

MAHESH TUTORIALS I.C.S.E.

ICSE X

SUBJECT : **BIOLOGY**

BOARD PAPER – 2016

ANSWER SHEET

SECTION - A (20 marks)

(Attempt all questions from this section)

Answer 1

(a)

- | | |
|-----------------------------------|---|
| (i) Crossing over | 1 |
| (ii) Population density | 1 |
| (iii) Passive immunity | 1 |
| (iv) Non-biodegradable pollutants | 1 |
| (v) Pons | 1 |

(b)

- | | |
|--|---|
| (i) B. Turgor pressure exceeds wall pressure | 1 |
| (ii) C. Thylakoids | 1 |
| (iii) D. Renal pelvis | 1 |
| (iv) D. Hypersecretion of Growth hormone | 1 |
| (v) C. Calcium | 1 |

(c)

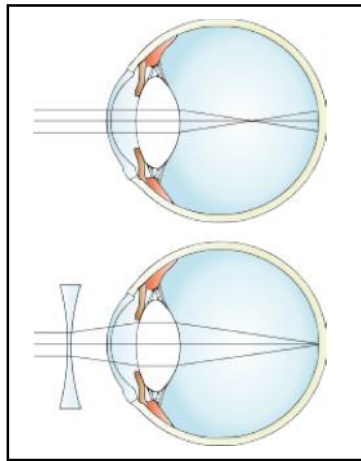
- | | |
|---|---|
| (i) Odd term : Styrofoam
Category : Biodegradable material. | 1 |
| (ii) Odd term : Pepsin
Category : Nitrogenous bases of DNA | 1 |
| (iii) Odd term : Iris
Category : Ear ossicles present in middle ear. | 1 |
| (iv) Odd term : Cortisone
Category : Hormones secreted by Pituitary gland. | 1 |
| (v) Odd term : Typhoid
Category : Genetic diseases/disorders. | 1 |

(d)

- | | |
|---|---|
| (i) Vasopressin or (ADH) Antidiuretic hormone | 1 |
| (ii) Posterior | 1 |
| (iii) Diabetes insipidus | 1 |
| (iv) Insulin | 1 |
| (v) Diabetes mellitus | 1 |

- (e)
- (i) **Centromere** : At the joining place of two chromatids of a chromosome. **1**
 - (ii) **Chordae tendinae** : The apices of the valves of the heart are attached to the wall of the ventricles by Chordae tendinae. **1**
 - (iii) **Thyroid gland** : It is present below larynx in the neck region. **1**
 - (iv) **Ciliary body** : It is present at the junction of choroid and iris. **1**
 - (v) **Proximal convoluted tubule** : It is highly coiled tube present just below the Bowman's capsule, found in the renal cortex. **1**

- (f)
- (i) i. Myopia **1**
 - ii. Two possible reasons for this defect: **1**
 - 1. The eyeball becomes lengthened from front to back
 - 2. The eye lens become too curved or bulged
 - iii. Concave lens of suitable focal length is used to rectify this defect. **1**
 - iv. Rectification of this defect by using concave lens :



Rectification of Myopia defect with Concave lens **2**

- (g)
- (i) Iris – Colour of eyes **1**
 - (ii) Addison's disease – Hypoglycemia **1**
 - (iii) Blind spot – Free of rod and cone cells **1**
 - (iv) Spermatozoa – Acrosome **1**
 - (v) Cushing syndrome – Hyperglycemia **1**

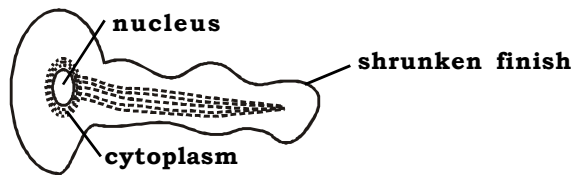
- (h)
- (i) Lymphocytes of blood cells : Produce antibodies **1**
 - (ii) Leydig cells : Dissolve themselves and produce testosterone hormone **1**
 - (iii) Guard cells : Helps in opening and closing of stomata. **1**
 - (iv) Eustachian tube : Equalizes the air pressure on either side of the eardrum. **1**
 - (v) Corpus luteum : Secretes progesterone hormone to prepare uterus to receive embryo. **1**

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

Answer 2

(a)

- (i) 1. Root hair ½
- 2. Soil particles ½
- 3. Xylem ½
- 4. Cortex ½
- (ii) Osmosis ½
- (iii) The pressure responsible for the movement of water is 'Root Pressure'.
Root Pressure:- It is the pressure developed in the roots due to the movement of water from the soil into the living cells of the root by cell to cell osmosis into the xylem vessels by which ascent of sap occurs in the stem. 1
- (iv) Guttation ½
- (v) 1



