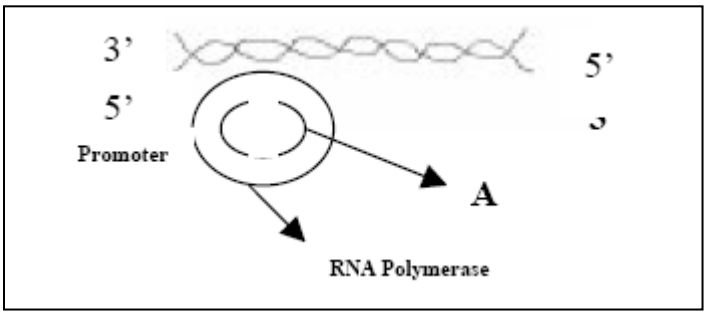
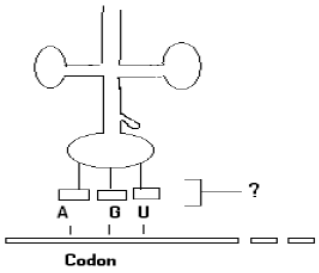
3) The diagram depicts a stage in transcription. Mention the stage and indicate A



4) Amino acid Arginine if coded by CGU; how many codons can code for this amino acid?

5) Write the anticodon of the given t-RNA



6) What is the difference between RNAs and RNase ?

Chapter-7
Evolution

Chapter No.	Chapter Name	Concepts	Degree of imp.	Ref. NCERT text book.: page nos	Common errors
7.	Evolution	1. Origin of Life 2. Evidences of Evolution 3. Adaptive Radiation 4. Biological Evolution 5. Mechanism of Evolution 6. Hardy-Weinburg Principle 7. A Brief Account of Evolution 8. Origin and Evolution of Man	* ** **** * ** *** * 	Fig 7.1 Fig. 7.3 Page 130-132 Fig. 7.5,7.6,7.7 Page 133 Page 134 Page 135 Fig. 7.8 Page 136-137 Fig. 7.9,7.10 Fig. 7.11 Page 140	 Branching Desent and Natural Selection Darwinism versus de-vries- -Saltation Hardy-Weinburg Equlibrium,Founder Effect

Definitions

- **ABIOGENSIS** :- The origin of life from non – living.
- **ADAPTIVE RADIATION** :- An evolutionary process in which a common stock / ancestor gives rise to new species that are adapted to new habitats and ways of life.
- **ALLOPATRIC SPECIATION** :- Origin of new species in geographically isolated populations.
- **ANALOGOUS ORGANS** :- Organs which are similar in appearance and perform similar functions but they are quite different in their origin and development.
- **ARTIFICIAL SELECTION** :- The process carried out by a select better breed of plants and animals, which are advantageous to human beings.
- **BIOGEOGRAPHICAL REALMS :-** Six major land masses on earth which are characterized by their own quota of life called flora and fauna.
- **BIOGEOGRAPHY** :- Study of patterns of distribution of plants and animals in different parts of the earth.
- **CONVERGENT EVOLUTION :-** Independent development of similar forms and features by unrelated organisms usually as an adaptation to a similar environment.
- **DIVERGENT EVOLUTION** :- Origin of a variety of species from a common ancestral form.
- **FOSSILS :-** The remains and / or impressions of organisms that lived in the remote part.
- **GENE POOL** :- The sum total of different kinds of genes (alleles) polled by all the members of a population, is called gene pool.
- **HOMOLOGOUS ORGANS** :- Organs in different groups of organisms, which have similar basic structural plan but superficially, look different and perform different functions.
- **NATURAL SELECTION :-** The process occurring in nature that acts over a number of generations and slowly increases the proportion of those individuals which are well adapted to the environment due to their heritable characteristics.
- **ONTOGENY** :- The stages of embryonic development of the organism.
- **ORIGIN OF LIFE :-** The appearance of life for the first time on the earth is called origin of life.
- **OUT BREEDING** :- Mating of two unrelated individuals.
- **PALAEOBOTANY** :- The study of fossil plants.
- **PALAEONTOLOGY :-** Study of fossils.
- **PALAEOZOOLOGY** :- The study of fossil animals.
- **PHYLOGENY** :- The evolutionary history of the organism.
- **SPECIATION :-** Origin of new species.
- **SPECIES** :- A taxonomic category including closely related, morphologically similar individuals which actually or potentially interbreed.
- **SYMPATRIC SPECIATION :-** Origin of new species in the populations occupying the same geographical area.
- **VESTIGIAL ORGANS :-** Organs that have no apparent function supposed to be remnants of organs once functional in the ancestors.

