

MAHESH TUTORIALS I.C.S.E.

ICSE X

SUBJECT : **BIOLOGY**

BOARD PAPER – 2017

ANSWER SHEET

SECTION - A (20 marks)

(Attempt all questions from this section)

Answer 1

(a)

- | | |
|--------------------------|---|
| (i) Osmosis [Endosmosis] | 1 |
| (ii) Liver | 1 |
| (iii) Concave lens | 1 |
| (iv) Oxytocin | 1 |
| (v) Red Cross | 1 |

(b)

- | | |
|------------------------------|---|
| (i) Refrigeration equipments | 1 |
| (ii) Antibody | 1 |
| (iii) Endosmosis | 1 |
| (iv) Oviduct | 1 |
| (v) DNA | 1 |

(c)

- | | |
|---|---|
| (i) The Graafian follicle after ovulation turns into a hormone producing tissue called Corpus luteum . | 1 |
| (ii) Deafness is caused due to the rupturing of the Eardrum/Tympanum . | 1 |
| (iii) Gyri and Sulci are the folds of Cerebrum . | 1 |
| (iv) Free movement of solutes in and out of the cell takes place across the Cell wall | 1 |
| (v) The solvent used to dissolve the chlorophyll pigments while testing a leaf for starch is Methylated spirit . | 1 |

(d)

- | | |
|---|---|
| (i) Platelets – Thromboplastin – Thrombin – Fibrinogen – Fibrin | 1 |
| (ii) Pinna – Malleus – Incus – Stapes – Cochlea | 1 |
| (iii) Receptor – Sensory neuron – Spinal cord – Motor neuron – Effector | 1 |
| (iv) Uterus – Fertilisation – Implantation – Gestation – Parturition | 1 |
| (v) Green leaves – Caterpillar – Frog – Snake – Owl | 1 |

(e)

- (i) Odd one : Central canal
Category : Rest are found in our eye whereas central canal is seen in spinal cord. **1**
- (ii) Odd one : Iodine
Category : Rest are disinfectants whereas Iodine is an antiseptic. **1**
- (iii) Odd one : ADH
Category : Rest are hormones secreted from anterior pituitary whereas ADH is secreted from posterior pituitary. **1**
- (iv) Odd one : RNA
Category : Rest are components of a nucleotide whereas RNA is a nucleic acid. **1**
- (v) Odd one : Bile
Category : Rest are nitrogenous metabolic waste whereas bile is produced in liver and stored in gall bladder and play an important role in digestion i.e. emulsification of fats. **1**

(f)

- (i) Eye : Optic nerve :: Ear : **Auditory nerve.** **1**
- (ii) Cytoplasm : Cytokinesis :: Nucleus : **Karyokinesis.** **1**
- (iii) TT : Homozygous :: Tt : **Heterozygous.** **1**
- (iv) Foetus : Amnion :: Heart : **Pericardium.** **1**
- (v) Adenine : Thymine :: Cytosine : **Guanine.** **1**

(g)

| | Column A | Column B | |
|-------|-------------------|---------------------|----------|
| (i) | Sacculus | Static body balance | 1 |
| (ii) | Birth rate | Natality | 1 |
| (iii) | DNA and histones | Nucleosome | 1 |
| (iv) | Euro norms | Vehicular standards | 1 |
| (v) | Diabetes mellitus | Hyperglycemia | 1 |

(h)

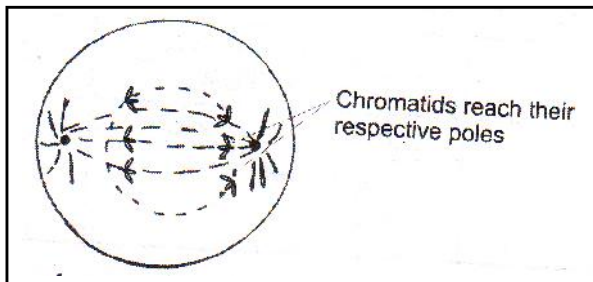
- (i) The endocrine gland shown in the diagram is thyroid gland. **1**
- (ii) The secretion of this gland is thyroxine which regulates basal metabolism. **1**
- (iii) The mineral element required for synthesis of thyroxine is iodine. **1**
- (iv) Cretinism is caused due to undersecretion of thyroxine in children. **1**
- (v) Exophthalmic goitre is caused due to hypersecretion of thyroxine **1**

