XI – STANDARD ZOOLOGY

HALF YEARLY EXAMINATION ANSWER KEY – DEC - 2019

PART - I

1. **a**) Kingdom, phylum, genus and species
2. **b**) Flame cells of planaria
3. **b)** Stickler Syndrome – Facial abnormalities
4. **a)** Single ovary on the left side
5. **d)** Deficiency of iodine in diet
6. **b)** Vitamin C
7. **a)** (A) is correct and (R) is also correct (R) explains (A)
8. **d)** Billirubin
9. **b)** Pre-molar
10. **c)** The functional unit of kidney is the glomerulus.
11. **a)** trochlear nerve
12. **b)** Clearing of wines
13. **c)** (1)-(ii), (2)-(iii), (3)-(iv), (4)-(i)
14. **c)** Calcium
15. **d)** Apiculture

PART - II

16. Significance of Thermus aquatics: Thermus aquatics is a bacterium(organisms) which can tolerate hig temperatures.
17. **Bone**
    - It is hard and inflexible
    - . Bone cells called osteocytes are present in spaces called Lacunae.
    - Marrow is present

    Cartilage
    - It is comparatively soft and flexible.
    - Cartilage Cells called chondrocytes are enclosed in small cavities within the matrix secreted by them

B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

- Marrow is absent

18. Yes. It is a chronic neurodegenerative disease .
    - The symptoms of difficulty in remembering recent events, problems with language, disorientation and moods wings.
19. In mature worms, segments of 14 to 17 may be found swollen with a glandular thickening of the skin called the clitellum.
    - Spermathecal openings are three pairs of small ventrolateral apertures lying intersegmentally between the grooves of the segments 6/7, 7/8 and 8/9.
20. The amount of dissolved oxygen is very low in water compared to the amount of oxygen in the air. So the rate of breathing in aquatic organisms(fishes) is much faster than the(Human beings) terrestrial animals.
21. According to Frank – Starling law of the heart, the critical factor controlling SV is the degree to which the cardiac muscle cells are stretched just before they contract. The most important factor stretching cardiac muscle is amount of blood returning to the heart and distending its ventricles, venous return.
22. **Name the analysis:** SKELETAL MUSCLE GLYCOGEN ANALYSIS (SMGA)
    It is a standard method to measure muscle glycogen. Muscle glycogen provides the main source of energy during anaerobic exercise. Furthermore, total glycogen stores within the body also contribute significantly to energy metabolism in endurance-type events lasting longer in duration.
23. a) An decreased the normal heart rate is called **bradycardia**.
    b) An increased the normal heart rate is called **tachycardia**
24. Deficiency disease - Pernicious anaemia
    Vitamin associated – B12 (Cobalamine)

B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

PART - III

25.

i) Schizocoelomate animals - In these animals the body cavity is formed by splitting of mesoderm. Eg: Annelids, Arthropods, Molluscs,

ii) Enterocoelomate animals - In these animals the body cavity is formed from the mesodermal pouches of archenteron. Eg; Echinoderms, hemichordates and chordates.

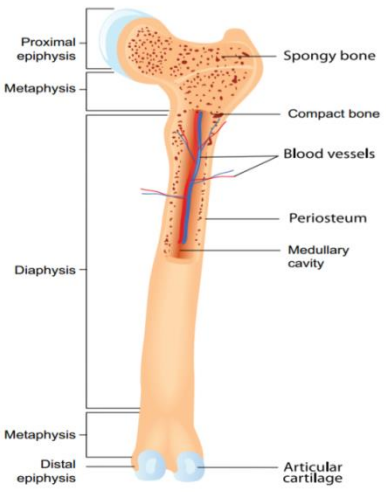
26.They are mostly terrestrial animals and their body is covered by dry and cornified skin with epidermal scales which checks loss of water.

- Most reptiles lay cleidoic eggs withextra embryonic membranes like ombion, chorion, allantois, and yolk sac, Sheel around the egg checks dessication.
- Enbryonic membranes enclose the embryo and provide watery environment.
- Internal fertilization method helps them to survive on land.

