

AP Board Class 10 Science Paper 2 2018 Question Paper with Solutions

Biological Science

PART-A

Section-I

4 x 1=4

1. What are the end products of Aerobic and Anaerobic Respirations?

Answer: Cellular respiration usually occurs inside the cells, where energy is released by the breakdown of glucose molecules. The process is conveniently divided into two categories on the basis of the usage of oxygen, namely aerobic and anaerobic respiration. In Aerobic respiration, glucose breaks down into carbon dioxide and water, whereas, in Anaerobic respiration, Glucose breaks down into ethyl alcohol, carbon dioxide and energy.

2. In which organisms, does blood not supply oxygen?

Answer: In almost all organisms including Mammals, blood flows through the circulatory system, being pumped by a four-chambered heart. When returning to the heart, after delivering nutrients and oxygen to all parts of the body, blood is depleted in oxygen. The lungs are continuously extracting oxygen from the atmosphere to replenish. However, blood does not supply oxygen to the organisms like Phylum Arthropoda also including the Insects such as cockroaches.

3. What is colostrum?

Answer: The first formed yellowish milk-like fluid secreted by mother from the mammary glands during initial days of lactation is colostrum and it has abundant antibodies to protect the infant.

4. Why do we use KOH in Mohl's half leaf experiment?

Answer: KOH solution is added to the Mohl's half leaf experiment to show that Carbon dioxide is essential for photosynthesis to take place. It is seen that when we take two leaves, the one kept in the KOH solution does not change its colour to blue-black, thus showing the absence of carbon-dioxide.

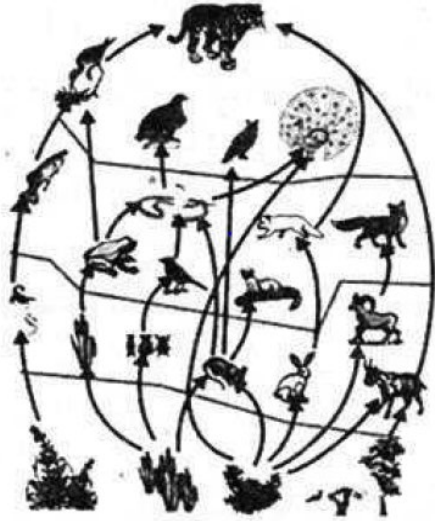
Section-II

5 x 2=10

5. What will happen if pulmonary veins are tied with a thread?

Answer: The pulmonary veins originate from the alveoli in the lungs, and it is the only vein that transports oxygen-rich blood to the left atrium of the heart. If the pulmonary veins are tied, then the oxygenated blood will not reach the heart and hence, oxygen will not be supplied to all the cells of the body. This can ultimately lead to death.

6. Observe the diagram and answer the following:



(i) Write any two food chains from the diagram above.

(ii) What are the secondary consumers in the food chain that are written by you?

Answer: (i) From the diagram you can see two types of food chain, that is the Detritus food chain and the grazing food chain.

- **Detritus food chain:** The detritus food chain includes different species of organisms and plants like algae, bacteria, fungi, protozoa, mites, insects, worms and so on. The detritus food chain begins with dead organic material. The food energy passes into decomposers and detritivores, which are further eaten by smaller organisms like carnivores. Carnivores, like maggots, become a meal for bigger carnivores like frogs, snakes and so on. Primary consumers like fungi, bacteria, protozoans, and so on are detritivores, which feed on detritus.

Grass- Grass hopper- frog- eagle

- **Grazing food chain:** The grazing food chain is a type of food chain that starts with green plants, passes through herbivores and then to carnivores. In a grazing food chain, energy in the lowest trophic level is acquired from photosynthesis.

Plants- deer- tiger (carnivores)

(ii) Secondary consumers in the first food chain are the carnivores.

Learn more about [food chain](#) from here.

