

CHAPTER - 1 HEREDITY & EVOLUTION (Blueprint – 1X1=1 & 3 X 2=6 Total Marks 7)
CHOOSE THE CORRECT ANSWER

1. Mendel observed 7 pairs of contrasting characters in *Pisum sativum*. Which one of the following is not a part of that?

- i) Tall and dwarf ii) Yellow and green seed colour iii) Terminal and axial flower iv) Smooth and rough stem

Ans: iv) Smooth and rough stem

2. Primitive man evolved in _____

- i) Africa ii) America iii) Australia iv) India

Ans : i) Africa

3. Which of the following is inheritable?

- i) an altered gene in sperm ii) an altered gene in liver cells iii) an altered gene in skin cells iv) an altered gene in udder cells

Ans : i) an altered gene in sperm

4. The theory of Natural Selection was proposed by _____.

- i) Charles Darwin ii) Hugo de Vries iii) Gregor Johann Mendel iv) Jean Baptise Lamarck

Ans : i) Charles Darwin

5. Somatic gene therapy causes _____.

- i) changes in sperm ii) changes in progeny iii) changes in body cell iv) changes in ovum

Ans : iii) changes in body cell

6. In a pea plant, the yellow colour of the seed dominates over the green colour. The genetic make up of the green colour of the seed can be shown as _____:

- i) GG ii) Gg iii) Yy iv) yy

Ans : iv) yy

7. Some people can roll their tongue and this is a genetically controlled auto-somal dominant character. [Roller = RR / Rr; Non-roller = rr] A child who can roll the tongue has one brother who is a non-roller and two sisters who are rollers. If both the parents are rollers, the genotypes of their parents would be _____.

- i) RR x RR ii) Rr x Rr iii) RR x rr iv) rr x rr

Ans : ii) Rr x Rr

8. Hydra, a multi-cellular invertebrate of phylum cnidaria (coelenterata) can give rise to new offspring by various methods. Choose the method by which the offspring are produced with significant variations.

- i) budding ii) regeneration iii) sexual reproduction iv) asexual reproduction

Ans : iii) sexual reproduction

9. The following are the events in the formation of the first cloned animal – the sheep Dolly.

- a) Removal of haploid nucleus from the ovum. b) Implantation of ovum with diploid nucleus into the surrogate mother.
 c) Collection of udder cell from the sheep. d) Injection of diploid nucleus of udder cell into the enucleated ovum.
 e) Development of a young clone.

The correct sequential order of these events is _____ . i) abcde ii) cabed iii) cadbe iv) edcba

Ans : iii) cadbe

10. The following are statements about stem cells:

- a) There are unspecialised / undifferentiated cells. b) They can be transformed into any type of body cell.
 c) They can multiply rapidly to form a large number of similar types of cells. d) They cannot transform into cardiac cells or nerve cells. e) They are obtained from reproductive progeny only.

The correct statements are _____:

- i) a,b,c only ii) c,d,e only iii) a,c,e only iv) b,c,e only

Ans : i) a,b,c only

11. In persons suffering from insulin-dependent diabetes, the cells of pancreas are degenerated.

- i) Alpha ii) Beta iii) Gamma iv) Delta

Ans : ii) Beta

12. Identical twins are born as a result of fertilization between _____.

- i) two eggs and two sperms ii) two eggs and one sperm iii) one egg and one sperm iv) one egg and two sperms

Ans : iii) one egg and one sperm

13. Identify the incorrect statement about identical twins.

- i) developed from a single zygote ii) always of the same sex iii) look alike in many aspects iv) differ in their blood groups

Ans : iv) differ in their blood groups

14. The correct statement about Neanderthal man is:

- i) the first human like hominid ii) started agriculture iii) ate meat and walked erectly iv) buried the dead

Ans : iv) buried the dead

15. The inheritance of characteristics through generation is called "heredity". In Mendel's *Pisum sativum* plant, the genetic material present is _____.

- i) DNA ii) RNA iii) Protein iv) Cytoplasm

Ans : i) DNA

PART - B

16. Mendel has observed Tallness as a dominant character in the garden pea plant. Similarly, tongue rolling is a dominant character in man. In a group of 60 students, 45 can roll their tongue and 15 are non-rollers.

- i) In the above context, calculate the percentage of dominant and recessive characters.

Ans : Total number of students = 60
 Tongue rollers (Dominant Characters) = 45
 Non-rollers (Recessive Characters) = 15
 Percentage of tongue rollers = $45/60 \times 100 = 75\%$
 Percentage of Non-rollers = $15/60 \times 100 = 25\%$

The percentage of **dominant** and **recessive** character is **75 : 25** or **3 : 1**

17. The inheritable characters vary in different species and within the same species. Name the variation in the following cases.

- i) The eye colour among the human beings are varied as blue, black, brown, green, etc. This is called as _____ variation.

- ii) The dentition in the rabbit and the elephant are not the same. This is called as _____ variation.

Ans : i. **Intraspecific Variation**

ii. **Intergeneric Variation**

18. Sexually reproducing organisms produce offspring with marked, significant and visible variation. Asexually reproducing offspring show minor variations.

- i) Do you agree with the above statements?
 ii) Among the following organisms point out the asexually reproducing organism.
 (Cockroach, Euglena, Earthworm and Bird)

Ans : a) Yes, I agree with the above statements.

b) Asexually reproducing organisms are Paramecium and Euglena

19. Here are certain important hereditary jargons. Fill in the blanks by choosing a suitable one from the list given.
 (allele, variation, speciation, gene, allelomorphs)

- i) _____ are the factors which form the physical basis of inheritance.
 ii) _____ is the alternate forms of the same gene.
 iii) _____ are the expressions of contrasting pair of alleles.

Ans : i. Gene

ii. Allele

iii. Allelomorphs

20. A change that affects the body cell is not inherited. However, a change in the gamete is inherited. The effects of radiation at Hiroshima have been affecting generations. Analyze the above statements and give your interpretation.

Ans : The radiation effects of Hiroshima had altered the **genes** of the **germ cells** or **gametes** and it is **inheritable**. That is why the radiation effects of Hiroshima have been affecting generations.

21. Sequentially arrange the different species of man from primitive to modern man.

(Neanderthal man, Homo habilis, Homo erectus, Homo sapiens)

Ans :

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Homo habilis
  ↓
Homo erectus
  ↓
Neanderthal man
  ↓
Homo sapiens
  
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22. Bio-technology, the modern science in biology, has helped in producing different types of products. One of the following groups does not have a product of bio-technology. Pick out and give reasons.

- i) enzymes, organic acids, steroids, vaccines ii) vaccines, enzymes, antibiotics, inorganic acids
 iii) antibiotics, hormones, steroids, vaccines iv) steroids, enzymes, antibodies, vaccines.

Ans : ii) Vaccines, Enzymes, Antibiotics, **inorganic acids**

Reason: **Inorganic acid** are derived from one or more inorganic compounds. **Inorganic acids** could not be produced by biotechnology.

23. What do you mean by phenotype and genotype of an individual? Explain.

Ans : Phenotype : Expression of morphological characters as tall or dwarf plant, violet or white flower is called Phenotype.

Genotype : The expression of gene (or genetic make up) of an individual for a particular trait is called Genotype.

24. What are variations? Mention their types.

Ans : Variation : Variation may be defined as differences in the characteristics among the individuals of the same species. (A) Intra specific variation or among the different genera (B) Intergeneric variation or different species (C) Inter specific variation.

Types of Variations

a. Somatic Variation - It pertains to body cells and it is not inherited.

b. Germinal Variation - It pertains to germ cells or gametes and it is inheritable. It leads to speciation and evolution.

25. Who proposed the theory of Natural Selection? Mention the two principles of this theory.

Ans : Charles Darwin proposed the theory of Natural Selection.

Two principles of Natural Selection are

1. Struggle for existence and
2. Survival of the fittest.

26. What are monoclonal antibodies? Mention its use.

Ans : Monoclonal antibodies are the antibodies produced from cloned cells by hybridoma technology.

Uses: Monoclonal antibodies are now used in treatment of cancer.

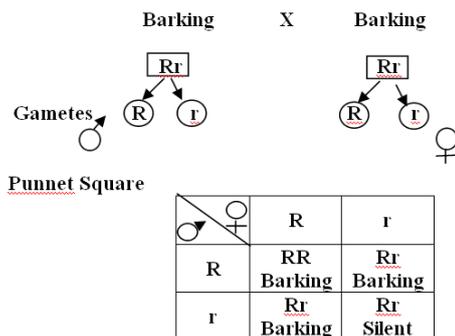
27. What is a clone? In what way is the cloning technique useful in the field of veterinary science?

Ans : A clone may be defined as an exact carbon copy or copies of a single genetical parent. The word 'clone' refers only to living species.

If the cloning technique is applied to veterinary science, valuable animals could be cloned from desirable adult cells.

28. In dogs, the barking trait is dominant over the silent trait. Using Punnet Square, work out the possible puppies born to two barking parents with genotype (Rr).

Ans :



Barking and silent puppies are produced in the ratio of **3:1**

29. In Dr. Ian Wilmut's cloning experiment, did the new born 'Dolly' resemble the udder cell donor Dorset white sheep or the surrogate mother sheep? Give reasons.

Ans : The new born Dolly resembled the udder cell donor sheep.

Reason : Since the ovum had the diploid nucleus of the Dorset white sheep, the Dolly showed all the characters of Dorset white sheep (Udder cell donor sheep).

30. The excessive use of pesticides has only resulted in the occurrence of more resistant varieties of pests rather than their complete eradication. How can you link this with Darwin's theory of Natural Selection and Evolution?

Ans : Pests become resistant by evolving physiological changes that protect them from the chemicals. Thus pest species evolves pesticide resistance via Natural Selection i.e. the most resistant specimens survive and pass on their genetic traits to their offspring.

31. The first clinical gene therapy was given in 1990 to a four year old girl suffering from Adenosine Deaminase Deficiency (ADA). Could you suggest a possible cure for such a disorder with the knowledge of gene therapy and its types?

Ans : Gene therapy is the means to treat or even cure genetic and acquired diseases like cancer and AIDS by using a normal gene to supplement or replace the defective gene. It can be used to treat defects in Somatic i.e. (body) or gametic (sperm or egg) cell.

Types of Gene Therapy

1. Somatic gene therapy:- The defective gene in somatic cells is replaced with a corrective gene. This change is not passed to the next generation.
2. Germ line gene therapy:- Egg and sperm of the parents are changed for the purpose of passing the changes to the next generation.

32. Find the unmatched pairs:

Nif genes	-Nitrogen Fixation
tt	-Alleles
Bio-chips	-Biological computer manufacturing
Interferon	-Antiproteins of Bacteria
Stem cells	-Unspecialised mass of cells

Ans : Interferon -Antiproteins of Bacteria

33. For the experimental research Dr. Ian Wilmut used the nucleus of the udder cell from a six year old Finn Dorset white sheep and preserved the diploid nucleus (2n). He took an ovum from the ovary of another sheep. The haploid ovum was removed. The diploid nucleus of the udder cell was injected into the cytoplasm of the enucleated ovum. Then the diploid nucleus ovum was implanted into the uterus of the surrogate mother sheep. The diploid ovum developed into a young one, named "Dolly".

i) Why did Wilmut select the udder cell? ii) Define the terms haploid and diploid.

Ans : i. Wilmut selected the udder cell because the diploid nucleus of the udder cell somewhat resembled the diploid nucleus of zygote of sheep.

ii. **Haploid:** A cell or organism having a single set or half number of chromosomes is known as haploid.

Diploid: A cell or organism having a two sets or double number of chromosomes is known as diploid.

34. Match the following by identifying the pair :

(medicines, fuel, microbes, metabolism, organic acids)

i) vaccine ii) natural gas iii) citric acid iv) monoclonal antibodies v) vitamins

Ans :

i. Vaccine	Microbes
ii. Natural Gas	Fuel
iii. Citric Acid	Organic acids
iv. Monoclonal Antibodies	Medicines
v. Vitamins	Metabolism

35. Mention the dominant and recessive traits observed by Mendel in the garden pea plant with respect to the seed and flower.

- Ans :**
1. Seed shape - Round / Wrinkled
 2. Seed colour - Yellow / Green
 3. Flower colour - Violet / White
 4. Flower position - Axillary / Terminal

36. Name the different species of mankind in chronological order from primitive to modern man.

- Ans :**
- Fifteen million years ago - Gorilla and Chimpanzees
 - 3-4 million years ago - Homo habilis (Hominids).
 - 1.5 million years ago - Homo erectus.
 - 1 million years ago - The Neanderthal man
 - Between 75,000 and 10,000 years - The modern Homo sapiens

37. i. When were the primitive caves developed?

ii. Name cholesterol containing steroid obtained from bread mould.

Ans : i. The primitive caves were developed about 18,000 years ago

ii. Cholesterol containing steroid obtained from bread mould is prednisolone.

38. Narrate the life led by early man like hominids.

Ans : 1. **3-4 million** years ago, men like hominids, walked into **Eastern Africa**.

2. Evidence shows that they hunted with **stone weapons** but were mostly **fruit eaters**.

3. They were probably **not taller** than **four feet** but, **walked upright** in the grass lands of East Africa.

4. These creatures were called the **First human** like being – the **hominid**. The hominid was called **Homo habilis**.

39. Find out who I am?

i) I am an acid used as a preservative and I have a sour taste. ii) I am organic and present in citrus fruits and I give immunity.

Ans : i. Vinegar ii. Citrus fruit

40. Find out who I am?

i) I am an enzyme and I cut DNA at specific sites. ii) I am the paste enzyme that joins segments of DNA.

Ans : i. Restriction Endonucleases ii. DNA Ligases

41. State whether true or false. Correct the statements that are false.

i) Variations give the organisms an individuality of their own.

ii) Charles Darwin postulated the use and disuse theory.

Ans : i) Variations give the organisms an individuality of their own. - **True**

ii) Charles Darwin postulated the use and disuse theory. – **False**

Corrected Statement : ii) Charles Darwin postulated **the theory of Natural Selection..**

42. State whether **true or false**. Correct the statements that are false.

i) To understand evolution, a branching diagram or a tree diagram is used to show the inferred evolution and the relationship among various biological species.

ii) Genetic engineering is the modification of the genetic information of living organisms by manipulation of DNA by adding, removing or repairing part of the DNA and changing the phenotype.

Ans : i) To understand evolution, a branching diagram or a tree diagram is used to show the inferred evolution and the relationship among various biological species. - **True**

ii) Genetic engineering is the modification of the genetic information of living organisms by manipulation of DNA by adding, removing or repairing part of the DNA and changing the phenotype. - **True**

43. Define evolution.

Ans : Evolution may be defined as a gradual development of more complex species from pre-existing simpler forms.

44. What are the uses of Bio-Sensor in medical field?

Ans : Uses of Bio-Sensor in medical field

1. Blood glucose level can be detected.

2. Production of any toxin in the body due to infection can be detected.

45. **Match the following.**

i. Gregor Johann Mendel	- Cloning
ii. Jean Baptise Lamarck	- Vaccine
iii. Edward Jenner	- Natural Selection
iv. Charles Darwin	- Genetics
v. Ian Wilmut	- Use and Disuse theory

Ans:

i. Gregor Johann Mendel	- Genetics
ii. Jean Baptise Lamarck	- Use and Disuse theory
iii. Edward Jenner	- Vaccine
iv. Charles Darwin	- Natural Selection
v. Ian Wilmut	- Cloning

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X Std Biology Chapter 2 – IMMUNE SYSTEM

(1 MARK -1Q) (2 MARKS – 1Q) (5 MARKS -1 Q)

PART – A**CHOOSE THE CORRECT ANSWER**

1. Pick out a case of healthy state of an individual.

- i) Mr. X is recovering from an infectious disease.
- ii) Mr. Y takes insulin injection every day.
- iii) Mrs. Z is very depressed.
- iv) Mr. K does his duty and spends time joyfully.

Ans : iv) Mr. K does his duty and spends time joyfully.

2. Which one of the following is not socially balanced ?

- i) He enjoys a birthday party. ii) He behaves rudely over trivial matters.
- iii) He adjusts well to the surrounding situation. iv) He attends to his ailing mother at the hospital.

Ans : ii) He behaves rudely over trivial matters.

3. _____ is a bacterial disease.