27. In cockroach, blood is not responsible for transporting respiratory gases because the respiratory pigment is absent in their blood.

- The haemolyph is colourless and consists of plasma and haemocytes which are ‘phagocytic’ in nature.

28.



B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

29.Cerebral cortex has three functional areas namely sensory areas occur in the parietal, temporal and occipital lobes of the cortex. They receive and interpret the sensory impulses.

- Motor area of the cortex which controls voluntary muscular movements lies in the posterior part of the frontal lobes.
- The areas other than sensory and motor areas are called Association areas that deal with integrative functions such as memory, communications, learning and reasoning.

30. **Vital capacity (VC) = (ERV) + (TV) +(IRV)**

= 1100 + 7000 + 3000

VC = **11100**

31. Bee wax is used for making candies, water proofing materials, polishes for floors, furniture, appliances, leather and tapes.

- It is also used for the production of comb foundation sheets in bee keeping and used in pharmaceutical industries.

32. **Osteichthyes.**

- It includes both marine and freshwater fishes with bony endoskeleton and spindle shaped body.
- Skin is covered by ganoid, cycloid or ctenoid scales.
- Air bladder is present with or without a connection to the gut. It helps in gaseous exchange (lung fishes) and for maintaining buoyancy in most of the ray finned fishes.
- They have a ventrally placed two chambered heart. Excretory organs are mesonephric kidneys and are ammonotelic.
- Presence of well developed lateral line sense organ. Sexes are separate, external fertilization is seen and most forms are oviparous.

B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

33. The enzymes are produced in pancreatic juice which are in inactive form are trypsinogen, chymotrypsinogen. Trypsinogen is activated by an enzyme, enterokinase, secreted by the intestinal mucosa into active trypsin, which in turn activates the enzyme chymotrypsinogen in the pancreatic juice.

PART – IV

34 a. Animal kingdomis divided into two sub-kingdoms, the parazoa and Eumetazoa based on the organization.

1. **Parazoa**: These include the multicellular sponges and their cells are loosely aggregated and do not form tissues or organs.

2. **Eumetazoa**: These include multicellular animals with well defined tissues, which are organized as organs and organ systems.

Eumetazoans includes two taxonomic levels called grades. They include Radiata and Bilateria.

Grade: 1 Radiata

Among the enumetazoa, a few animals have an organization of two layers of cells, the outer ectoderm and inner endoderm, separated by a jelly like mesoglea. They are radially symmetrical and are diploblastic.

Examples: Cnidarians (sea anemone, jelly fish) and Ctenophores (comb jellies).

Grade: 2. Bilateria

The eumetazoans other than Radiata, show organ level of organisation and are bilaterally symmetrical and triploblastic. The grade Bilateria includes two taxonomic levels called **Division.**

Division: 1. Protostomia (*Proto*:first; *stomium*: mouth)

Protostomia includes the eumetazoans in which the embryonic blastopore develops into mouth. This division includes three subdivisions namely acoelomata, pseudocoelomata and schizocoelomata.

Division: 2. Deuterostomia (*deuteron*: secondary; *stomium*: mouth)

Eumetazoans in which anus is formed from or near the blastopore and the mouth is formed away from the blastopore. It includes only one

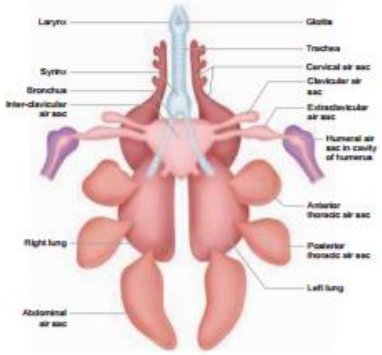
subdivision Enterocoelomata. They have a true coelom called enterocoel, formed from the archenteron.

(OR)

34. b) In birds the type of respiration is **pulmonary.** The respiratory system includes the respiratory tract, the respiratory organs and air sacs. A true muscular diaphragm is absent in birds. The **respiratory tract** includes the nares, nasal sacs, glottis, larynx, trachea and syrinx. The **respiratory organs** are the lungs and air sacs.

