CBSE Class 11 Biology

Sample Paper 02 (2020-21)

Maximum Marks: 70

Time Allowed: 3 hours

General Instructions:

i. All questions are compulsory.
ii. The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.
iii. Section–A has 14 questions of 1 mark each and 02 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D has 3 questions of 5 marks each.
iv. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
v. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. Amoeba multiplies by mitotic cell division. Is this phenomenon growth or reproduction? Explain.
2. What is the function of simple epithelium?
3. What is shape of plant body of a liverwort?
4. Which filaments are responsible for muscle contraction?
5. What is inflorescence?
6. Define connective tissues.
7. State the role of centrioles other than spindle formation.
8. Mention the number of protons that passes through complex V for the synthesis of 2 molecules of ATP.
9. Which hormone is secreted by corpus luteum?
10. What are the main processes of urine formation?
11. **Assertion :** Euglena is a plant due to the presence of chlorophyll.
    Reason : Euglena cannot be classified on the basis of the two-kingdom system.

a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c. Assertion is correct statement but reason is wrong statement.
d. Assertion is wrong statement but reason is correct statement.

OR

Assertion : Cyanobacteria have chlorophyll a similar to green plants and are photosynthetic autotrophs.
Reason : Some of cyanobacteria can fix atmospheric nitrogen in specialised cells called heterocysts.

a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c. Assertion is correct statement but reason is wrong statement.
d. Assertion is wrong statement but reason is correct statement.

12. **Assertion:** Non-protein constituents called co-factors are bound to the enzyme to make the enzyme catalytically active.
Reason: Catalytic activity is not affected when the co-factor is removed from the enzyme.
a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c. Assertion is correct statement but reason is wrong statement.
d. Assertion is wrong statement but reason is correct statement.
13. **Assertion:** In animal cells lipid-like steroidal hormones are synthesised in SER.
Reason: The smooth endoplasmic reticulum (SER) is the major site for synthesis of lipid.
a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c. Assertion is correct statement but reason is wrong statement.
d. Assertion is wrong statement but reason is correct statement.

14. **Assertion:** Inspiration is initiated by the contraction of the diaphragm which increases the volume of the thoracic chamber in the antero-posterior axis.
Reason: The contraction of external intercostal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis.
a. Assertion and reason both are correct statements and reason is correct explanation for assertion.
b. Assertion and reason both are correct statements but reason is not correct explanation for assertion.
c. Assertion is correct statement but reason is wrong statement.
d. Assertion is wrong statement but reason is correct statement.

15. **Read the following and answer any four questions:**
Camillo Golgi (1898) first observed densely stained reticular structures near the nucleus. The Golgi apparatus was first described by Camillo Golgi. Golgi apparatus consists of a set of membrane-bounded, fluid-filled vesicles, vacuoles and flattened cisternae. The cisternae consist of many flat, disc-shaped sacs of 0.5µm to 1.0µm diameter.
i. The Golgi cisternae are concentrically arranged near the _____.
a. Periphery
b. Vacuole
c. Plastid
d. Nucleus
ii. Golgi apparatus is the important site of formation of _____.
a. Glycoproteins
b. Glycolipids
c. Phospholipids
d. Both glycoproteins and glycolipids.
iii. In Golgi apparatus, _____ are stacked parallel to each other.
a. Thylakoids
b. Cisternae
c. Grana
d. Cristae
iv. The plant cells contain many freely distributed subunits of Golgi apparatus, called

_____.

a. Dictyosomes
b. Stroma
c. Thylakoid
d. Granum

v. **Assertion:** Materials to be packaged in the form of vesicles from the ER fuse with the cis face of the Golgi apparatus.

Reason: The Golgi apparatus remains in close association with the endoplasmic reticulum.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

16. **Read the following and answer any four questions:**

Exchange of gases also occurs between blood and tissues. O_2 and CO_2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient. The solubility of the gases, as well as the thickness of the membranes involved in diffusion, are also some important factors that can affect the rate of diffusion.

i. Pressure contributed by an individual gas in a mixture of gases is called _____.
   a. Atmospheric pressure
   b. Partial pressure
   c. Differential pressure
   d. Capillary pressure

ii. _____ are the primary sites of exchange of gases.
   a. Alveoli
   b. Diaphragm
   c. Trachea
   d. Bronchi

iii. The diffusion membrane is made up of _____ major layers.
   a. Two
   b. Four

c. Three

d. Five

iv. What are the values of pO_2 and pCO_2 in the body tissues?

