CBSE Class 12 Biology
Important Questions
Chapter 8
Human Health and Disease

1 Marks Questions

1.Name the diagnostic test which confirms typhoid.

Ans. Widal test

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2. Name the two major groups of cells required to attain specific immunity.

Ans. B-lymphocytes and T-lymphocytes.

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3. You have heard of many incidences of Chickengunya in our country. Name the vector of the disease.

Ans. Aedes mosquitoes.

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4. Breast fed babies are more immune to diseases than the bottle fed babies. Why?

Ans. The mothers milk consists of antibodies (Ig A) such antibodies are notavailable to bottle fed babies.

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5. Name the pathogen which causes malignant malaria.

Ans. Plasmodium falciparum.

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6. Which microorganism is used to produce hepatitis B Vaccine?

Ans. Yeast.

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7. What is the reason of shivering in malarial patient?

Ans. Vermiform appendix, wisdom teeth.

7.What is the cause of speciation according to Hugo De Vries?

Ans. Mutations.

8.Name the phenomenon by which rapid speciation takes place?

Ans. Genetic Drift.

9.Name the two scientists who set up a special experiment to prove Oparin's theory of origin of life?

Ans. Urey & Miller.

10.Name the common ancestor of apes & man?

Ans. Dryopithecus.

11.Which period is known as "Age of amphibians"?

Ans. Carboniferous period.

12.What provided energy for a biotic synthesis on primitive earth?

Ans. Very high temperature due to lightening or uv – rays provided energy for a biotic synthesis.

13.Who showed that life comes from pre-existing life?

Ans. Louis Pasteur

14.What is meant by Gene pool?

Ans. Gene pool refers to sum total of different kinds of genes pooled by all the members of a

population.

15.Which period is called "Age of Reptiles".

Ans. Jurassic period.

16.Name the species of human beings which is most closely related to modern man.

Ans. Cro-magnon.

17.What is "Founder's effect"?

Ans. Sometime a change in allele frequency is so different in new sample of population that they become a new species in such cases original drifted population becomes founder & this effect is called Founder's effect.

2 Marks Questions

1. Explain Oparin-Haldane theory of chemical evolution of life.

Ans. The first life form could have come from the pre-existing, non-living organic molecules (like RNA, Proteins, etc.) and the formation of life was preceded by chemical evolution.

2. Distinguish between convergent and divergent evolution giving one example of each.

Ans. Divergent Evolution - Development of different functional structures from a common ancestral form is called divergent evolution.
Homologous organs show divergent evolution.
Examples: Darwin's Finches, Australian Marsupials, locomotion in mammals.
Convergent Evolution - Development of similar adaptive functional structures in unrelated groups of organisms is called convergent evolution.
Analogous organs show convergent evolution.
Examples: Australian Marsupials and Placental mammals, various aquatic vertebrate and wings of insect, bird and bat.

3. What is adaptive radiation? Explain with an example.

Ans. Adaptive radiation is an evolutionary process that produces new species from a single, rapidly diversifying lineage. This process occurs due to natural selection. An example of adaptive radiation is Darwin finches, found in Galapagos Island. A large variety of finches is present in Galapagos Island that arose from a single species, which reached this land accidentally. As a result, many new species have evolved, diverged, and adapted to occupy new habitats. These finches have developed different eating habits and different types of beaks to suit their feeding habits. The insectivorous, blood sucking, and other species of finches with varied dietary habits have evolved from a single seed eating finch ancestor.

4. How did Louis Pasteur disprove spontaneous generation theory?

Ans. Louis Pasteur showed that in pre-sterilized flasks, life did not come from killed yeast while in another flask open to air, new organisms arose from 'killed yeast.

5.Define homologous organs? Give one example of organ homologous to hand of man?

Ans. Homologous organs are those organs which are similar in basic structure & embryonic developments but perform different functions. e.g. bones of forelimbs of whales, bat, birds and human beings.

6.What is the role of variation in evolution?

Ans. Variations are useful for survival of species in changed environmental situations. If a population of reproducing organisms are suited to a particular niche & if the niche is drastically altered the population could be wiped out however if some variations were to be present in few individuals, there would be some chances for them to survive.

7.Describe one evidence which decisively proves that birds have evolved from reptiles?

Ans. Missing link between birds & reptiles called. Archaeopteryx showed that "Birds have evolved from reptiles". These are organisms which show the characters of both birds (e.g. presence of wings & feathers in the body) as well as of reptiles (e.g. gong tail & jaws with identical teeth).

8.What is the study of fossils called? Mention any three points how the fossils throw light on past life?

Ans. Study of fossils is known as paleontology.

→ Cross-section of the earth's crust indicates the arrangement of sediments one over the other during the long history of Earth.

→ Different sediments contain different life forms which probably died during the formation ofparticular sediment.

→ Connecting or missing link – which contains characters of different groups.

9.Why has natural selection not eliminated sickle – cell anaemia?

Ans. Sickle cell anaemia is not eliminated during natural selection because in some cases, sickle cell anaemia is beneficial as it provides natural defense against malarial parasite.

10.Life originated from the earth's inorganic atmosphere in the post, but this no longer happens today. Give two reasons?

Ans. Life cannot be originated in the present day atmosphere because:-

(i)The temperature of present day atmosphere is much less than that of primitive atmosphere.

(ii)The present day atmosphere is oxidizing & not reducing due to presence of oxygen.

11.If you discovered a fossil bird with scales on the body & teeth in the beak. What would youconclude about its position in the animal kingdom?

Ans. Since this fossil bird has both avian characters & reptilian characters e.g. scales on body & teeth in beak it would be considered as a connecting link between reptiles & bird.

12.What is speciation? List any two events that lead to speciation?

Ans. Speciation refers to the origin of new species or the phenomena of development of new speciesfrom pre-existing one.

The two factors which lead to speciation are – Genetic drift, mutation & natural selection.

13.Would you consider wings of butterfly & a bat as homologous or Analogous & why?

Ans. Wings of butterfly & bat are said to be analogous because they have originated from different parts – e.g. in butterfly wings are originated from skin and feather & in bats wings are originated from forelimbs but both of them performs the same function of flying.

14.Define natural selection? Who else along with Charles Darwin proposed it as the mechanism of evolution?

Ans. Natural selection is a process of selection lay nature in which individuals with thosecharacteristics which enable them to survive better in natural conditions would outnumber theothers who are less adapted under the same natural conditions Alfred Wallace also proposed the same mechanism of evolution & called it “survival of fittest”.

15.A chimpanzee can hold objects by its hand & an elephant by trunk. Are these organs Analogous or homologous?

Ans. These organs are analogous organs as they are performing the same function of holding objects but are originated from different parts eg forelimbs in chimpanzee & nose in elephants.

16.Differentiate between convergent & divergent evolution?

Ans.

Divergent Evolution	Convergent Evolution
1. Evolutionary process of different species which produces new species diverged from a single ancestral form 2. e.g. Australian marsupials	1. When more than one adaptive radiation occurs in an isolated geographical area. 2. e.g. Camels are found in Asia &Llammas are found in south America.

17.Bring out differences between De Vrie's mutations Darwinian Variations?

Ans. (i) Mutations are large heritable changes in the characteristics of a population that arisesuddenly. & cause speciation in single step while evolution for Darwin is gradual & occurs due tovariations over number of generations.