7. Suggest some precautions to avoid cardiac problems.

Answer: The best treatment for cardiovascular disease or cardiac problem normally involves surgery, lifestyle changes and medications. Avoid the usage of tobacco. Also be active daily. Maintain a healthy diet and weight. Also, manage stress and get good quality sleep. It is also good to get regular health check-ups. Other than that for people who have cardiovascular

problems, they should take medications such as antiplatelets (like aspirin, clopidogrel), blood-thinning medications (like heparin, warfarin) and anti-diabetic medications should be taken as required. Also, the patient may have to undergo surgery, if required. The surgeries include Vascular surgery and Endovascular surgery. Meanwhile, treatment of Ischemic heart disease includes medications like Organic nitrates which help to relax the non-specific smooth muscles, Beta-blockers which help to reduce cardiac work and increase oxygen consumption, Aspirin which reduces the risk of angina and Calcium channel blockers which reduce the total coronary flow by blocking beta receptors.

8. What questions do you ask a nephrologist to know more about Kidney related diseases?

Answers: Below given are some questions to ask your nephrologist to know more about Kidney related diseases:

1. What caused my Kidney problem?
2. What are the main symptoms of Kidney problems?
3. What percentage of my Kidney is functioning properly?
4. What are my lab results?
5. What is the next step in treatment?
6. Will I need a Kidney transplant or a dialysis? What is the timeline if I need it?
7. Is a High Blood Pressure normal?
8. Will hypertension or diabetes worsen my Kidney problem?
9. What are the lifestyle changes that I need to make?
10. What kind of dialysis would you recommend?

9. Prepare some slogans about VANAM-MANAM program to display in your school rally.

Answer: Some slogans about Vanam-Manam program include:

Vriksho Rakshita Rakshitaha
Take Care of the Trees, They Will Take Care of You
Save Trees, Save Environment!
Be Earth Wise and Earth Friendly

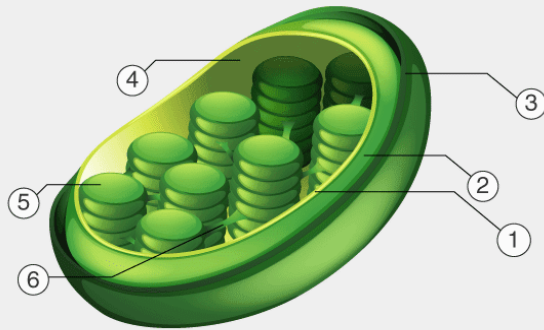
Section-III

4 x 4 = 16

10. (A) Explain the structure of cell-organelle that performs the photosynthesis, with the help of a labelled diagram

Answer: Chloroplasts – The double membrane-bound organelles that usually vary in their shape – from a disc shape to spherical, discoid, oval and ribbon. They can be found in mesophyll cells of leaves, which store chloroplasts and other carotenoid pigments. These pigments are responsible for trapping light energy for photosynthesis. The inner membrane encloses a space called the stroma. Flattened disc-like chlorophyll-containing structures known as thylakoids are arranged in a stacked manner like a pile of coins. Each pile is called granum (plural: grana) and the thylakoids of different grana are connected by flat membranous tubules known as stromal lamella. Just like the mitochondrial matrix, the stroma of chloroplast also contains a double-stranded circular DNA, 70S ribosomes, and enzymes that are required for the synthesis of carbohydrates and proteins.

CHLOROPLAST



- 1 Inner membrane | 2 Intermembrane space | 3 Outer membrane
4 Stroma | 5 Thylakoid | 6 Lamella

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Or

10. (B) Name the important parts of the brain and write the functions of the fore-brain.

Answer: Following are the major parts of the human brain:

- Forebrain
- Midbrain and
- Hindbrain

Learn about [parts of the brain](#) from here. One important forebrain function is that it controls the reproductive functions, body temperature, emotions, hunger and sleep. The largest among the forebrain parts is the cerebrum. It is also the largest part of all vertebrate brains. More about [forebrain](#) is also here.

11.(A) You have done an experiment in your school laboratory to prove Carbondioxide is evolved during respiration. Now, answer the following questions.

(i) List out the apparatus used in the experiment

(ii) Write the procedure of the experiment

Answer: (i) Given below is the list of apparatus used in the experiment to prove it is evolved during respiration:

- Soaked gram seeds
- U-shaped delivery tube
- Conical flask
- Blotting paper (moist) /cotton wool
- Thread
- Water
- Beaker
- Test tube
- Rubber cork with a single hole
- Freshly prepared KOH solution (20%)
- Vaseline

(ii) Now, for the procedure of the experiment and complete observations and conclusion check out [here](#).

Or

11.(B) "Taste is something connected to the tongue and palate." Write an activity to prove it.