SECTION - B (40 marks)
(Attempt any four questions from this section)

Answer 2

(a)

- (i) The stage shown in the figure is telophase due to the following reasons : 1
- (1) Nuclear membrane and nucleolus have reappeared.
 - (2) Spindle fibres are disappearing.
 - (3) Furrows have been formed for the division of cytoplasm.
 - (4) Sister chromatids reach opposite poles.
 - (5) The two sets of daughter chromosomes have reached the opposite poles.
- (ii) (1) Chromatin fibres ½
 (2) Nuclear membrane ½
- (iii) The division of nucleus is called Karyokinesis. 1
- (iv) The stage comes before this stage that is shown in the diagram is anaphase. 1



- (v) Meiosis is the cell division that results in half the number of chromosomes in daughter cells. 1

(b)

| | | | |
|-----|--|---|---|
| (i) | Active Transport | Diffusion | 1 |
| | In plants the mineral nutrients like nitrates, sulphates, potassium etc. are taken up by root hairs from the soil by active transport. | Gaseous exchange during respiration and photosynthesis in plants occurs by diffusion process. | |

| | | | |
|------|---|---|---|
| (ii) | Demography | Population density | 1 |
| | Statistical study of human population specially with reference to size and density, distribution and other vital statistics is called demography. | Population density is the number of individuals per square kilometer at any given time. | |

| | | | |
|-------|--|---|----------|
| (iii) | Antibiotic | Antibody | 1 |
| | Antibiotics are chemical substances produced by some microorganisms like fungi, bacteria which can kill or inhibit the growth of other microbes. | Antibodies are proteins produced by a specialized lymphocytes called B-lymphocytes on exposure to antigens. | |

| | | | |
|------|--|--|----------|
| (iv) | Renal cortex | Renal medulla | 1 |
| | Bowman's capsule, proximal convoluted tubule, distal convoluted tubule lies in the renal cortex. | Loop of Henle which is the U-shaped part of nephron lies in renal medulla. | |

Answer 3

(a)

- (i) The cell shown in the diagram is in flaccid [plasmolysed] state. ½
- (ii) Plasma membrane acts as a selectively permeable membrane. ½
- (iii) 1- Cell wall ½
 2- Strong sugar solution ½
 3- Plasma membrane ½
 4- Nucleus ½
- (iv) If this flaccid or plasmolysed cell is placed in water, its protoplasm again swells up and cell can retain back its original condition. This recovery of the cell is called deplasmolysis. **1**
- (v) In plant cell cell wall, a large vacuole in the centre and chloroplasts are present which is not seen in an animal cell. **1**

(b)

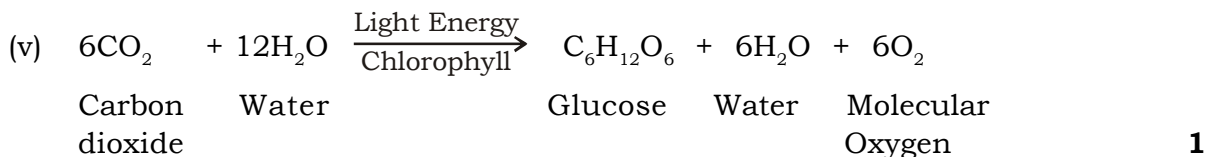
- (i) The diagram shown represents noise pollution. **1**
- (ii) The three common sources of noise pollution are : **1**
 - (a) Industrial machines and workshops
 - (b) Loudspeakers and musical bands
 - (c) Trains and automobiles on street
- (iii) The three harmful effects of noise pollution on human health are : **1**
 - (a) Interrupts concentration of thought and disturbs peace of mind.
 - (b) Disturbs sleep and leads to nervous irritability.
 - (c) A sudden loud sound can damage ear drum and prolonged noise leads to deafness.
- (iv) Pollutant is any such constituent which causes pollution. **1**
 A pollutant is a substance or energy introduced into the environment that has undesired effects, or adversely affects the usefulness of a resource.