(ii) Mutation are random & directionless while variations are small & directional.

3 Marks Questions

1. (i) State the Hardy-Weinberg principle.

(ii) When there is a disturbance in the Hardy-Weinberg equilibrium, what would it result in?

(iii) According to this principle, what is the sum total of all allelic frequencies?

Ans. (i) The allele frequency in a population are stable and constant from generation to generation.

(ii) Evolution.

(iii) One.

2. Classify the following as examples of homology and analogy

(i) Hearts of fish and crocodile

(ii) Wings of butterfly and birds

(iii) Eyes of Octopus and Mammals

(iv) Tubers of potato and Sweet potato

(v) Thorns of Bougainvillea and spines of Opuntia

(vi) Thorn of Bougainvillea and tendrils of cucurbits.

Ans. (i) Homology **(ii)** Analogy **(iii)** Analogy **(iv)** Analogy **(v)** Analogy **(vi)** Homology

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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 aim of the experiment?

(ii) In what forms was the energy supplied for chemical reactions to occur?

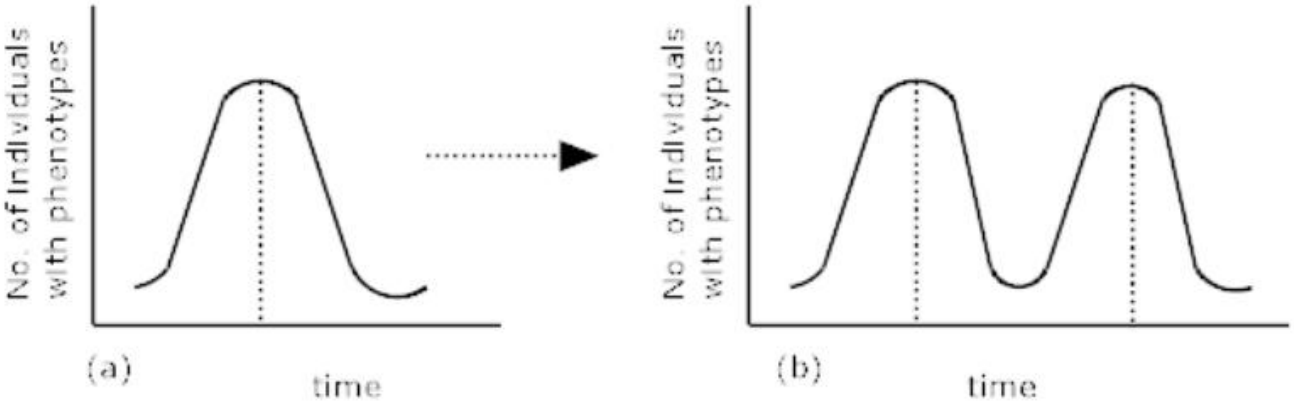
(III) For how long was the experiment run continuously? Name two products formed.

Ans. (i) To prove Oparins theory of origin of life.

(ii) Electric discharge using electrodes.

(iii) One week; Amino acids and Sugar.

4.Study the figures given below & answer the following question.



i) Under the influence of which type of natural selection would graph (a) become like graph (b).

ii) What could be the likely reason of new variations arising in a population.

iii) Who suggested natural selection as mechanism of evolution?

Ans. (i) Disruptive & elective.

(ii) Because individuals at the extremes contribute more offspring compared to those in the centre&produces two peaks in distribution of a trait.

(iii) Charles Darwin.

5. Fill up the blanks left in the table showing Era, period and organism.

Era	Period	Organisms
Cenozoic	A	Modern man, mammals, birds, rise fo monocot
B	Tertiary	Rise of first Primate, angiosperm
Mesozoic	C	Gingko, Gnetales
D	Jurassic	Conifers, cycads, Reptiles
Paleozoic	E	Early reptiles (extinct)
F	Silurian	Psilophyton

Ans. (a) Quaternary (b) Coenozoic (c) Cretaceous

(d) Mesozoic (e) Carboniferous (f) Paleozoic

6. (i)In which part of the world, Neanderthal man lived?

(ii)What was his brains capacity?

(iii)Mention the advancement which Neanderthal man showed over Homoerectus.

Ans.(i) Near Eastern and Central Asia

(ii) 1400 c.c.

(iii) More brain capacity, use of hides to cover body and burial of dead.

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7. Figures given below are of Darwins finches?

Variety of beaks of Darwin's finches.

(a) Mention the specific geographical area where these were found.

(b) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.

(c) How did Darwin visit the particular geographical area?

Ans. (a) Galapagos Island.

(b) Adaptive radiation - The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation.

(c) Through sea voyage in a sail ship called H.M.S. Beagle.

8. Give examples to show evolution by anthropogenic action.

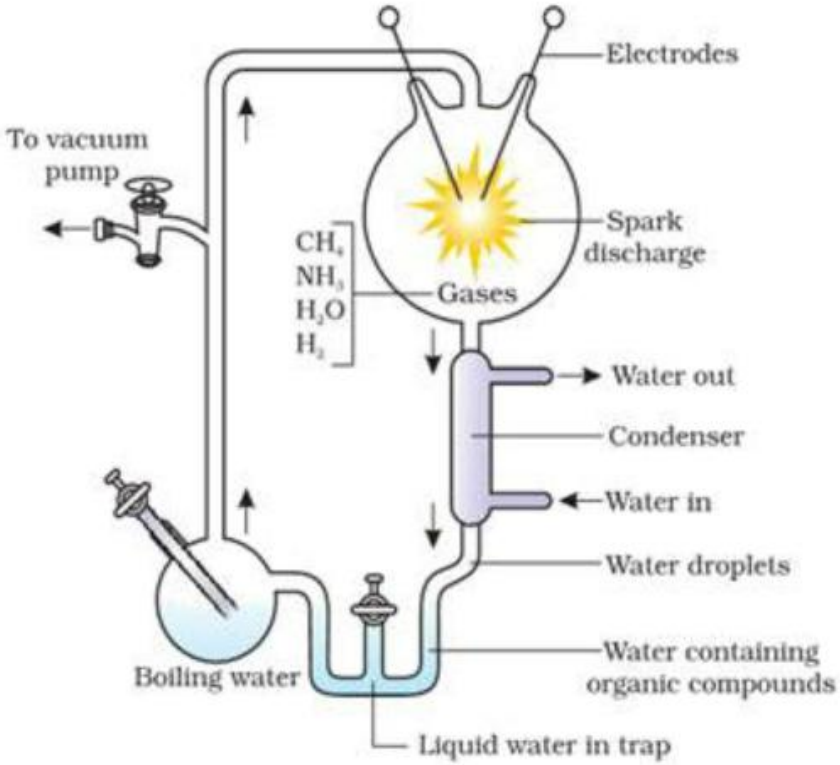
Ans. Excess use of herbicides pesticides etc. has resulted in selection oresistent varieties in a much lesser time scale. Same is true for antibiotic or drug resistant microbes.

9.By taking industrial melanism as on example, explain the concept of natural selection by evolution?

Ans. Theory of natural selection states that due to survival of fittest, the species change readilyowing to preservation & transmission of minute variation & gradually give rise to new forms.