(b)

(i)	Human skin cell	Human Ovum	1
	Number of chromosomes in human skin cell is 46	Number of chromosomes in ovum is 23.	
(ii)	Sperm duct	Fallopian tube	1
	Carries sperms from testis to urethra.	Carry egg from ovary to uterus.	
(iii)	Red Cross	WHO	1
	Arrange ambulance service in all emergency situations.	Promote and supports projects for research on diseases.	
(iv)	Red Cross	WHO	1
	Pigment in rod cells is rhodopsin	Pigment in cone cells is iodopsin.	
(v)	LUBB	DUP	1
	Tricuspid and Bicuspid valves get closed at the beginning of ventricular systole.	Semilunar valves present at the base of pulmonary artery and aorta get closed sharply at the time of ventricular diastole.	

Answer 3

(a)

- (i) 1. Pituitary gland ½
- 2. Thyroid gland ½
- 3. Pancreas ½
- 4. Adrenal gland ½
- (ii) Thyroxine hormone. This hormone controls basal metabolic rate of the body. 1
- (iii) Islets of Langerhans ½
- (iv) Pituitary gland secret tropic hormones and these hormones controls the secretions of other endocrine glands of our body. Hence this gland is known as master gland. Hypothalamus of forebrain controls the Pituitary gland. 1
- (v) Adrenal gland secrets the emergency hormone adrenalin. ½

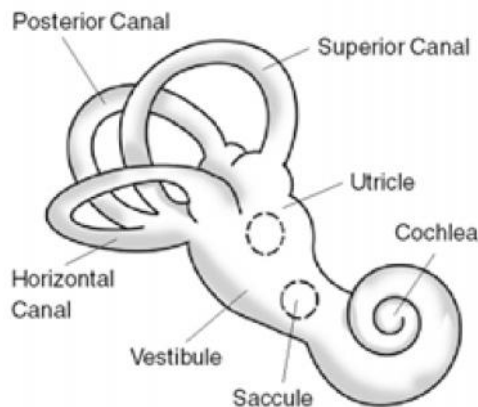
(b)

- (i) The apparatus is Ganong's Potometer. ½
- (ii) Rate of Transpiration of a leafy shoot. 1
- (iii) The loss of water in the form of water vapor through the aerial parts of the plant is known as 'Transpiration'. 1
- (iv) Limitations in using this apparatus:-
 - 1. Any changes in the outside air or temperature may effect the position of the air bubble in the capillary tube.
 - 2. Inserting a single air bubble into the Potometer is not an easy task. 1
- (v) The movement of air bubble along the scale gives a measure of water absorbed by the plant over a period of time and hence indicates the rate of transpiration. 1
- (vi) Stomata ½

Answer 4

(a)

- (i) Membranous labyrinth diagram:- 1



- (ii) Organ of corti 1
- (iii) Sacculus and Utriculus 1
- (iv) Oval window 1
- (v) Endolymph 1
- (vi) Ampulla region of semi-circular canals 1

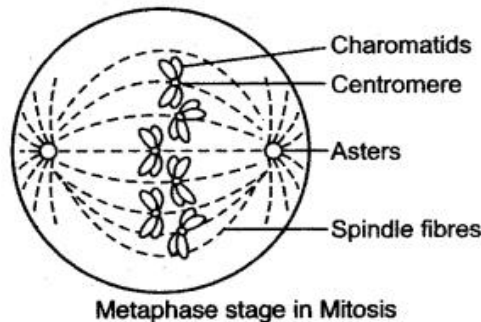
(b)

- (i) Menopause ½
- (ii) Urochrome ½
- (iii) Hepatic portal vein ½
- (iv) Inguinal canal ½
- (v) Pollution ½
- (vi) Excretion ½
- (vii) Nucleotides ½
- (viii) Mutation ½
- (ix) Active transport ½
- (x) Pulmonary veins ½

Answer 5

(a)

- (i) The stage of the cell division is 'Prophase'. The reason for this is nuclear membrane is disappearing. 1
- (ii) The next stage is Metaphase. 1



(iii)	Animal cell	Plant cell	1
	Cytokinesis in animal cell occurs through furrowing method while in plant cell through cell plate formation.	Aster formation can be seen in animal cell whereas aster formation cannot be seen in plant cell.	