- i) Meningitis ii) Rabies iii) Tetanus iv) Small pox

Ans : iii) Tetanus

4. One of the following is transmitted through air. Find it out.

- i) Tuberculosis ii) Meningitis iii) Typhoid iv) Cholera

Ans : i) Tuberculosis

5. The most serious form of malaria is caused by Plasmodium _____.

- i) ovale ii) malariae iii) falciparum iv) vivax

Ans : iii) falciparum

6. An example of protozoan infecting our intestine is _____

- i) Plasmodium vivax ii) Entamoeba histolytica iii) Trypanosoma gambiense iv) Taenia solium

Ans : ii) Entamoeba histolytica

7. One of the means of indirect transmission of a disease is _____.

- i) sneezing ii) coughing iii) through placenta iv) using utensils of patients

Ans : iv) using utensils of patients

8. When antibodies, extracted from other animals are injected into your body, what kind of immunity do you gain?

- i) Artificially active acquired immunity ii) Artificially passive acquired immunity
- iii) Naturally active acquired immunity iv) Naturally passive acquired immunity

Ans : ii) Artificially passive acquired immunity

9. The first vaccine injected into a just born baby is _____.

- i) Oral polio ii) DPT iii) DPT and Oral polio iv) BCG

Ans : iv) BCG

10. In order to lead a healthy life, a person should enjoy physical, mental and social well-being. If a person lacks any one of them, then that person is suffering from _____.

Ans : Disease

11. A child eats food rich in carbohydrates and avoids protein in its diet. Which type of nutritional deficiency will affect that child?

- i) Kwashiorkar ii) Nyctalopia iii) Diabetes iv) Down syndrome

Ans : i) Kwashiorkar

12. Assertion (A) Expulsion of excess unused glucose in the blood through urine is observed in a diabetic mellitus person.

Reason (R) : insulin is not produced in sufficient quantity by pancreas.

- i) Both 'A' and 'R' are true and 'R' explains 'A'. ii) Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
- iii) Only 'A' is true but 'R' is false. iv) A is false but 'R' is true.

Ans : i) Both 'A' and 'R' are true and 'R' explains 'A'.**PART - B**

13. Marasmus and Kwashiorkar are both protein deficiency defects. Marasmus differs from Kwashiorkar in enlarged belly and swelling in the face. Are these symptoms for the above diseases correct? If not, correct it.

Ans : No, the symptoms for the above diseases are not correct.In **Marasmus**, the child loses weight and suffers severe diarrhea and it will appear as though bones are covered by skin.

In **Kwashiorkar**, the child develops an enlarged belly and swelling in the face.

14. A list of disorders is given below. Pick out the odd one out and give reasons.

(Thalassemia, haemophilia, night blindness, albinism, sickle cell anaemia)

Ans : **Night blindness** is a vitamin deficiency disease.

Thalassemia, Haemophilia, albinism and sickle cell anaemia are hereditary diseases.

15. What are the symptoms of common cold?

i) _____ ii) _____

Ans : 1. Inflammation of upper respiratory passage – nasal epithelium.

2. Flow of mucous.

16. Differentiate between the diseases-night blindness and colour blindness.

Ans :

No.	Night blindness	Colour blindness
1.	It is a vitamin deficiency disease .	It is a hereditary or Genetic disorder .
2.	It is caused due to the deficiency of Vitamin A	It is caused due to defective or mutated gene .

17. After observing dark patches with itching sensation on the skin of a student in a school hostel, the warden advises his roommates not to share towels, clothes and combs among themselves. Name the disease the student is suffering from and name the causative organisms.

Ans : The name of the disease is **Ringworm**. The causative organisms are

1. Epidermophyton,
2. Microsporum and
3. Trichophyton

18. Name the vector host of the malarial parasite. Mention the species of malarial parasite which causes malignant and fatal malaria.

Ans : The vector host of the malarial parasite is the female **Anopheles** mosquito.

Plasmodium falciparum causes malignant and fatal malaria.

19. Name the tests done for the diagnosis and confirmation of AIDS.

Ans : **Test for HIV Virus:**

- i. Enzyme Linked Immuno Sorbent Assay (ELISA)
- ii. Western Blot – a confirmatory test.

20. What is triple antigen? Name the three diseases which, can be prevented by using it.

Ans : **DPT** is known as **Triple Antigen**.

The three diseases which, can be prevented by using triple antigen are

1. Diphtheria,
2. Pertussis and
3. Tetanus

21. Mention the type of immunity acquired by a baby through breast-feeding.

Ans : The type of immunity acquired by a baby through breast-feeding is **Naturally Passive Acquired Immunity**.

22. Study the following statements and state whether they are true or false.

i) Colour blindness is a genetic disorder, whereas night blindness is a nutritional disorder.

ii) Pernicious anaemia is a nutritional deficiency disease, whereas sickle cell anaemia is a genetic disease / disorder.

iii) Administering TT injection to an injured child is related to passive artificial immunity, whereas giving BCG vaccine is active artificial immunity.

iv) Malaria is a bacterial disease, whereas ring worm is a viral disease.

Ans : i) Colour blindness is a genetic disorder, whereas night blindness is a nutritional disorder. - **TRUE**

ii) Pernicious anaemia is a nutritional deficiency disease, whereas sickle cell anaemia is a genetic disease / disorder. - **TRUE**

iii) Administering TT injection to an injured child is related to passive artificial immunity, whereas giving BCG vaccine is active artificial immunity. - **FALSE**

Corrected Statement : Administering TT injection to an injured child and giving BCG vaccine are **Artificially Active Acquired Immunity**

iv) Malaria is a bacterial disease, whereas ring worm is a viral disease. - **FALSE**

Corrected Statement : Malaria is a **protozoan** disease, whereas ring worm is a **fungal** disease.

23. Ramya is suffering from bleeding gums and loosening teeth. On diagnosis, it was found to have been caused by vitamin deficiency. Tell Ramya the vitamin that is lacking in her food and the name of deficiency disease she is suffering from.

(A) Vitamins (B) Deficiency diseases (C) Symptoms are given. Match B and C with A:

A	B	C
Vitamins	Deficiency diseases	Symptoms
Vitamin A	Nyctalopia	Night Blindness
Vitamin B ₁	Scurvy	Nervous disorder
Vitamin C	Rickets	Bleeding gums
Vitamin D	Haemorrhage	Defective calcification of bones
Vitamin K	Beri-beri	Profuse loss of blood

Ans : Ramya is suffering from the disease “**Scurvy**”

It is caused due to deficiency of **Vitamin C**

A	B	C
Vitamins	Deficiency diseases	Symptoms
Vitamin A	Nyctalopia	Night Blindness
Vitamin B ₁	Beri-beri	Nervous disorder
Vitamin C	Scurvy	Bleeding Gum
Vitamin D	Rickets	Defective calcification of bones
Vitamin K	Haemorrhage	Profuse loss of blood

24. A health worker advises the people in a locality not to have tattooing done using common needles and to insist the barber to change the shaving razors/ blades in the salon. Name the dreadful disease, the spreading of which, can be prevented by following these measures. Also mention other preventive measures that can be taken with regard to this disease.

Ans : The dreadful disease is **AIDS**.

Other preventive measures are

- Protected sexual behaviour.
- Safe sex practices and
- Screening of blood for HIV before blood transfusion.
- Usage of disposable syringes in the hospitals.

25. Match the following:

List I (Disease)	List II (Symptoms)
A. Amoebiasis	I) Chills and high fever recurring for 3 to 4 days
B. Tuberculosis	II) Patches on skin and nails with itching sensation
C. Ringworm	III) Abdominal pain with blood and mucus in stools
D. Malaria	IV) Persistent cough and loss of body weight

Ans :

	List I (Diseases)	List II (Symptoms)
A	Amoebiasis	Abdominal pain with blood and mucus in stools.
B	Tuberculosis	Persistent cough and loss of body weight
C	Ringworm	Patches on skin and nails with itching sensation.
D	Malaria	Chill and high fever for 3 to 4 days.

26. A student had an attack of measles and recovered from the infection. His science teacher said that he will not get that disease again in his life time. Is it true? Why?

Ans : Yes, it is true. Because natural immunity against measles which is acquired through disease will give life long immunity.

27. List out the diseases based on their mode of transmission (water borne, air borne, sexual contact)

- cholera
- typhoid
- tuberculosis
- leprosy
- syphilis
- gonorrhoea
- pneumonia
- common cold
- amoebic dysentery
- AIDS

Ans :

Mode of transmission	Disease
Water borne	1.Cholera 2.Typhoid and 3.Amoebic dysentery
Air borne	1.Tuberculosis 2.Leprosy 3.Pneumonia and 4.Common cold
Sexual contact	1.Syphilis 2.Gonorrhoea and 3.AIDS

28.i) Give any three examples for the most infectious diseases in man and their causative agents.

ii) To discover medicine for viral infected diseases like AIDS is more difficult than other diseases. Is the statement true or false? Discuss.

Ans : i. The most infectious diseases in man and their causative agents are

	Diseases	Causative agent
1.	Influenza	A (H ₁ N ₁) VIRUS
2.	Tuberculosis	Mycobacterium tuberculosis
3.	Typhoid	Salmonella typhi

ii. The statement is **true**. Because HIV causes profound immuno suppression in humans. It is due to the depletion of one type of WBC, which, is involved in the formation of antibodies called CD4 plus T-helper cells (lymphocytes).

As the HIV attacks T₄ cells, our body cannot synthesize immunity against AIDS. Hence it is difficult to discover medicine for AIDS.

29. Name the causative organisms responsible for ring worm in humans? Mention the symptoms of the infection.

Ans : Ring worm is caused by **three** different **genera** of fungi namely,

1.Epidermophyton,

2.Microsporium and

3.Trichophyton

Symptoms of Ringworm

Fungi can live on the dead cells of epidermis. They can cause superficial infections in skin, hair, nail, etc. form patches and cause itching.

30. Pick out the odd ones:

i) AIDS : Retro virus, lymphocytes, BCG, ELISA

ii) Bacterial disease : Rabies, cholera, common cold, influenza

iii) DPT vaccine : Diphtheria, tuberculosis, pertusis, tetanus

iv) Infective stage of Plasmodium in humans : Sporozoites, merozoites, trophozoites, gametocytes.

v) Mental dimension : brightness of skin, normal metabolism, no black rings around eyes, knows his capacity.

Ans : i) AIDS : Retro virus, lymphocytes, BCG, ELISA

Odd one : BCG

ii) Bacterial disease : Rabies, cholera, common cold, influenza

Odd one :

iii) DPT vaccine : Diphtheria, tuberculosis, pertusis, tetanus

Odd one : cholera

iv) Infective stage of Plasmodium in humans : Sporozoites, merozoites, trophozoites, gametocytes.

Odd one : Sporozoites

v) Mental dimension : brightness of skin, normal metabolism, no black rings around eyes, knows his capacity.

Odd one : Knows his capacity.

31. In the manufacturing of anti-venom injection against snake bite, antibodies produced in the horse are being used. Mention the type of immunity involved.

Ans : **Artificial Passive Acquired Immunity**

32. Say whether each of the following diseases is a metabolic disorder, a genetic disorder or a nutritional deficiency disease.

- i) thalassemia ii) beriberi iii) diabetes mellitus iv) bubble boy syndrome v) scurvy vi) marasmus vii) obesity viii) Alzheimer's disease ix) nyctalopia x) haemophilia

Ans :

Metabolic Disorder	1.Diabetes mellitus 2.Obesity 3.Alzheimer's disease
Genetic disorder	1.Thalassemia 2.Bubble boy syndrome 3.Haemophilia
Nutritional deficiency disease	1.Beriberi 2.Scurvy 3.Marasmus 4.Nyctalopia

33. Find the correct statement (True / False) :

- i) Tuberculosis is caused by Mycobacterium tuberculosis bacteria.
ii) Typhoid is caused by Trichophyton fungi.
iii) Malaria is caused by Plasmodium vivax.
iv) Influenza is caused by Entamoeba histolytica protozoan.

Ans : i) Tuberculosis is caused by Mycobacterium tuberculosis bacteria. - **TRUE**

ii) Typhoid is caused by Trichophyton fungi. - **FALSE**

Corrected statement : Typhoid is caused by **Salmonella typhi**

iii) Malaria is caused by Plasmodium vivax. - **TRUE**

iv) Influenza is caused by Entamoeba histolytica protozoan. - **FALSE**

Corrected statement : Influenza is caused by **A(H1N1) Virus**

34. Malarial fever is not caused in a person immediately after introducing the sporozoites by an infected anopheles mosquito. Why?

Ans : When the mosquitoes bite a healthy person, the sporozoites (the infectious stage) are introduced into his body. They multiply within the liver cells first and enter the Red Blood Cells(RBC) of man, resulting in the rupture of RBC. This results in the release of toxic substance called haemozoin which is responsible for the chill and high fever , recurring every three to four days. Hence malarial fever is not caused in a person immediately after introducing the sporozoites by an infected anopheles mosquito

35. Name the stages of Plasmodium.

- i) Introduced by an infected Anopheles mosquito.
ii) Picked up by Anopheles mosquito from an infected human being.

Ans : i) Introduced by an infected Anopheles mosquito - **Sporozoites (Asexual Stage)**

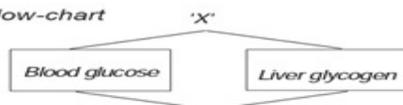
ii) Picked up by Anopheles mosquito from an infected human being - **Gametocytes (Sexual Stage)**

36. Name two diseases that are transmitted by houseflies. Mention their causative pathogens.

Ans

Diseases that are transmitted by houseflies	Causative pathogens
1.Amoebic dysentery (Amoebiasis)	Entamoeba histolytica – a protozoan parasite
2.Typhoid	Salmonella typhi – Bacteria

37. Observe the following flow-chart



Mention the metabolic disorder 'X' and the causative factor from the options given below:

Disorder	Factors
a) Diabetes insipidus	Deficiency of ADH hormone
b) Diabetes mellitus	Deficiency of insulin hormone
c) Coronary heart disease	Blockage of arteries supplying blood to heart muscles
d) Renal failure	Failure of nephrons to filter the blood

Ans : The metabolic disorder "X" is **Diabetes mellitus**.

The causative factor is '**Deficiency of Insulin Hormone**'

PART - C

38. Kala has delivered a baby,

- Suggest the immunization schedule for the baby, in the first six months.
- What are the diseases that can be cured as per the schedule?

Ans : i..The immunization schedule for the baby, in the first six months .

S.No.	Age	Vaccine	Dosage
1.	New born	BCG	1 st dose
2.	15 days	Oral polio	1 st dose
3.	6 th week	DPT & Polio	1 st dose
4.	10 th week	DPT & Polio	2 nd dose
5.	14 th week	DPT & Polio	3 rd dose

ii.The diseases that can be cured as per the schedule.

BCG –Tuberculosis

Oral polio - Polio

DPT - Diphtheria, Pertusis & Tetanus (Triple Antigen)

39. There is a widespread outbreak of malaria in your area.

- Suggest some controlling measures to the local authorities concerned.
- Pick out the right symptom for malaria. (chills, shivering and a rise in temperature / diarrhoea)

Ans : i. **Controlling measures of Malaria.**

- Sanitary measures include ground fogging with disinfectants.
- Closure of stagnant pools of water and covering ditches is suggested.
- Using mosquito nets and repellants also, will grossly lower the chance for infection.

ii. The right symptom for malaria is **chills, shivering and a rise in temperature**

40. 15th October is observed as ‘Handwashing Day’ i) Tell your friend the effects of hand washing.

ii) How frequently do you wash your hands everyday and when?

Ans : i.**The effects of hand washing.**

- It minimizes the growth of harmful bacteria and virus.
- It limits the spread of infectious microbes.
- It prevents the entry of disease causing germs into the body.

ii.**The occasions in which we wash our hands.**

- Before and after the food.
- After using the toilet.
- If we touch fomites of diseased person.
- After playing
- After disposing sanitary products and garbage.

41. What is immunity? Write a note on the various types of immunity.

Ans : **Immunity:** Immunity is the body’s defence against or the specific resistance exhibited towards infectious organisms.

Types of Immunity

I.Natural or Innate Immunity: The **natural or innate immunity** enables an individual to develop resistance to the disease, to which, the particular species is immune.

e.g. Plant diseases do not affect animals.

II.Acquired or Specific Immunity: The resistance against some infectious diseases developed by an individual during lifetime,on exposure to the infections is called **acquired or specific** immunity.

A. Active acquired immunity: This kind of immunity is developed by our body, during the first infection of any pathogen. The antibodies produced in the blood remain for a long period and kill the similar pathogens, whenever they enter the body.

1. Naturally Active Acquired Immunity: If the antibody production is stimulated naturally after recovery from a disease, it is called Naturally Active Acquired Immunity.