Example – In collection of moths in 1850 it was observed that there were whiter winged moth than dark winged but after industrialization there were darker wringed moth. This is due to the reason that During post industrial period trees trunk become dark due to industrial smoke under this condition, white winged moth do not survive due to predators dark winged moth survived Before industrialization sets in, thick growth off white colored lichen covered trees in that background white winged moth survived but dark – colored moth were picked out by predators hence nature selects which species is suitable.

10.Who were the two scientists that conducted an experiment to synthesise organic molecule abiotically? How did they provide the probable condition of the primitive earth in this experiment?



Ans. Urey & Miller tried to create in the laboratorythe similar conditions which might have existedin early primitive atmosphere. A mixture of watervapours methane, ammonia & hydrogen is exposedto electric discharge in a closed chamber, this fluidthus formed is allowed to stand for several week as aresult, amino acids e.g. glycerine& alanine areformed from fluid. They suggested that electric discharge produced during lightening in primitiveatmosphere of earth might have resulted in formation of organic compound.

11.What is Biogenetic law? How does comparative embryology provides evidences for evolution?

Ans. It has become evident from embryological studies that there was one developmental pattern.

In all organisms life begins with a unicellular structure. The embryo of fish, frog, turtle, bird & manresembles one another so closely that it becomes difficult to distinguish them. Mammalian embryoparses through fish – like, amphibian-like, reptiles like & bird like stages

during development of anorganism (ontogeny), some of the evolutionary steps (phylogeny) are repeated in different group oforganism. This leads Ernst Haeckal to formulate famous theory – "RECAPITULATION THEORY /

BIOGENETIC LAW.Which states that "Ontogeny recapitulates phylogeny" The sequence ofembryonic development shows striking similarity e.g. appearance of gill cleft and notochord inembryonic development of all vertebrates from fish to man.

12.Chemical insectides remain useful only for a limited time. Explain with reference to evolution with a suitable example.

Ans."Chemical insectides remain useful only for a limited time" because of the phenomena ofnatural selection with the course of time when chemical insecticides are excessively used to killinsects, some of the resistant varieties of the organism would have been created which are notkilled lay the insect icicle such resistant varieties of the unseats are selected lay nature & theymultiply after sometime population of this resistant variety increases & the chemical insecticidewould lee ineffective to control these insects for example DDT is a common insecticide formosquitoes lout is now ineffective because DDT – resistant mosquitoes have appeared & selected innature.

13.What are the facts that support Darwin's theory of Natural selection?

Ans. The following facts that supports Darwin's theory of Natural selection

1. Overproduction: - All organisms tend to multiply at high rate but it is not possible for allorganisms to survive.
2. Struggle for Existence: - Because of limitation of space & food all the offspring of the result ofoverproduction will not survive & they will compete with one another to grow this develops struggle for existence not only among individuals of different species but also among same species.
3. Variations :- No two individuals of same species are exactly alike even coming out from sameparent al stock.
4. Survival of fittest :- The individuals with useful variation will survive during struggle of existencewhile those with less fortunate variation would perish.

14.Trace the important events or stages of human development?

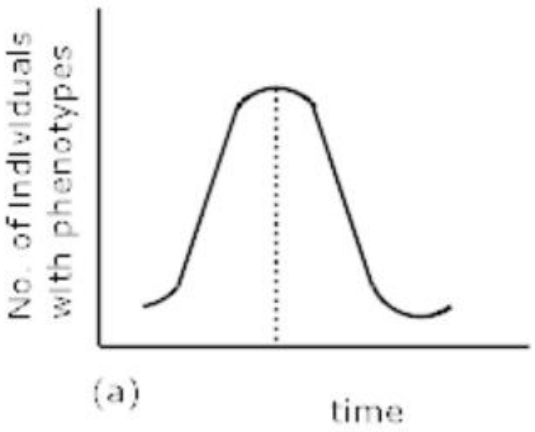
Ans. The common ancestor of apes & man is a primate Dryopithecus that lived about 15 millionyears ago the human evolution is as follows :-

1. Australopithecus :- They are 4ft, with brain capacity – 500 to 650 cc. They have bipedal locomotion, omnivorous &has erect posture. They hunted with stone weapon & lived in caves.
2. Homo Erectus :- They showed increase in brain size They are good hunters, ate meat domesticate animal & discover fire.
3. Netherlands man :- They were short with heavy brows retreating forehead large jaws & stooped postures They wore clothes, good hunters & tool makers.
4. Cromagnonman :- They were completely erect & 6ft tall. He used bones as tools & was a cave dweller. They are excellent tool makers & fine artists.
5. Homo sapiens :- They have brain capacity 1450cc. & skull much thicker. His intelligence has enabled him to adapt & control environment. He started agriculture.

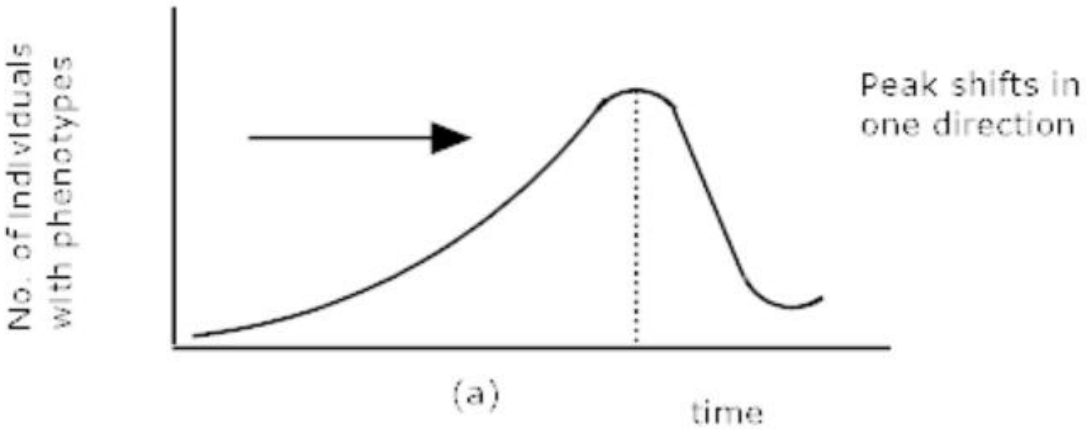
15.What are the three different ways in which selection may occur.

Ans. The three different ways in which selection may occur are as below:-

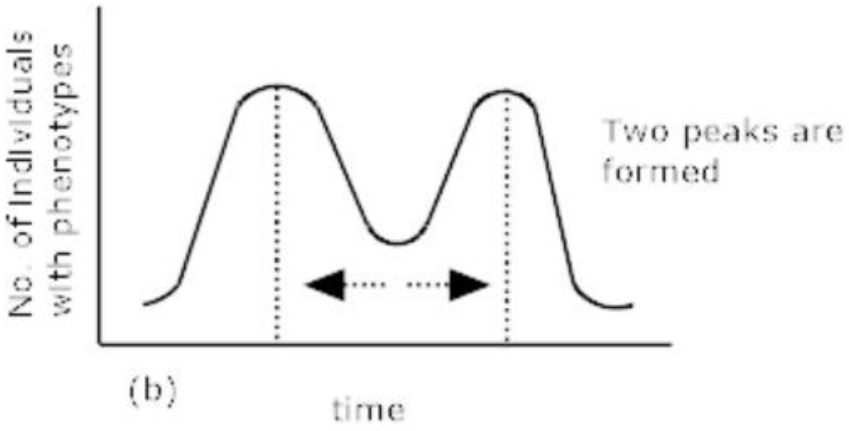
(i) StablisingSelection :- Individuals with intermediate value of heritable phenotypic characteristics are favoured over other individuals.



