

Q.1 A) Answer the following questions

- 1) tRNA it is present in the cytoplasm. According to the message of the mRNA, it carries the specific amino acid up to the ribosomes as per the message coded on mRNA.
- 2) Transfer of pollen grains from anther to the stigma is called pollination.
- 3) Supping nourishment to the growing foetus.
- 4) This is a metaphase stage.
- 5) Biodiversity can be conserved by following ways: i) Protection of the rare species.
ii) Creating National Parks and Sanctuaries.

B) Match the following pairs

Column I	Column II
Polluting energy	Thermal energy
Pollutants	Soot particles
Natural gas	Limited reserves
Hydroelectric Energy	Rehabilitation of displaced people
Hazards to the ecosystem	Nuclear energy

Q.2 Answer the following Questions. (Any Five)

- 1) i) The radiations emitted either through the natural sources or through man – made sources cause radioactive pollution. ii) The natural radiations is in the form of ultra violet and infrared radiations iii) Artificial or man-made radiations are X-rays radiations or atomic radiation. iv) All radiations are highly hazardous for the living organisms. The impact of radiation is also for a very long time. v) It has brought about major accidental mishaps at Chernobyl, Wind scale, and Three Miles Island. These disasters have affected thousands of people. vi) Some other effects of radiations are as follows — (a) Due to higher radiations of cancerous ulceration occurs. (b) Radiations causes genetic change. (c) There is adverse effect on the vision.
- 2) Some of the main objections raised against Darwinism are as follows: i) There are other factors too for evolution and just not the Natural Selection. ii) Arrival of useful and useless modifications were not explained by Darwin, though he said about the survival of the fittest. iii) He has not given any explanation about slow changes and abrupt changes occurring during evolution.
- 3) All chordates possess notochord in some period of their development. All vertebrates also have notochord during embryonic life, which is later replaced by vertebral column. Therefore all vertebrates are chordates. But some chordates like Urochordata and cephalochordata do not possess vertebral column and hence they are not vertebrates.

4) Human male reproductive system	Human female reproductive system
1) Testis are essential organs Which are located outside the abdomen in the scrotal sacs.	1) Ovaries are essential organs which are located, along with all other organs inside the abdomen.
2) There is common urethra through which urine and semen, both are passed out.	2) Urethra and vagina are two separate openings that open to outside.
3) Reproductive system of male continues to work even in old age.	3) Reproductive system works only till the menopause.
4) Sperms or male gametes are produced by meiosis in the testis.	4) Oocytes or ova are produced by meiosis in the ovaries.
5) Sperms are produced in millions at one time.	5) Only single oocyte is produced per month.
6) Three accessory glands are associated with the male reproductive system.	6) Only one gland is associated with female reproductive system.

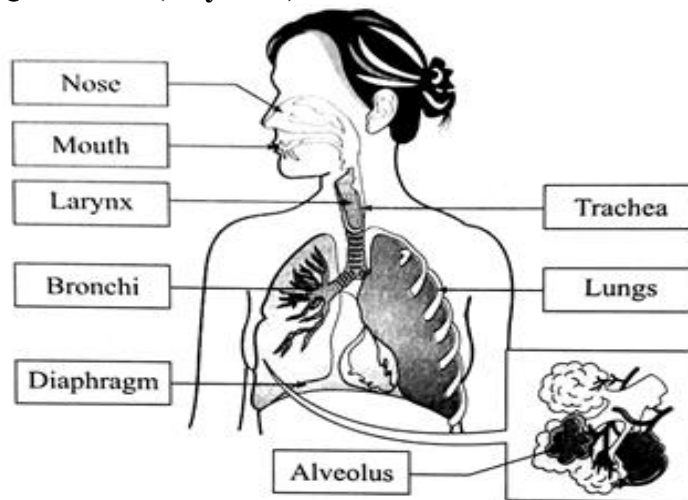
7) Testis secrete testosterone which is essential male hormone.