The larynx opens into the trachea and is supported by a series of closely set rings. The trachea divides into two **bronchi**, each of which divides and sub-divides into smaller branches, ultimately ending in fine aircapillaries which lies intermingled with the capillaries of the pulmonary vessels.

Lungs are solid spongy organs; attached dorsally to the ribs. There are nine air-sacs: a pair of **cervical sacs** at the base of the neck one on each side; a single median **interclavicular air sac** connected with both lungs and situated in between the two limbs of the furcula and on either sides it gives off an **extraclavicular air sac** communicating with an air - cavity of the humerus and a **clavicular air sac**; two pairs of **thoracic air sacs** and a pair of **abdominal air sacs**. This complicated arrangement adds to the efficient respiratory function and maintenance of a high temperature

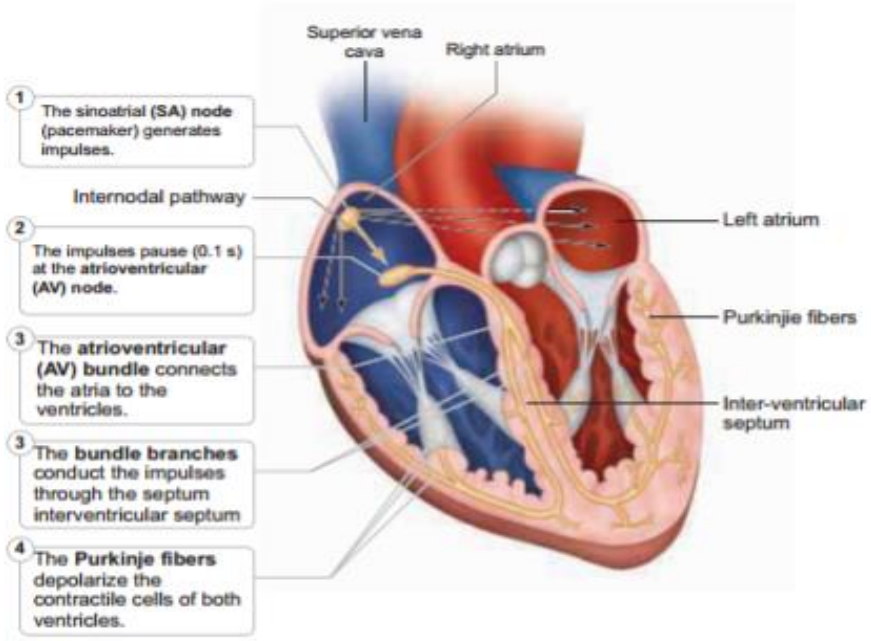


B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

35. a) The heart in human is myogenic (cardiomyocytes can produce spontaneous rhythmic depolarisation that initiates contractions). The sequence of electrical conduction of heart is shown here. The cardiac cells with fastest rhythm are called the Pacemaker cells, since they determine the contraction rate of the entire heart. These cells are located in the right sinuatrial (SA) node/ Pacemaker.

On the left side of the right atrium is a node called auriculo ventricular node (AV node). Two special cardiac muscle fibres originate from the auriculo ventricular node and are called the bundle of His which runs down into the interventricular septum and the fibres spread into the ventricles. These fibres are called the Purkinje fibres.

Pacemaker cells produce excitation through depolarisation of theircell membrane. Early depolarisation is slow and takes place by sodium influx and reduction in potassium efflux. Minimum potential is required to activate voltage gated calcium (Ca+) channels that causes rapid depolarisation which results in action potential. The pace maker cells repolarise slowly via K1 efflux.



B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

35 b) i) Protein deficient diet during early stage of children may lead to protein energy malnutriation such as Marasmus and Kwashiorikor.