(ii) Directional Selection :- Individuals with one extreme of heritable phenotypic characteristic have an advantage over individuals in a population.



(iii) Disruptive Selection :- individuals with either of both extreme of heritable phenotypic characteristics have advantage over individuals with intermediate phenotype.



16.State in what ways Stanley miller simulated the condition of :-

i) Primitive atmosphere on earth.

ii) Energy source at the time of origin of life .

iii) Formation of organic molecule of life.

Ans. i) A fluid containing mixture of methane, ammonia, hydrogen & water vapour in a closed flask.

ii) Energy source during origin of life was sun. This energy in the experiment is provided lay electricdischarge using electrode.

iii) Organic molecules formed during experiment are amino acids.

17.What is Biogeography? How Darwin's finches provide biogeographical evidence in favour of evolution.

Ans. The branch of geography which deals with the study of pattern of distribution of plants &animals in different parts of earth is called Biogeography.

Example Galapagos islands – group of 14 islands in Pacific Ocean on west coast of South America.Charles Darwin during his voyage found that animals of these is lands resembles with those of SouthAmerican is lands. E.g. birds of Galapagos Island called Darwin's finches do not resemble birds ofSouth America so he concluded that finches were derived from ancestral stock that had emigratedfrom mainland to island & has undergone profound changes under environmental conditions.

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18. How did louispasteur successfully demolish the popular theory of spontaneous generation?

Ans. Louis Pasteur used a special swam-necked flask for his experiment. He took mixture of sugar &yeast powder & filled about half of it with water in this flask. He then boiled the content of flask till asteady current of steam rushed out from s-shaped tube –causing death of all microorganisms. Afterthis flask remains unchanged. But when neck of flask was cut-off showed thick growth ofmicroorganisms this is presumed that are contains microorganisms which in first case could notreach the flask whereas in second case they comes in direct contact with solution.

5 Marks Questions

1. What does Hardy weinberg's principle states? What are the factors which affects Hardyweinberg's equilibrium?

Ans. Acc. to Hardy Weinberg's principle, allele frequency in a population are stable & is constantfrom generation to generation i.e. total gene pool remains constant. This is called Geneticequilibrium e.g. In a diploid organism, suppose 'p' represents frequency of allele 'A' & 'q' representsfrequency of allele 'q'.then frequency of AA = p2

" " Aa =pq

" " aa = q2

total alleles in F1 Generation

AA + 2Aa + aa = 1

P2 + 2pq + q2 = 1

(p + q) 2 = 1

Factors affecting Hardy – Weinberg Equilibrium :-

(i)Gene flow :- when migration of a section of a population to another place occurs, gene frequency changes in original as well as in new population.

(ii)Genetic Drift :- If just by virtue of a chance or accident a particular allele frequency decrease or increase in a population.

(iii)Mutations:- which are sudden changes in the genotype which are carried over generation.

(iv)Genetic Recombination:- Sometimes changes in allele frequency is so different in new sample of population that they become a new species.

(v)Natural Selection:- process by which individual with particular heritable characteristics survive & reproduces at higher rate than other individuals favored by natural selection tend to be more common in next generation than in parent generation.

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2. How do Darwin and Hugo de Vries after regarding Mechanism of Evolution?

Ans. Darwin : Darwinian variatious are gradual, small and directional Hugo deVries : put forth idea of mutations, mutations are sudden random and directional

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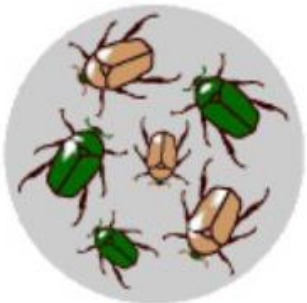
3. With the help of suitable diagram, represent the operation of naturalselection on different traits.

Ans. Natural selection is one of the basic mechanisms of evolution, along with mutation, migration, and genetic drift.

Darwin's grand idea of evolution by natural selection is relatively simple but often misunderstood. To find out how it works, imagine a population of beetles:

1. There is variation in traits.



For example, some beetles are green and some are brown.

2. There is differential reproduction.

Since the environment can't support unlimited population growth, not all individuals get to reproduce to their full potential. In this example, green beetles tend to get eaten by birds and survive to reproduce less often than brown beetles do.

3. There is heredity.

The surviving brown beetles have brown baby beetles because this trait has a genetic basis.

4. End result:

The more advantageous trait, brown coloration, which allows the beetle to have more offspring, becomes more common in the population. If this process continues, eventually, all individuals in the population will be brown.

If you have variation, differential reproduction, and heredity, you will have evolution by natural selection as an outcome. It is as simple as that.

4.What does Oparin – haldane hypothesis about origin of life suggests.

Ans. According to Oparin& Haldane's Biochemical origin of life; origin of life occurs in three

stages

5.What is Chemogeny?

Ans. CHEMOGENY / CHEMICAL EVOLUTION :-Acc to them most of the primitive form of life would have generated spontaneously from some inorganic matter as a result of action of special external forces e.g. electric charge, uv-light etc.

1. Many saturated & unsaturated hydrocarbons were feasted when temp cooled to 900 c or below.
2. From hydrocarbons small chain compounds of C, H, O are formed which condense to form sugar.
3. Ketones & aldehydes condenses&polymerises to form fatty acid.
4. Ammonia, hydrocarbon & H2 O reacted together to form amino acid.
5. Hot sea water which was rich in primary organic compound reacted to form nucleotides.

6. What is biogeny?

Ans. BIOGENY / BIOLOGICAL EVOLUTION :- This stage consists of

i)Formation of nucleic acids by polymerization of nucleotide.

ii)Giant molecules of nucleoproteins have a tendency to be aggregated in various combinations to form large colloidal particles called COACERVATES.

iii)The development of plasma membrane resulted in accumulation of different substances inside coacervates& occurrence of certain internal reaction lad to development of cell.

7. Whai is Cognogeny?

Ans. Cognogeny :-Cognogeny involves differentiation or diversification of living beings from simplest first living cell. The first organism evolved was chemo- autotrophic bacteria which later converted to tree autotrophic bacteria e.g. green algae.

Ans. After sparozoite infection, when RBC ruptures, a toxic substance haemozoin is released which cause chilling and high fever.

8.When is a tumourrefered to as malignant?

Ans.A tumour is said to be malignant when grows rapidly, invade & damage the surrounding normal tissues.

9.Why does an AIDS patient suffer from many infections?

Ans. Because in AIDS patient, immune system greatly weakens & cannot fight against any infection.

10.Name two curable sexually transmitted diseases?

Ans. Gonorhoea&Syphillis

11.Name the type of cells that produce antibodies?

Ans.B – lymphocytes.

12.Give the scientific name of causative germ of elephantiasis?

Ans. WuchereriaBancrofti.

13.Name the fish that help in eradication of mosquito larvae.