7) Ovaries produce estrogen and progesterone which are essential female hormones.

- 5) i) Different systems work in co-ordination with each other in the body of the living organisms. In human body the homeostasis is very advanced. ii) Digestive system, respiratory system, circulatory system, excretory system, nervous system and all the external and internal organs in the body work independently but in coordination with each other. iii) The digested and absorbed nutrients of the food are transported to various cells with the help of circulatory system due to pumping of the heart. Simultaneously, the oxygen absorbed in the blood by lungs is also transported to each cell by RBCs. iv) Mitochondria in every cell brings about oxidation of nutrients and produce energy required for all of these functions. v) The control is exercised by the nervous system all these actions. This keeps the organism alive and helps in growth and development of the same.
- 6) i) When the dough for bread is prepared, the baker's Yeast *Saccharomyces cerevisiae* is added to it. ii) This yeast carries out anaerobic fermentation. iii) This results in formation of CO₂ and ethanol. iv) The CO₂ formed tries to escape out of the flour and thus the dough rise. When such dough is baked, it produces spongy bread.
- 7) i) Michael Faraday had invented the principle of electromagnetic induction which most of the power generation plants use. ii) A potential difference is generated across the conductor by changing the magnetic field. iii) This change is done by two methods: a) The conductor is kept stationary and magnet is rotated. b) By other method, a magnet is kept stationary, and the conductor is kept moving. iv) In both the cases the field around the conductor changes creating a potential difference across the conductor. v) In electric generators, this principle is used for making electricity. vi) The magnet in a generator is rotated with the help of a turbine. A turbine has blades on which the flow of liquid or gas is directed making them rotate which produces kinetic energy. vii) This turbine is connected to electric generator making the magnet in electric generator to rotate. In this way the electricity is generated

Q.3 Answer the following Questions. (Any Five)

1)



- 2) Some living organisms possess some characters in them which are the distinctive feature of different groups or phyla. Such individuals connect these two groups by sharing the characters and hence they are known as connective links
- Examples: i) Peripatus: Peripatus is the connecting link between Annelida and Arthropoda. It shows characters of both animal phyla. Like annelid worm, it shows segmented body, thin cuticle and parapodia. Like an arthropoda, it shows open circulatory system and tracheal system for respiration. ii) Duck Billed platypus: This is a connecting link between reptiles and mammals. Like reptiles it lays eggs but like mammals it has mammary glands and hairy skin. iii) Lung fish: Lung fish is a connecting link between fishes and amphibians. Though a fish, it shows lungs for respiration as in amphibian animals. (iv) Connecting links indicate the direction and hierarchy of evolution.
- 3) The above signs are warning symbols which should never be ignored. The meaning of each symbol is given below. They are giving warnings about explosive, inflammable,

cc oxidizing, compressed gas, corrosive, toxic, irritant, environmentally hazardous and health hazard.

i) Explosive: Some materials are explosive. While handling such materials care should be taken. We should not take anything that would cause fire leading to explosion. If explosion occurs, there would be a major disaster causing great loss of life and property. Thus if this sign is seen, great care has to be taken.

ii) Inflammable: Similar to explosive substances, the inflammable materials can also catch fire easily. Therefore, to warn people such sign is given on materials that can cause hazard by burning.

iii) Oxidizing: Some chemical substances are oxidizing. They carry out chemical reactions with a rapid speed. E.g. If potassium permanganate falls on the cloths, it starts the reaction on its C-C. Due to such property of carrying out reactions, the cloths may catch fire. Therefore, oxidizing substances should be handled with care.

iv) Compressed: Compressed substances are filled under pressure in some container. If mishandled, they can come out of the container by bursting it open. This can cause some injuries.

5) Corrosive: The corrosive substances are very reactive. The mere touch of corrosive substances can cause destruction of skin, eyes, respiratory passages, digestive organs, etc. with a great speed. Just touching or smelling of such substances can Disaster We will try to cause major injury and thus warning sign of corrosive substance should never be ignored.