- (v) The two soil pollutants are : (a) Industrial waste like chemical residues, metallic ash, fly ash etc. (b) Chemical fertilizers and pesticides like DDT. **1**

Answer 4

(a)

- (i) Photosynthesis is the physiological process that is occurring in the green plant which kept the mouse alive. **1**
- (ii) Photosynthesis is the process by which living plant cells containing chlorophyll produce food substances like glucose and starch from carbon dioxide and water by using light energy. Plants release oxygen gas during this process which is a life supporter for the living organisms on the earth's surface. **1**
- (iii) In bell jar B there is no green plant so no oxygen is produced by photosynthesis process. The oxygen gas that is present in the bell jar has already been consumed by the mouse and the burning candle. So due to lack of oxygen the mouse died and also the candle got extinguished. **1**
- (iv) The significance of photosynthesis process is that it is the only biological process which releases oxygen into the atmosphere that supports all life forms on the earth's surface. **1**



(b)

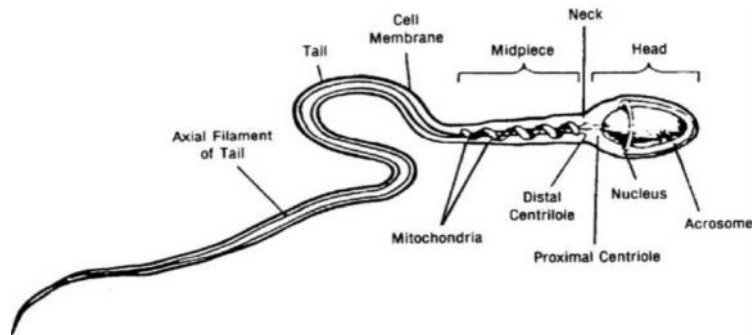
- (i) **Prostate gland** : It surrounds the urethra close to its origin from the urinary bladder. **1**
- (ii) **Myelin sheath** : It is an insulating envelope that surrounds the axon of nerve cells. **1**
- (iii) **Islets of Langerhans** :
It is a special group of hormone secreting cells found in the pancreas. **1**
- (iv) **Semi-circular canals** :
They are a set of three canals found in inner ear which are arranged at right angles to each other in three different planes so that one is horizontal and other two are vertical. **1**
- (v) **Eustachian tube** : It connects the cavity of the middle ear with the throat. **1**

Answer 5

(a)

- (i) 1 . Scrotum 2. Vas deferens/ Sperm duct 3. Epididymis **1**
- (ii) The sperms are produced in seminiferous tubules. **1**
- (iii) The function of scrotum or scrotal sacs is that they contain the testes

- and temperature in them is 2°C or 3°C lower than body temperature that favours production of sperms. The function of epididymis is that it stores the sperms for some days during which they mature and become motile. **1**
- (iv) The interstitial cells or Leydig cells produce male hormone testosterone. **1**
- (v) **1**