2.Artificially Active Acquired Immunity: If the antibody synthesis is stimulated by administration of vaccines or any other man-made methods, the immunity thus gained is called Artificially Active Acquired Immunity. For example the polio drops and the triple antigen injection given to the child in the immunization programme.

B. Passive Acquired Immunity: In this type of immunity, a ready-made antibody is introduced from outside, instead of stimulating the body to produce antibody with antigenic stimulus.

1. Naturally Passive Acquired Immunity : If the readymade antibody is taken from the mother's blood into the foetus, it is called Naturally Passive Acquired Immunity.

2. Artificial Passive Acquired Immunity: If the readymade antibody is given to an individual artificially, (produced in some other animal and extracted) it is called Artificial Passive Acquired Immunity. This immunity is not permanent.

42. Describe the life-cycle of plasmodium in man.

Ans : Life cycle of malarial parasite – Plasmodium:

1. The sexual stage of Plasmodium takes place in female Anopheles mosquito whereas the asexual stage occurs in man.

2. When a female Anopheles mosquito bites an infected person, these parasites enter the mosquito and undergo further development in the body of the mosquito.

3. The parasites multiply within the body of the mosquito to form sporozoites that are stored in the salivary glands of the mosquito.

4. When these mosquitoes bite a healthy person, the sporozoites (the infectious stage) are introduced into his body.

5. They multiply within the liver cells first and enter the Red Blood Cells (RBC) of man, resulting in the rupture of RBC.

6. This results in the release of toxic substance called haemozoin which is responsible for the chill and high fever, recurring every three to four days.

43. List out the various diseases caused due to nutritional deficiency. Add a note on their symptoms.

Ans : 1. Protein Deficiency diseases

Disease	Symptoms
1. Marasmus	The child loses weight and suffers severe diarrhoea and it will appear as though bones are covered by skin.
2. Kwashiorkor	The child develops an enlarged belly with face and feet swelling.

2. Vitamin Deficiency Disease

Vitamin	Deficiency disease	Symptoms
Vitamin A	Nyctalopia	Night blindness
Vitamin D	Rickets	Defective calcification of bones
Vitamin E	Sterility	Inability to reproduce
Vitamin K	Haemorrhage	Profuse loss of blood
Vitamin B1	Beri-Beri	Nervous disorder
Vitamin B5	Pellagra	Dementia, dermatitis, diarrhoea
Vitamin B12	Pernicious anaemia	Destruction of RBC
Vitamin C	Scurvy	Bleeding gums and loosening of teeth

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CHAPTER – 3 STRUCTURE AND FUNCTIONS OF HUMAN BODY**(1 MARK -1Q) (2 MARKS – 1Q) (5 MARKS -1 Q)****PART - A**

1. Unipolar neurons are found in the _____.
i) Brain ii) Spinal Cord iii) Embryonic nervous tissue iv) Adult nervous tissue
Ans : iii) Embryonic nervous tissue
2. The sensory organs contain _____.
i) Unipolar neuron ii) Bipolar neuron iii) Multipolar neuron iv) Medullated neuron
Ans : ii) Bipolar neuron
3. The part of brain which controls emotional reactions in our body is _____.
i) Cerebellum ii) Cerebrum iii) Thalamus iv) Hypothalamus
Ans : iv) Hypothalamus
4. One of the following is a part of the brain stem. Pick it out.
i) Forebrain and midbrain ii) Midbrain and hindbrain
iii) Forebrain and hindbrain iv) Forebrain and spinal cord
Ans : ii) Midbrain and hindbrain
5. Spinal nerves are _____.
i) sensory nerves ii) motor nerves iii) mixed nerves iv) innervating the brain
Ans : iii) mixed nerves
6. An endocrine gland found in the neck is _____.
i) adrenal gland ii) pituitary gland iii) thyroid gland iv) pancreas
Ans : iii) thyroid gland
7. An endocrine gland which is both exocrine and endocrine is the _____.
i) pancreas ii) pituitary iii) thyroid iv) adrenal
Ans : i) pancreas
8. Normal blood glucose level in 1dl of blood is _____.
i) 80-100 mg/dl ii) 80-120 mg/dl iii) 80-150 mg/dl iv) 70-120 mg/dl
Ans : ii) 80-120 mg/dl
9. The “T” lymphocytes are differentiated to resist infection in the _____.
i) parathyroid gland ii) lymph gland iii) thymus gland iv) adrenal gland
Ans : iii) thymus gland
10. In Meiosis-I, the pairing of homologous chromosomes take place during _____ stage.
i) leptotene ii) zygotene iii) pachytene iv) diplotene
Ans : ii) zygotene
11. The two systems of the human body which help in the control and co-ordination of metabolic activities are _____.
i) digestive and circulatory ii) respiratory and circulatory iii) excretory and skeletal iv) nervous and endocrine
Ans : iv) nervous and endocrine
12. Neurotransmitters are released at the synapse by _____.
i) Tips of Dendrites ii) Synaptic Knobs iii) Organelles of Cyton iv) Myelin sheath of Axon
Ans : ii) Synaptic Knobs
13. The endocrine gland related to the immune system is _____.
i) Thyroid ii) Thymus iii) Adrenal iv) Pineal
Ans : ii) Thymus
14. The hormone administered by doctors to a pregnant woman to help in childbirth during the time of natural delivery is _____.
i) Oestrogen ii) Progesterone iii) Insulin iv) Relaxin
Ans : iv) Relaxin
15. The important event of meiosis is the crossing over. It occurs during _____.
i) Leptotene ii) Pachytene iii) Diplotene iv) Zygotene
Ans : ii) Pachytene
16. Reduction division is the process by which gametes are produced. The cells in which reduction division take place are _____.
i) germinal epithelial cells ii) the sensory epithelial cells iii) cuboidal epithelial cells iv) columnar epithelial cells
Ans : i) germinal epithelial cells

17. In Amoeba, the cell division takes place _____

- i) involving changes in the chromatin reticulum ii) without involving changes in the chromatin reticulum
iii) leading to reduction in the number of chromosomes iv) without dividing the nucleus

Ans : ii) **without involving changes in the chromatin reticulum**

18. Pick out the item which has sequential arrangement.

- i) zygotene -> Leptotene -> Pachytene -> Diplotene -> Diakinesis
ii) Diakinesis -> zygotene -> Leptotene -> Pachytene -> Diplotene
iii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis

Ans : iii) **Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis**

19. Polio is a viral disease and the affected child suffers from physical disability of limbs. Which system of the body is mostly affected due to this infection?

- i) Nervous system ii) Digestive system iii) Respiratory system iv) Excretory system

Ans : i) **Nervous system**

20. Blinking when a beam of light is suddenly focussed on the eyes and sudden withdrawal of hand upon touching a hot body are some of the examples of reflex actions. Which part of the central nervous system acts as the centre these actions?

- i) Forebrain ii) Spinal cord iii) Hindbrain iv) Synapse

Ans : ii) **Spinal cord**

21. The following are the parts of a neuron:

- a) Axon b) Terminal branches c) Cyton d) Dendrites

The correct pathway of a nerve impulse through these parts are _____.

- i) badc ii) dcab iii) bdac iv) adbc

Ans : ii) **dcab**

22. For minor surgeries in the body, doctors administer local anaesthesia to a part of the body so that the pain will not be felt by the patient. At which part, do you think, the nerve impulse is being arrested due to the effect of anaesthesia?

- i) at cyton ii) at axon iii) at synapse iv) in the middle of axon

Ans : iii) **at synapse**

23. Assertion (A) : All spinal nerves are mixed nerves.

Reason (R) : Each spinal nerve has a sensory root and a motor root.

- i) Both 'A' and 'R' are true and 'R' explains 'A'.
ii) Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
iii) Only 'A' is true but 'R' is false.
iv) 'A' is false but 'R' is true.

Ans : i) **Both 'A' and 'R' are true and 'R' explains 'A'.**

PART - B

24. Name the two systems which help in the control and co-ordination of metabolic activities. Write any one difference between them.

Ans : The two systems which help in the control and co-ordination of metabolic activities are

1. Nervous system and
2. Endocrine system

Nervous system	Endocrine system
The nervous system provides an organized network of point-to-point connections for quicker coordination	The endocrine system provides chemical integration through hormones.

25. Differentiate medullated neurons from non-medullated neurons. Where are they found in the nervous system?

Ans :

No.	Medullated Neuron	Non-Medullated Neuron
1.	The axon is enclosed by the white fatty myelin cover.	This neuron is not enclosed by the myelin sheath ; so it appears grayish in colour.
2.	They are also known as Myelinated neurons .	They are also known as Non-Myelinated neurons .
3.	This type of neuron is found in the white matter of our brain.	This type of neuron is found in the grey matter of cerebrum.

26. Name the part of the brain which regulates heart beat and respiration. Where is it located in the brain?

Ans : **Medulla oblongata** regulates of heart beat and respiration.

Location of Medulla oblongata - Medulla is the posterior most part of the brain where it merges with the spinal cord.

27. What is corpora quadrigemina? Name the functions associated with it.

Ans : The dorsal portion of the midbrain consists of four hemispherical bodies called **corpora quadrigemina**.

Functions : It controls and regulates various visual reflexes and optical orientation.

28. What are endocrine glands? Name the secretions of these glands. How do these secretions reach the target organs?

Ans : 1.The endocrine glands are ductless glands (without ducts) which is responsible for the chemical coordination of physiological processes to maintain the homeostasis.

2.The secretion of endocrine glands is known as **hormone**.

3.The hormones are carried by the blood from the site of production to the site of action.

29. Name the following endocrine glands: i) The master of endocrine orchestra ii) The dual gland

Ans : i) The master of endocrine orchestra – **Pituitary Gland**

ii) The dual gland – **Pancreas** (Islets of Langerhans)

30. Which hormone(s) is/are called i) Personality hormone ii) fight, flight and fright hormones.

Ans : i) Personality hormone - **Thyroxine**

ii) Fight, flight and fright hormones – **Adrenalin**

31. Name the male and female sex hormones. List out their functions.

Ans : A. Male sex hormone - **Testosterone (androgen)**.

Functions of Testosterone

1.Testosterone stimulates the growth of reproductive organs and the production of male gametes- the sperm.

2.Testosterone determines the secondary sexual characters in male, such as growth of facial hair, hoarse voice, broadening of shoulder, etc.

B. Female sex hormones – 1. Oestrogen 2.Progesterone and 3. Relaxin

Functions of female sex hormones

1. **Oestrogen** is responsible for growth of female reproductive organs and the appearance of secondary sexual characters in female, such as growth of pubic hair, soft voice, feminine body,etc.

2.**Progesterone** maintains pregnancy and regulates menstrual cycle.

3.**Relaxin** relaxes the muscles of the pelvic region at the time of childbirth.

32. In which sub-stages of meiosis-I do the following events occur?

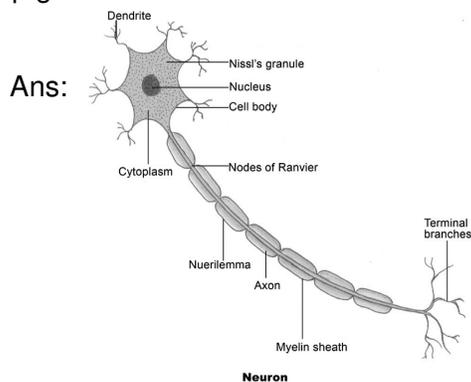
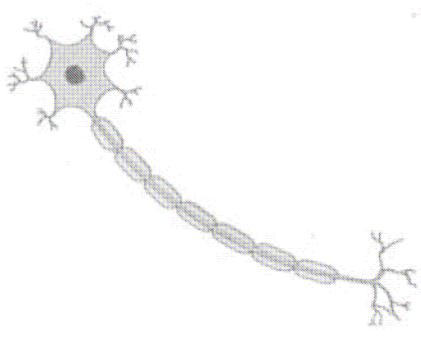
i)pairing of homologous chromosomes ii)terminalization iii)crossing over iv)formation of spindle apparatus.

Ans :

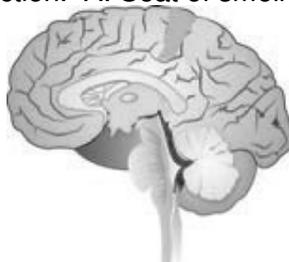
Event	Sub-stages of Meiosis - I
i) Pairing of homologous chromosomes	Zygotene
ii) Terminalization	Diplotene
iii) Crossing over	Pachytene:
iv) Formation of spindle apparatus.	Diakinesis

33. Copy the diagram and label any two parts in the group given:

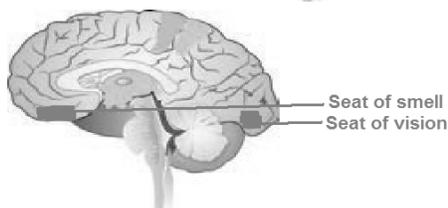
(cyton, axon, dendron, terminal branches)



34. The diagram is of the human brain. Shade the areas marked A and B in the parts of the brain, corresponding with the function. A. Seat of smell B. Seat of vision



Ans :



35. On the basis of the function performed, pick out the right statements.

- i) Pituitary gland secretes hormones and enzymes.
- ii) Thyroid gland secretes thyroxine and insulin.
- iii) Leydig cells produce testosterone hormone.
- iv) Pancreas produces enzymes and hormones.

Ans : iii) Leydig cells produce testosterone hormone.
iv) Pancreas produces enzymes and hormones.

36. Correct the statements, if they are wrong.

- i) Alpha cells produce insulin and beta cells produce glucagon. ii) Cortisone suppresses the immune response.
- iii) Thymus gland is a lymphoid mass. iv) Ovary produces eggs and androgen.

Ans : i) Alpha cells produce insulin and beta cells produce glucagon. – **False**

Corrected statement: Alpha cells produce glucagon and beta cells produce insulin.

ii) Cortisone suppresses the immune response.- **True**

iii) Thymus gland is a lymphoid mass. - **True**

iv) Ovary produces eggs and androgen. -**False**

Corrected statement: Ovary produces eggs and oestrogen.

37. Here are a few statements about the endocrine system in man. State whether each of them is true or false. If the statement is false write the correct statement.

- i) Endocrine system controls and co-ordinates the physical process of growth, reproduction and sustenance of life.
- ii) Endocrine glands are duct bearing glands which secrete chemical substances called hormones.
- iii) The pancreas is a dual gland. iv) Malfunctioning of the thymus gland causes goitre.

Ans : i) Endocrine system controls and co-ordinates the physical process of growth, reproduction and sustenance of life. - **True**

ii) Endocrine glands are duct bearing glands which secrete chemical substances called hormones.-**False**

Corrected statement: Endocrine glands are ductless glands which secrete chemical substances called hormones.

iii) The pancreas is a dual gland. - **True**

iv) Malfunctioning of the thymus gland causes goitre. –**False**

Corrected statement: Malfunctioning of the thyroid gland causes goitre.

38. Copy and complete the following table:

No.	Hormones of adenohipophysis	Functions and malfunctions
1	Somatotropic or growth hormone (STH or GH)	
2		2. It stimulates the growth of thyroid gland and produces thyroxine.

Ans :

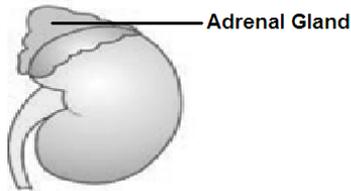
No.	Hormones of adenohipophysis	Functions and malfunctions
1	Somatotropic or growth hormone (STH or GH)	<p>1.Function: It contributes growth in general.</p> <p>Malfunctions</p> <p>1.Less production in children – <i>dwarfism</i> with retarded growth</p> <p>2.Excess production in children – <i>gigantism</i> with excess growth</p> <p>3.Excess production in adolescents – <i>acromegaly</i> with large limbs and lower jaw</p>
2	Thyrotropic or Thyroid stimulating hormone (TSH)	2. It stimulates the growth of thyroid gland and produces thyroxine.

39. Copy the diagram and label the parts with the help of the clues given:

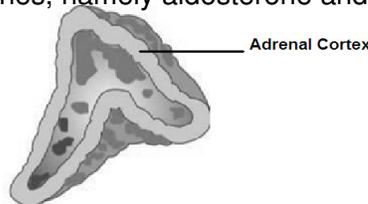
- i) It is otherwise called supra renal gland. ii) It secretes two hormones, namely aldosterone and cortisone.