Ans. Gambusia

2 Marks Questions

1. Where are B-cells and T-cells formed? How do they differ from each other?

Ans.B-cells and T-cells are formed in bone marrow. B-cells produce antibodies but E-cells do not produce antibodies but help B-cells to produce them.

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2. Given below are the pathogens and the diseases caused by them. Which out of these pairs is not correct matching pair and why?

(a) Wuchereria Filariasis

(b) Microsporum Ringworm

(c) Salmonella Common Cold

(d) Plasmodium Malaria

Ans. Salmonella : Common cold is not a matching pair.

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3. What would happen to the immune system, if thymus gland is removed from the body of a person?

Ans.T-lymphocytes are developed and matured in thymus gland, Immune system will become weak on removal of thymus gland.

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4. Lymph nodes are secondary lymphoid orgAns. Describe the role of lymph nodes in our immune response.

Ans. Lymph nodes provide the sites for interaction of lymphocytes with the antigen. When the microorganisms enter the lymph nodes, lymphocytes present there are activated and cause the immune response.

5. What is the role of histamine in inflammatory response? Name few drugs which reduce the symptoms of allergy.

Ans. Histamine acts as allergy-mediator which cause blood vessels to dilate. It is released by mast cells. Antihistamine steroids and adrenaline quickly reduce the symptoms of allergy.

6.Differentiate between two different types of tumours?

Ans.

BENIGN TUMOUR	MALIGNANT TUMOUR
i) tumour remain confined to place of origin or affected organ	i) tumour invade surrounding tissue & spread throughout the body.
ii) It is harmless	ii) It is harmful
iii) rate of growth of tumour is low	iii) rate of growth of tumour is rapid
iv) causes limited damage	iv) Cause uncontrolled damage.

7.What do you mean withdrawal Symptoms? What are its characteristics?

Ans. Withdrawal symptoms refers to the characteristic unpleasant symptoms by body of a drug addict if regular dose of drug is abruptly discontinued. These include anxiety, shakiness, sweating, restlessness, depression, muscular cramps etc.

8.Differentiate between active & passive immunity?

Ans.

ACTIVE IMMUNITY	PASSIVE IMMUNITY
i) when antibodies are developed by our own cells in response to antigen	i) when antibodies developed in other vertebrates in response to deliberate infection of antigen
ii) It takes time to develop immunity	ii) It is used when the immune response has to be faster
iii) It stays for longer period	iii) It stays for short period

9.Enumerate the two properties of cancer cells that distinguish them from normal cell.

Ans.i) uncontrolled proliferation of cells without any differentiation

ii) Ability of these cells to invade other tissues called metastasis.

10.What are allergens? How do they cause inflammatory response inside human body?

Ans. The substance which causes the hypersensitive reaction of the immune system is called an allergeneg. dust, pollen grains etc. These allergens are actually weak antigens. First exposure to allergen does not cause allergy but consequent exposure, allergen combines with Ig E on mast cell. That causes cells to burst & release Histamines which cause inflammatory response.

11.What are autoimmune diseases? Give two examples?

Ans. Immunity is based on ability to differentiate foreign organism from self cells. Sometimes immune system may go off the track & turns against self antigen and elicit immunity. Such conditions are called auto – immune diseases eg. Rheumatoid arthritis, Myasthenia gravis.

3 Marks Questions

1. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body is affected by consuming these substances?

Ans. - Cannabinoids are a group of chemicals which interact with Cannabinoid receptors present

- Principally in the brain Cannabinoids are obtained from the inflorescences of the plant Cannabis sativa.

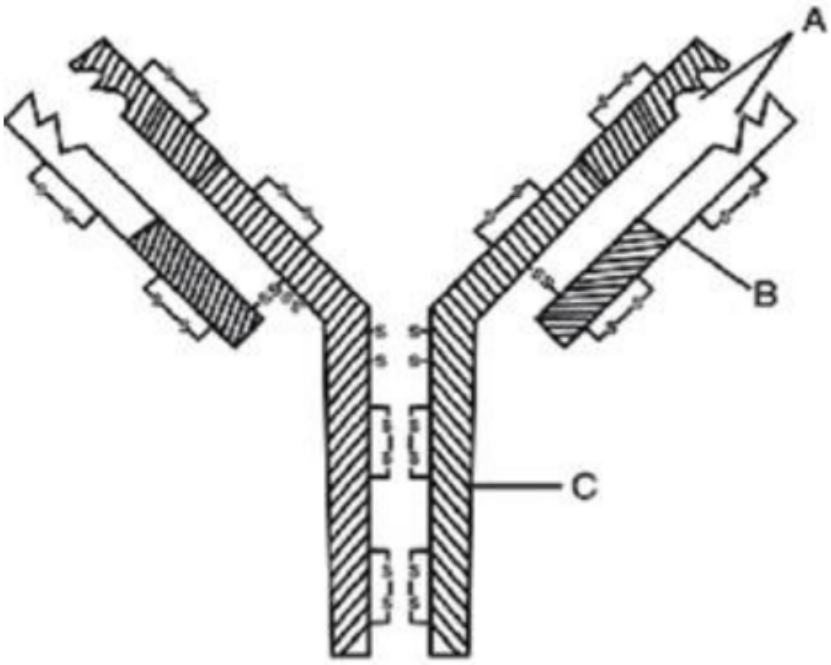
- The substances affect the cardiovascular system adversely

2. In the figure, structure of an antibody molecule is shown. Observe it and Give the answer of the following questions.

(i) Label the parts A, B and C.

(ii) Which cells produce these chemicals?

(iii) State the function of these molecules.



Ans.(a) A-Antigen binding site B-Light chain

(b) B-lymphocytes.

(c) Heavy Chain

(d) Antibodies provide acquired immune response.

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3. Mention any three causes of drug abuse. Suggest some measures for the prevention and control of drug abuse.

Ans. Reasons to attract towards drug abuse : Curiosity, peer pressure, escape from frustation and failure, family problems, false belief of enhanced performance.

Preventive measures :

- Avoid undue peer pressure

- Education and Counselling

- Seeking help from parents and peers.

- Looking for danger signs

- Seeking professional and medical help

4. A person shows unwelcome immunogenic reactions while exposed to certain substances.

(a) Name this condition.

(b) What common term is given to the substances responsible for this condition?

(c) Name the cells and the chemical substances released which cause such reactions.

Ans.(a) Allergy **(b)** Allergens

(c) Mast Cells Histamine, Serotonin

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5. Fill in the blanks in the different columns of the table given below to identify the nos 1 to 6.

Name of disease	Causative organism	Symptoms
Pneumonia	Streptococcus	(1)
Typhoid	(2)	High fever, weakness,headache, stomach pain
(3)	Rhinoviruses	Nasal Congestion, anddischarge sorethroat cough, headache
Ascariasis	Ascaris	(4)
Ringworm	(5)	Dry, Scaly lesions onvarious body parts,Intense itching, redness.
(6)	Entamoebahistolytica	Constipation, cramps,abdominal pain, Stoolswith excess mucous andblood clots.

Ans.(i) Alveoli filled with fluid, reduced breathing, fever, chills, cough and headache.

(ii) Salmonella typhi

(iii) Common Cold

(iv) Internal bleeding, muscular pain, anaemia, fever and blockage of the intestinal passage.

