

### Q. 1. (A)

- (i) (B)
- (ii) (B)
- (iii) (B)
- (iv) (D)
- (v) (D).

### Q. 1. (B)

- (i) False
- (ii) EMP pathway
- (iii) Secretions of Prostate gland, seminal vesicles and Cowper's glands along with sperms.
- (iv) Turbine. When it rotates it produces kinetic energy.
- (v) Annelida.

### Q. 2. (A)

- (i)** (1) Fibres are indigestible substance.  
(2) They are thrown out along with other useless and undigested matter.  
(3) This aids in egestion. Some fibres also help in digestion of other substances.  
(4) Green leafy vegetables, fruits, cereals, etc. are considered as important in diet as they supply nutritious fibres.  
(5) Thus, fibres are considered as one of the important nutrients.
- (ii)** (1) Hydroelectric energy does not cause pollution.  
(2) Generation of hydroelectric energy does not involve burning of fossil fuel.  
(3) If sufficient water storage is available then electricity generation can be done as per requirement.  
(4) Rainwater can replenish the water storage and power generation can thus be done uninterrupted.
- (iii)** (1) All chordates possess notochord in some period of their development.  
(2) All vertebrates also have notochord during embryonic life, which is later replaced by vertebral column.  
(3) Therefore all vertebrates are chordates.  
(4) But some chordates like Urochordata and cephalochordata do not possess vertebral column and hence they are not vertebrates.

**Q. 2. (B)**

(i) The phase given in diagram is metaphase.

(1) Chromosomes are arranged in equatorial plane of the dividing cell.

(2) Spindle fibres are formed from the polar regions from centrioles. They are seen attached to centrosomes of the chromosomes.

(3) Nuclear membrane disappears completely.

(ii) (1) Corpus luteum : Corpus luteum is the secondary structure that is formed from empty ovarian follicle after ovulation. This corpus luteum produces progesterone and thereby maintains pregnancy.

(2) Sperm bank : Sperm bank is the place where semen donated by the desired men is collected after their thorough physical and medical check-up and stored at sub-zero temperatures in sterile conditions.

(iii) Vulnerable species : Tiger, Lion

Rare species : Red panda, Musk deer.

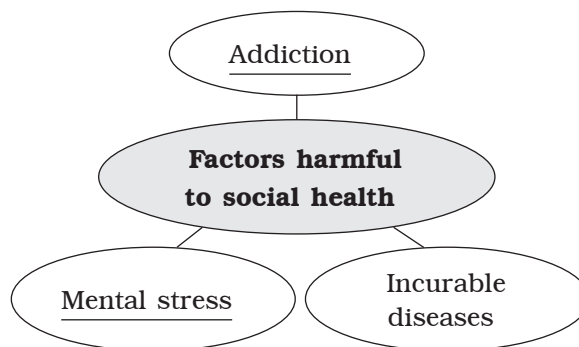
(iv) (1) Sea horse : Class Pisces.

Distinguishing characters : Bony fish. Highly modified body structure showing brood pouch for development of offspring gills for respiration, fins for swimming.

(2) Penguin : Class Aves.

Distinguishing characters : It is flightless bird. Body covered with thick feathery coat. Oviparous mode.

(v)



- Tobacco products are included under addiction.

**Q. 3. (i)** (1) Transcription : Process of synthesis of mRNA according to the nucleotide sequence present on DNA is called transcription.

(2) Translation : The process of bringing tRNA possessing anticodon that is complementary to the codon on mRNA for protein synthesis is called translation.

(3) Translocation : The process of movement of the ribosome from one end of mRNA to other end by the distance of one triplet codon is called translocation.

- (ii) (1) This method of reproduction is called multiple fission. Amoeba shows such type of reproduction.
- (2) It takes place under unfavourable conditions.
- (3) Amoeba forms protective covering and becomes encysted. Inside the cyst, amoeba undergoes repeated nuclear divisions, which are followed by cytoplasmic divisions.
- Many amoebulae are formed inside the cyst which remain dormant. When favourable conditions return back, the cyst ruptures and many amoebae come out at one time.
- (iii) (1) The reaction shown in nuclear fission or chain reaction.
- (2) This reaction is used in nuclear power plants where electricity is generated.
- (3) Uranium-235 is used in the nuclear fission reactions.

(iv)	Fruit	Microbe used	Name of beverage
	<u>Coffea arabica</u>	<u>Lactobacillus brevis</u>	Coffee
	<u>Theobroma cacao</u>	<u>Candida, Hasenula, Pichia, Saccharomyces</u>	<u>Cocoa</u>
	Grapes	<u>Saccharomyces cerevisiae</u>	<u>Wine</u>
	Apple	<u>Saccharomyces cerevisiae</u>	<u>Cider</u>

- (v) (1) The oil spills in rivers or oceans are caused by crude oil or petroleum hydrocarbons.
- (2) This crude oil is highly toxic to the flora and fauna of the aquatic environment.
- (3) By using mechanical means the oil spill can be removed, but this is very difficult.
- (4) The biological way to remove this pollution is done by using culture of microbes like *Pseudomonas* spp. and *Alcanovorax borkumensis*.
- (5) They have the ability to destroy the pyridines and other chemicals present in the hydrocarbons.
- (6) These bacteria are called as hydrocarbonoclastic bacteria (HCB) which decompose the hydrocarbons and bring about the reaction of carbon with oxygen.
- (7) In the process CO<sub>2</sub> and water are formed. In this way the oil spills are cleaned, by releasing HCB at the place of oil spills.
- (vi) Differentiation of stem cells can form various tissues in the body. Stem cells are present in the umbilical cord by which the foetus is joined to the uterus of the mother. Stem cells are also present in the blastocyst stage of embryonic development. Stem cells are present in red bone marrow and adipose connective tissue of adult human beings. It has become possible to produce different types of tissues and the degenerated part of any organ with the help of these stem cells.

- (vii) (1) The process of making transgenic potatoes is shown in the figure.
- (2) (a) These potatoes act against bacteria causing cholera e.g. *Vibrio cholerae*.  
Also they are effective against *Escherichia coli*.
- (b) Consumption of raw potatoes produces immunity against cholera and colitis – disease caused by *Escherichia coli*.
- (3) (a) Per hectare yield is increased though there are limitations in crop agriculture.
- (b) Expenses of disease control are minimized due to development of resistant varieties.
- (viii) (1) Exercise, yoga and meditation are the ways to reduce mental and physical stress.
- (2) In yoga various asanas and pranayama are performed.
- (3) It also includes good food and discipline of the body and mind.
- (4) Deep breathing, yogic sleep can help in the building up health.
- (5) Meditation helps in concentration and brings positivity to the mind.
- (6) Especially, the students increase the concentration in the studies.

**9. 4.**

- (i) (1) In this picture, food chain having five trophic levels is shown.
- (a) Trophic level 1 = Producers : Green plant.
- (b) Trophic level 2 = Primary consumer (Herbivore) : Grasshopper.
- (c) Trophic level 3 = Secondary consumer (Carnivore) : Bird.
- (d) Trophic level 4 = Tertiary consumer (Carnivore) : Snake.
- (e) Trophic level 5 = Top or Apex consumer (Carnivore) : Owl.
- (2) Decomposers are not shown in the diagram. If they are lacking the organic components will not be converted back into inorganic constituents.
- (ii) (1) First aid is the help given to a victim or a patient immediately before the qualified medical help is obtained.

(2)