6) Toxic: To taste a toxic substance or even to smell it can lead to death. The packing of these substances are therefore marked as dangerous. They should be avoided as far as possible.

7) Irritant: When skin or any delicate part of the body comes in contact with the irritant substance, it can cause harmful reaction. Especially, eyes, nasal mucosa and skin are affected by contact with corrosive substances.

8) Environmentally hazardous: Many substances cause harm to the environment due to their toxicity. Air, water or soil can be polluted due to such pollutants. When environment is affected, ultimately these hazardous effects come back to human species. Therefore, such substances should be carefully used. Their use should be judicious and controlled.

9) Health hazard: The substances that can cause hazard to our health should always be distanced from us. Such substances should not be kept in proximity. As far as possible they should be kept away and handled with great care if needed for any work.

- 4) i) Carbohydrates are converted to glucose after the process of digestion is completed. The oxidation of glucose for releasing energy is called glycolysis which takes place in cytoplasm. ii) Glycolysis can occur in presence of oxygen or without oxygen too. The first type of glycolysis takes place in aerobic respiration and the second type is in anaerobic respiration. iii) In aerobic respiration, there is step-wise oxidation of glucose molecule forming two molecules each of pyruvic acid, ATP, NADH₂ and water. iv) Later the pyruvic acid formed in this process is converted into molecules of Acetyl-Coenzyme-A along with two molecules of NADH₂ and two molecules of CO₂. v) During anaerobic respiration along with glycolysis there - is fermentation too. This is incomplete oxidation of glucose and thus it results in formation of lesser energy. vi) The process of glycolysis was discovered by Gustav Embden, Otto Meyerhof, and Jacob Parnas. Therefore, in their honour, glycolysis is also called as Embden-Meyerhof-Parnas pathway (EMP pathway). For the discovery they had performed experiments on muscles.
- 5) i) Some couples want a child but they are not able to bear one due to various problems either in mother or in father. In such cases modern techniques such as IVF, surrogacy and sperm bank are useful in conceiving a child. ii) In women if there are problems like irregularity in a menstrual cycle, difficulties in oocyte production or implantation in uterus, obstacles in the oviduct, etc, then she can resort to any one technique of the above. iii) In man if there are no sperms in the semen, slow movement of sperms, or anomalies in the sperms then he becomes sterile. iv) But now with the help of advanced medical techniques these problems can be overcome and a childless couple can be parents. v) These methods are as follows:
- i) Surrogacy: In woman if there is problem regarding the implantation of embryo in uterus, then help of another woman is taken. This woman is called surrogate mother. Oocyte from real mother is taken out and fertilized with sperms collected from her husband. These gametes are fertilized outside in a test-tube and then the fertilized zygote is implanted in the surrogate

mother.

ii) In Vitro Fertilization (IVF) is done when there are problems like less sperm count or obstacles in oviduct. In IVF, fertilization is done in the test-tube. The embryo formed is implanted in uterus of woman for further growth.

iii) Sperm bank: If man has problems with the sperm production, then the sperms are collected from the sperm bank. Sperm bank is the place where the donor's donate the sperms and such sperms are kept stored. The donor's identity is kept secret and he should also be physically and medically fit person.

6) Online Blue Whale or Blue Whale challenge is an internet game which originated in Russia. This is very dangerous game. It reportedly consists of a series of tasks assigned to players by administrators over a 50-day period. In these 'tasks' there are challenges like watching horror movie alone, inflict wounds on the body, leaving the house and going anywhere, etc. After performing 50 tasks like these, the final challenge requires the player to commit suicide. Many adolescents have lost their lives due to Blue Whale game. In India too, five children have committed suicide due to blue whale challenge. This game was invented in 2013 by Philipp Budeikin, a 21-year-old former psychology student. He is now arrested in 2016 and is in Russian prison. This game is banned in India. The children who spent solitary life, the children whose parents are not around and those who are in deep stress usually fall into the traps like Blue Whale Game. One must always remember, if you are in stress, talk to your elders, parents or teachers. The problems can be solved by logical and rational thinking. Our life is precious, it should not be wasted.