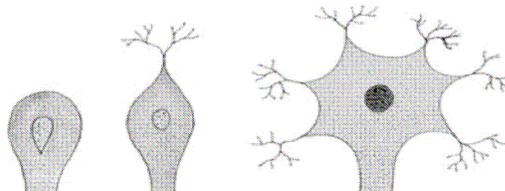
Ans : i) It is otherwise called supra renal gland – **ADRENAL GLAND**



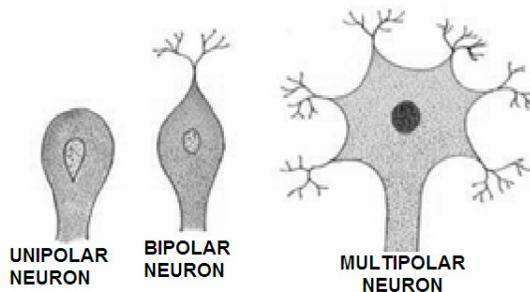
ii) It secretes two hormones, namely aldosterone and cortisone – **ADRENAL CORTEX**



40. Copy and identify the types of neurons given below:



Ans :



41. Here are some statements about meiosis. State whether each of them is true or false:
 i) It takes place in somatic cells. ii) Meiosis is also called reduction division.
 iii) Pairing of homologous chromosomes is called crossing over.
 iv) Meiosis leads to variations which form the raw material for evolution.

Ans : i) It takes place in somatic cells. – **FALSE**

Corrected statement : It takes place in **Germinal Epithelial** cells.

ii) Meiosis is also called reduction division. - **TRUE**

iii) Pairing of homologous chromosomes is called crossing over. – **FALSE**

Corrected statement : Pairing of homologous chromosomes is called **Synapsis**

iv) Meiosis leads to variations which form the raw material for evolution. - **TRUE**

42. Match the following:

A. leptotene	I. nuclear membrane and nucleolus disappear
B. zygotene	II. terminalization
C. diplotene	III. pairing, synapsis, bivalents
D. diakinesis	IV. chromosomes condense and appear like threads

Ans :

A. leptotene	I. chromosomes condense and appear like threads
B. zygotene	II. pairing, synapsis, bivalents
C. diplotene	III. terminalization
D. diakinesis	IV. nuclear membrane and nucleolus disappear

43. A person was riding a two-wheeler without wearing a helmet. He met with an accident and sustained a head injury. He was dead before he was shifted to the hospital and it was found that his death was due to breathlessness and heart failure. Which part of his brain might have been damaged? Justify your answer.

Ans : **Medulla oblongata** has been damaged.

Reason : Medulla is the posterior most part of the brain where it merges with the spinal cord. It acts as a coordination pathway for both ascending and descending nerve tracts. Medulla is the centre for several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing, etc.

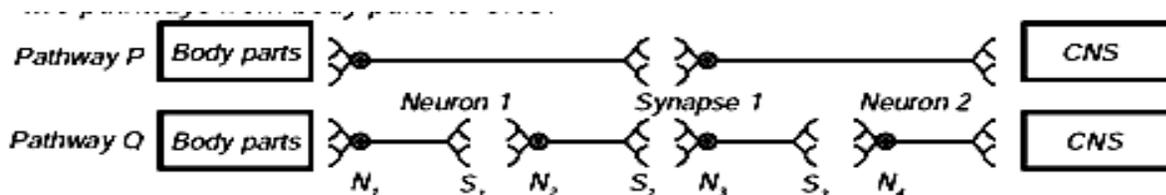
44. Match the following:

List I	List II
A. Vasopressin	I. Resist infection
B. Insulin	II. Diabetes insipidus
C. Oxytocin	III. Diabetes mellitus
D. Thymosin	IV. contraction and relaxation of uterus

Ans :

List I	List II
A. Vasopressin	I. Diabetes insipidus
B. Insulin	II. Diabetes mellitus
C. Oxytocin	III. Contraction and relaxation of uterus
D. Thymosin	IV. Resist infection

45. Observe the following diagrams that depict the transmission of nerve impulses through two pathways from body parts to CNS:



If all the nerves at both the places are similar in thickness and structure, through which pathway will the transmission of an impulse (of same threshold) be faster and why?

Ans : **Pathway P** transmits impulses faster than Pathway Q.

Because the transmission of impulses depends upon the number of synapse. As Pathway P has lesser number (one) of synapse, the transmission would be faster than Pathway Q which has 3 synapses.

46. Which gland is called the 'dual gland'? Why?

Ans : **Pancreas** is called as the dual gland.

Reason : Pancreas plays a dual role both as an **Exocrine (Produces enzyme)** and an **Endocrine gland (Produces Hormone)**.

47. A 16 year old boy was brought to a doctor with a complaint of non-masculine features (lack of moustache / beard / gruff voice / broadening of shoulders etc). After keen examination, the doctor found that it was a hormonal disorder and the endocrine glands responsible were not functioning properly. Mention the glands and the hormone lacking in the boy.

Ans :

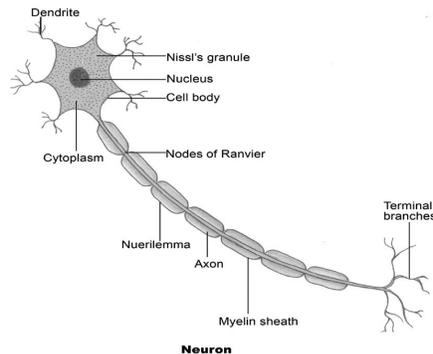
The endocrine gland is **Testes**

The hormone is **Testosterone**

PART - C

48. Describe the structure of a neuron with the help of a neat, labelled diagram,

Ans : **The structure of a neuron** :



Nerve cells or neurons are the structural and functional units of the nervous system. The Human Brain is made up of about 86 billion neurons and many more neuroglial cells (more than 86 billion). A nerve cell is a microscopic structure consisting of three major parts namely, cell body, dendrites and axon.

I. Cell body

The cell structure is irregular in shape or polyhedral. It is also called cyton. Cell body contains cytoplasm with typical cell organelles and certain granular bodies called Nissle's granules. Nissle's granules are a group of ribosomes for protein synthesis.

II. Dendrites

Dendrites or Dendrons are short fibres which branch repeatedly and protrude out of the cell body. Dendrites transmit electrical impulses towards the cyton.

III. Axon

One of the fibres arising from the cell body is very long with a branched distal end and it is called Axon. The distal branch of the axon terminates in bulb-like structures called synaptic knob filled with chemicals called neuro transmitters. The cytoplasm of the axon is known as axoplasm. The axon which is covered by a myelin sheath is formed of many layers of Schwann cells. The outermost layer of Schwann cells is called Neurilemma. The gaps left by the myelin sheath are called Nodes of Ranvier. Neurilemma is discontinuous at Nodes of Ranvier. The myelin sheath ensures rapid transmission of electric impulses.

49. List out the various parts of the human brain and write a note on their functions.

Ans : The brain is the central information processing organ and acts as the command and control system.

The human brain as in the case of other vertebrates, is divided into three major parts:

- a) Forebrain
- b) Midbrain
- c) Hindbrain

a. Forebrain

The forebrain consists of

1. Cerebrum,
2. Thalamus and
3. Hypothalamus.

Functions of Cerebrum

Cerebrum is the seat of consciousness, intelligence, memory, imagination and reasoning. It receives impulses from different parts of the body and initiates voluntary activities. Specific areas of cerebrum are associated with specific functions. Thus there is a respective centre for hearing, seeing, tasting, smelling, speaking and so on. A damage in a specific centre of the cerebrum will deprive the particular part from carrying out its functions.

Functions of Thalamus

The cerebrum wraps around a structure called thalamus – a major conducting centre for sensory and motor signaling.

Functions of Hypothalamus

It lies at the base of the thalamus. It controls body temperature, urge to eat and drink, the regulation of sexual behavior and expresses emotional reactions like excitement, anger, fear, pleasure and motivation.

b. Midbrain

The midbrain is located between the thalamus and the hindbrain. A canal called **cerebral aqueduct** passes through the midbrain. The dorsal portion of the midbrain consists of four hemispherical bodies called **corpora quadrigemina** which controls and regulates various visual reflexes and optical orientation.

c. Hindbrain

The hindbrain comprises

1. Cerebellum,
2. Pons and
3. Medulla oblongata.

Functions of Cerebellum

Cerebellum regulates and coordinates the group movements of voluntary muscles as in walking or running.

Functions of Pons

It is the bridge of nerve fibres that connects the lobes of the cerebellum. It relays the information from the cerebrum to the cerebellum. It also contains the sleep and respiratory centres.

Functions of Medulla oblongata

Medulla is the posterior most part of the brain where it merges with the spinal cord. It acts as a coordination pathway for both ascending and descending nerve tracts. Medulla is the centre for several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing, etc.

50. Name the endocrine glands and their location in the human body. Describe any two of them in detail.

Ans :Endocrine Glands and their location

No.	Endocrine Gland	Location
1.	Pituitary Gland	It is attached to the hypothalamus of the brain
2.	Pineal gland	It lies under the corpus callosum in the brain.
3.	Thyroid gland	It is located on the either side of larynx. (Neck)
4.	Parathyroid gland	These are found within the thyroid.
5.	Thymus gland	It is a lymphoid mass, present above the heart.
6.	Pancreas – Islets of Langerhans	In the abdomen, below the stomach.
7.	Adrenal gland	It is present on top of each kidney.
8.	Testes	They are contained in scrotal sac.
9.	Ovaries	They are present on either side of uterus.

I. The Islets of Langerhans

Pancreas plays a dual role both as an exocrine and an endocrine gland. The an endocrine portion is called **Islets of Langerhans**. It consists of two types of cells namely, alpha cells and beta cells. **Alpha cells** produce a hormone called **glucagon** and **Beta cells** produce **insulin**.

A. Insulin

1. It promotes the uptake of glucose by the cells for tissue oxidation.
2. It favours conversion of glucose into glycogen and its storage in the liver and the muscles.
3. It prevents the formation of glucose from protein and fat.

Diabetes Mellitus

Less production of insulin causes Diabetes mellitus, in which the excess, unused glucose is excreted in the urine.

B.Glucagon

1. It is secreted when the glucose level in the blood is low.
2. It influences conversion of glycogen into glucose, thus raising the blood glucose level.
3. A proper balance between insulin and glucagon is necessary to maintain proper blood glucose level of 80 – 120 mg / dl of blood.

II.Testes

They are both cytogenic (producing gametes) and endocrine (producing male sex hormones) in function. Leydig cells constitute the endocrine part of the testes. It secretes male sex hormone called *testosterone* (*androgen*).

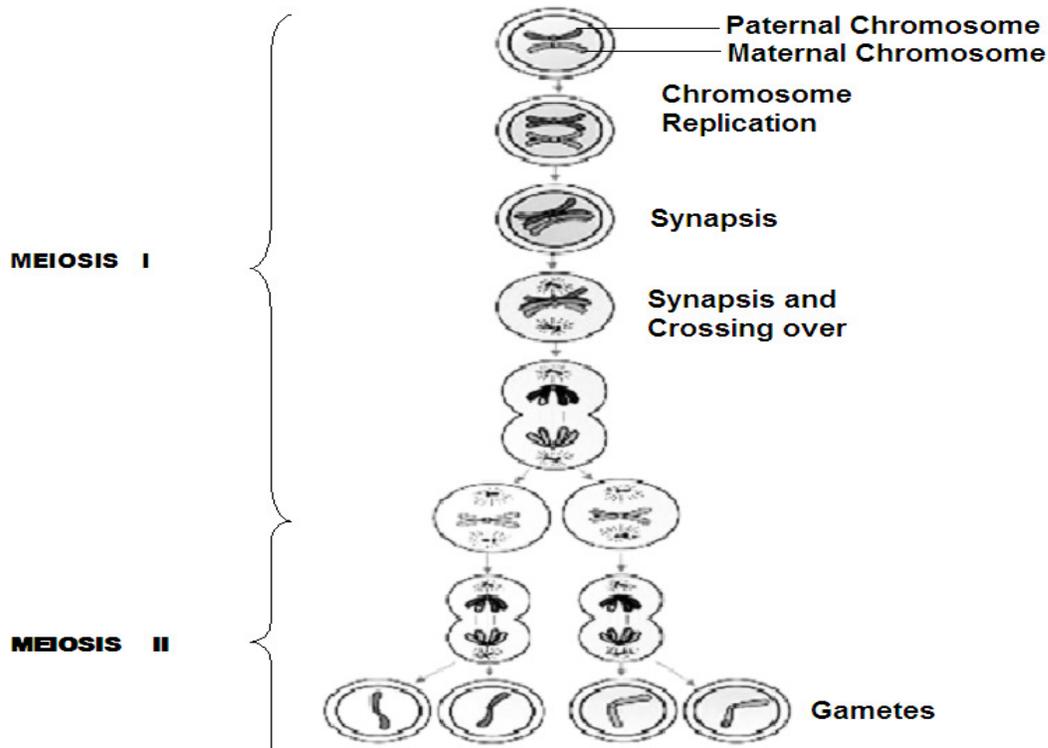
Functions of testosterone (androgen).

1. Testosterone stimulates the growth of reproductive organs and the production of male gametes- the sperm.
2. Testosterone determines the secondary sexual characters in male, such as growth of facial hair, hoarse voice, broadening of shoulder, etc.

51. Why is meiosis called reduction division? Describe the various stages with relevant diagrams. Add a note on significance of meiosis.

Ans : I. **Meiosis** is called **reduction division** because it reduces the number of chromosomes from 46 chromosomes or 2n(**Diploid**) to 23 chromosomes or n (**Haploid** or single chromosome set).

II.Various Stages of Meiosis :Meiosis is completed in two successive divisions – **Meiosis-I** and **Meiosis-II**.



Meiosis – I The various events of Meiosis-I are studied under **four sub-stages** namely

- Prophase-I,
- Metaphase-I,
- Anaphase-I and
- Telophase-I.

Prophase I this stage is studied under **five sub-divisions** as

1.Leptotene : The chromosomes condense and appear like threads. Each chromosome splits up longitudinally, except at the centromere.

2.Zygotene: The homologous chromosomes come closer and start **pairing**. The pairing starts from the tip or from the middle and they get attached laterally throughout the length. This pairing is called **Synapsis** and the paired chromosomes are called **Bivalents**.

3.Pachytene: The paired chromosomes become shorter and thicker. Each bivalent appears to have four chromatids called **tetrads** or **quadrivalents**. The point of contact between the homologous pair of chromosomes is called **Chiasmata**. At the point of chiasmata, exchange of chromosomal segment takes place, between the non-sister chromatids of the homologous pairs. This exchange of segments of chromatids between homologous chromosomes is called **crossing over**.

4.Diplotene : After the crossing over is completed, the homologous chromosomes separate and this separation is called **terminalization**. Terminalization may begin in chiasmata and move to the terminal end of the chromosomes.

5.Diakinesis The nuclear membrane and the nucleolus disappear. The spindle apparatus is formed in the cytoplasm.

Metaphase – I The chromosomes get condensed. Bivalents now appear on the equator of the spindle with their chromatids pointing towards the equatorial plate and the centromere pointing towards the poles.

Anaphase – I The spindle fibres contract pulling the chromosomes towards the opposite poles. The entire chromosome, with two chromatids move to the opposite poles. This involves a reduction in the number of chromosomes. Now two groups of chromosomes are produced, one at each pole with half the number of chromosomes.

Telophase – I At the poles, around the group of chromosomes, a nuclear membrane develops. Thus two daughter nuclei each with half the number of chromosomes, are formed at the poles. The spindle fibres disappear. At the end of Meiosis-I at right angle to the position of the nuclei, the cytoplasmic constriction takes place leading to the division of the cell. The cytoplasmic division is called Cytokinesis.

Meiosis - II

Meiosis-II is similar to Mitosis and so it is called Meiotic Mitosis. The events of Meiosis-II are studied in four sub-divisions as: Prophase-II, Metaphase-II, Anaphase-II and Telophase-II.

Prophase - II

The bivalent chromosomes get shortened. The centrioles form asters and move to the poles. The nucleolus and the nuclear membrane disappear.

Metaphase - II

Chromatids arrange themselves in the equator of the cell. The centromeres are attached to the spindle fibres.

Anaphase - II

The centromere divides into two and the two chromatids separate and now, they are called daughter chromosomes or new chromosomes. The daughter chromosomes move towards the opposite poles.

Telophase - II

The haploid set at the two poles coil to form chromatin material. The nuclear membrane and the nucleolus reappear. Thus two daughter nuclei are formed.

Cytokinesis

The cytoplasmic division takes place at right angles to the position of the nuclei, resulting in the formation of four gametes.