Answer: Place some sugar crystals on your tongue, then keep your mouth open and see that your tongue doesn't touch the palate. Record the time from the moment you placed the crystals on your tongue till you got the taste by using a stop watch. Now repeat the test by placing the sugar crystals on the tongue and pressing it against the palate. Record the time from placing sugar crystals to getting the taste or you can even put a drop of sugar solution on your tongue using a dropper. Now observe:

- Can we taste on dry tongue?
- Which way helped you taste faster ? Why?

Based on the above activity we know that taste can be identified easily when the tongue is pressed against the palate. As we know the tongue is sensory in function and contains taste buds. These taste buds are tiny papillae with an opening on top. Within them there are several taste sensitive cells. Any food substance when placed on the tongue gets dissolved in the saliva secreted by salivary glands in the mouth. When the tongue is pressed against the palate the food substance is pressed against the opening of the taste bud letting it to reach the taste cells and triggering taste signals. Finally, the taste is recognised in the brain.

12. (A) Read the information about Kolleru lake in the given table and answer the following question:

Classes	Area in 1967(Km ²)	Area in 2004(Km ²)
Lake-water spread area	70.70	62.65
Lake with sparse weed	0	47.45
Lake with dense weed	0	15.20
Lake- liable to flood in rainy season	100.97	0
Aquaculture ponds	0	99.74
Rice Fields	8.40	16.62
Encroachment	0.31	1.37
Total	180.38	180.38

- a. In which year, the lake spread area is more?
- b. Why do you think weeds are more in the lake?
- c. Guess the reasons for decrease in the lake area.
- d. What measures are to be taken to control pollution in the lake?

Answer: (a) Lake spread area is more in the year 1967

(b) Excessive nutrient addition, especially from anthropogenic sources has led to explosive weed growth.

Ex: Eichornia

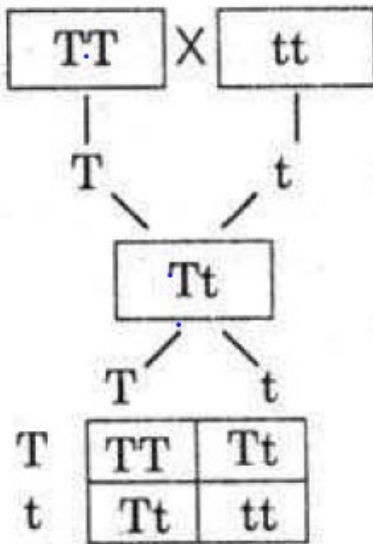
(c) This largest sweet water lake not only shrunk in size but also faced great threat due to pollution. The decrease in water area and muddy ground in the lake resulted in flooding in the lake area. Meanwhile, as Aquaculture in Kolleru was started extensively in the eighties which later spread to other areas in the Krishna Godavari delta and attracted many investors to the area. In 1996, almost the entire lake was

brought under cultivation and bunds were constructed to keep water out to protect the crops. This diversion affected the natural flow system of the lake. The water holding capacity of the lake is also found significantly reduced.

(d) The Ministry of Environment and Forest (MoEF), Government of India (GoI) constituted a committee "Operation Kolleru" to protect the lake. The objective of the program is to bring back the ecological balance of Kolleru Lake, which is a Gift of nature.

Or

12 (B) Observe the flow chart and answer the following:



- What does the flow chart represent?
- What are the Phenotype characters in the F_1 generation?
- What is the Genotype, Phenotype ratio of the F_2 generation?
- What laws of inheritance did you understand from this flow-chart above?

Answer: (i) The flow chart represents monohybrid cross of tall and dwarf plants.

