MODEL QUESTION PAPER SET-1: 2021 - 22

MM : 40 **Std. 10th – SCIENCE - II (THEORY)** **Time : 3 Hrs**

Entire Syllabus **SOLUTIONS**

Q.1(A) Choose the correct alternative. **5M**

1. a) Diabetes

2. b) Neanderthal

3. b) Geobacter

4. d) Testes

5. d) Elephant

Q.1(B) Answer the following **5M**

i. BONDINGS

ii. Vestigial organ.

iii. **False.**
Dizygotic twins are formed from two different zygotes. So the gender may or may not be the same.

iv. Glycolysis—1—p
TCA -2—r

v. Clostridium (Rest all are useful microorganisms)

Q.2. A Give scientific reasons (Attempt any 2) **4M**

i. When detergents are mixed with microbial enzymes they start working more efficiently. The cleaning process that is removal of dirt takes place at lesser temperature. Therefore for better results enzymes obtained by microbial process are mixed with detergents.

ii. Since existence of humans there is inter relationship between human and environment. Human stepped on the earth long after formation of Earth. On the earth human beings proved their superiority as compared to other animals .With the help of characters like intelligence ,memory ,imaginary ability etc. Humans established domination over the nature. Humans utilised all the natural resources as much as possible. In an attempt to live a satisfactory life human kept on snatching from the nature . And this lead to increase in problems. From this entire scenario we can understand that human has a crucial role in maintaining the environmental balance. If humans have disturbed the environmental balance then human itself only can conserve and improve the quality of nature. Thus, human beings have an important place in the environment.

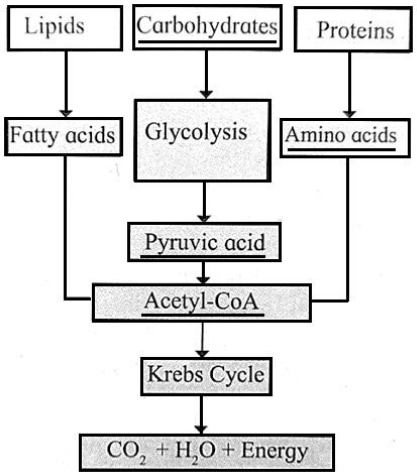
iii. The body can be in best health if all the vital organs of the body are also in best condition. Brain, kidney, heart, liver, pancreas, lungs, bone and skin are some such vital organs which are most essential for proper metabolism and functioning of the body. The sense organs of the body are also of utmost importance specially eyes. One cannot survive if any of these vital organs are not functioning properly. Some of your organs can be brought back to functionality but by performing surgeries. These organs can be donated to save the life of individuals in need. During the life of an individual certain organs like kidney and skin can be donated to people who have lost the function of these organs due to aging, accidents, infection, disorder etc. Even after death organs like lever ,heart and eyes can be donated. Hence, these organs in human body are more valuable.

Q.2. B Answer the following (Attempt any 3) **6M**

i Objectives of disasters

1. Disposal of human life suffered by human being during the calamity and release of the people.
2. Supply of essential commodities of the people to reduce the effect of disaster.
3. The restore the human life in the region by creating reconciliation in disaster.
4. Rehabitant disaster victims.
5. Considering protective measure in disaster, such disaster will not reach in future and slop take care to reduce their intensity.

ii. Complete the following chart.



iii. The professional uses of biotechnology are as follows:

1) Biotechnology is used in the field of agriculture in order to improve crops variety and yield by techniques such as genetic modification, hybridization etc.

2) Techniques such as artificial insemination and embryo transfer are useful in animal husbandry to improve quality and quantity of animal products like milk, wool, meat etc.

3) Biotechnology has applications for the welfare of human health in diagnosis and treatment of diseases using vaccines, interferons, antibiotics also gene therapy and therapeutic cloning have applications in treating genetic disorders.

4) Biotechnology is used for the manufacture of industrial products environmental management, food processing, green revolution, white revolution and blue revolution.

5) DNA fingerprinting technique plays an important role in forensic sciences and paternity testing.

iv. Alcoholism is the adoption to have alcohol in the form of different types of liquor.

Consuming liquor becomes an addiction for a long-term. Due to alcohol the efficiency of The nervous system and specially the brain is affected.

Other vital organs such as kidney and liver are also adversely affected.

Lifespan of an alcoholic decreases due to constant drinking and malnourishment.