III. Significance of Meiosis

1. Haploid sex cells are produced in order to maintain constancy in the number of chromosomes of a species.
2. Crossing over results in variation of genetic traits in the offspring.
3. Variations form the raw material for evolution.

52. Use words from the given list to complete the following paragraph. (The words may be used once/ more than once / not at all).

(Skull, Vertebral column, Pia mater, Arachnoid membrane, Brain, Spinal cord, Meninges, Duramater)

The central nervous system is covered by three protective coverings collectively called _____. The outermost cover lying below the _____ and _____ is double thick and is called _____. The middle covering is thin and vascularised and is called _____. The innermost cover is a very thin delicate membrane and is closely stretched over the outer surface of _____ and _____ and is called _____.

Ans :

The central nervous system is covered by three protective coverings collectively called **Meninges**. The outermost cover lying below the **Skull** and **Vertebral column** is double thick and is called **Duramater**. The middle covering is thin and vascularised and is called **Arachnoid membrane**. The innermost cover is a very thin delicate membrane and is closely stretched over the outer surface of **Brain** and **Spinal cord** and is called **Pia mater**.

53. Match these parts with their functions:-

(medulla oblongata, cerebellum, forebrain, thalamus, cerebral cortex, hind brain, pons, hypothalamus)

- Sleep centre and respiratory centre
- Several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.
- Consists of cerebrum, thalamus and hypothalamus
- Motor and sensory areas
- A major conducting centre for sensory and motor signalling
- Regulation of sexual behaviour
- Consists of pons, cerebellum and medulla oblongata
- Co-ordinates the group movements of voluntary muscles, as in walking or running

Ans : a) Sleep centre and respiratory centre - **Pons**

b) Several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc. -

Medulla oblongata

c) Consists of cerebrum, thalamus and hypothalamus - **Forebrain**

d) Motor and sensory areas - **Cerebral cortex**

e) A major conducting centre for sensory and motor signaling - **Thalamus**

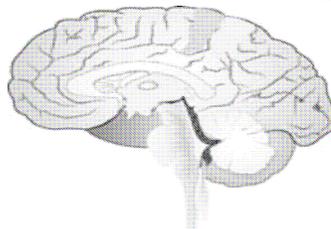
f) Regulation of sexual behavior - **Hypothalamus**

g) Consists of pons, cerebellum and medulla oblongata - **Hind brain**

h) Co-ordinates the group movements of voluntary muscles, as in walking or running - **Cerebellum**

54. Observe the diagram of the human brain and identify the areas mentioned:

- The area responsible for consciousness, intelligence, memory, imagination and reasoning.
- The area responsible for regulation and co-ordination of group movements of voluntary muscles.
- The area responsible for sleeping and respiration.
- The area responsible for reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.



Ans : i) The area responsible for consciousness, intelligence, memory, imagination and reasoning.-

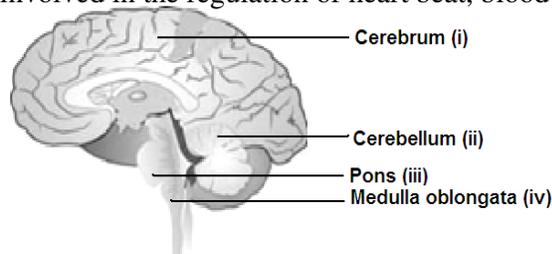
Cerebrum

ii) The area responsible for regulation and co-ordination of group movements of voluntary muscles.-

Cerebellum

iii) The area responsible for sleeping and respiration. - **Pons**

iv) The area responsible for reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc. – **Medulla oblongata**



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X Std Biology

CHAPTER 7 CONSERVATION OF ENVIRONMENT

Blue print – 1 X 1 = 1, 1 x 2 = 2 and 1 x 5 = 5 Total Marks 8

PART - A

1. Which of the following groups contain only bio-degradable items?

- i) Grass, flowers and leaves ii) Grass, wood and plastic iii) Fruit peels, cake and plastic iv) Cake, wood and glass

Ans: i) Grass, flowers and leaves

2. Which of the following constitutes a food chain?

- i) Grass, wheat and mango ii) Grass, goat and human iii) Goat, cow and elephant iv) Grass, fish and goat

Ans: ii) Grass, goat and human

3. Which of the following are environmental friendly practices?

- i) Carrying cloth bags for shopping ii) Switching off light and fans when not in use
iii) Using public transport iv) All the above

Ans: iv) All the above

4. What is called as 'black gold'?

- i) hydrocarbons ii) coal iii) petroleum iv) ether

Ans: iii) petroleum

5. Based on the food chain, pick the odd one out:

plants → grasshopper → frog → tiger → snake

Ans: tiger

6. Example for product of green chemistry is _____.

- i) plastic ii) paper iii) bio plastics iv) halogen flame retardants

Ans: iii) bio plastics

7. _____ is a green house gas which causes climate change and global warming.

- i) hydrogen ii) oxygen iii) nitrogen iv) carbondioxide

Ans: iv) carbondioxide

8. The _____ form decomposers in the pond ecosystem.

- i) plants ii) bacteria iii) frogs iv) phytoplanktons

Ans: ii) bacteria

9. _____ is used in seeding clouds.

- i) potassium iodide ii) calcium carbonate iii) sulphurdioxide iv) ammonium phosphate

Ans: i) potassium iodide

10. An example for fossil fuel is _____.

- i) copper ii) iron iii) magnesium iv) coal

Ans: iv) coal

11. Air pollution is caused by transport exhaust fumes and emission of gases like SO₂, CO₂, NO₂ from industries. Similarly, water pollution is caused by _____.

- i) sewage ii) crop cultivation iii) rain iv) soil erosion

Ans: i) sewage

12. If wild animals are killed, what difficulty would we face?

- i) imbalance in nature ii) decrease in fog rain iii) decrease in population iv) increase in rain

Ans: i) imbalance in nature

13. Water is an essential commodity for survival. What can we do to help increase water resources?

- i) deforestation ii) reducing the use of vehicles iii) the burning of the wastage iv) afforestation

Ans: iv) afforestation

14. The tiger and the lion are carnivores. Likewise the elephant and the bison are _____.

Ans: Herbivores

15. Assertion (A) : Coal and petroleum are called fossil fuels.

Reason (R) : Fossil fuels are formed from the remains of dead organisms after millions of years.

- i) Both 'A' and 'R' are true and 'R' explains 'A'. ii) Both 'A' and 'R' are true and but 'R' doesn't explain 'A'
iii) Only 'A' is true but 'R' is false. iv) 'A' is false but 'R' is true.

Ans: i) Both 'A' and 'R' are true and 'R' explains 'A'.

16. Compressed Natural Gas (CNG) is considered a better fuel than coal/ petroleum, because _____.

Ans: CNG causes less damage to the environment.

17. Now-a-days water bottles and lunch boxes are made from agricultural products like fruit pulp. These are called _____.

Ans: Bio-plastic

PART - B

18. Classify the following into producers, consumers, decomposers.

i) butterfly ii). grass hopper iii) calottes iv) snakes v). shoe flower vi) nitrobacteria

Ans:

Producers	Shoe flower
Consumers	Butterfly , Grasshopper, Calottes and Snakes
Decomposers	Nitrobacteria

19. Living organisms adapt themselves according to their habitat.

Match the following:-

a.	fish	wings
b.	camel	hind limbs with web
c.	frog	fins
d.	birds	hard skin

Ans:

a.	fish	fins
b.	camel	hard skin
c.	frog	hind limbs with web
d.	birds	wings

20. Fill in the blanks

i) Animals give out _____ through respiration.

ii) In the presence of sunlight, plants prepare _____.

Ans: i. Carbon-dioxide ii. Carbohydrate

21. Bacteria and fungi are responsible for the decay of dead plants and animals. Decaying matter is recycled to grow plants. What do we call this?

Ans: Bio-Geo Chemical cycle

22. Fill in the blanks with suitable answers from those given in the brackets.

(harmful, heavy metals, carbon dioxide, sulphur particles)

Generation of waste products which contain Mercury, Uranium, Thorium, Arsenic, and other _____ are _____ to human health and environment. _____ present in the coal will cause acid rain and the release of _____, a green house gas, causes climate change and global warming.

Ans: Generation of waste products which contain Mercury, Uranium, Thorium, Arsenic, and other **heavy metals** are **harmful** to human health and environment. **Sulphur particles** present in the coal will cause acid rain and the release of **carbon dioxide**, a green house gas, causes climate change and global warming.

23. Depict a food chain by placing the following organisms in the correct trophic levels:

(snake, grass, eagle, frog, grasshopper)

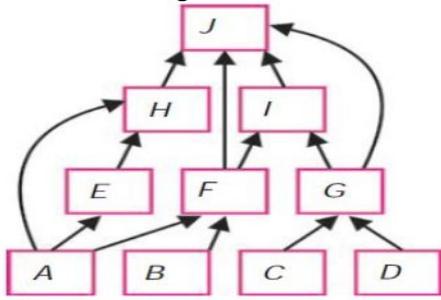
Ans: Grass → Grasshopper → Frog → Snake → Eagle
 T₁ T₂ T₃ T₄ T₅

24. Show an aquatic food chain using the following organisms.

(Small fish, Phytoplanktons, Kingfisher, Zooplanktons)

Ans: Phytoplanktons → Zooplanktons → Small fish → Kingfisher

25. Observe the following food web:



(i) Find out the wrong statement:

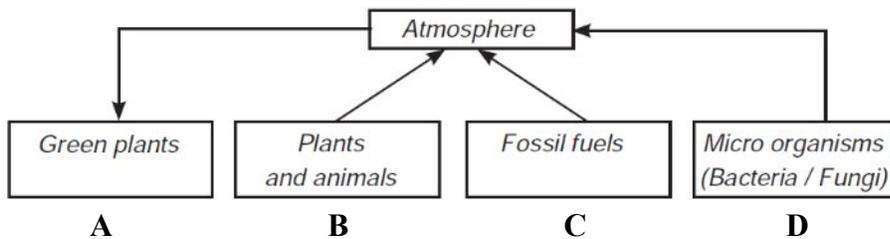
a) 'A' is a producer b) 'F' is a herbivore c) 'H' is an omnivore d) 'I' is a climax carnivore

(ii) Find out how many food chains are present in the above food web.

Ans: i. d) 'I' is a climax carnivore

ii. Total number of food chains are present in the above food web is **10**

26. Observe the following Bio-geo chemical cycle.



i) Mention the nutrient in the given cycle.

ii) Write the activities from 'A' to 'D'.

Ans: i. The nutrient in the given cycle is **Carbon**.

- ii. A - Photosynthesis
- B - Respiration
- C - Combustion
- D - Decomposition

27. Study the food chain below, correct it and convert it into a pyramid of energy.

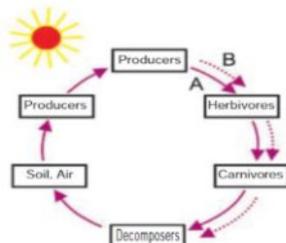
Mulberry → Sparrow → Caterpillar → Kite

Ans: Mulberry → Caterpillar → Sparrow → Kite



28. Study the illustration and answer the questions:

i) Which line (A or B) represents the flow of energy? Why do you say so? ii) Give an example of a decomposer.



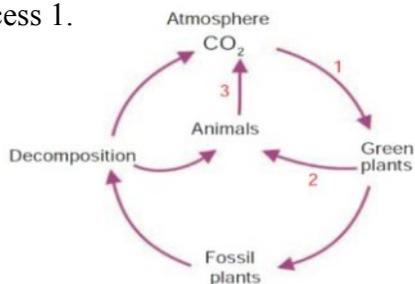
Ans: i. Line B represents the flow of energy because energy flows in one direction only as follows

Producers → Herbivores → Carnivores → Decomposers

ii. **Bacteria and Fungi** are examples for decomposer

29. i) Name the processes noted as No. 1 and 3.

ii) Define process 1.



Ans: i. No.1. Photosynthesis and
3. Respiration

ii. **Photosynthesis**

The conversion of carbon-dioxide and water into carbohydrates in the presence of light and chlorophyll is known as photosynthesis.

PART - C

30. i) Classify the following substances – wood, paper, plastic and grass.

ii) Give a detailed account of your classification.

Ans:

BIODEGRADABLE	NON-BIODEGRADABLE
Wood , Paper and Grasses	Plastic
Because substances that are broken down by biological process of biological or microbial action are called bio-degradable waste.	Because substances that are not broken down by biological or microbial action are called non-bio-degradable wastes.

31. In your locality people are affected due to water scarcity. What measures will you take to deal with the problem of water scarcity?

Ans: i) Seeding clouds

Seeding clouds with dry ice or potassium iodide particles sometimes can initiate rain, if water laden clouds and conditions that favour precipitation are present.

ii) Desalination: (Reverse osmosis)

Desalination of ocean water is a technology that has a great potential for increasing the supply of fresh water. Desalination is more expensive than most other methods of obtaining fresh water. In desalination, the common methods of evaporation and re-condensation are involved.

iii) Dams, Reservoirs and Canals

Dams and storage reservoirs trap run-off water in them and transfer the water from areas of excess to areas of deficit using canals and underground pipes.

iv) Water Shed Management

The management of rain water and the resultant run-off is called water shed management. Water shed is an area characterized by construction of small dams to hold back water which will provide useful wildlife habitat and stock watering facilities.

v) Rain Water Harvesting

Rain water harvesting essentially means collecting rain water from the roof of buildings or courtyards and storing it underground for later use. The main idea in harvesting rain water is to check the run-off water. The rain water that falls on the roofs of buildings or in courtyards is collected through pipes and stored in underground tanks of the buildings fitted with motor for drawing the water for use. The process of rain water harvesting is not only simple but also economically beneficial. It helps in meeting the increased demand for water, particularly in urban areas and prevent flooding of living areas.

vi) Wetland Conservation

It preserves natural water storage and acts as aquifer recharge zones.

vii) Domestic Conservation

As an individual, everyone can reduce the water loss by using a bucket of water than by taking a shower, using low-flow taps, using recycled water for lawns, home gardens, vehicle washing and using water conserving appliances.

viii) Industrial Conservation

Cooling water can be recharged and waste water can be treated and reused.

32. We are surrounded by smoke. Is this situation good for our health. Give reason.

Ans: No, this situation is not good for our health.

Reason: 1.A large number of hazardous air pollutants are present in smoke. Air pollutants that are inhaled have serious impact on human health affecting the lungs and the respiratory system.

2.Smoke causes health problems including respiratory infections, heart disease, stroke and lung cancer.

3.Smoke leads to difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions.

4.Smoke causes allergy and irritation to the eyes, nose and throat, and upper respiratory infections such as bronchitis and pneumonia.

33. List out the harmful effects of burning coal.

Ans: Harmful effects of burning coal

1. Generation of waste products which contain mercury, uranium, thorium, arsenic and other heavy metals, which are harmful to human health and environment.

