SHRI VIDHYABHARATHI MATRIC.HR.SEC.SCHOOL

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PUBLIC EXAMINATION 2019

XI PURESCIENCE | **TENTATIVE KEY** | **DATE: 12.03.2019**

SUBJECT: ZOOLOGY | **TYPE - A** | **MARKS : 70**

Q. NO	ANSWER KEY	MARKS
	PART -I	
1.	a) red muscle fibres	1
2.	d) stiffling	1
3.	b) EEG	1
4.	a) Sporodic goitre	1
5.	a) Ctenophora - Veliger	1
6.	c) Hepato-pancreatic duct	1
7.	d) heparin, serotonin and histamines	1
8.	b) 26	1
9.	c) Icthyophis	1
10.	b) VC+ RV	1
11.	d) (i) and (iii)	1
12.	d) i and iii	1
13.	c) P=Acetylcholine, Q=Ca^{++}	1
14.	b) Ornamental breeds - Silkie	1
15.	d) Bone	1
	PART - II	
16.	• Mules are produced by mating of Male donkey and female horse. • Mules are sterile animals because they cannot produce gametes due to problems in pairing up of chromosomes. They have odd number of chromosomes.	1 1
17.	**Waste Products of protein metabolism** • The major nitrogenous waste products are ammonia, urea and uric acid. • Other waste products of protein metabolism are trimethyl amine oxide (TMO) in marine teleosts, guanine in spiders, hippuric acid, allantonin, allantoic acid, ornithuric acid, creatinine, creatine,purines, pyramidines and pterines.	1 1
18.	**Pseudo -stratified epithelium** • Pseudo-stratified epithelial cells are columnar, but unequal in size. • Although the epithelium is single layered yet it appears to be multi-layered. • because the nuclei lie at different levels in different cells. Hence, it is also called pseudostratified epithelium .	1 1
19.	**Vermiwash** • Vermiwash is a liquid collected after the passage of water through a column of vermi bed. It is useful as a foliar spray to enhance plant growth and yield. • It is obtained from the burrows or **drilospheres** formed by earthworms. Nutrients, plant growth promoter substances and some useful microorganisms are present in vermiwash.	1 1

20.	**peritonitis** • Appendicitis is the inflammation of the vermiform appendix, leading to severe abdominal pain. The treatment involves the removal of appendix by surgery. • If treatment is delayed the appendix may rupture and results in infection of the abdomen, called peritonitis.	1 1
21.	**Uses of surfactants** • The surfactant lowers the surface tension in the alveoli and prevents the lungs from collapsing. • It also prevents pulmonary oedema.	1 1
22.	**Cross breeding:** • Breeding between a superior male of one breed with a superior female of another breed. • The cross bred progeny has superior traits (hybrid vigour or heterosis.)	1 1
23.	**Diluting fluid** ➢ RBC - Hayem's solution ➢ WBC - Turk's solution	1 1
24.	**Cardio pulmonary resuscitation** • **CPR** is a life saving procedure that is done at the time of emergency conditions such as when a person's breath or heart beat has stopped abruptly in case of drowning, electric shock or heart attack. • CPR includes rescue of breath, which is achieved by mouth to mouth breathing, to deliver oxygen to the victim's lungs by external chest compressions which helps to circulate blood to the vital organs. • CPR must be performed within 4 to 6 minutes after cessation of breath to prevent brain damage or death. Along with CPR,defibrillation is also done. Defibrillation means a brief electric shock is given to the heart to recover the function of the heart.	 1 1
	PART -III	
25.	**Rules of nomenclature** • The scientific name should be italicized in printed form and if handwritten, it should be underlined separately. • The generic name's (*Genus*) first alphabet should be in uppercase. • The specific name (*species*) should be in lowercase. • The scientific names of any two organisms are not similar. • The name or abbreviated name ofthe scientist who first publishes the scientific name may be written after the species name along with the year of publication. For example Lion-*Felis leo* Linn., 1758 or *Felis leo* L., 1758. • If the species name is framed after any person's name the name of the species shall end with i, ii or ae. For example, a new species of a grounddwelling lizard (Cyrtodactylus) has been discovered and named after Scientist Varad Giri, *Cyrtodactylus varadgirii*.	 **1** **1** **1**
26.	**Types of dislocation of joints** • **Congenital deformities** are due to genetic factors or factors operating on the developing foetus. • **Traumatic dislocation** is due to serious violence. It occurs in the shoulder, elbow and hip. • **Pathological dislocation** is caused by some diseases like uberculosis. It may cause dislocation of the hip. • **Paralytic dislocation** caused by paralysis of one group of muscles of an extremity.	 1 1 1

27.

Characters	Frog	Toad
Family	Ranidae	Bufonidae
Teeth	Maxillary and vomerine teeth.	Teeth absent.
Egg formation	Lays eggs in clusters.	Lays eggs in strings.