1. **Kwashiorkor**: Symptoms are dry skin, potbelly, oedema in the legs and face, staunted growth, changes in hair colour, weakness and irritability.
2. **Marasmus**: Marasmus is an acute form of protein malnutrition. This condition is due to a diet with inadequate carbohydrate and protein . Such children are suffer from diarrhea, body becomes lean and weak (emaciated) with educed fat and muscle tissue with thin and folded skin.

ii)Peptic Ulcer:

- It refers to an eroded area of the tissue lining (mucosa) in the stomach or duodenum. Duodenal ulcer occurs in people in the age group of 25-45 years.
- Gastric ulcer is more common in persons above the age of 50 years.Ulcer is mostly due to infections caused by the bacterium Helicobacter pylori.
- It may also be caused due to uncontrolled usage of aspirin or certain anti inflammatory drugs.

36.a) Functions of skeletal system (any 5)

- Support –It forms a rigid framework and supports the weight of the body against gravity.
- Shape - It provides and maintains the shape of the body.
- Protection – It protects the delicate internal organs of the body.
- Acts as reservoir – It stores minerals such as calcium and phosphate.
- Fat (Triglyceride) is stored in yellow bone marrow and represents a source of stored energy for the body.
- Locomotion – It acts as lever along with the muscles attached to it.
- Strength – It can withstand heavy weight and absorbs mechanical shock.

36 b) i) ADH and Diabetes insipidus

- The functioning of kidneys is efficiently monitored and regulated by hormonal feedback control mechanism involving the hypothalamus,

juxta glomerular apparatus and to a certain extent the heart.

- Osmoreceptors in the hypothalamus are activated by changes in the blood volume, body fluid volume and ionic concentration.
- When there is excessive loss of fluid from the body or when there is an increase in the blood pressure, the osmoreceptors of the hypothalamus respond by stimulating the neurohypophysis to secrete the antidiuretic hormone (ADH) or vasopressin (a positive feedback).
- ADH facilitates reabsorption of water by increasing the number of aquaporins on the cell surface membrane of the distal convoluted tubule and collecting duct.
- This increase in aquaporins causes the movement of water from the lumen into the interstitial cells, thereby preventing excess loss of water by diuresis.
- When you drink excess amounts of your favourite juice, osmoreceptors of the hypothalamus is no longer stimulated and the release of ADH is suppressed from the neurohypophysis (negative feedback) and the aquaporins of the collecting ducts move into the cytoplasm. This makes the collecting ducts impermeable to water and the excess fluid flows down the collecting duct without any water loss.
- Hence dilute urine is produced to maintain the blood volume.
- Vasopressin secretion is controlled by positive and negative feedback mechanism. Defects in ADH receptors or inability to secrete ADH leads to a condition called diabetes insipidus, characterized by excessive thirst and excretion of large quantities of dilute urine resulting in dehydration and fall in blood pressure.

ii) ANF

- Excessive stretch of caradiac atrial cells cause an increase in blood flow to the atria of the heart and release Atrial Natriuretic Peptide or factor (ANF) travels to the kidney where it increases Na1 excretion and

increases the blood flow to the glomerulus, acting on the afferent glomerular arterioles as a vasodilator or on efferent arterioles as a vasoconstrictor.

- It decreases aldosterone release from the adrenal cortex and also decreases release of rennin, thereby decreasing angiotensin II. ANF acts antagonistically to the rennin-angiotensin system, aldosterone and vasopressin.

37a). Stages involved in rearing:

There are some steps involved in rearing of chicken.

- **Selection of the best layer:** An active intelligent looking bird, with a bright comb, not obese should be selected.
- **Selection of eggs for hatching:** Eggs should be selected very carefully. Eggs should be fertile, medium sized, dark brown shelled and freshly laid eggs are preferred for rearing. Eggs should be washed, cleaned and dried.
- **Incubation and hatching:** The maintenance of newly laid eggs in optimum condition till hatching is called incubation. The fully developed chick emerges out of egg after an incubation period of 21 – 22 days.
- There are two types of incubation namely natural incubation and artificial incubation.In the natural incubation method, only a limited number of eggs can be incubated by a mother hen. In artificial incubation, more number of eggs can be incubated in a chamber (**Incubator)**.
- **Brooding -** Caring and management of young chicks for 4 – 6 weeks immediately after hatching is called brooding.
- **Housing of Poultry**

  To protect the poultry from sun, rain and predators it is necessary to provide housing to poultry. Poultry house should be moisture- proof, rat proof and it should be easily cleanable and durable.
- **Poultry feeding:** The diet of chicks should contain adequate amount of water, carbohydrates, proteins, fats, vitamins and minerals.