2. Sulphur particles present in the coal causes acid rain.

3. Interference with ground water and water table levels.

4. Contamination of land and water bodies.

5. Dust pollution.

6. Release of CO₂, a green house gas, causing climate change and global warming.

7. Coal is the largest contributor to the man-made increase of CO₂ in the air.

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X STD BIOLOGY - QUARTERLY QUESTION BANK 2015-16**CHAPTER - 1 HEREDITY & EVOLUTION****BLUEPRINT : 1 X 1 = 1 AND 3 X 2 = 6 TOTAL MARKS 7****PART - A****I. CHOOSE THE CORRECT ANSWER**

- Mendel observed 7 pairs of contrasting characters in *Pisum sativum*. Which one of the following is not a part of that?
 - Tall and dwarf
 - Yellow and green seed colour
 - Terminal and axial flower
 - Smooth and rough stem
- Primitive man evolved in _____.
 - Africa
 - America
 - Australia
 - India
- Which of the following is inheritable?
 - an altered gene in sperm
 - an altered gene in liver cells
 - an altered gene in skin cells
 - an altered gene in udder cells
- The theory of Natural Selection was proposed by _____.
 - Charles Darwin
 - Hugo de Vries
 - Gregor Johann Mendel
 - Jean Baptise Lamarck
- Somatic gene therapy causes _____.
 - changes in sperm
 - changes in progeny
 - changes in body cell
 - changes in ovum
- In a pea plant, the yellow colour of the seed dominates over the green colour. The genetic make up of the green colour of the seed can be shown as _____.
 - GG
 - Gg
 - Yy
 - yy
- Some people can roll their tongue and this is a genetically controlled auto-somal dominant character. [Roller = RR / Rr; Non-roller = rr] A child who can roll the tongue has one brother who is a non-roller and two sisters who are rollers. If both the parents are rollers, the genotypes of their parents would be _____.
 - RR x RR
 - Rr x Rr
 - RR x rr
 - rr x rr
- Hydra, a multi-cellular invertebrate of phylum cnidaria (coelenterata) can give rise to new offspring by various methods. Choose the method by which the offspring are produced with significant variations.
 - budding
 - regeneration
 - sexual reproduction
 - asexual reproduction
- The following are the events in the formation of the first cloned animal – the sheep Dolly.
 - Removal of haploid nucleus from the ovum.
 - Implantation of ovum with diploid nucleus into the surrogate mother.
 - Collection of udder cell from the sheep.
 - Injection of diploid nucleus of udder cell into the enucleated ovum.
 - Development of a young clone.
 The correct sequential order of these events is _____.
 - abcde
 - cabed
 - cadbe
 - edcba
- The following are statements about stem cells:
 - There are unspecialised / undifferentiated cells.
 - They can be transformed into any type of body cell.
 - They can multiply rapidly to form a large number of similar types of cells.
 - They cannot transform into cardiac cells or nerve cells.
 - They are obtained from reproductive progeny only.
 The correct statements are _____.
 - a,b,c only
 - c,d,e only
 - a,c,e only
 - b,c,e only
- In persons suffering from insulin-dependent diabetes, the cells of pancreas are degenerated.
 - Alpha
 - Beta
 - Gamma
 - Delta
- Identical twins are born as a result of fertilization between _____.
 - two eggs and two sperms
 - two eggs and one sperm
 - one egg and one sperm
 - one egg and two sperms
- Identify the incorrect statement about identical twins.
 - developed from a single zygote
 - always of the same sex
 - look alike in many aspects
 - differ in their blood groups
- The correct statement about Neanderthal man is:
 - the first human like hominid
 - started agriculture
 - ate meat and walked erectly
 - buried the dead
- The inheritance of characteristics through generation is called “heredity”. In Mendel's *Pisum sativum* plant, the genetic material present is _____.
 - DNA
 - RNA
 - Protein
 - Cytoplasm

PART - B

- Mendel has observed Tallness as a dominant character in the garden pea plant. Similarly, tongue rolling is a dominant character in man. In a group of 60 students, 45 can roll their tongue and 15 are non-rollers.
 - In the above context, calculate the percentage of dominant and recessive characters.
- The inheritable characters vary in different species and within the same species. Name the variation in the following cases.
 - The eye colour among the human beings are varied as blue, black, brown, green, etc. This is called as _____ variation.
 - The dentition in the rabbit and the elephant are not the same. This is called as _____ variation.
- Sexually reproducing organisms produce offspring with marked, significant and visible variation. Asexually reproducing offspring show minor variations.
 - Do you agree with the above statements?
 - Among the following organisms point out the asexually reproducing organism. (Cockroach, Euglena, Earthworm and Bird)

19. Here are certain important hereditary jargons. Fill in the blanks by choosing a suitable one from the list given. (allele, variation, speciation, gene, allelomorphs)

i) _____ are the factors which form the physical basis of inheritance.

ii) _____ is the alternate forms of the same gene.

iii) _____ are the expressions of contrasting pair of alleles.

20. A change that affects the body cell is not inherited. However, a change in the gamete is inherited. The effects of radiation at Hiroshima have been affecting generations. Analyze the above statements and give your interpretation.

21. Sequentially arrange the different species of man from primitive to modern man.

(Neanderthal man, Homo habilis, Homo erectus, Homo sapiens)

22. Bio-technology, the modern science in biology, has helped in producing different types of products. One of the following groups does not have a product of bio-technology. Pick out and give reasons.

i) enzymes, organic acids, steroids, vaccines ii) vaccines, enzymes, antibiotics, inorganic acids

iii) antibiotics, hormones, steroids, vaccines iv) steroids, enzymes, antibodies, vaccines.

23. What do you mean by phenotype and genotype of an individual? Explain.

24. What are variations? Mention their types.

25. Who proposed the theory of Natural Selection? Mention the two principles of this theory.

26. What are monoclonal antibodies? Mention its use.

27. What is a clone? In what way is the cloning technique useful in the field of veterinary science?

28. In dogs, the barking trait is dominant over the silent trait. Using Punnett Square, work out the possible puppies born to two barking parents with genotype (Rr).

29. In Dr. Ian Wilmut's cloning experiment, did the new born 'Dolly' resemble the udder cell donor Dorset white sheep or the surrogate mother sheep? Give reasons.

30. The excessive use of pesticides has only resulted in the occurrence of more resistant varieties of pests rather than their complete eradication. How can you link this with Darwin's theory of Natural Selection and Evolution?

31. The first clinical gene therapy was given in 1990 to a four year old girl suffering from Adenosine Deaminase Deficiency (ADA). Could you suggest a possible cure for such a disorder with the knowledge of gene therapy and its types?

32. Find the unmatched pairs:

Nif genes -Nitrogen Fixation

tt -Alleles

Bio-chips -Biological computer manufacturing

Interferon -Antiproteins of Bacteria

Stem cells -Unspecialised mass of cells

33. For the experimental research Dr. Ian Wilmut used the nucleus of the udder cell from a six year old Finn Dorset white sheep and preserved the diploid nucleus (2n). He took an ovum from the ovary of another sheep. The haploid ovum was removed. The diploid nucleus of the udder cell was injected into the cytoplasm of the enucleated ovum. Then the diploid nucleus ovum was implanted into the uterus of the surrogate mother sheep. The diploid ovum developed into a young one, named "Dolly".

i) Why did Wilmut select the udder cell? ii) Define the terms haploid and diploid.

34. Match the following by identifying the pair :

(medicines, fuel, microbes, metabolism, organic acids)

i) vaccine ii) natural gas iii) citric acid iv) monoclonal antibodies v) vitamins

35. Mention the dominant and recessive traits observed by Mendel in the garden pea plant with respect to the seed and flower.

36. Name the different species of mankind in chronological order from primitive to modern man.

37. i. When were the primitive caves developed? ii. Name cholesterol containing steroid obtained from bread mould.

38. Narrate the life led by early man like hominids.

39. Find out who I am?

i) I am an acid used as a preservative and I have a sour taste. ii) I am organic and present in citrus fruits and I give immunity.

40. Find out who I am?

i) I am an enzyme and I cut DNA at specific sites. ii) I am the paste enzyme that joins segments of DNA.

41. State whether true or false. Correct the statements that are false.

i) Variations give the organisms an individuality of their own. ii) Charles Darwin postulated the use and disuse theory.

42. State whether **true or false**. Correct the statements that are false.

i) To understand evolution, a branching diagram or a tree diagram is used to show the inferred evolution and the relationship among various biological species.

ii) Genetic engineering is the modification of the genetic information of living organisms by manipulation of DNA by adding, removing or repairing part of the DNA and changing the phenotype.

43. Define evolution.

44. What are the uses of Bio-Sensor in medical field?

45. Match the following.

- | | |
|--------------------------|-------------------------|
| i. Gregor Johann Mendel | - Cloning |
| ii. Jean Baptise Lamarck | - Vaccine |
| iii. Edward Jenner | - Natural Selection |
| iv. Charles Darwin | - Genetics |
| v. Ian Wilmut | - Use and Disuse theory |

Chapter 2 – IMMUNE SYSTEM**Blue print – 1 X 1 = 1, 1 x 2 = 2 and 1 x 5 = 5 Total Marks 8****PART – A****I. CHOOSE THE CORRECT ANSWER**

- Pick out a case of healthy state of an individual.
 - Mr. X is recovering from an infectious disease.
 - Mr. Y takes insulin injection every day.
 - Mrs. Z is very depressed.
 - Mr. K does his duty and spends time joyfully.
- Which one of the following is not socially balanced ?
 - He enjoys a birthday party.
 - He behaves rudely over trivial matters.
 - He adjusts well to the surrounding situation.
 - He attends to his ailing mother at the hospital.
- _____ is a bacterial disease.
 - Meningitis
 - Rabies
 - Tetanus
 - Small pox
- One of the following is transmitted through air. Find it out.
 - Tuberculosis
 - Meningitis
 - Typhoid
 - Cholera
- The most serious form of malaria is caused by Plasmodium _____.
 - ovale
 - malariae
 - falciparum
 - vivax
- An example of protozoan infecting our intestine is _____.
 - Plasmodium vivax
 - Entamoeba histolytica
 - Trypanosoma gambiense
 - Taenia solium
- One of the means of indirect transmission of a disease is _____.
 - sneezing
 - coughing
 - through placenta
 - using utensils of patients
- When antibodies, extracted from other animals are injected into your body, what kind of immunity do you gain?
 - Artificially active acquired immunity
 - Artificially passive acquired immunity
 - Naturally active acquired immunity
 - Naturally passive acquired immunity
- The first vaccine injected into a just born baby is _____.
 - Oral polio
 - DPT
 - DPT and Oral polio
 - BCG
- In order to lead a healthy life, a person should enjoy physical, mental and social well-being. If a person lacks any one of them, then that person is suffering from _____.
 - Kwashiorkar
 - Nyctalopia
 - Diabetes
 - Down syndrome
- Assertion (A) Expulsion of excess unused glucose in the blood through urine is observed in a diabetic mellitus person.
Reason (R) : insulin is not produced in sufficient quantity by pancreas.
 - Both 'A' and 'R' are true and 'R' explains 'A'.
 - Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
 - Only 'A' is true but 'R' is false.
 - A is false but 'R' is true.

PART - B

- Marasmus and Kwashiorkar are both protein deficiency defects. Marasmus differs from Kwashiorkar in enlarged belly and swelling in the face. Are these symptoms for the above diseases correct? If not, correct it.
- A list of disorders is given below. Pick out the odd one out and give reasons.
(Thalassemia, haemophilia, night blindness, albinism, sickle cell anaemia)
- What are the symptoms of common cold?
 - _____
 - _____
- Differentiate between the diseases-night blindness and colour blindness.
- After observing dark patches with itching sensation on the skin of a student in a school hostel, the warden advises his roommates not to share towels, clothes and combs among themselves. Name the disease the student is suffering from and name the causative organisms.

6. Name the vector host of the malarial parasite. Mention the species of malarial parasite which causes malignant and fatal malaria.
7. Name the tests done for the diagnosis and confirmation of AIDS.
8. What is triple antigen? Name the three diseases which, can be prevented by using it.
9. Mention the type of immunity acquired by a baby through breast-feeding.
10. Study the following statements and state whether they are true or false.
- Colour blindness is a genetic disorder, whereas night blindness is a nutritional disorder.
 - Pernicious anaemia is a nutritional deficiency disease, whereas sickle cell anaemia is a genetic disease / disorder.
 - Administering TT injection to an injured child is related to passive artificial immunity, whereas giving BCG vaccine is active artificial immunity.
 - Malaria is a bacterial disease, whereas ring worm is a viral disease.
11. Ramya is suffering from bleeding gums and loosening teeth. On diagnosis, it was found to have been caused by vitamin deficiency. Tell Ramya the vitamin that is lacking in her food and the name of deficiency disease she is suffering from.

(A) Vitamins (B) Deficiency diseases (C) Symptoms are given. Match B and C with A:

A	B	C
Vitamins	Deficiency diseases	Symptoms
Vitamin A	Nyctalopia	Night Blindness
Vitamin B ₁	Scurvy	Nervous disorder
Vitamin C	Rickets	Bleeding gums
Vitamin D	Haemorrhage	Defective calcification of bones
Vitamin K	Beri-beri	Profuse loss of blood

12. A health worker advises the people in a locality not to have tattooing done using common needles and to insist the barber to change the shaving razors/ blades in the salon. Name the dreadful disease, the spreading of which, can be prevented by following these measures. Also mention other preventive measures that can be taken with regard to this disease.

13. Match the following:

List I (Disease)	List II (Symptoms)
A. Amoebiasis	I) Chills and high fever recurring for 3 to 4 days
B. Tuberculosis	II) Patches on skin and nails with itching sensation
C. Ringworm	III) Abdominal pain with blood and mucus in stools
D. Malaria	IV) Persistent cough and loss of body weight

14. List out the diseases based on their mode of transmission (water borne, air borne, sexual contact)

- i) cholera ii) typhoid iii) tuberculosis iv) leprosy v) syphilis vi) gonorrhoea vii) pneumonia viii) common cold ix) amoebic dysentery x) AIDS

15.i) Give any three examples for the most infectious diseases in man and their causative agents.

ii) To discover medicine for viral infected diseases like AIDS is more difficult than other diseases. Is the statement true or false? Discuss.

16. A student had an attack of measles and recovered from the infection. His science teacher said that he will not get that disease again in his life time. Is it true? Why?

17. Name the causative organisms responsible for ring worm in humans? Mention the symptoms of the infection.

18. Pick out the odd ones:

i) AIDS : Retro virus, lymphocytes, BCG, ELISA

ii) Bacterial disease : Rabies, cholera, common cold, influenza

iii) DPT vaccine : Diphtheria, tuberculosis, pertussis, tetanus

iv) Infective stage of Plasmodium in humans : Sporozoites, merozoites, trophozoites, gametocytes.

v) Mental dimension : brightness of skin, normal metabolism, no black rings around eyes, knows his capacity.

19. In the manufacturing of anti-venom injection against snake bite, antibodies produced in the horse are being used. Mention the type of immunity involved.

20. Say whether each of the following diseases is a metabolic disorder, a genetic disorder or a nutritional deficiency disease.

- i) thalassemia ii) beriberi iii) diabetes mellitus iv) bubble boy syndrome v) scurvy vi) marasmus vii) obesity viii) Alzheimer's disease ix) nyctalopia x) haemophilia

21. Find the correct statement (True / False) :

- i) Tuberculosis is caused by Mycobacterium tuberculosis bacteria.
 ii) Typhoid is caused by Trichophyton fungi.
 iii) Malaria is caused by Plasmodium vivax.
 iv) Influenza is caused by Entamoeba histolytica protozoan.

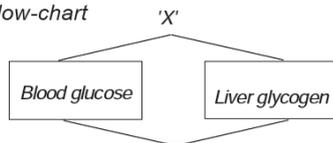
22. Malarial fever is not caused in a person immediately after introducing the sporozoites by an infected anopheles mosquito. Why?

23. Name the stages of Plasmodium.

- i) Introduced by an infected Anopheles mosquito.
 ii) Picked up by Anopheles mosquito from an infected human being.

24. Name two diseases that are transmitted by houseflies. Mention their causative pathogens.

25. Observe the following flow-chart



Mention the metabolic disorder 'X' and the causative factor from the options given below:

Disorder	Factors
a) Diabetes insipidus	Deficiency of ADH hormone
b) Diabetes mellitus	Deficiency of insulin hormone
c) Coronary heart disease	Blockage of arteries supplying blood to heart muscles
d) Renal failure	Failure of nephrons to filter the blood

PART - C

1. Kala has delivered a baby,

i) Suggest the immunization schedule for the baby, in the first six months.

ii) What are the diseases that can be cured as per the schedule?

2. There is a widespread outbreak of malaria in your area.

i) Suggest some controlling measures to the local authorities concerned.

ii) Pick out the right symptom for malaria. (chills, shivering and a rise in temperature / diarrhoea)

3. 15th October is observed as 'Handwashing Day'

i) Tell your friend the effects of hand washing.

ii) How frequently do you wash your hands everyday and when?