(v) Microsporum species/Trichophyton species/Epidermophyton Species.

(vi) Amoebiasis/amoebic dysentery

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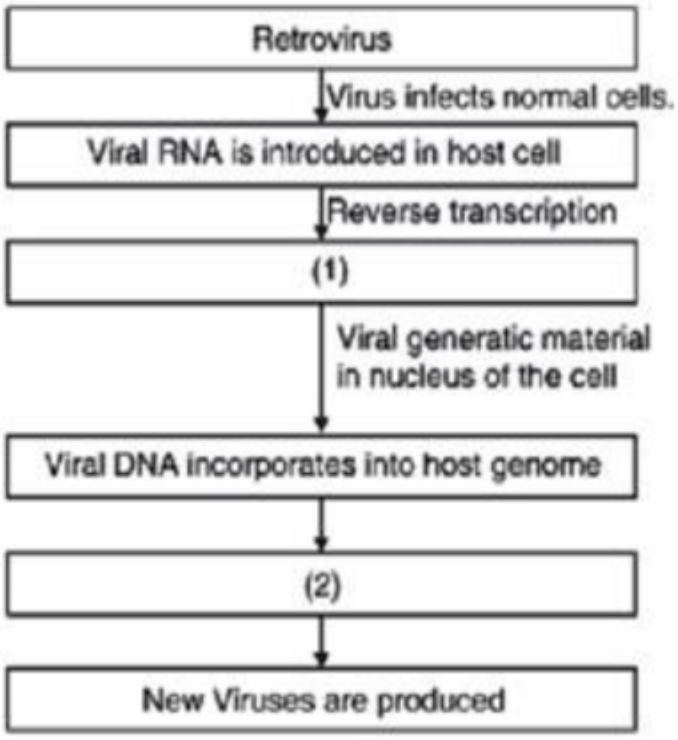
6. In the given flow diagram, the replication of retrovirus in a host cell is shown. Examine it and answer the following questions

(a) Why is virus called reterovirus?

(b) Fill in (1) and (2)

(c) Can infected cell survie while viruses are being replicated and released by host cell?



Ans.(a) HIV has RNA genome. It produces DNA by reverse transcription.

(b) 1 : Viral DNA is produced by reverse transcriptase.

2 : New Viral RNA is produced by the infected cell.

(c) Infected cell can survive.

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7. What is innate immunity? List the four types of barriers which protect the body from the entry of the foreign agents.

Ans. Innate Immunity is non-specific type of defense that is present at the time of birth.

(i) Physical Barriers : Skin, mucous-coated epithelium or respiratory, digestive and urinogenital tract.

(ii) Physiological Barriers : Acidity of Stomach, lysozyme in saliva, tears, sweat.

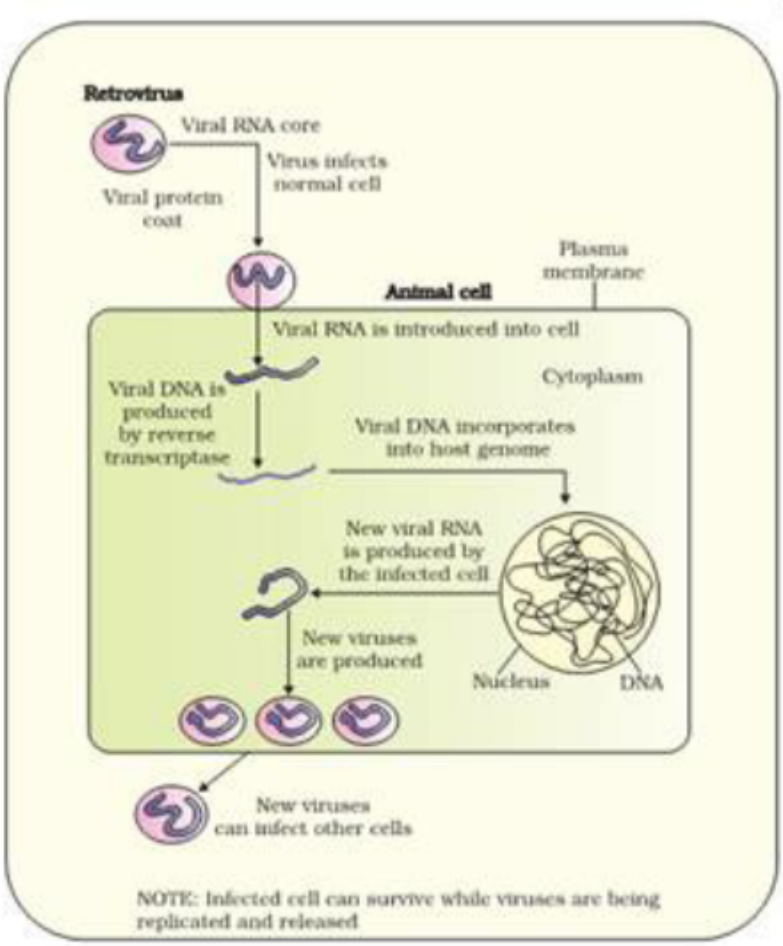
(iii) Cellular Barrier : Macrophages, neutorophils, monocytes and natural killer lymphocytes..

(iv) Cytokine Barriers :Interferons produced by Viral infected cells, protect the non-infected cells from further Viral infection.

8.How does humoral immune system works when our body is infected?

Ans. Humoral immune response is one in which antibodies are developed which are capable of attacking microbes. Each B-cell has receptors on its surface that recognize a specific antigen. Initial exposure of B-cell to Antigen triggers B-cells to proliferate forming a large clone cell continuous stimulation increases the number of B-lymphocytes which differentiates into smaller antibody producing plasma cells. Each clone of plasma cells manufactures antibodies that specifically react with antigenic determinant that stimulated the initial proliferation. The antibody binds to antigen- forming an antigen-antibody complex which is later digested by phagocytic cells. Some of these plasma cells develops into memory cells which rapidly differentially into plasma cells on later exposure to same antigen.

9.It was diagnosed by a specialist that the immune System of the body of a patient has been suppressed. Describe the infection & the mechanism of its proliferation in the body.



Ans. If the immune system of the patient is found to be suppressed, he is found to suffer from human immunodeficiency virus (HIV). The HIV virus enters into helper T- cells & replicate to produce progeny viruses. The replication of virus involves:-

(i)After viral capsid enters the cell enzyme reverse transcriptase copies single stranded RNA into complementary DNA.

(ii)The RNA is degraded lay ribonuclease H & the DNA strand is duplicated to form double – stranded DNA.

(iii)Proviral DNA is integrated into cells DNA through a complex sequence of reactions catalysed lay Integrase enzyme.

(iv)Once the virus has infected the cell, virus becomes active & large number of virus particles are liberated that can infect other cells.

10.What are carcinogens? What are the different types of carcinogens? Also mention the different methods of treatment of cancer?

Ans. The things that cause cancer are called CARCINOGENS. These agents may be chemical or physical things like:-

1. Smoking
2. Tobacco chewing
3. Radiations eg. uv- x-ray, cosmic rays.
4. Chemical eg. mustard gas, aflatoxin, cadmium oxide
5. Biological agents eg. retroviruses
6. Cellular agents proto-oncogenes which when activated under certain condition may lead to oncogenic transformation of cells.