37, b)Hormones are Chemical Messengers

- The endocrine system influences the metabolic activities by means of hormones (hormone means *to excite*) which are chemical messengers released into the blood and circulated as chemical signals and acts specifically on certain organs or tissues called target organs or target tissues.
- Physiological functions of our human body is regulated and coordinated by both neural and endocrine systems. The endocrine system influences the metabolic activities by means of **hormones** (hormone means *to excite*) which are chemical messengers released into the blood and circulated as chemical signals and acts specifically on certain organs or tissues called target organs or target tissues.
- Hormones may speed up or slow down or alter the activity of the target organs. The hormones secreted do not remain permanently in the blood but are converted by the liver into inactive compounds and excreted by the kidneys.Hormones are chemical messengers because they act as organic catalysts and coenzymes to perform specific functions in the target organs. The target organs contain receptor molecules either on the surface or within the cell.
- Although different hormones come in contact with cells, only the cells that contain receptor molecules specific for the hormone are physiologically activated. A single hormone may have multiple effects on a single target tissue or on different target tissues.
- Many hormones exhibit long term changes like growth, puberty and pregnancy. Hormones often influence many organs and organ systems at the same time. Serious deficiency or excess secretion of hormones leads to disorders. Hormones coordinate different physical, physiological, mental activities and maintain homeostasis. Hormones are composed of water soluble proteins or peptides or amines or fat soluble steroids.

B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619

38. a)

- The fine respiratory bronchioles terminate into highly vascularised thin walled pouch like air sacs called alveoli meant for gaseous exchange. The diffusion membrane of alveolus is made up of three layers – the thin squamous epithelial cells of the alveoli, the endothelium of the alveolar capillaries and the basement substance found in between them.
- The thin squamous epithelial cells of the alveoli are composed of Type I and Type II cells. Type I cells are very thin so that gases can diffuse rapidly through them. Type II cells are thicker, synthesize and secrete a substance called **Surfactant**. The lungs are light spongy tissues enclosed in the thoracic cavity surrounded by an airtight space.
- The thoracic cavity is bound dorsally by the vertebral column and ventrally by the sternum, laterally by the ribs and on the lower side by the dome shaped diaphragm. The lungs are covered by double walled pleural membrane containing a several layers of elastic connective tissues and capillaries, which encloses the pleural fluid. Pleural fluid reduces friction when the lungs expand and contract.

38, b)

i) A number of species of prawn are distributed in water resources such as Penaeusindicus, Penaeusmonodon, Metapenaeusdobsoni and Macrobrachium rosenbergii.

ii) **Culture of freshwater prawn**

- *Macrobrachium rosenbergii* is commonly seen in rivers, fields and lowsaline estuaries. The prawn collected from ponds, river, and paddy fields are transferred to the tanks which are aerated. For fertilization, one pair of prawn are kept in a separate tank.

- After mating, the eggs are laid. Spawning tanks of different sizes should be prepared with proper aeration. Temperature (240 C – 300 C) and pH (7-8) should be maintained in the hatching tank.
- eggs hatch into first and second stage larva. Artificial feed is supplied. Young ones of 5cm length (60 days old) can be reared in fresh or slightly brackish water ponds and rice fields. Harvesting of prawns can be done twice in a year.

B. BALAJI., M.A.,M.Sc.,M.PhIL.,B.Ed., PG ASSISTANT IN BIOLOGY .
Mail : sribala138@gmail.com CELL : 9843359619