4. What is immunity? Write a note on the various types of immunity.

5. Describe the life-cycle of plasmodium in man.

6. List out the various diseases caused due to nutritional deficiency. Add a note on their symptoms.

CHAPTER – 3 STRUCTURE AND FUNCTIONS OF HUMAN BODY

Blue print – 1 X 1 = 1, 1 x 2 = 2 and 1 x 5 = 5 Total Marks 8

PART - A

1. Unipolar neurons are found in the _____.

- i) Brain ii) Spinal Cord iii) Embryonic nervous tissue iv) Adult nervous tissue

2. The sensory organs contain _____.

- i) Unipolar neuron ii) Bipolar neuron iii) Multipolar neuron iv) Medullated neuron

3. The part of brain which controls emotional reactions in our body is _____.

- i) Cerebellum ii) Cerebrum iii) Thalamus iv) Hypothalamus

4. One of the following is a part of the brain stem. Pick it out.

- i) Forebrain and midbrain ii) Midbrain and hindbrain iii) Forebrain and hindbrain iv) Forebrain and spinal cord

5. Spinal nerves are _____.

- i) sensory nerves ii) motor nerves iii) mixed nerves iv) innervating the brain

6. An endocrine gland found in the neck is _____.

- i) adrenal gland ii) pituitary gland iii) thyroid gland iv) pancreas

7. An endocrine gland which is both exocrine and endocrine is the _____.

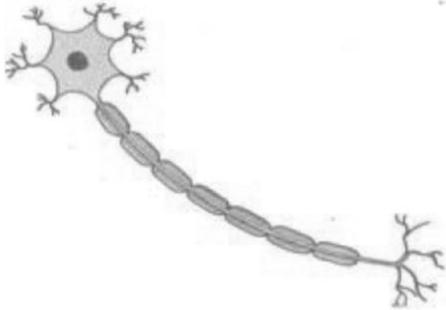
- i) pancreas ii) pituitary iii) thyroid iv) adrenal

8. Normal blood glucose level in 1dl of blood is _____.
- i) 80-100 mg/dl ii) 80-120 mg/dl iii) 80-150 mg/dl iv) 70-120 mg/dl
9. The "T" lymphocytes are differentiated to resist infection in the _____.
- i) parathyroid gland ii) lymph gland iii) thymus gland iv) adrenal gland
10. In Meiosis-I, the pairing of homologous chromosomes take place during _____ stage.
- i) leptotene ii) zygotene iii) pachytene iv) diplotene
11. The two systems of the human body which help in the control and co-ordination of metabolic activities are _____.
- i) digestive and circulatory ii) respiratory and circulatory iii) excretory and skeletal iv) nervous and endocrine
12. Neurotransmitters are released at the synapse by _____.
- i) Tips of Dendrites ii) Synaptic Knobs iii) Organelles of Cyton iv) Myelin sheath of Axon
13. The endocrine gland related to the immune system is _____.
- i) Thyroid ii) Thymus iii) Adrenal iv) Pineal
14. The hormone administered by doctors to a pregnant woman to help in childbirth during the time of natural delivery is _____.
- i) Oestrogen ii) Progesterone iii) Insulin iv) Relaxin
15. The important event of meiosis is the crossing over. It occurs during _____.
- i) Leptotene ii) Pachytene iii) Diplotene iv) Zygotene
16. Reduction division is the process by which gametes are produced. The cells in which reduction division take place are _____.
- i) germinal epithelial cells ii) the sensory epithelial cells iii) cuboidal epithelial cells iv) columnar epithelial cells
17. In Amoeba, the cell division takes place _____.
- i) involving changes in the chromatin reticulum ii) without involving changes in the chromatin reticulum iii) leading to reduction in the number of chromosomes iv) without dividing the nucleus
18. Pick out the item which has sequential arrangement.
- i) zygotene -> Leptotene -> Pachytene -> Diplotene -> Diakinesis
 ii) Diakinesis -> zygotene -> Leptotene -> Pachytene -> Diplotene
 iii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis
19. Polio is a viral disease and the affected child suffers from physical disability of limbs. Which system of the body is mostly affected due to this infection?
- i) Nervous system ii) Digestive system iii) Respiratory system iv) Excretory system
20. Blinking when a beam of light is suddenly focussed on the eyes and sudden withdrawal of hand upon touching a hot body are some of the examples of reflex actions. Which part of the central nervous system acts as the centre these actions?
- i) Forebrain ii) Spinal cord iii) Hindbrain iv) Synapse
21. The following are the parts of a neuron:
 a) Axon b) Terminal branches c) Cyton d) Dendrites
- The correct pathway of a nerve impulse through these parts are _____.
- i) badc ii) dcab iii) bdac iv) adbc
22. For minor surgeries in the body, doctors administer local anaesthesia to a part of the body so that the pain will not be felt by the patient. At which part, do you think, the nerve impulse is being arrested due to the effect of anaesthesia?
- i) at cyton ii) at axon iii) at synapse iv) in the middle of axon
23. Assertion (A) : All spinal nerves are mixed nerves.
 Reason (R) : Each spinal nerve has a sensory root and a motor root.
- i) Both 'A' and 'R' are true and 'R' explains 'A'.
 ii) Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
 iii) Only 'A' is true but 'R' is false.
 iv) 'A' is false but 'R' is true.

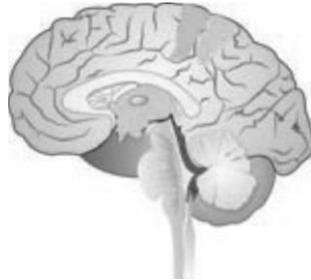
PART - B

- Name the two systems which help in the control and co-ordination of metabolic activities. Write any one difference between them.
- Differentiate medullated neurons from non-medullated neurons. Where are they found in the nervous system?
- Name the part of the brain which regulates heart beat and respiration. Where is it located in the brain?
- What is corpora quadrigemina? Name the functions associated with it.
- What are endocrine glands? Name the secretions of these glands. How do these secretions reach the target organs?
- Name the following endocrine glands: i) The master of endocrine orchestra ii) The dual gland

7. Which hormone(s) is/are called i) Personality hormone ii) fight, flight and fright hormones.
8. Name the male and female sex hormones. List out their functions.
9. In which sub-stages of meiosis-I do the following events occur?
i)pairing of homologous chromosomes ii)terminalization iii)crossing over iv)formation of spindle apparatus.
10. Copy the diagram and label any two parts in the group given:
(cyton, axon, dendron, terminal branches)



11. The diagram is of the human brain. Shade the areas marked A and B in the parts of the brain, corresponding with the function. A. Seat of smell B. Seat of vision



12. On the basis of the function performed, pick out the right statements.
 - i) Pituitary gland secretes hormones and enzymes.
 - ii) Thyroid gland secretes thyroxine and insulin.
 - iii) Leydig cells produce testosterone hormone.
 - iv) Pancreas produces enzymes and hormones.

13. Correct the statements, if they are wrong.
 - i) Alpha cells produce insulin and beta cells produce glucagon.
 - ii) Cortisone suppresses the immune response.
 - iii) Thymus gland is a lymphoid mass.
 - iv) Ovary produces eggs and androgen.

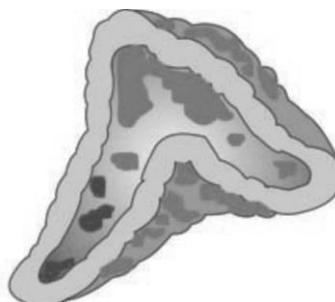
14. Here are a few statements about the endocrine system in man. State whether each of them is true or false. If the statement is false write the correct statement.

- i) Endocrine system controls and co-ordinates the physical process of growth, reproduction and sustenance of life.
- ii) Endocrine glands are duct bearing glands which secrete chemical substances called hormones.
- iii) The pancreas is a dual gland.
- iv) Malfunctioning of the thymus gland causes goitre.

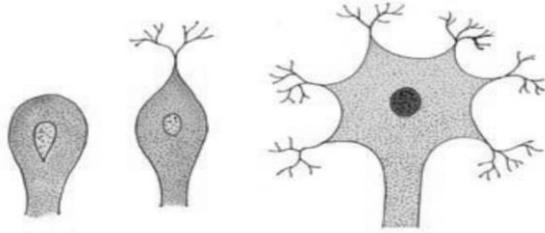
15. Copy and complete the following table:

No.	Hormones of adenohipophysis	Functions and malfunctions
1	Somatotropic or growth hormone (STH or GH)	
2		2. It stimulates the growth of thyroid gland and produces thyroxine.

16. Copy the diagram and label the parts with the help of the clues given:
 - i) It is otherwise called supra renal gland.
 - ii) It secretes two hormones, namely aldosterone and cortisone.



17. Copy and identify the types of neurons given below:



18. Here are some statements about meiosis. State whether each of them is true or false:

- i) It takes place in somatic cells.
- ii) Meiosis is also called reduction division.
- iii) Pairing of homologous chromosomes is called crossing over.
- iv) Meiosis leads to variations which form the raw material for evolution.

19. Match the following:

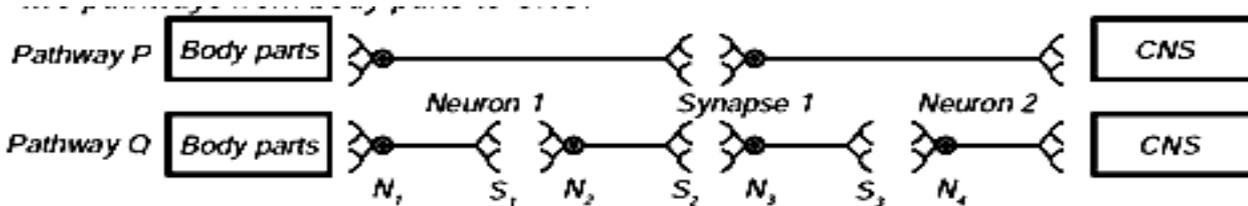
A. leptotene	I. nuclear membrane and nucleolus disappear
B. zygotene	II. terminalization
C. diplotene	III. pairing, synapsis, bivalents
D. diakinesis	IV. chromosomes condense and appear like threads

20. A person was riding a two-wheeler without wearing a helmet. He met with an accident and sustained a head injury. He was dead before he was shifted to the hospital and it was found that his death was due to breathlessness and heart failure. Which part of his brain might have been damaged? Justify your answer.

21. Match the following:

List I	List II
A. Vasopressin	I. Resist infection
B. Insulin	II. Diabetes insipidus
C. Oxytocin	III. Diabetes mellitus
D. Thymosin	IV. contraction and relaxation of uterus

22. Observe the following diagrams that depict the transmission of nerve impulses through two pathways from body parts to CNS:



If all the nerves at both the places are similar in thickness and structure, through which pathway will the transmission of an impulse (of same threshold) be faster and why?

23. Which gland is called the 'dual gland'? Why?

24. A 16 year old boy was brought to a doctor with a complaint of non-masculine features (lack of moustache / beard / gruff voice / broadening of shoulders etc). After keen examination, the doctor found that it was a hormonal disorder and the endocrine glands responsible were not functioning properly. Mention the glands and the hormone lacking in the boy.

PART - C

1. Describe the structure of a neuron with the help of a neat, labelled diagram,
2. List out the various parts of the human brain and write a note on their functions.
3. Name the endocrine glands and their location in the human body. Describe any two of them in detail.
4. Why is meiosis called reduction division? Describe the various stages with relevant diagrams. Add a note on significance of meiosis.
5. Use words from the given list to complete the following paragraph. (The words may be used once/ more than once / not at all).

(Skull, Vertebral column, Pia mater, Arachnoid membrane, Brain, Spinal cord, Meninges, Duramater)
 The central nervous system is covered by three protective coverings collectively called _____. The outermost cover lying below the _____ and _____ is double thick and is called _____. The middle covering is thin and vascularised and is called _____. The innermost cover is a very thin delicate membrane and is closely stretched over the outer surface of _____ and _____ and is called _____.

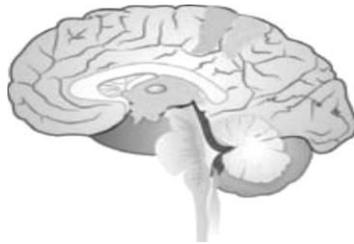
6. Match these parts with their functions:-

(medulla oblongata, cerebellum, forebrain, thalamus, cerebral cortex, hind brain, pons, hypothalamus)

- Sleep centre and respiratory centre
- Several reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.
- Consists of cerebrum, thalamus and hypothalamus
- Motor and sensory areas
- A major conducting centre for sensory and motor signalling
- Regulation of sexual behaviour
- Consists of pons, cerebellum and medulla oblongata
- Co-ordinates the group movements of voluntary muscles, as in walking or running

7. Observe the diagram of the human brain and identify the areas mentioned:

- The area responsible for consciousness, intelligence, memory, imagination and reasoning.
- The area responsible for regulation and co-ordination of group movements of voluntary muscles.
- The area responsible for sleeping and respiration.
- The area responsible for reflexes involved in the regulation of heart beat, blood vessel contraction, breathing etc.



Chapter – 4 REPRODUCTION IN PLANTS

Blue print – 1 X 1 =1 1 X 2 =2 1 X 5 = 5 Total marks - 8

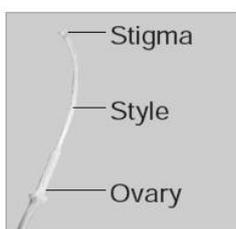
PART - A

- The method of reproduction in unicellular organisms like amoeba and bacteria in which they split into two equal halves and produce new ones is called _____.
i) fragmentation ii) binary fission iii) budding iv) spore formation
- In sexual reproduction of flowering plants, the first event involved in this is _____.
i) fertilization ii) germination iii) regeneration iv) pollination
- Which of the following statement is true?
i) Thin-walled non-mobile spores are called zoospores.
ii) A motile asexual spore produced by some algae, bacteria and fungi are Akinetes.
iii) Uninucleate, non-motile, asexual spores produced by fungus are called conidia.
iv) Thick-walled vegetative cells produced by algae during adverse conditions are called aplanospores.
- The fertilized ovary is a fruit. The fruit that develops from a single flower with multicarpellary, apocarpous superior ovary is _____.
i) Aggregate fruit ii) Composite fruit iii) Simple fruit iv) Multiple fruit
- If a water soaked seed is pressed, a small drop of water comes out through the _____.
i) stomata ii) lenticel iii) micropyle iv) radicle
- The mango fruit is called a stone fruit because it has _____.
i) skinny epicarp ii) stony mesocarp iii) fleshy endocarp iv) hard endocarp
- Pick out the wrong statement.
i) In a dicot seed there is a short longitudinal whitish ridge called the raphae.
ii) The minute opening in a dicot seed is known as micropyle.
iii) The rudimentary stem portion is known as radicle.
iv) The rudimentary root portion is called radicle.
- Consider the following statements regarding the dispersal of fruits and seeds by wind and select the correct answer.
i) Fruits and seeds are dispersed with a sudden jerk by an explosive mechanism.
ii) The fruits of tridax carry a persistent calyx modified into pappus.
iii) The fruits of xanthium have sharp pointed stiff hooks.
iv) The mesocarp of coconut is fibrous.

9. The product of triple fusion which acts as nutritive tissue for the development of an embryo is _____.
- i) zygote ii) placenta iii) scutellum iv) endosperm
10. The disadvantage of self-pollination is _____.
- i) There is no wastage of pollen grains. ii) The seeds are less in number.
iii) Self-pollination is sure in bisexual flowers iv) Flowers need not depend on agents of pollination.
11. The flower is important to a plant because it helps in _____.
- i) attracting ii) production of nectar iii) pollination iv) sexual reproduction
12. The essential organs of the flower are _____.
- i) Calyx and Corolla ii) Androecium and Gynoecium iii) Calyx and Androecium iv) Corolla and Gynoecium
13. Cross pollination is important for producing _____.
- i) new varieties of plants ii) plants with better growth iii) disease resistant plants iv) all of the above
14. Anemophily occurs in _____.
- i) Vallisneria ii) Grass iii) Coconut iv) Datura
15. Which of the following structure / arrangement favours entomophily ?
- i) Pollen grains with wings and feathery stigma ii) Colourful petals and nectar secretion
iii) A bunch of flowers with less pollen iv) Pollen grains with mucous covering.
16. Post-fertilization, the ovule changes into a/an _____.
- i) seed ii) fruit iii) endosperm iv) pericarp.
17. Which of the following is correctly matched?
- i) False fruit – mango ii) Multiple fruit – apple iii) Aggregate fruit – polyalthia iv) Caryopsis – banana
18. Identify the mismatched pair.
- i) Legume – Dry dehiscent fruit ii) Cypsela – Dry indehiscent fruit
iii) Pome – Fleshy fruit iv) Regma – Resembles legume

PART - B

- Write any two differences between asexual and sexual modes of reproduction.
- What is vegetative propagation? Mention the vegetative propagules in: i) Bryophyllum ii) Spirogyra
- Arrange the following events of sexual reproduction in plants in the correct sequential order :
seed formation, pollination, dispersal of seeds, fertilization.
- Define pollination.
- Define fertilization.
- Name the agents of pollination in the following cases:
 - Bright coloured flowers with scent and nectar glands.
 - No colour / scent/ nectar but pollen grains are dry, light weight and powdery. Stigma is feathery.
 Also mention the plants in cases (i) & (ii).
- Name the events (i) & (ii) and mention the nature of the nuclear structures formed at the end in the following cases:
 - male gamete (n) + egg (n) = Zygote (2n)
 - male gamete (n) + secondary nucleus (2n) = Endosperm nucleus (3n).
- Differentiate dehiscent fruits and indehiscent fruits with suitable examples.
- What are monocotyledons and dicotyledons? Give examples.
- Give suitable terms for the following methods of seed / fruit dispersal, with one example each:
 - by wind
 - by water
 - by animals.
- Give any two examples for each of the following cases where dispersal of fruits and seeds take place :
 - by birds (through excreta)
 - by human beings
- What is double fertilization?
- What is triple fusion?
- a. Identify Fig. A and B.
b. Which part of A is modified into B.