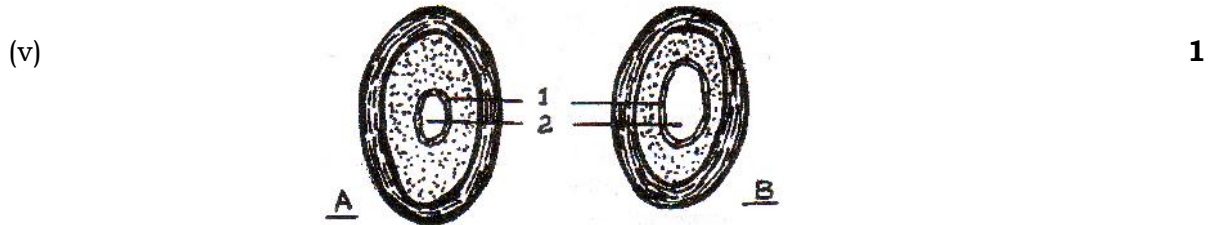


- (b)**
- (i) When women have high level of androgens in blood or if there is an over growth of adrenal cortex in a mature woman , she develops certain male characteristics such as a beard, moustaches and deep male voice. This condition is known as adrenal virilism. **1**
- (ii) Cutting of trees should be discouraged because if there were no green plants all life on the earth would come to an end. Trees provide food and oxygen to all by the process of photosynthesis. Oxygen is the life supporting gas. They release water in form of vapours by transpiration process which helps in bringing rain so they also affect our climate. **1**
- (iii) In some xerophytes leaves are modified into spines to reduce transpiration process as xerophytes are mainly found in deserts where there is water scarcity. As leaves are modified into spines their surface area is reduced, hence transpiration will be less. **1**
- (iv) During winter surrounding temperature is low and there is almost no sweating. So water is not lost by perspiration. Hence water along with waste substances is mainly removed through urine. So we urinate frequently in winter than in summer. **1**
- (v) The left ventricle pumps blood to the farthest points of the body like toes, feet, brain and other parts of the body whereas right ventricle pumps blood only up to the lungs. So walls of left ventricle are thicker than walls of right ventricle. **1**

Question 6

- (a)**
- (i) Ventricles are in the diastolic phase as semilunar valves at root of aorta and pulmonary artery are closed and bicuspid and tricuspid valves are open. Blood enters from atria to ventricles through atrio-ventricular valves. **1**
- (ii) 1 - Pulmonary artery 2 - Pulmonary vein

- Deoxygenated blood flows through pulmonary artery and oxygenated blood flows through pulmonary veins. 1
- (iii) LUBB sound is caused by the closure of atrio-ventricular valves i.e. tricuspid and bicuspid valves. Due to closure of semilunar valves located at the root of pulmonary artery and aorta DUP sound is produced. 1
- (iv) Coronary artery supplies oxygenated blood to the heart muscles. 1



- (b)**
- (i) Innate immunity ½
- (ii) Recessive allele ½
- (iii) Seminal vesicles ½
- (iv) Ganong's potometer ½
- (v) Fraternal twins ½
- (vi) Homologous chromosomes ½
- (vii) Antiseptics ½
- (viii) Biomedical waste ½
- (ix) Lysozyme ½
- (x) RBCs/ Erythrocytes ½

Answer 7.

- (a)**
- (i) The phenotype of the F₁ generation will be plants with axial flowers produced. The genotype of F₁ generation plants is (Aa). 1
- (ii)
- | | | | |
|---|------|---|------|
| | (Aa) | x | (Aa) |
| | A | | a |
| A | AA | | Aa |
| a | Aa | | aa |
- 1
- (iii) From the above cross 3 plants with axial flowers(AA), (Aa) and 1 plant with terminal flower (aa) is produced. So phenotypic ratio is 3 : 1 .
Genotypic ratio is 1 : 2 : 1 1
- (iv) Mendel's Law of Dominance states that - 'Out of a pair of contrasting characters present together, only one is able to express itself while the other remains suppressed. The one that expresses itself is the dominant character and the one unexpressed is the recessive. The recessive character can express only when the pair is homozygous recessive'. 1

- (v) Haemophilia and colour blindness are two common genetic disorders commonly seen in human males. **1**
- (b)**
- (i) A - Cerebrum B - Cerebellum C - Spinal cord **1**
- (ii) Cerebrum is the seat of intelligence, consciousness, will power. It controls all voluntary activities. Cerebellum coordinates muscular activities and maintains balance of the body. **1**
- (iii) Neuron is the structural and functional unit of the brain. In cerebrum outer portion contains cell bodies of the neuron whereas inner portion contains axons of the neurons. Whereas in spinal cord outer portion contains axons and inner portion contains cell bodies of neurons. **1**
- (iv) The membrane covering the brain is meninx which are 3 membranous coverings. **1**
- (v) Cerebrospinal fluid is a watery fluid found within the space of the covering membrane and also in ventricles of brain and central canal of spinal cord. It acts like a cushion to protect the brain from shocks. It also acts as a medium for the exchange of food materials, waste products respiratory gases with neurons. **1**

