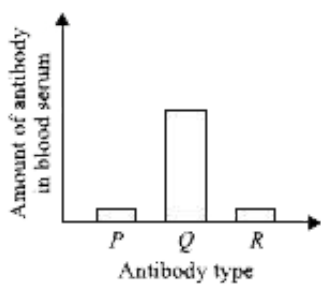
Answer: C



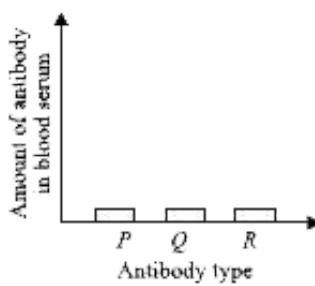
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3. Ritu was suffering from high fever for many days. Doctor advised her some antipyretic which she took according to the prescribed doses. Her temperature went down to normal but reoccurrence of fever continued.

Doctor then advised Ritu to get her blood test done to rule out the presence of some antibodies and then gave her medications accordingly. She recovered soon. The given graphs show the result of her blood tests during illness (graph I) and after recovery (graph II).



Graph I



Graph II

What could be inferred from the given graphs?

- A. Ritu suffered from three kinds of pathogenic infections simultaneously.
- B. This time Ritu suffered only from that pathogenic infection for which her body produced antibody Q.

C. Ritu might be vaccinated or had contracted the actual diseases in her life for which her body produced antibodies P and R.

D. Both B and C

Answer: D



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4. Refer to the given figure showing three different organisms P, Q and R. Select the correct statement(s) regarding these organisms.



(i) Organism has true coelom whereas organisms P and R are pseudocoelomates.

(ii) Organisms P and R are diploblastic whereas organism is triploblastic.

(iii) Bodies of organisms P and Q are metamerically segmented.

(iv) Organism Q bears special paired locomotory appendages called parapodia however in organism R tube feet helps in locomotion.

(v) Excretion in organisms P and takes place by flame cells and nephridia respectively.

A. (ii) and (iii) only

B. (v) only

C. (iv) and (v) only

D. (i) only

Answer: B



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5. Which of the following is true in case of intercropping?

- (i) Crops are grown in definite pattern of rows.
- (ii) Fertilisers cannot be applied easily to different crops.
- (iii) Crops can be harvested and threshed

separately.

(iv) Spraying of pesticides for separate crops is not possible.

(v) Seeds are mixed before sowing.

A. (i), (iv) and (v) only

B. (i) and (iii) only

C. (iii) and (v) only

D. (iv) and (v) only

Answer: B



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6. Which of the following statements are incorrect about vegetative propagation in plants?

(i) It makes possible the propagation of some seedless fruit plants like banana, etc.

(ii) It is the means to produce genetically identical offspring.

(iii) It makes plants more adaptable to the changing environmental conditions.

(iv) Vegetative propagation by plant tissue culture can be used for the production of

disease-free plants.

(v) It brings adequate dispersal of vegetative propagules and thus reduces over-crowding.

- A. (ii) and (iv) only
- B. (ii), (iv) and (v) only
- C. (i), (iii) and (iv) only
- D. (iii) and (v) only

Answer: D



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7. Some humans are able to roll their tongue, while others are not. Two parents (both tongue-rollers) have four children, all of whom are not tongue-rollers. Which of the following statements hold true regarding this?

(i) The allele for tongue-rolling is dominant.

(ii) The probability that their next child will be a tongue-roller is 0.5.

(iii) The probability that their next child will not be a tongue roller is 0.75.

(iv) Both parents have one allele for tongue-rolling and one allele for non-tongue-rolling.

A. (i) and (iii) only

B. (i) and (iv) only

C. (ii) and (iii) only

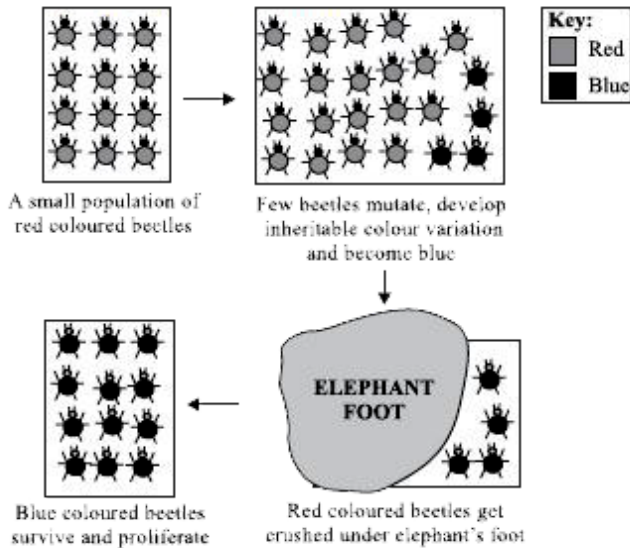
D. (ii) and (iv) only

Answer: B



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8. Refer to the given illustration.



What could be inferred from the process illustrated above?