ii) Phenotype of F_1 generation shows all tall plants

iii) Genotype: $1:2:1$ tall homozygote : tall heterozygote : dwarf homozygote

Phenotype: $3:1$ tall: dwarf

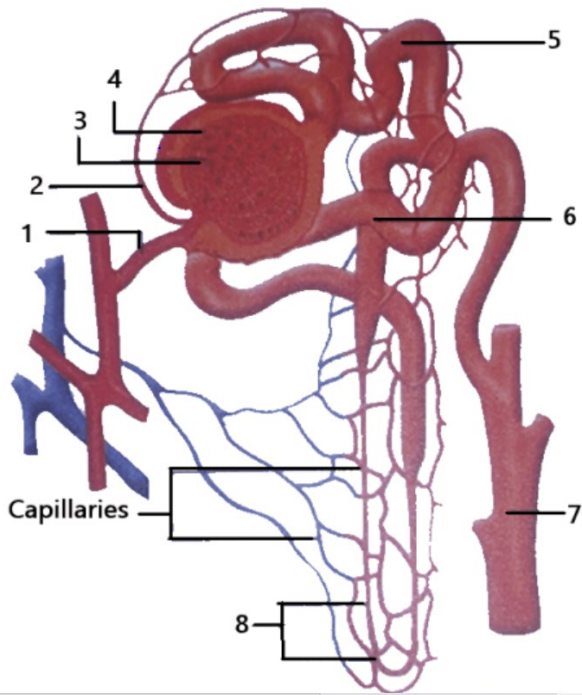
iv) Law of dominance: In F_1 generation, tallness dominates over dwarfness and all the plants are tall
Law of segregation: In F_2 generation, segregation of character occurs at the time of gamete formation and when tall heterozygotes of F_1 are self crossed, we get tall and dwarf plants in the ratio $3:1$

13. (A) Which diagram do you draw to label these parts?

(i) Bowman's Capsule (ii) Uriniferous tubule (iii) Collecting Tubule

Draw the diagram and label the parts

Answer: Find below the diagram of the nephron with the parts labelled:

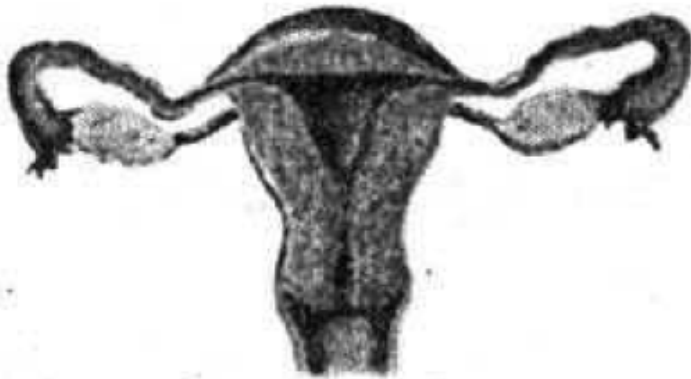


Parts indicated by 1 to 8 are as follows:

1. Afferent arteriole from renal artery
2. Efferent arteriole
3. Bowman's capsule
4. Glomerulus
5. Proximal convoluted tubule with blood capillaries
6. Distal convoluted tubule with blood capillaries
7. Collecting tubule
8. U-shaped loop of Henle

Or

13. (B) Observe the diagram and answer the following:



- (i) Which part produces the female gamete?
- (ii) Where does fertilization take place in the female reproductive system?

(iii) Where does the embryo develop until it is ready to be born?

(iv) In some cases, doctors cut and tie the ends of the fallopian tubes. What is the name of the surgery?

Answer: (i) Ovaries produce the female gamete

(ii) Fertilization actually takes place in the fallopian tubes next to the ovaries. The ovum enters the widened funnel of an oviduct (fallopian tube), a tube that extends from the neighbourhood of an ovary to the muscular, thick-walled uterus. Fertilization occurs as the ovum passes through the oviduct

(iii) Development of the embryo takes place inside the amniotic sac, under the lining of the uterus on one side. The fertilized ovum undergoes division. As it moves down the oviduct and finally attaches to the soft tissues of the uterus. Once attached, the embryo sinks into the soft inner uterine wall. Then certain cells of the embryo develop into membranous structures that help to nourish, protect, and support the developing embryo.

(iv) In females a small portion of oviducts (fallopian tube) is removed by surgical operation and the cut ends are tied. This prevents the ovum from entering into the oviducts. This method is called tubectomy.

Part-B

Section- IV

20 x ½ = 10

14. Name the plant that is used to make the soil Nitrogen rich.

- (A) Marigold
- (B) Acacia
- (C) Gliricidia
- (D) Cactus

Answer: (C) Gliricidia

Planting Gliricidia (Madri, a leguminous plant adapted to grow in dry areas) on field bunds to strengthen them and make the soil nitrogen-rich.