Especially in adolescence age if alcohol is consumed the brain functioning does not take place properly. The mental ability of memorization and learning become slow. There is lack of concentration in studies.

The alcoholic person lacks the rational thinking and hence faces social ,mental and family problems along with physical illness.

v.

Sexual reproduction	Asexual reproduction
1. Sexual reproduction is the process in which two cells fuse with each other.	1. Asexual reproduction is the process in which only one cell divides into two.
2. Two parents belonging to two different sexes participate in sexual reproduction.	2. Only one parent participates in sexual reproduction.
3. Both mitosis and meiosis take place at the time of sexual reproduction.	3. Only mitosis takes place at the time of asexual reproduction.
4. Chromosome number is reduced to half in sexual reproduction. Diploid (2n) condition is changed to haploid (n) by meiosis at the time of gamete formation	4. Chromosome number is kept constant in asexual to reproduction. Diploid (2n) condition always remains the same.
5. The process of fertilization and zygote formation S are the important steps in sexual reproduction.	5. The process of fertilization and formation of zygote do not take place in asexual reproduction.
6. Germ (Reproductive) cells are involved in the sexual reproduction.	6. Somatic cells are involved in the asexual reproduction.
7. Rate of reproduction is slow and gradual in sexual reproduction	7. Rate of reproduction is rapid in asexual reproduction.
8. Genetic variations are always produced by sexual & reproduction.	8. Genetic variations are not produced by asexual reproduction
9. Sexual reproduction occurs in higher organisms like animals and plants.	9. Unicellular and lower organisms show asexual reproduction. eg. yeast, protozoa like Euglena, Paramoecium, Amoeba, etc.

(Note : Any six points)

Q.3. Solve the following questions (Any Five) **15M**

i. a) Embryological evidence.

b) All vertebrate embryos show extreme similarities during initial stages of development. These similarities disappear gradually in later stages.Indicating that there may be a common ancestor.

c) Morphological evidence & Anatomical evidence.

ii. a. Redemption.
b. Impact of disaster.
c. Preparedness
d. Resurgence
e. Response
f. Restoration

iii. What will you do in the following situations? Why?

a) The hazards of chewing tobacco will be explained to the child. Different photographs and videos showing the conditions of oral cancer will be shown to the child to persuade him so that he can stay away from it.

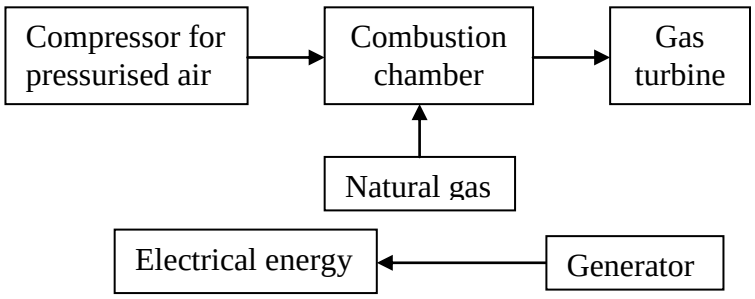
b) The syllabus of class 12 is vast. If the studies are not taken seriously from the beginning of the academic year then the stress develops due to the fear of examination and result. Therefore, instead of being stressed he should practice time management and study schedule. He should think of only one subject at a time. The atmosphere in the house should be maintained happy and tension free.

c) The individual who prefers to be incommunicative has lots of thoughts in his or her mind. I would take my sister into confidence and find the reason behind the lack of communication. Most often such persons are suffering from depression. So we should not leave her alone. We would call her friends home so that she can converse with them. She should be motivated to mix with her favourite people and pursue her hobbies.

iv. a) Natural gas power plant.

b) It is not considered as green energy as it makes use of natural gas which is a fossil fuel.

c)



v. Explain how energy is formed from oxidation of carbohydrates, fats and proteins.

i. First of all the dietary carbohydrates are digested in the digestive system with the help of various enzymes and converted into glucose. Similarly, proteins are converted into amino acids and fats are broken down into fatty aid and glycerol (alcohol).

ii. Oxidation of carbohydrates takes place during cellular respiration. Glucose is oxidized by three steps during aerobic respiration, viz. glycolysis, tricarboxylic acid cycle or Krebs cycle and electron transfer chain

iii. From one molecule of glucose two molecules of each pyruvic acid, ATP, $NADH_2$ and water are formed during glycolysis. Pyruvic acid which is formed in this process is converted into Acetyl-Coenzyme-A along with release of two molecules each of $NADH_2$ and CO_2.