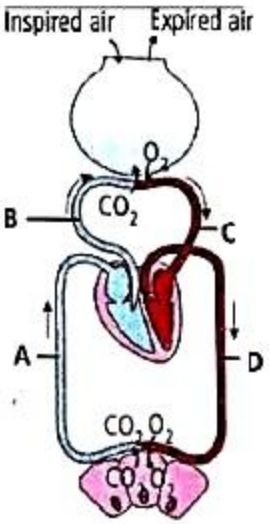
a. pO_2 – 104 mm Hg, pCO_2 – 40 mm Hg

b. pO_2 – 104 mm Hg, pCO_2 – 140 mm Hg

c. pO_2 – 95 mm Hg, pCO_2 – 40 mm Hg

d. pO_2 – 40 mm Hg, pCO_2 – 45 mm Hg

v. The following statements are drawn as conclusions for the image shown.



I. The given diagram represents the exchange of gases at the alveolus and the body tissues with blood and the transport of oxygen and carbon dioxide.

II. The amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much lesser compared to that of O_2.

III. All the factors in our body are favourable for the diffusion of O_2 from tissues to alveoli and that of CO_2 from alveoli to tissues.

IV. The total thickness of the diffusion membrane is much less than a millimetre.

Choose from below the correct alternative.

a. Only I is true

b. I and IV are true

c. III and II are true

d. I and III are true

Section B

17. Show the pathway of fermentation in yeast by a figure.

18. How do IBA and 2, 4-D are used in agriculture?
19. Give a brief description of the neural system.
20. What is fermentation? Name any two organic compounds produced in the process.

OR

Explain oxidative phosphorylation.

21. Differentiate between stroma and grana of chloroplasts.
22. $2H_2O \rightarrow 2H^+ + O_2 + 4e^-$

    Based on the above equation, answer the following questions:
    i. Where does this reaction take place in plants?
    ii. What is the significance of this reaction?

OR

The entire process of photosynthesis consists of a number of reactions. Where in the cell do each of these take place?

i. Synthesis of ATP & NADPH _____
ii. Photolysis of water _____
iii. Fixation of CO_2 _____
iv. Synthesis of sugar molecule _____
v. Synthesis of starch _____

23. What are the four basic shapes of bacteria?
24. Distinguish between endocrine and exocrine glands
25. Write the characteristic of Mammalia.

Section C

26. Discuss "The respiratory pathway is an amphibolic pathway".
27. A typical angiosperm flower consists of four floral parts. Give the names of the floral parts and their arrangement sequentially.
28. Differentiate between Carboxylation and Oxygenation.
29. Name three phases of interphase. Give one major event of each phase.
30. What are the benefits of a five kingdom classification over a two kingdom classification?

OR

List out some living features of viruses.

Section D

31. Amphibians are supposed to be the linking point between aquatic and terrestrial life. Explain.

OR

Give a comparative account of chordates and non-chordates. Discuss certain characters of chordates which are beneficial from evolutionary point of view.

32. What are the different classes of enzymes? Explain any two with the type of reaction they catalyze.

OR

Describe the mechanism of enzymatic action.

33. Differentiate between Systolic pressure and Diastolic pressure.

OR

List the main functions of blood in our body.

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Solution

Section A

1. In unicellular organisms like Amoeba, growth is synonymous with reproduction and takes place by increase in number of cells by mitotic cell division.
2. Simple epithelium facilitates diffusion , absorption and secretion .
3. Thalloid, Theydo not have stems or leaves; instead their main body is flat, like a green pancake.
4. Actin and myosin filaments are responsible for muscle contraction.
5. Arrangement of flowers on the floral axis is called inflorescence.
6. Connective tissues are made of a matrix with cells of different types embedded in it. They perform special function of linking and supporting other tissues/organs of the body.
7. Centrioles also serve other purposes apart from its role in spindle formation it formed the basal body of cilia and flagella. They also help in formation of microtubules and sperm tail.
8. Two pairs of protons (i.e., 4) pass through complex V for the synthesis of 2 molecules of ATP from 2 ADP and 2 inorganic phosphate molecules.
9. Progesterone
10. Urine formation involves three main processes - filtration, reabsorption, and secretion.
11. (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

    Explanation: Euglena is photosynthetic organisms in the presence of sunlight but when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms. Two Kingdom system of classification categorizes all living organisms into Plantae and Animalia kingdoms and can not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and photosynthetic (green algae) and non-photosynthetic (fungi) organisms. Hence, Euglena cannot be classified on the basis of the two-kingdom system.