Treatment of cancer involves :-

1. SURGERY :- surgical removal of tumour
2. CHEMOTERAPY : treatment with drugs that can destroy cancer cells
3. IMMUNOTHERAPY : use of interferons, interleukin, vaccines to generate non-specific defense mechanism
4. RADIATION THERAPY :- x-ray therapy or radiotherapy use of ionizing radiations to kill cancer cells.
5. HARMONAL SUPPRESSION : providing or blocking certain hormones.

11.Describe the ill – effects of drug abuse in males & females. Also mention the preventive measures that is to be taken to reduce such effects.

Ans.1) ILL – DEFECTS IN MALES :- acne, increased aggressiveness , mood swing depression reduction of size of testicles, decreased Sperm production, kidney & liver dysfunction, premature baldness.

2) ILL – EFFECTS IN FEMALES :-masculinisation, increased aggressiveness, mood swings, depression abnormal menstrual cycle, excessive hair growth on face & body & deepening of voice.

The following measures are need to be taken to prevent such problems :-

1. EDUCATION & COUNSELLING :- to face problem or stress, to accept failure as part of life & to channelize child's energy to some health promoting activities.
2. AVOID UNDUE PEER PRESSURE :- to pressurize a child to perform beyond his capabilities
3. SEEKING HELP FROM PARENTS &PEERS :- to share the feeling of anxiety & guilty.
4. SEEKING PROFESSIONAL FOR MEDICAL HELP :- help available in the form of highly qualified psychiatrist, psychologist etc.

12.What is vaccination? What type of immunity is provided by vaccination?

Ans. Vaccination is a process of development of immunity with administration of vaccines in the body, here weakened pathogen are infected into the body to produce immunity against a particular pathogen. This pathogen stimulates the body to produce antibodies. The antibodies produced against these antigens would neutralize the pathogenic agent. The vaccine also generates memory B – and T – cells that recognize pathogen quickly on subsequent exposure & overwhelm the invaders with massive production of antibodies.

The type of immunity is ACTIVE IMMUNITY.

However, if a person is infected with some deadly microbe to which quick immune response is required, we need to directly injected to patient's body, This type of immunization is called PASSSIVE IMMUNISATION.

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13. (i) Differentiate between communicable & non – communicable diseases?

(ii) Name the body part & the host in which following events takes place in life cycle of plasmodium.

(a) fertilization

(b) Development of Gametophyte :-

(c) Release of sporozoites :-

(d) Asexual Reproduction.

Ans. (i) Communicable diseases are caused lay biological agents & can spread from one person to another or one place to another through air, water, physical contact etc.

Non – communicable diseases are confined to a person & do not easily spread from one person to another.

(ii) (a) in the gut of female anopheles.

(b) in RBCS of Human beings.

(c) Salivary gland of female anopheles.

(d) liver cells of human beings.

5 Marks Questions

1. Answer the following with respect to Caner.

(a) How does a cancerous cell differ from a normal cell?

(b) Benign tumor is less dangerous than malignant tumor. Why

(c) Describe causes of cancer.

(d) mention two methods of treatment of the disease.

Ans. (a) In normal cells, growth and differentiation is highly controlled and regulated (contact inhibition). The cancerous cells have lost the property of contact inhibition, hence continue to divide giving rise to masses of cells (tumors).

(b) The benign tumor remains confined in the organ affected as it is enclosed in a connective tissue sheath and does not enter the metastatic stage.

(c) Cancer may be caused due to carcinogens which are physical (radiations), chemicals (Nicotine, Aflatoxin, Cadmium oxide, Asbestos) and biological (viral oncogens).

(d) Surgery, radiotherapy, Chemotherapy

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2. The pathogen of a disease depends on RBCs of human for grwoth and reproduction. The person with this pathogen suffers with chill and high fever.

(d) Represent the life cycle of the pathogen diagrammatically.

Ans. (a) Malaria

(b) Different species of Plasmodium viz P. vivax, P. Malariae and P. falciparum.

(c) Malaria is caused by the toxins (haemozoin) produced in the human body by the malarial parasite. This toxin is released by the rupturing of RBCs.

(d) Life cycle of Plasmodium : Fig. 8.1 Page 148, NCERT book, Biology - XII

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3. The immune system of a person is supressed. He was found positive for a pathogen in the diagnostic test ELISA.

(a) Name the disease, the patient is suffering from.

(b) Which pathogen is identified by ELISA test?

(c) Which cells of the body are attacked by the pathogen?

(d) Suggest preventive measure of the infection.

Ans. (i) AIDS (Acquired Immuno Deficiency Syndrome)

(ii) HIV (Human Immunodeficiency Virus)

(iii) Helper T-cells, macrophages, B-lymphocytes.

(iv) Preventive measures :

(a) People should be educated about AIDS transmission.

(b) Disposable needles and syringes should be used

(c) Sexual habits should be changed immediately

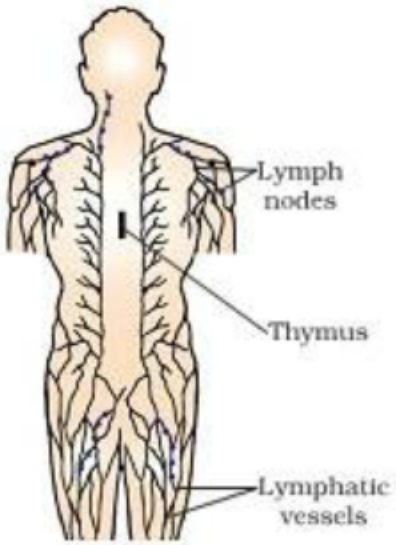
(d) High-risk groups should be discouraged from donating blood.

(e) Routine screening may be done.

4.Discuss the role of lymphoid organs in the immune response. Explain the different types of lymphoid organs giving two examples of each type in humans.

Ans. Lymphoid organs are organs where origin or maturation & proliferation of lymphocytes occurs. These lymphoid organs are of two types:-

1.PRIMARY LYMPHOID ORGAN: - where immature lymphocytes differentiate into antigen – sensitive lymphocytes. It includes :-



(a)BONEMARROW :– It is the main lymphoid organ present in the thigh region where all types of blood cells including lymphocytes are formed. It provides micro – environment for the development & maturation of B – cells.

(b)THYMUS :- It is located beneath the chest bone near heart. It provides microenvironment for the development & maturation of T – lymphocytes.

2.**SECONDAR LYMPHOID ORGAN :-** They provide the site for interaction of lymphocytes with antigen which then proliferate to become effector cells. It includes.

(a)SPLEEN :- It is large bean shaped organ & contains mainly lymphocytes & phagocytes. It acts as a filter of blood by trapping blood – bound micro – organism.