Differences

Homologous Organs	Analogous organs

1. They differ phenotypic ally. 2. They have similar internal structure. 3. They arise from similar position over the body. 4. Stages in the development are the similar. 5. They perform different functions. 6. They show adaptive radiation. 7. They occur in related organisms.	1. They show superficial resemblance. 2. Internal structure of analogous organs is quiet different. 3. They often arise from different positions over the body. 4. Stages in development are different. 5. They have similar functions. 6. Show convergent evolution. 7. Found in unrelated organisms.

Lamarkism	Darwinism
1. The theory believes in the presence of an internal vital force in all organisms. 2. It considers perfecting principle to be guiding principle for all organisms to achieve harmony with environment. 3. Modifications and even new organs can develop due to new needs, desires and conscious reaction. 4. Use and disuse of organs brings about their development and degeneration respectively. 5. Change in environment produces variations. 6. It does not consider any struggle for existence.	1. The theory does not believe in the presence of any internal vital force in all organisms. 2. Nature selects only those individuals which are adapted to the environment in which they live. 3. Modifications and development of new organs due to new needs, desires and conscious reaction do not form part of the theory. 4. An organ can develop further or degenerate only due to variations appearing in that direction. 5. Variations are already present. Changing

	environment selects some particular variations suitable for it. 6. Struggle for existence is very important ingredient of this theory.

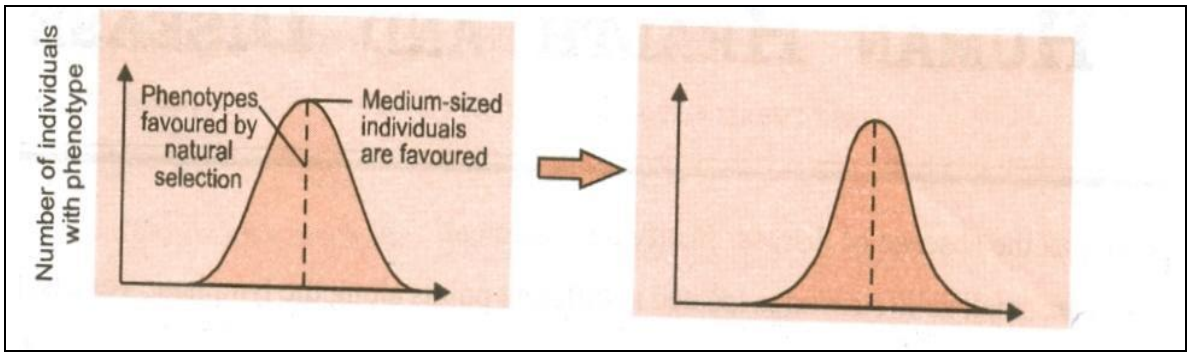
Assignment Questions

LEVEL 1

1. What is 'fitness' according to Darwin?
2. What is evolution according to Hardy-Weinberg?
3. What is common among the Australian marsupials like Koala, wombat, sugar glider etc.?
4. Can we call the human evolution as an example of adaptive radiation?
5. Why did the animals resembling horse, rabbit etc. of South America disappear, but the pouched mammals of Australia survived and flourished after continental drift.
6. Each of the placental mammals living in Australia resembles a similar marsupial. What is it due to? Give two examples of each
7. Name and explain the common evolutionary phenomenon shown by Australian marsupials and Darwin's finches

LEVEL 2

1. How does biochemistry provide evidence for organic evolution?
2. Give an example of evolution by anthropogenic activities?
3. Mention the two key concepts of Darwinism.
4. What is saltation
5. Name the group of extinct reptiles that was the ancestor of the present day reptiles and birds? Name the period of the geological time scale in which it lived?
6.



What type of selection is indicated? What happens in the process?

7. Hearts and brains of different classes of vertebrates are homologous or analogous? What do they indicate about evolution?