OR

(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Explanation: The cyanobacteria, also referred to as blue-green algae, have chlorophyll a similar to green plants and are photosynthetic autotrophs. Some of these organisms can fix atmospheric nitrogen in specialised cells called heterocysts, e.g., Nostoc and Anabaena.

12. (c) Assertion is correct statement but reason is wrong statement.

    Explanation: If the cofactor is removed, the enzyme will not be able to do its job and will no longer work as a catalyst. Hence catalyst activity is affected by cofactor.

13. (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

    Explanation: Assertion and reason both are correct statements and reason is correct explanation for assertion.

14. (b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

    Explanation: Inspiration is initiated by the contraction of diaphragm which increases the volume of thoracic chamber in the antero-posterior axis. The contraction of external inter-costal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis.

15. i. (d) The Golgi cisternae are concentrically arranged near the nucleus with distinct convex cis or the forming face and concave trans or the maturing face.
    ii. (d) Golgi apparatus is the important site of the formation of glycoproteins and glycolipids.
    iii. (b) In the Golgi apparatus, cisternae are stacked parallel to each other.
    iv. (a) The plant cells contain many freely distributed subunits of Golgi apparatus, called dictyosomes.
    v. (a) Materials to be packaged in the form of vesicles from the ER fuse with the cis face of the Golgi apparatus and move towards the maturing face. That is why the Golgi apparatus remains in close association with the endoplasmic reticulum. Hence, both assertion and reason are true, and reason is the correct explanation of the assertion.

16. i. (b) Pressure contributed by an individual gas in a mixture of gases is called partial pressure.
    ii. (a) Alveoli are the primary sites of exchange of gases.

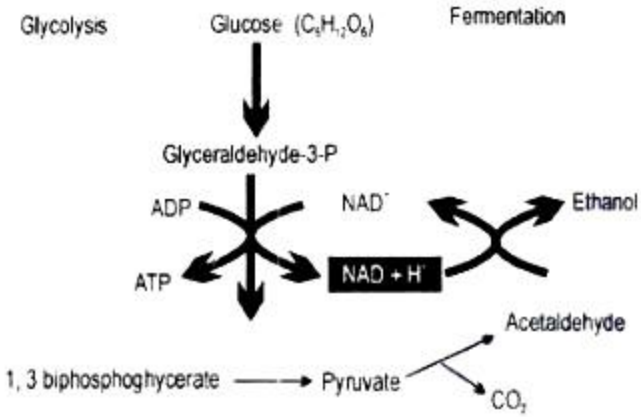
iii. (c) The diffusion membrane is made up of three major layers.

iv. (d) The values of pO_2 and pCO_2 in the body tissues is: pO_2 – 104 mm Hg, pCO_2 – 40 mm Hg.

v. (b) The given diagram represents the exchange of gases at the alveolus and the body tissues with blood and the transport of oxygen and carbon dioxide. The amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O_2. All the factors in our body are favourable for the diffusion of O_2 from alveoli to tissues and that of CO_2 from tissues to alveoli. The total thickness of diffusion membrane is much less than a millimetre.

Section B

17.



Pathway of anaerobic respiration in yeast(fermentation).

18. IBA and 2, 4-D ate used to induce the formation of roots on cuttings of many ornamental, horticultural and forest trees. 2, 4-D can also be used as a weedicide.

19. The neural system is composed of specialized cells called neurons. It detects stimuli and transmits neural signals. The neural system of complex animals is composed of two parts, viz. central neural system and peripheral neural system. The brain and nerve cord comprise the central neural system and other nerves comprise the peripheral neural system

20. Anaerobic respiration also called fermentation. It involves the production of energy from food nutrients in the absence of oxygen. Organic compounds produced in the process

    i. Ethyl alcohol in yeast cell

    ii. The lactic acid in muscles.