(b)**LYMPHNODE :-** They are small – solid structure located at different points along lymphatic system. It serves to trap antigen which happens to get into lymph & tissue fluid. Antigen trapped in lymph nodes are responsible for activation of lymphocytes,

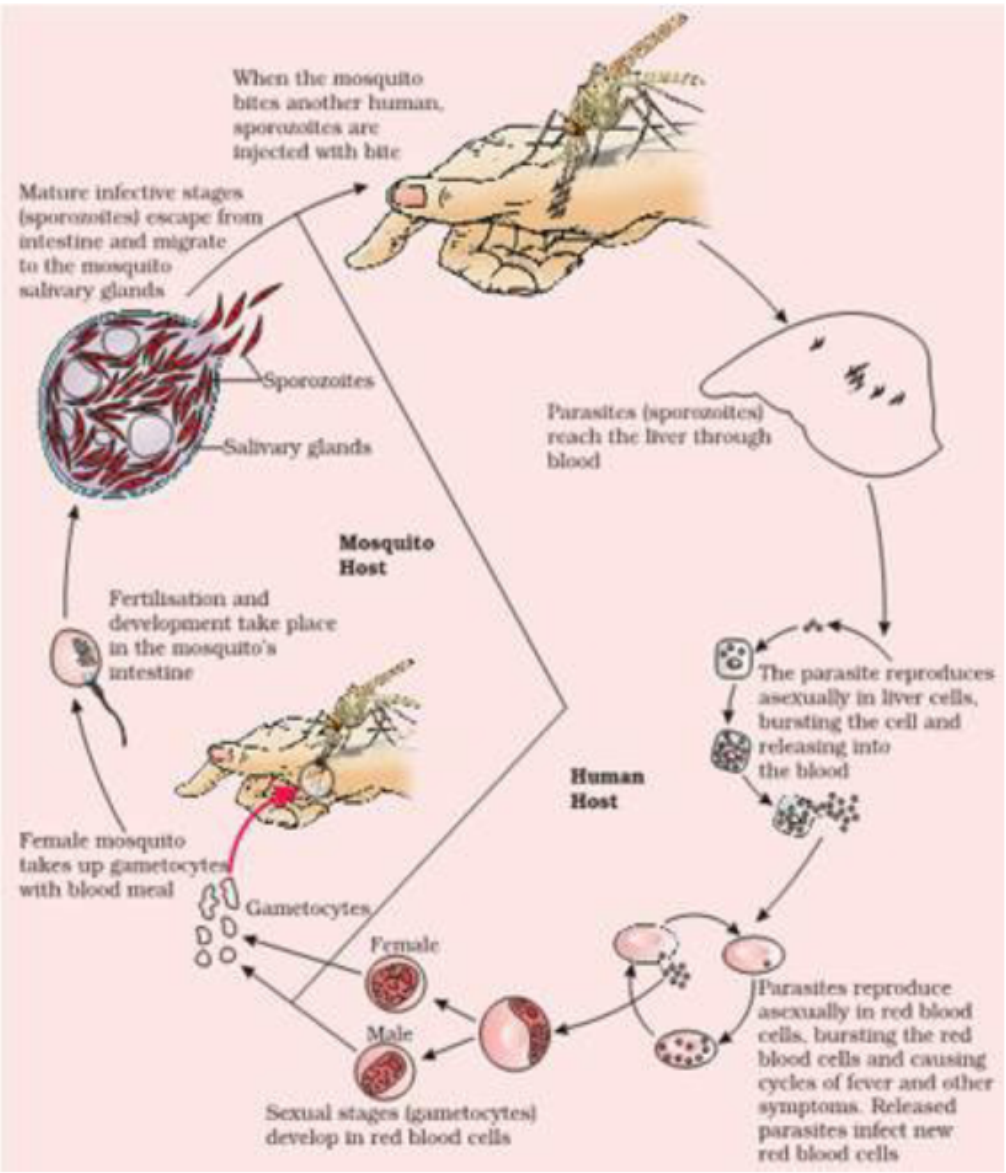
5.With the help of a well – labelled diagram, Describe the life cycle of malarial parasite.

Ans. Malaria is caused by plasmodium vivax. It has two hosts – female anopheles is the vector of plasmodium while the primary host is man where the parasite maintains an amoeboid stage in RBCS & later produces gametophyte.

Life cycle of plasmodium involves following steps:-

1. The sporozoites enters the human body, reach the liver through blood & multiply within the liver cells such liver cells burst & release the parasites into blood.
2. They attack RBCS, multiply & cause their rupture.

The rupturing of RBCS is associated with the release of a toxin called haemozoin, which is responsible for recurring fever & the chill / shivering.



1. Gametophytes are developed in RBCS.
2. When a female anopheles mosquito bites an infected person, these parasites enter the mosquito's body & undergo further development. These parasites multiply within then in the stomach & develop a cyst.
3. The cyst produces sporozoites which reach salivary gland of mosquito. When such infected Anopheles sucks blood of a healthy person, it transfers. Sporozoites to repeat amoeboid stage again.

6. What do you mean by "Out – breeding". What are the different methods employed for out breeding.

Ans. Breeding between the unrelated ale & female animals is called Outbreeding. It can be done in following ways:-

1. OUT CROSS :- The mating of animals within the same breed but do not have any common ancestor on either side of their pedigree for 4-6 generation is called an out cross. It is the best method of breeding of animals that are below average in milk production, growth rate of beef cattle etc.
2. CROSS–BREEDING :- It is a cross between superior males of one breed & Superior females of another breed. It allows the desirable qualities of two different breeds to be combined & are used for commercial production eg .Hisardale, a new breed of sheep is developed by crossing bikaneri ewes & Marino rams.
3. INTERSPECIFIC HYBRIDISATION :- male & female animals of two different related species are mated so, that progeny may combine desirable features of both parents eg. mule is produced by crossly donkey & a female house.

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7. What is somatic hybridization – Explain the steps involved in the production of somatic hybrids?

Ans. Somatic hybridization is the process of fusing protoplasts of somatic cells derived from two different varieties or species of a plant on a suitable nutrient culture medium under sterile condition. One example of somatic hybrid is topato produced by fusion of protoplast of tomato & potato.

Somatic hybridization involves the following steps:-

1. Isolation of protoplast from two different varieties of plants – each having a desirable character,
2. Fusion of cytoplasm of two protoplast results in coalescence of cytoplasm. The nuclei of two protoplasts may or may not fuse together even after fusion of cytoplasm, fusion of protoplast requires a suitable agent called fusogeneg. PEG or polyethylene glycol.
3. Under favourable conditions, hybrid protoplast synthesise new cell wall around it. Hybrid cell functions as a single cell & then undergo sustained division to form callus.
4. The regenerated callus is transferred to a new culture plates containing suitable culture media.Here callus divide & form root & shoot after organogenesis.

CBSE Class 12 Biology
Important Questions
Chapter 7
Evolution

1 Marks Questions

1.Name one fish like reptile that evolved from land reptile about 200 million years ago?

Ans. Ichthyosaurs.

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2. For a long time, it was believed that life originated from decaying matter. What is this theory known as? Name the scientist who experimentally disproved this theory.

Ans. Theory of Spontaneous generation; Louis Pasteur.

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3. If abiotic origin of life is in progress on a planet other than earth, what should be the conditions there?

Ans. Very high temperature, volcanic storms, Reducing atmosphere containing CH4, NH3, H2 and water vapours.

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4. Name the person who proposed that population tends to increase geometrically while food production increases arithmetically.

Ans. Thomas Malthus

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5. Name the scientist who had also come to similar conclusion as that of Darwin about natural selection as a mechanism of evolution. Which place did he visit to come to conclusions?

Ans. Alfred Wallace, Malay Archipelago

6.Name any two vestigial organs found in human body?