- (iv) A. Mitotic cell division occurs in the growth of a shoot.
- B. Meiotic cell division occurs in the formation of pollen grains. 1

(b)

- (i) Color blindness is defect caused through a defective recessive gene attached to the sex chromosomes of an individual. The defect to appear in female, the defective recessive gene should be present on both the

- homozygous sex chromosomes of the female. But if the defective gene is attached to one of the sex chromosome of male, the defect get expressed because male sex chromosomes are in heterozygous condition. **1**
- (ii) Injury to medulla leads to death since respiratory and heart beat centers are located on Medulla oblongata. If Medulla oblongata is damaged heart beat and breathing in a person stops instantaneously which leads to death. **1**
- (iii) When an ovum gets fertilized, the progesterone hormone level increases which prevents development of another follicle and stops menstrual cycle. **1**
- (iv) Lack of nucleus in R.B.C. cells will help to accommodate more haemoglobin pigment in its cell for the transport of respiratory gases. Lack of mitochondria help the R.B.C. cells to prevent the self utilization of oxygen for its own needs. **1**
- (v) The walls of the arteries are highly muscular and the lumen present in arteries is very narrow. The walls of the artery expand and contract alternatively as they are highly muscular and elastic in nature. The blood flowing in arteries will carry the force applied by heart while pushing the blood into arteries. Due to this the blood flowing in arteries is at high pressure and also flow in jerky fashion. **1**

Question 6

(a)

- (i) 1. Umbilical cord
2. Placenta
3. Amniotic fluid **1½**
- (ii) Part labelled '2' is Placenta.
1. Placenta transports oxygen, nutrients like glucose and minerals, hormones and antibodies from mothers blood into foetus by diffusion method.
2. Metabolic wastes like CO₂, nitrogenous wastes from foetus are carried into mother's blood by diffusion method through placenta. **1**
- (iii) Part '3' in the diagram is Amniotic fluid which protects the foetus from sudden shocks and jerks. **½**
- (iv) The time duration taken for the intrauterine development of the foetus from the time of conception till the time of delivery is known as gestation period. The normal gestation period in human is 280 days. **1**
- (v) The sex chromosomes of a human male are XY and female are XX. **1**
- (b)**
- (i) Oxygen is evolved during photosynthesis in green plants. **1**
- (ii) Photosynthesis is process in which the green plants by using

- chlorophyll, CO₂, energy from solar radiation, water and minerals can prepare their own food. 1
- (iii) 1. Oxygen getting filled in the empty space in test tube
2. Hydrilla twigs
- (iv) Photosynthesis overall balanced chemical equation:- 1
- $$6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Chlorophyll}]{\text{Light energy}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2 \uparrow$$
- (v) The rate of bubbling of the will increase. 1
If a pinch of NaHCO₃ (sodium bicarbonate) is added to the water, the reaction results in the release of CO₂. This CO₂ is then utilized for photosynthesis. The increased amount of CO₂ will increase the rate of photosynthesis, which subsequently will increase the rate of release of oxygen bubbles. 1

Answer 7.

(a)

- (i) All the plants obtained in F₁ generation are phenotypically Tall and Red only. Genotypically all the plants obtained in F₁ generation are TtRr (Mixed tall and red). 1
- (ii) The possible combination of gametes obtained from F₁ hybrids are TR, Tr, tR, tr. 1
- (iii) Law of Independent Assortment : When there are two or more pairs of contrasting characters, the factors or genes controlling different characters assort independently without influencing each other during the formation of gametes. 1
- (iv) The Phenotypes obtained in F₂ generation are 9 Tall and Red coloured Flower plants, 3 Tall and White coloured plants, 3 Dwarf and Red colored Flower plants, 1 Dwarf and White coloured plant. 1
- (v) Phenotypic ratio of F₂ generation:- 9 : 3 : 3 : 1 1

(b)

- (i) The sudden automatic, instantaneous, stereotypic, involuntary response to a stimulus mediated by spinal cord is known as reflex action. 1
- (ii) Adjustment of the eye to see objects which are nearby and far off by changing the focal length of the lens by using ciliary body and ciliary muscles is known as Power of Accommodation. 1
- (iii) Formation of energy rich ATP molecules by using ADP and inorganic phosphate molecules in the light reaction of photosynthesis is known as Photophosphorylation. 1
- (iv) Hormones are chemical messengers which are produced in one part of our body and will have their influence at other parts of the body or target organs. 1
- (v) The point of contact between two neurons across which impulse get transmitted from one neuron to the other is known as synapse. 1