1
1
1

28. **succus entericus**

- The secretions of the Brunner's gland along with the secretions of the intestinal glands constitute the intestinal juice or **succus entericus**. The enzymes in the intestinal juice such as maltase, lactase, sucrase (invertase), dipeptidases, lipases, nucleosidases act on the breakdown products of bile and pancreatic digestion.

1

Maltose —Maltase→ glucose + glucose

Sucrose —sucrase→ glucose + fructose

Lactose —Lactase→ glucose + galactose

Dipeptides, Tripeptides —Peptidase→ amino acids

Nucleotides —Nucleotidase→ Nucleoside + Phosphoric acid

Nucleoside —Nucleosidase→ Sugar + Nitrogen base

Diglycerides and monoglycerides —Lipases→ Fatty acids + glycerol

2

29. **Clinical significance of ultra sound imaging (any 3)** 3x1=3

- Ultrasound waves are used to image the foetus at different stages of pregnancy to study the progress of the developing foetus.
- They are used to hear foetal heart sound, blood flow, etc.
- Used in echocardiography to diagnose the damages in heart.
- Used for diagnosis of tumours, gall stones, kidney stones, obstructions in the genital tracts.

30.

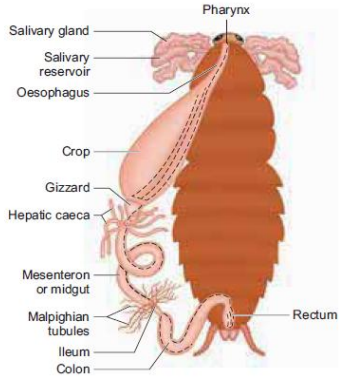
- **Hyperglycaemia** is otherwise known as **Diabetes mellitus**. It is caused due to reduced secretion of insulin. As the result, blood glucose level is elevated. 1
- Diabetes mellitus is of two types, **Type I Diabetes** and **Type II Diabetes**. Type I diabetes is also known Insulin dependent diabetes, caused by the lack of insulin secretion due to illness or viral infections. 1
- Type II diabetes is also known as Non- Insulin dependent diabetes, caused due to reduced sensitivity to insulin, often called as insulin resistance. Symptoms of diabetes includes, polyurea (excessive urination), polyphagia (excessive intake of food),polydipsia (excessive consumption liquids due to thirst), ketosis (breakdown of fat into glucose results in accumulation of ketone bodies) in blood. Gluconeogenesis (Conversion of non- carbohydrate form like amino acids and fat into glucose) also occur in diabetes. 1

31.	(any 3) <table><tr><th>Living Jawless fishes</th><th>Cartilaginous fishes</th></tr><tr><td>Theses belong to class cyclostomata under subphylum vertebrata, Phylum chordate.</td><td>These belong to class Chondrichthyes. under subphylum vertebrata, Phylum chordate.</td></tr><tr><td>These are Jawless fishes. Mouth is circular and suctorial</td><td>Mouth is located ventrally and Jaws are very powerful</td></tr><tr><td>They have true tree</td><td>Teeth are modified placoid scales which are backwadly directed</td></tr><tr><td>They have pouch like gills</td><td>They have lamelliform gills without operculum</td></tr><tr><td>Eg: Petromyzon, lamprey</td><td>Eg: Trygon (stingray)</td></tr></table>	3x1=3
32.	• **The Haldane effect**, on the other hand describes how oxygen concentrations determines hemoglobin's affinity for carbon dioxide. The amount of carbon dioxide transported in blood is remarkably affected by the degree oxygenation of the blood. The lower the partial pressure of O2 lower is the affinity of haemoglobin saturation with oxygen hence more CO2 is carried in the blood. This phenomenon is called Haldane effect. • This effects CO2 exchanges in both the tissues and lungs. In the lungs the process is reversed as the blood moves through the pulmonary capillaries, its PCO2 declines from 45mm Hg to 40mm Hg. • For this to occur carbondioxide is freed from HCO3- ions and Cl- ions moves in to the plasma and reenters the RBC and binds with H+ to form carbonic acid which dissociates in to CO2 and water. This CO2 diffuses along its partial gradient from the blood to the alveoli	1 1 1
33.	Wearing helmet will protect the head as well as the brain at the same time it prevents it from shock during injury as because the brain conducts vital functions like : • **The cerebellum** controls and coordinates muscular movements and body equilibrium. Any damage to cerebellum often results in uncoordinated voluntary muscle movements. • The respiratory nuclei found in the **pons** cooperate with the medulla to control respiration. • **Medulla oblongata** receives and integrates signals from spinal cord and sends it to the cerebellum and thalamus. Medulla contains vital centres that control cardio vascular reflexes, respiration and gastric secretions.	1 1 1
	PART-IV	
34. a)	**Taxonomic hierarchy** • In biological classification, the taxonomical hierarchy includes seven major categories namely kingdom, phylum, class, order, family, genus and species and other intermediate categories such as subkingdom, grade, division, subdivision, subphylum, superclass, subclass, superorder, suborder, superfamily, subfamily and subspecies. • **Species** Species is the basic unit of classification in the taxonomic hierarchial system. It is a group of animals having similar morphological features (traits) and is reproductively isolated to produce fertile offspring. There are some exceptional animals which can produce **sterile offspring** because of mating with closely related species • **Genus:** It is a group of closely related species which have evolved from a common ancestor. In some genus there is only one species which is called as **monotypic genus** (e.g. Red panda is the only species in the genus *Ailurus* : *Ailurus fulgens*) (Figure 1.3). If there are more than one species in the genus it is known as **polytypic genus,** for example 'cats' come under the Genus *Felis*, which has a number of closely related species, *Felisdomestica* (domestic cat),	1 1