OR

In respiration the **energy of oxidation-reduction** reaction is utilised for the production

of **proton gradient** required for phosphorylation. Hence this process is called oxidative phosphorylation.

During oxidative phosphorylation, ATP is synthesized by the ATP synthase enzyme when the chemiosmotic gradient is used to drive the phosphorylation of ADP. The electrons are finally transferred to the oxygen which acts as the final hydrogen acceptor.

21.

Stroma	Grana
It is the jelly-like matrix of the chloroplast.	These are formed of stacks of thylakoids.
Dark reaction takes place here.	Light reaction takes place here.

22. i. It shows the decomposition of water molecule. It takes place in PS II. It is located on the inner surface of thylakoid membrane.
    ii. Splitting of water continuously provides electrons to the electron transport chain; for further steps of photosynthesis.

OR

i. Synthesis of ATP and NADPH2 takes place at the outer side of the thylakoid membrane.
ii. Photolysis of water takes place at the Inner side of thylakoid membrane.
iii. Fixation of carbon dioxide occurs at the stroma of the chloroplast.
iv. Synthesis of sugar occurs in chloroplast.
v. Synthesis of starch takes place in the cytoplasm

23. Shapes of bacteria:
    - Bacillus (rod shaped)
    - Coccus (spherical)
    - Vibrio (comma shaped)
    - Spirillum (spiral shaped)

24.

Endocrine Glands	Exocrine Glands
They do not have ducts.	They have ducts.
They secrete hormones directly into the blood.	They secrete their secretions into the ducts.

e.g., thyroid, hypothalamus, pituitary, etc.	e.g., sweat and oil glands **(of skin)** liver and salivary glands.

25. **Characteristic of Mammalia:** Mammals are supposed to be the highest developed animals on earth. They usually nourish their young ones with their milk produced in **mammary glands.** Man, Lemur, Orangutan, Gorilla, monkey, whale, cow, buffalo, horse, elephant, rat, etc., are included in this group. These animals live everywhere in the world. They possess great power of adaptation.

Section C

26. The respiratory pathway is involved in both anabolism and catabolism. For example, fatty acids is broken down to acetyl CoA before entering the respiratory pathway when it is used as a substrate. But when the organism needs to synthesise fatty acids, acetyl CoA is withdrawn from the respiratory pathway for it. Hence, the respiratory pathway comes into the picture both during breakdown and synthesis of fatty acids.
Similarly, during breakdown and synthesis of protein too, respiratory intermediates form the link. Hence the respiratory pathway is considered as an amphibolic pathway rather than as a catabolic one.
27. A typical angiosperm flower consists of four floral parts. The names of the floral parts and their arrangement sequentially are as follow.:
    i. Sepals It is the green leaf-like outermost whorl (calyx).
    ii. Petals It is the second whorl (corolla) from below often brightly coloured floral parts.
    iii. Stamens Third whorl (androecium) of knobbed thread-like male reproductive floral parts.
    iv. Carpels Central single whorl (gynoecium) of female reproductive floral parts.
28.

Carboxylation	Oxygenation
It is the first step of the Calvin cycle (C_3 in biosynthetic phase).	The oxygenation of RuBP in the presence of O_2 is the first reaction of photorespiration.
Carboxylation occurs inside chloroplasts.	Initial oxygenation occurs inside chloroplasts. Second oxidation takes place in peroxisomes.

Ribulose 1, 5 biphosphate combines with a mol. of CO_2 in presence of lightly regulated enzyme RuBP carboxylase.	The photorespiration is initiated in the chloroplasts in light only.
2-carboxy 3 keto arabinitol 1, 5 biphosphates is formed.	Rubisco catalyses oxygenation. It leads to the formation of phosphoglycolate (2C).