A. The given process illustrates speciation through genetic drift.

B. The given process illustrates speciation through reproductive isolation.

C. The given process depicts an example of natural selection.

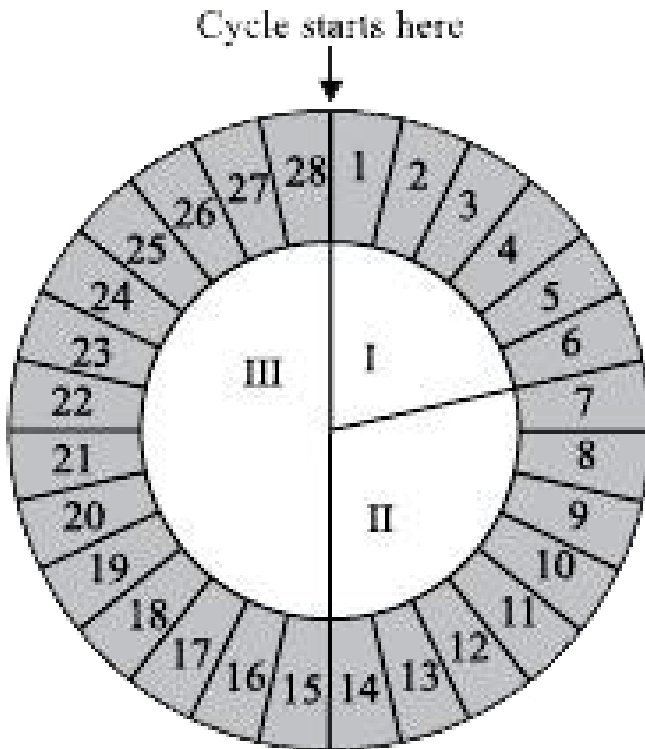
D. The given process depicts an example of artificial selection.

Answer: A



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9. The given diagram shows a normal 28 day menstrual cycle in a human female.



Select the correct statement regarding this.

A. The hormone secreted in large amounts in phase III is also responsible for maintaining pregnancy in human females.

B. Primary follicle of ovary matures into Graafian follicle in phase II.

C. Corpus luteum secretes progesterone in phase I however it degenerates completely in phase III.

D. Both A and B

Answer: D



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10. Read the given paragraph.

Photosynthesis in plants consists of two phases: X and Y. Phase X requires light energy and occurs in granum of chloroplast whereas phase Y is light independent and occurs in stroma of chloroplast. Which of the following holds true regarding phases X and Y of photosynthesis?

A. In phase X, light energy is used up in photolysis of water and molecular oxygen is evolved.

B. In phase Y, electrons and protons are used up in synthesis of assimilatory power.

C. Assimilatory power generated in phase Y is used up in phase X to convert CO_2 into carbohydrates.

D. Phase X utilises carbon dioxide gas of atmosphere whereas phase Y evolves oxygen gas that escapes into atmosphere.

Answer: A



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11. Refer to the given food chain operating in an aquatic ecosystem.

Phytoplankton → Daphnia → Platy fish

→ Catfish → Shark

When a new species X was introduced into this community, the population of platy fish rose and population of catfish fell over subsequent two weeks. Species X is most likely to be

A. Another herbivore like platy fish

B. A predator of Daphnia only

C. A predator of catfish only

D. A predator of platy fish and prey of shark.

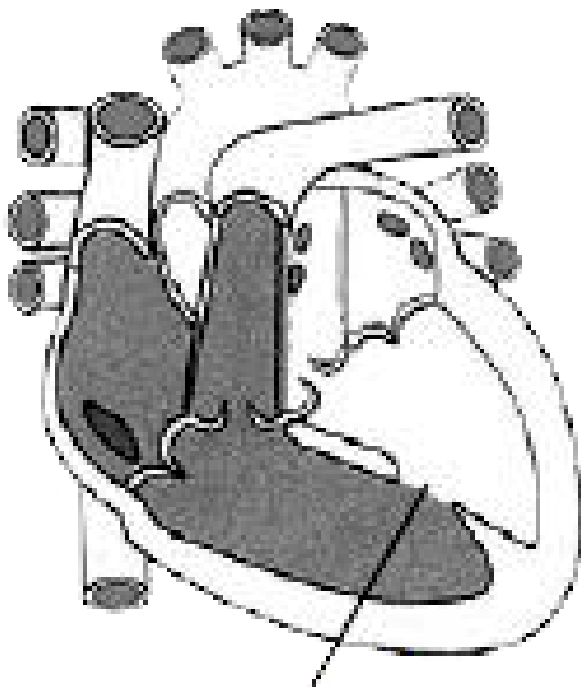
Answer: C



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Achievers Section

1. The given diagram shows a congenital defect in which the ventricular septum of the human heart fails to form fully resulting in a 'hole in the heart'.



**Ventricular
septal defect**

Which of the following would not be a likely consequence of this disease?

- A. A reduction in the pressure of blood leaving through the aorta

- B. A reduction in the percentage of oxygenated blood in the aorta
- C. A reduction in the amount of oxygen brought to body cells
- D. A reduction in the pressure of blood entering the lungs.

Answer: D



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2. Read the given statements each with one, two or three blanks and select the option that correctly fills any four of these.

(i) An ecological pyramid of numbers is upright in ___P___ ecosystem and inverted in ___Q___ food chain.

(ii) Pyramid of biomass is upright in ___R___ and inverted in ___S___ ecosystem.

(iii) Gases like CO_2 allow the ___T___ wave heat radiations of sun to reach the earth's surface but do not allow the ___U___ wave heat radiations reemitted by earth to escape,

thereby causing ___ V ___ flux.

(iv) Large amount of ___ W ___ is added to the atmosphere by marshes, paddy fields and biogas plants.

A. P-Grassland, Q-Aquatic, T-Long, W-

Sulphur dioxide

B. Q-Parasitic, S-Pond, U-Long, W-Methane

C. Q-Detritus, R-Pond, V-Greenhouse, W-

Chlorofluorocarbon

D. P-Parasitic, T-Short, U-Long, W-Carbon

monoxide

Answer: B



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