iv. In the next step, i.e. in TCA cycle, molecules of Acetyl-Co-A enter the mitochondria and a cyclic chain of reactions take place. Acetyl part of Acetyl-co-A is completely oxidized through this cyclical process. The molecules CO_2, H_2O, $NADH_2$, $FADH_2$ are released in this process.

v. In third stop, i.e. in ETC reaction, $NADH_2$ and $FADH_2$ formed during first two steps are used for obtaining ATP molecules. 3 molecules of ATP are obtained from each $NADH_2$ molecule and 2 molecules of ATP from each $FADH_2$.

vi. Thus, one molecule of glucose upon complete oxidation in presence of oxygen yields 38 molecules of ATP. This is how from carbohydrates, energy is obtained.

vii. If carbohydrates are insufficient in diet, then proteins or lipids are used for energy production Fatty acids derived from fats and amino acids derived from proteins are converted into Acetyl-Co-A. Acetyl-Co-A once again can yield energy through TCA cycle.

vi. (1) Cockroach belongs to the phylum Arthropoda and class Insecta.
(2) Scientific reasons for placement of Cockroach in the phylum Arthropoda:
(a)The body is divided into three parts- Head,Thorax and Abdomen.
(b) The body is covered by chitinous exoskeleton.
(c) Jointed appendages present, three pairs of walking legs and two pairs of membranous wings.
(d) Body is eucoelomate, triploblastic, bilaterally segmented and segmented.
(e) Respiration by spiracles and tracheal tubes.
(f) Sexes are separate.

vii **a)** Bioremediation is the technique of absorption for destruction of toxic chemicals and harmful pollutants with the help of plants and microorganisms.

b) Complete the given chart.

Sr.	Plants /Microbes	Function
1.	*Pteris Vittata*	**1 Absorbing the arsenic from the soil.**
2.	*Pseudomonas*	**Cleaning the hydrocarbon and oil pollutants from the soil and water.**
3.	**sunflower**	Absorption of uranium and arsenic
4.	**Deinococcus radiodurans.**	Absorption of radiations of nuclear waste

viii. A- Condenser
B- Turbine
C- Boiler
D- Cooling tower

a. In thermal power plant, coal is burned which causes air pollution.
b. Gases like carbon dioxide, sulphur oxide and nitrogen oxide which are harmful to health are emitted during the burning of coal.
c. Soot particles are also released into the environment which cause serious health problems related to the respiratory system.
i. Coal which is used as a fuel in thermal power plant is available limited quantity and will get depleted in the future.

Q.4. Answer the following (Attempt any 1) **5M**

i a) Crop plant→Grasshopper→Rats→Snake.
b) If snakes are removed from the ecosystem then the rodents population would increase and grasshoppers would be reduced.
c) If the crop is harvested then the whole ecosystem would collapse.
d) If hawks are present around the cropland then the snake population would be controlled.
e) Food chain in pond ecosystem
Phytoplankton→Zooplankton→small fish→Big fish→man/ Bear/water bird.

ii (a) Frog:
Classification
Kingdom : Animalia
Phylum : Chordata
Class : Amphibia
Characters : The frog is a true amphibian that can live in water as well as on land. When on land it respires with the help of lungs while in water it uses its skin for breathing. It does not have exoskeleton. The skin is soft, slimy and moist. It is suitably coloured and hence the frog can camouflage in the surroundings. Body is divisible into head and trunk. Two pairs of limbs are seen. The forelimbs are short and used for support during locomotion. The hind limbs are long and strong, used for jumping when on land and for swimming when in water.

The eyes are large and protruding. Since the neck is absent, such eyes help in looking around. The tympanum is present.

(B) **Lizard**

Classification:
Kingdom: Animalia
Phylum: Chordata
Class: Reptilia

Characters: The lizard is a cold blooded reptile. The limbs are weak and do not support the body weight, hence lizard is seen creeping. But the feet are provided with pads and suckers due to which lizards are well-adapted to climb on the vertical walls. The exoskeleton has fine scales. The body is divisible into head, neck and trunk The capacity to regenerate is developed in lizards, hence it can produce the lost tail or limbs. The mode of reproduction is egg laying It feeds on insects with the help of long and sticky tongue