7) The ways of stress-burst in case as follows:

1) Laughter Club: People gather together and laugh collectively to reduce stress.

2) Good communication: One should establish good communication with friends, siblings, cousins, teachers, parents or anybody in whom we can confide and express our feelings.

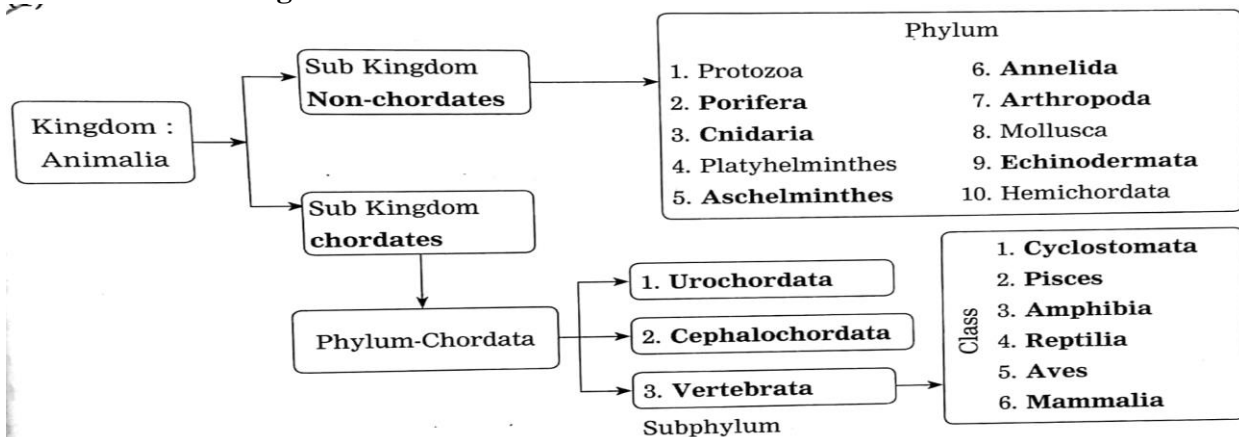
3) Writing: By writing and noting the thoughts we feel relieved. We can confess and analyse about our mistakes through writing to reduce our stress.

4) Hobbies: Collecting curios, photography, reading good literature, music, cooking, gardening, bird watching, keeping a pet, sculpturing, drawing, rangoli, dancing, etc. are such hobbies which necessary for utilizing our spare time by creativity. Persuading hobby is the best way to be stress-free. Music in particular is said to change the negative thoughts, therefore, listening to music, learning the music and singing helps to fight stress. By admiring nature too, stress is relived.

5) Outdoor games and physical exercise: By participating in the sports, there are various benefits such as physical exercise, improving discipline, interaction with others and creating the tendency of unity, becoming more social and reduce stress.

Q.4 Answer the following.

1)



2)

i) Asexual reproduction. a – Paramoecium, b – Hydra, c – Fungi, d – Amoeba.

ii) Prokaryotic organisms.

iii) Because it leads to the formation of a new cell.

iv) 'a' is regeneration, 'b' is fragmentation, 'c' is budding, 'd' is cyst formation.

- v) a – Regeneration is a procedure where an organism is regenerated from the cut part of the parent organism.
- b – The parent organism divides into multiple parts and each individual part regrows into a new organism.
- c – Formation of bud on the parent body which matures to form a new organism.
- d – Formation of multiple granules in a hard covering known as cyst which breaks on the occurrence of favourable conditions.

*This question paper is for practice purpose only.