15. Which enzyme starts the digestion in human beings?

- A. Salivary amylase
- B. Pepsin
- C. Trypsin
- D. Lipase

Answer: (B) Pepsin

16. Which of the following is not related to Darwin's theory of Evolution?

- A. All living organisms of a group are not identical
- B. Variations may be passed from parent to offspring
- C. Evolution is a slow and continuous process
- D. Population do not grow in geometrical proportion

Answer: (D) Population do not grow in geometrical proportion

17. Which of the following Pyramids in Aquatic ecosystem is not upright?

- A. Pyramid of Number
- B. Pyramid of Biomass
- C. Pyramid of Energy
- D. Pyramid of Heat

Answer: (B) Pyramid of Biomass

18. Which of the following is not a secretion in human beings?

- A. Enzyme
- B. Hormones
- C. Saliva
- D. Sweat

Answer: (A) Enzyme

19. What reagent do you use to prove action of Saliva on Starch?

- A. KOH
- B. Alcohol
- C. Iodine
- D. Lime Water

Answer: (C) Iodine

20. In Mimosa Pudica, Thigmotropism helps in protection, whereas in bitter-guard tendrils help in _____

- A. Support
- B. Nutrition
- C. Respiration
- D. Excretion

Answer: (A) Support

21. Which of the following is not a Green house gas?

- A. Carbon dioxide
- B. Methane
- C. Ozone
- D. Chloro-fluoro carbons

Answer: (D) Chloro-fluoro carbons

22. Find the statement that does not belong to Prophase

- A. Nuclear Membrane disappears
- B. Chromosomes splits
- C. Nucleoli becomes smaller
- D. Centromeres splits

Answer: (D) Centromeres splits

23. Find the correct match:

A	B
(i) Bulbs	a. Potato
(ii) Tuber	b. Jasmine
(iii) Stolon	(c) Onion

- A. (i) c, (ii) a, (iii) b
- B. (i) b, (ii) c, (iii) a
- C. (i) a, (ii) b, (iii) c
- D. (i) b, (ii) a, (iii) c

Answer: (A) (i) c, (ii) a, (iii) b

24. Fibrinogen $\xrightarrow{?}$ Fibrin Name the enzyme involves this reaction.

- A. Thrombokinase
- B. Thrombin
- C. Prothrombin
- D. Enterokinase

Answer: (B) Thrombin

25. Reason for the growth of mosquito population.

- A. Seawater
- B. Streams of rivers
- C. Streams of canals
- D. Stagnation of water

Answer: (D) Stagnation of water

26. The second brain refers to _____

- A. Cerebrum
- B. Cerebellum
- C. Enteric Nervous system
- D. Hind brain

Answer: (C) Enteric Nervous system

27. The middle step between the gaseous exchange at lung's level and tissue level is _____

- A. Cellular respiration
- B. Gas transport by blood
- C. Breathing
- D. Lung's expansion

Answer: (B) Gas transport by blood

28. What precaution do you take while conducting experiment on root pressure?

- A. Plant should have branches
- B. Plant should be kept in the dark
- C. Size of the glass tube should be equal to the size of the stem
- D. Size of the glass tube should be more than the size of the stem

Answer: (C) Size of the glass tube should be equal to the size of the stem

29. Rama's heartbeat is 72 per minute, so his pulse rate is _____

- A. More than 72/ min
- B. Less than 72/ min
- C. Exactly 72/min
- D. Cannot give

Answer: (C) Exactly 72/min

30. Analogous organs are _____

- A. Fore limb of goat and wings of bird
- B. Fin of Whale and wings of bird
- C. Fore limbs of Man and wings of bird
- D. Wings of Bat and wings of bird

Answer: (D) Wings of Bat and wings of bird

31. Geetha always uses durable items because _____

- A. To Reduce Waste
- B. To Reduce Re-Use
- C. To Reduce Recycle
- D. To Promote Recover

Answer: (A) To Reduce Waste

32. Find the correct statement

- A. Using pressure cooker saves the gas
- B. Use more water for cooking
- C. Do not soak the food materials before cooking
- D. Put on the stove before arranging the things

Answer: (A) Using pressure cooker saves the gas

33. Particulate matter causes _____

- A. Kidney problems
- B. Arthritis
- C. Joint pains

D. Respiratory disease

Answer: (D) Respiratory disease