29. Three main events that occur in interphase are as follows:
G_1-phase (post-mitotic or pre-synthetic phase), S-phase (synthesising phase) and G_2-phase (post-synthetic or pre-mitotic phase). Major events of each phase are:
    i. G_1-phase is the longest phase during which the synthesis of RNA and DNA takes place.
    ii. S-phase is the phase during which chromosomes replicates and prepare themselves for equal distribution.
    iii. G_2-phase is the phase in which the synthesis of DNA gets stopped. However, the formation of RNA takes place.
30. Two kingdom classification was unable to accommodate certain living beings as they neither had properties of animals nor of plants. Through two kingdom classification it was not possible to include every set of characters in a particular kingdom.
Five kingdom classification could accommodate more set of characters. As a result it was easier to categorize all living beings.
For example bacteria can be autotrophic as well as heterotrophic. It was a difficult question to categorize them either under plant or animal.A separate kingdom was the most logical choice.
Similarly viruses are a borderline case between living and non-living. When they don't get host then they behave like a non-living. Once, inside a host they spring to life.
Although the five kingdom classification does not have room for virus but it opened the way for a better and more inclusive system of classification.

OR

Viruses have the following features that make them similar to living things

    i. They have DNA or RNA.
    ii. Their nucleic acid can undergo mutation.

iii. They can reproduce only in living host cells.

iv. They infect different types of host cells.

v. The nucleic acids of viruses are identical in composition to those of other organisms.

Section D

31. Amphibians are adapted to survive in both aquatic as well as terrestrial life. As research has proved that the life started in water and finally moved to land and air. Aquatic life has its own limitations. The area is limited and there is less variety in primary producers which limits the type of food available to the animals living in water. Specially in deep sea limited reach of sunlight doesn't permit variations of certain kind. Following paragraphs highlights certain features which amphibians developed to adapt in a terrestrial environment.

- Emergence of lungs enabled frogs to breathe in air. When they are in water they breathe through skin. Some aquatic mammals, like whale need to come on surface, frequently, to breathe in oxygen which limits the time they can chase a prey underwater. So frogs are having a better mechanism to do so.
- Emergence of four limbs meant frogs can travel larger distances. Their webbed fingers enable them to swim, while the stronger hind legs are used for better jump. Ease of mobility is helpful from two perspectives. One is in getting food and another is in saving from predators.
- Frogs are ammonotelic which is more suitable for aquatic life. But later animals have switched over to ureotelic and urecotelic mode of excretion.
- The feeding habit of frogs enables them to survive both on land as well as on water. While on land they eat small insects.
- Presence of nictitating membrane over eyes allows them to swim under water. In higher animals, like mammals nictitating membrane becomes a vestigial organ showing their relationship with the aquatic life.

OR

Comparison of Chordate and Non-chordates

Chordates	Non-chordates
1. Notochord present.	1. Notochord absent.
	2. Central nervous system is ventral,

2. Central nervous system is dorsal.	Solid and single, and double.
3. Pharynx perforated by gill slits.	3. Gill slits absent.
4. Heart is ventral.	4. Heart is dorsal (if present).
5. A post anal part (tail) is present.	5. Post anal tail absent.

Evolutionary Steps of Chordates

The presence of notochord is a sign of better development of body architecture. As notochord develops into the vertebral column so it gives more strength and support to the body. In non-chordates a single nerve ganglion or a couple of nerve ganglia is responsible for all neural control. In chordates there is more elaborate system of a central nervous system and peripheral nervous system for better control and coordination. Pharyngeal gill slits rule out the need for ingesting large volume of water for food ingestion and it is an evolutionary step towards terrestrial life.

The notochord and the post anal tail help the aquatic animal to swim at faster speed. Development of musculoskeletal system is another means to attain faster speed of locomotion.

32. Enzymes are divided into 6 classes each with 4 - 13 subclasses and named accordingly by a four-digit number.
    i. **Oxidoreductases/dehydrogenases:** Enzymes which catalyze oxidoreduction between two substrates S and S' E.g., Alcohol dehydrogenase
    Reaction- Acetaldehyde+$NADH_2$ $\longrightarrow$ Ethyl alcohol + NAD
    ii. **Transferases:** Enzymes catalyzing a transfer of a group. G (other than hydrogen) between a pair of substrate S and S', E.g., Glucokinase
    Reaction- Glucose +ATP $\longrightarrow$ Glucose 6 Phosphate + ADP
    iii. **Hydrolases:** Enzymes catalyzing the hydrolysis of ester, ether, peptide, glycosidic, C-C. C-halide or P-N bonds. All digestive enzymes come under this category. E.g., Glucose 6 phosphatase. Reaction- Glucose 6 phosphate +water $\longrightarrow$ Glucose + phosphoric acid
    iv. **Lyases:** Enzymes that catalyze the removal of groups from substrates by mechanisms other than hydrolysis leaving double bonds. E.g., Pyruvic acid carboxylase.
    Reaction- Pyruvic acid $\longrightarrow$ Acetaldehyde +CO_2
    v. **Isomerases:** Includes.all enzymes catalyzing inter-conversion of optical, geometric, or positional isomers. eg-Triose phosphate isomerase