A



B

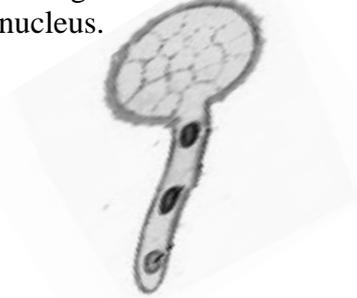
15. The methods of reproduction and the organisms are given below. Match the type of reproduction with the suitable organism.

<i>Fission</i>	<i>Spirogyra</i>	<i>Yeast</i>
<i>Budding</i>	<i>Protozoans</i>	<i>Flatworms</i>
<i>Fragmentation</i>	<i>Bryophyllum</i>	<i>Bacteria</i>

16. i) Composite fruits are formed by all the flowers of _____,
 ii) _____ fruit is developed from a single flower with a multicarpellary apocarpous superior ovary.

17. Draw the given diagram and label the following parts:

i) Exine ii) Tube nucleus.



18. Match the following with respect to dispersal of fruits / seeds:

a) <i>Autochory</i>	I) <i>Lotus</i>
b) <i>Anemochory</i>	II) <i>Xanthium</i>
c) <i>Hydrochory</i>	III) <i>Tridax</i>
d) <i>Zoochory</i>	IV) <i>Balsam</i>

19. Use words from the given list to complete the following paragraph. (The words may be used once / more than once / not at all).

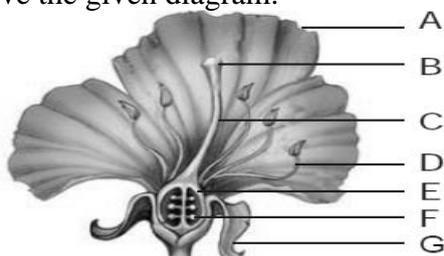
(seed, fruit, pollination, dispersal, germination, fertilization, flower, reproduction)

Ramu went to the field along with his father. He sowed mustard seeds in the soil. After a few days he observed the process of _____. The seeds grew into plants and produced _____. On maturity, these flowers produced pollen grains that were transferred to the stigma by _____. The male gametes fused with the female gametes during the process of _____.

20. Coconut seeds are dispersed by Hydrochory (dispersal by water). Mention the part of the fruit whose modification help in this mechanism.

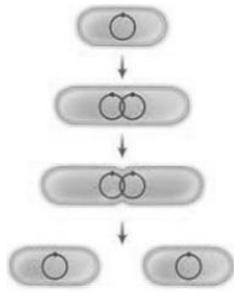
PART - C

1. i) Name the process by which a fruit is developed.
 ii) Explain the development process in brief.
 iii) Draw a neat, labelled diagram of that process.
2. Write the two events involved in the sexual reproduction of a flowering plant.
 i) Discuss the first event and write the types.
 ii) Mention the advantages and the disadvantages of that event.
3. i) Fruit is the product of fertilization. Is there any fruit which is formed without the act of fertilization?
 ii) Represent the classification of fruits in a diagrammatic sketch.
4. Compare aggregate fruits with multiple fruits and give suitable examples.
5. Describe the structure of a dicot seed.
6. Describe the structure of a monocot seed.
7. Observe the given diagram:



- i) Draw the diagram and label the parts.
 ii) What happens to the parts labelled 'E' and 'F', after the process of fertilization?

8. Look at the diagram given below:



Answer the following:

- i) Name the method of reproduction depicted here.
 ii) Name an organism in which you find this method of reproduction.
 iii) Does this method of reproduction favour variation?

9. Imagine you have a garden with the plants listed below. A swarm of bees visit your garden. Do you think the bees will visit all the flowers? Name the flowers which you think the bees will be attracted to. Give reasons to substantiate your answer.

(Jasmine, Nerium, Gulmohar, Rose, Lotus, Corn, Sugarcane, Bamboo, Chrysanthemum, Dahlia, Grass, Coconut and Peas)

10. A farmer has two fields A and B. He cultivates peas (*Pisum sativum*) in both the fields. Field A is covered with nets to keep out birds and insects. Field B is left uncovered.

- i) Name the type of pollination that would occur in field 'A' and field 'B'
 ii) Which of these fields will give a higher yield?
 iii) To raise the next crop, from which field should the seeds be chosen by the farmer.
 Give reason to support your answer.

11. Mango and Coconut are both drupes. The mesocarp of mango is edible, while it is not so in coconut. Based on this fact, answer the following:

- i) Which part of the coconut is edible?
 ii) Why does the coconut have a fibrous mesocarp?
 iii) Can you mention any other use of the fibrous mesocarp?

12. Group the following under the given heads: (a) fruit (b) seed (c) neither fruit nor seed.

tomato, cucumber, sprouted pulses, naked bean, grapes, celery, potato, sugarcane, apple, runner bean.

13. Ramu and Somu happened to observe *Calotropis* seeds floating in the air. They decided to follow a few of them till the seeds landed on the ground. They recorded their observations in a table as follows:

Distance travelled by seeds in metre Time taken in minutes

- i) Draw a graph for the above data taking Distance on 'X' axis and Time on 'Y' axis.
 ii) Is there any relationship between the distance travelled and the efficiency of dispersal?
 iii) State the inference you draw from the graph.

14. Given below is a list of dry fruits. Assign the fruits to their relevant types.

(Cotton, Tridax, Paddy, Castor, Coriander, Beans, Peas, *Calotropis*, *Mirabilis*, Cashew, Acacia, Lady's finger)

- i) Achene ii) Caryopsis iii) Cypsela iv) Nut v) Cremocarp vi) Lomentum vii) Regma viii) Loculicidal capsule
 ix) Septicidal capsule x) Follicle xi) Legume

15. Monish enters the kitchen and happens to see his mother getting the ingredients ready to prepare kadamba sambar. He sees the ingredients laid out in the kitchen. Help him sort out the ingredients into the fruit types you have studied.

(dhal, tamarind, brinjal, tomato, drumstick, coriander, mustard, lady's finger, mango)

16. Name the parts of a dicot seed based on the given clues:

- i) Rudimentary root _____.
 ii) Rudimentary shoot _____.
 iii) Fleshy structure storing food for the embryo _____.
 iv) The outer protective layer of a seed is _____.
 v) The minute opening seen in the seed coat is _____.

17. What are the types of pollination? Which among them is more advantageous? Why?

18. What is self-pollination? Mention its merits and demerits.

19. What is known as pollination? List out biotic and abiotic factors which are involved in pollination?

CHAPTER 7 CONSERVATION OF ENVIRONMENT

Blue print – 1 X 1 = 1, 1 x 2 = 2 and 1 x 5 = 5 Total Marks 8

PART - A

1. Which of the following groups contain only bio-degradable items?

i) Grass, flowers and leaves ii) Grass, wood and plastic iii) Fruit peels, cake and plastic iv) Cake, wood and glass

2. Which of the following constitutes a food chain?

i) Grass, wheat and mango ii) Grass, goat and human iii) Goat, cow and elephant iv) Grass, fish and goat

3. Which of the following are environmental friendly practices?

i) Carrying cloth bags for shopping ii) Switching off light and fans when not in use
iii) Using public transport iv) All the above

4. What is called as 'black gold'?

i) hydrocarbons ii) coal iii) petroleum iv) ether

5. Based on the food chain, pick the odd one out:

plants → grasshopper → frog → tiger → snake

6. Example for product of green chemistry is _____.

i) plastic ii) paper iii) bio plastics iv) halogen flame retardants

7. _____ is a green house gas which causes climate change and global warming.

i) hydrogen ii) oxygen iii) nitrogen iv) carbondioxide

8. The _____ form decomposers in the pond ecosystem.

i) plants ii) bacteria iii) frogs iv) phytoplanktons

9. _____ is used in seeding clouds.

i) potassium iodide ii) calcium carbonate iii) sulphurdioxide iv) ammonium phosphate

10. An example for fossil fuel is _____.

i) copper ii) iron iii) magnesium iv) coal

11. Air pollution is caused by transport exhaust fumes and emission of gases like SO₂, CO₂, NO₂ from industries. Similarly, water pollution is caused by _____.

i) sewage ii) crop cultivation iii) rain iv) soil erosion

12. If wild animals are killed, what difficulty would we face?

i) imbalance in nature ii) decrease in fog rain iii) decrease in population iv) increase in rain

13. Water is an essential commodity for survival. What can we do to help increase water resources?

i) deforestation ii) reducing the use of vehicles iii) the burning of the wastage iv) afforestation

14. The tiger and the lion are carnivores. Likewise the elephant and the bison are _____.

15. Assertion (A) : Coal and petroleum are called fossil fuels.

Reason (R) : Fossil fuels are formed from the remains of dead organisms after millions of years.

i) Both 'A' and 'R' are true and 'R' explains 'A'. ii) Both 'A' and 'R' are true and but 'R' doesn't explain 'A'
iii) Only 'A' is true but 'R' is false. iv) 'A' is false but 'R' is true.

16. Compressed Natural Gas (CNG) is considered a better fuel than coal/ petroleum, because _____.

17. Now-a-days water bottles and lunch boxes are made from agricultural products like fruit pulp. These are called _____.

PART - B

18. Classify the following into producers, consumers, decomposers.

i) butterfly ii). grass hopper iii) calottes iv) snakes v). shoe flower vi) nitrobacteria

19. Living organisms adapt themselves according to their habitat.

Match the following:-

a.	fish	wings
b.	camel	hind limbs with web
c.	frog	fins
d.	birds	hard skin

20. Fill in the blanks

i) Animals give out _____ through respiration.

ii) In the presence of sunlight, plants prepare _____.

21. Bacteria and fungi are responsible for the decay of dead plants and animals. Decaying matter is recycled to grow plants. What do we call this?

22. Fill in the blanks with suitable answers from those given in the brackets.

(harmful, heavy metals, carbon dioxide, sulphur particles)

Generation of waste products which contain Mercury, Uranium, Thorium, Arsenic, and other _____ are _____ to human health and environment. _____ present in the coal will cause acid rain and the release of _____, a green house gas, causes climate change and global warming.

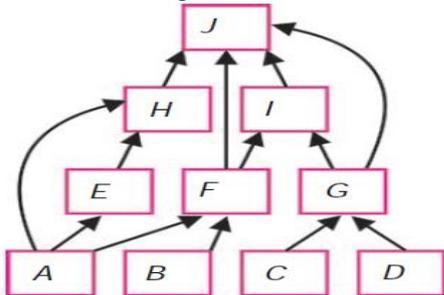
23. Depict a food chain by placing the following organisms in the correct trophic levels:

(snake, grass, eagle, frog, grasshopper)

24. Show an aquatic food chain using the following organisms.

(Small fish, Phytoplanktons, Kingfisher, Zooplanktons)

25. Observe the following food web:

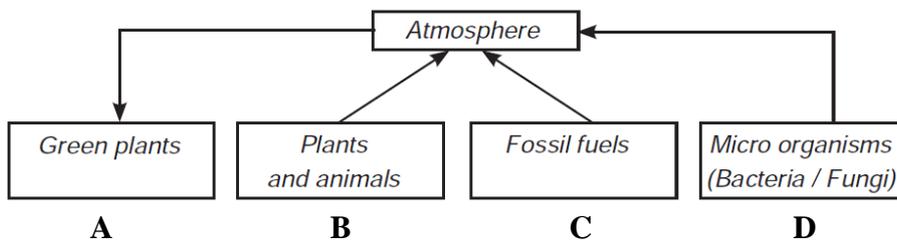


(i) Find out the wrong statement:

a) 'A' is a producer b) 'F' is a herbivore c) 'H' is an omnivore d) 'I' is a climax carnivore

(ii) Find out how many food chains are present in the above food web.

26. Observe the following Bio-geo chemical cycle.



i) Mention the nutrient in the given cycle.

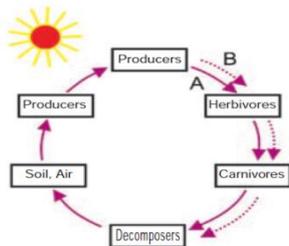
ii) Write the activities from 'A' to 'D'.

27. Study the food chain below, correct it and convert it into a pyramid of energy.

Mulberry → Sparrow → Caterpillar → Kite

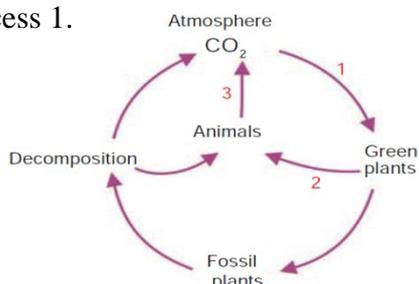
28. Study the illustration and answer the questions:

i) Which line (A or B) represents the flow of energy? Why do you say so? ii) Give an example of a decomposer.



29. i) Name the processes noted as No. 1 and 3.

ii) Define process 1.



PART - C

30. i) Classify the following substances – wood, paper, plastic and grass.

ii) Give a detailed account of your classification.

31. In your locality people are affected due to water scarcity. What measures will you take to deal with the problem of water scarcity?

32. We are surrounded by smoke. Is this situation good for our health. Give reason.

33. List out the harmful effects of burning coal.

BLUE PRINT

CHAPTER	1 MARK	2 MARKS	5 MARKS	TOTAL
1	1	3	-	7
2	1	1	1	8
3	1	1	1	8
4	1	1	1	8
5	1	3	-	7
6	1	3	-	7
7	1	1	1	8
8	1	3	-	7
TOTAL	8	32	20	60

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SSLC GOVERNMENT EXAMINATION – 2015 -16

SCIENCE - BLUEPRINT

MARKS : 75

TIME : 2.30 Hrs

SECTION – I(15 X 1 = 15)

I. ANSWER ALL THE 15 QUESTIONS

II. CHOOSE THE CORRECT ANSWER FROM THE ALTERNATIVES GIVEN IN THE BRACKETS.

1. Heredity and Evolution
2. Immune System
3. Structure and Functions of Human Body- Organ Systems
4. Reproduction in Plants
5. A Representative Study of Mammals
6. Life Processes
7. Conservation of Environment
8. Waste Water Management 9.
9. Solutions
10. Chemical Reactions
11. Periodic Classification of Elements
12. Carbon and its Compounds
13. Laws of Motion and Gravitation
14. Electricity and Energy
15. Magnetic Effect of Electric Current and light

SECTION – II (20 X 2 = 40)

I. ANSWER FOR ANY TWENTY QUESTIONS.

16. Heredity and Evolution
17. Heredity and Evolution
18. Heredity and Evolution
19. Immune System
20. Structure and Functions of Human Body- Organ Systems
21. Reproduction in Plants
22. A Representative Study of Mammals
23. A Representative Study of Mammals
24. A Representative Study of Mammals
25. Life Processes
26. Life Processes
27. Life Processes
28. Conservation of Environment
29. Waste Water Management
30. Waste Water Management
31. Waste Water Management
32. Solutions
33. Solutions
34. Atoms and Molecules
35. Chemical Reactions
36. Chemical Reactions
37. Periodic Classification of Elements
38. Periodic Classification of Elements

- 39. Carbon and its Compounds
- 40. Laws of Motion and Gravitation
- 41. Laws of Motion and Gravitation
- 42. Electricity and Energy
- 43. Electricity and Energy
- 44. Electricity and Energy
- 45. Magnetic Effect of Electric Current and light
- 46. Magnetic Effect of Electric Current and light
- 47. Magnetic Effect of Electric Current and light

SECTION – III (4 X 5 = 20)

I. ANSWER ANY FOUR QUESTIONS BY CHOOSING ONE QUESTION FROM EACH PART.

II. EACH QUESTION CARRIES FIVE MARKS.

DRAW DIAGRAM WHEREVER NECESSARY.

PART - I

- 48. Immune System
- 49. Structure and Functions of Human Body- Organ Systems

PART - II

- 50. Reproduction in Plants
- 51. Conservation of Environment

PART - III

- 52. Atoms and Molecules
- 53. Carbon and its Compounds

PART - IV

- 54. Laws of Motion and Gravitation
- 55. Magnetic Effect of Electric Current and light.

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