8. Explain how the atmosphere of Earth was formed?

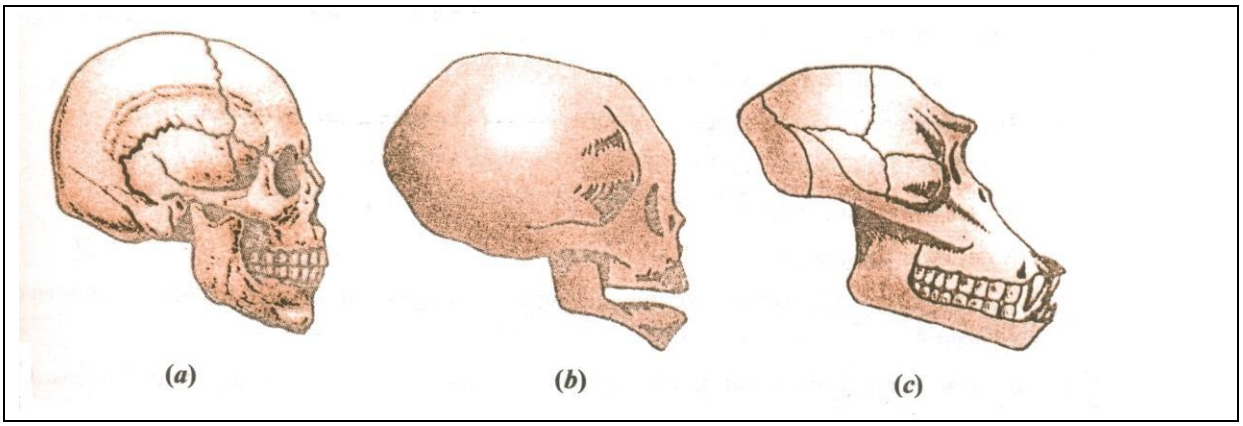
9. Fill in the blanks with the names of the mammals of Australia

Placental mammals	Marsupial mammals
a	Numbat
Lemur	b
Bob Cat	c
d	Flying phalanger

LEVEL 3

1. What is genetic drift?

2. Identify the animal to which each of the following three skulls belong. Which two of them resemble more closely than the others?



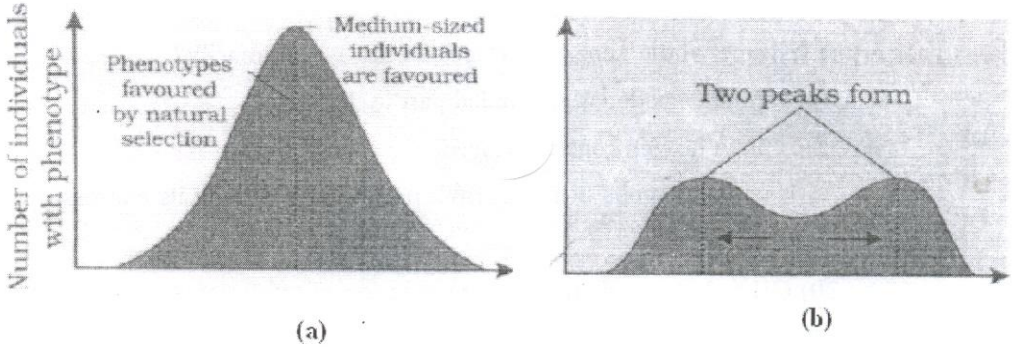
3. Stanley Miller and Harold Urey performed an experiment by recreating in the laboratory the probable conditions of the atmosphere of the primitive earth.

i) what was the purpose of the experiment .

ii) in what form was the energy supplied for the chemical reactions to occur?

4. Why do we consider the lobefins have evolved into amphibians? Give reason.

5. Study the figures (a) and (b) given below and answer the question given after the graph



i) Under the influence of which type of natural selection would graph (a) becomes like graph (b)
ii) What could be the likely reasons of new variations arising in the population?
iii) Who suggested natural selection as a mechanism of evolution?
6. In England, after industrialization it was observed that white winged moth did not survive.
a) What you think the cause may be?
b) What was the change and why it has happened?
c) Which organism is known as natural indicator to air pollution?

Questions for Self Evaluation

1) Why do the animals have certain functionless organs in their body?
2) Which of the following are homologous organs?
a Trunk of an Elephant and forelimbs of a Monkey
b) Wings of a bird and wings of butterfly
3) Which of the following are analogous organs?
a) Legs of Cockroach and legs of Cat.
b) Pectoral fin of fish and forelimb of a frog.
4) Wing of bat is homologous to
a) Arm of a human
b) Tail of a kangaroo
c) Wing of a butterfly
5) Name the common ancestors of Apes and Man.
6) Give the Scientific name of first human like ancestors.
7) What causes speciation according to Hugo deVries?
8) Which were the first organisms that began to release oxygen as a byproduct of photosynthesis?
9) Name the extinct representative of modern man.
10) Consider a thorn in Bougainvillea and a tendril in cucurbita . Are these 2 organs homologous or analogous. Give reasons.