Reaction-Glyceraldehyde -3-phosphate $\longrightarrow$Dihydroxyacetone phosphate

vi. **Ligases:** Enzymes catalyzing the linking together of 2 compounds, e.g., enzymes that catalyze joining of C - O, C - S, C - N, P - O, etc. bonds. eg-Acetyl Co A synthetase.
Reaction- ATP + acetic acid+CoA$\longrightarrow$AMP +P +Acetyl Co A

OR

Mechanism of Enzymatic Action

i. Enzymes act by lowering the activation energy of reactions by creating an environment in which the transition state is stabilized (e.g. straining the shape of a substrate by binding the transition-state conformation of the substrate/ product molecules, the enzyme distorts the bound substrate(s) into their transition state form, thereby reducing the amount of energy required to complete the transition).
ii. Lowering the energy of the transition state, but without distorting the substrate, by creating an environment with the opposite charge distribution to that of the transition state.
iii. Providing an alternative pathway: For example, temporarily reacting with the substrate to form an intermediate ES complex, which would be impossible in the absence of the enzyme.
iv. Reducing the reaction entropy change by bringing substrates together in the correct orientation to react. Considering ΔH^{+}_{+} alone overlooks this effect.
v. Increase in temperature speeds up reactions. Thus, temperature increase helps the enzymes function and develop the end product even faster. However, if heated too much, the enzyme's shape deteriorates and only when the temperature comes back to normal does the enzyme regains its original shape. Some enzymes like thermolabile enzymes work best at low temperatures.

The catalytic cycle of an enzyme action can be described in the following steps:

i. First, the substrate binds to the active site of the enzyme.
ii. The binding of the substrate induces the enzyme to alter its shape (conformational change), fitting more tightly around the substrate.
iii. The active site of the enzyme, now in close proximity of the substrate breaks the chemical bonds of the substrate and the new enzyme - product complex is formed.
iv. The enzyme releases the products of the reaction and the free enzyme is ready to bind to another molecule of the substrate and run through the catalytic cycle once again.

33.

Systolic pressure	Diastolic pressure
When the blood pressure is highest or when the heart beats (heart muscles contracts), the systolic pressure is generated.	When the blood pressure is minimum, it is called diastolic blood pressure. Diastolic pressure is produced between the beats or at the resting of heart muscles between the beats, this is the time of refilling the blood.
Blood pressure inside the arteries is maximum.	Blood pressure inside the arteries is minimum.
Systolic stage occurs when the left ventricle gets contracted.	Diastolic stage occurs when the left ventricle gets relaxed.
Blood vessels contract.	Blood vessels relaxed.
90-120 mm Hg in adults; 100 mm Hg(6-9 years); 95 mm Hg (infants).	60-80 mm Hg; 65 mm Hg (6-9 years); 65 mm Hg (infants).

OR

Main Functions of blood:

i. **Oxygen carrier:** With the help of haemoglobin in the RBCs, O_2 is transported to various tissues.

ii. **Removal of CO_2:** Blood plasma contains Na_2CO_3 which absorbs CO_2 to form $NaHCO_3$ which on decomposition gives CO_2 with the lungs from where it is thrown out.

iii. **Transport of food material:** The digested food materials are assimilated by the blood in liquid form from the intestine and is taken by the blood to various tissues.

iv. Removal of waste material: Blood helps to discharge the metabolic waste from the body.

v. **Transport of other substances:** Hormones and the antitoxins are circulated by the blood to the desired sites.

vi. **Clotting of blood:** Blood helps in its clotting so that most of its parts remain intact in the body.