	Felis margarita (jungle cat). *Felis silvestris* (wild cat) • **Family:** It is a taxonomic category which includes a group of related genera with less similarity as compared to genus and species. For example, the family Felidae includes the genus *Felis* (cats) and the genus *Panthera* (lions, tigers, leopards). • **Order:** This category includes an assemblage of one or more related families which show few common features. One or more similar families are grouped together to form an order. For example, family *Canidae* and *Felidae* are placed in the order Carnivora. • **Class**: This category includes one or more related orders with some common characters. For example order Primata comprising monkeys, apes and man is placed in the Class Mammalia, along with the order Carnivora which includes dogs and cats. • **Phylum:** The group of classes with similar distinctive characteristics constitute a phylum. The classes Pisces, Amphibia, Reptilia, Aves and Mammalia constitute the next higher category, phylum Chordata. These classes share some common features like presence of a notochord and a dorsal tubular nerve cord hence included in the phylum Chordata. • **Kingdom:** All living animals belonging to various phyla are included in the Kingdom Animalia and it is the top most of the taxonomic hierarchy.	½ ½ ½ 1 ½
B. **OR**	**Absorption and assimilation** • Absorption is a process by which the end product of digestion passes through the intestinal mucosa into the blood and lymph. The villi in the lumen of ileum are the absorbing units, consisting of a lacteal duct in the middle surrounded by fine network ofblood capillaries. The process of absorption involves active, passive and facilitatedtransport. • Small amounts of glucose, amino acids and electrolytes like chloride ions are generally absorbed by simple diffusion. The passage of these substances into the blood depends upon concentration gradients. However, some of the substances like fructose are absorbed with the help of the carrier ions like Na+. This mechanism is called facilitated transport. • Nutrients like amino acids, glucose and electrolytes like Na+ are absorbed into the blood against the concentration gradient by active transport. The insoluble substances like fatty acids, glycerol and fat soluble vitamins are first incorporated into small, spherical water soluble droplets called micelles and are absorbed into the intestinal mucosa where they are re-synthesized into protein coated fat globules called chylomicrons which are then transported into the lacteals within the intestinal villi and eventually empty into lymphatic duct. • The lymphatic ducts ultimately release the absorbed substances into the blood stream. While the fatty acids are absorbed by the lymph duct, other materials are absorbed either actively or passively by the capillaries of the villi Water soluble vitamins are absorbed by simple diffusion or active transport. Transport of water depends upon the osmotic gradient. • Absorption of substances in the alimentary canal takes place in mouth, stomach, small intestine and large intestine. However maximum absorption takes place in the small intestine. Absorption of simple sugars, alcohol and medicines takes place in the stomach. Certain drugs are absorbed by blood capillaries in the lower side of the tongue and mucosa of mouth. Large intestine is also involved in absorption of more amounts of water,vitamins, some minerals and certain drugs. • Absorbed substances are transported through blood and lymph to the liver through the hepatic portal system. From the liver, nutrients are transported to all other regions of the body for utilization. All the body tissues utilize the absorbed substance for their activities andincorporate into their protoplasm, this process is called assimilation.	1 1 1 1 1

35. a) **Digestive system of *Periplaneta americana***

- The digestive system of cockroach consists of the alimentary canal and digestive glands. The alimentary canal is present in the body cavity and is divided into three regions: foregut, midgut and hindgut . ½
- The foregut includes pre-oral cavity, mouth, pharynx and oesophagus. This in turn opens into a sac like structure called the **crop** which is used for storing food. The crop is followed by the **gizzard** or **proventriculus** which has an outer layer of thick circular muscles and thick inner cuticle forming six highly chitinous plates called **"teeth"**. Gizzard helps in the grinding of the food particles. 1
- The midgut is a short and narrow tube behind the gizzard and is glandular in nature. At the junctional region of the gizzard are eight fingers like tubular blind processes called the **hapatic caecae** or **enteric caecae.** The hindgut is marked by the presence of 100 – 150 yellow coloured thin filamentous **malphigian** tubules which are helpful in removal of the excretory products from the haemolymph. 1
- The hindgut is broader than the midgut and is differentiated into ileum,colon, and rectum. The rectum opens out through the anus. ½
- Digestive glands of cockroach consist of the salivary glands, the glandular cells and hepatic caecae. A pair of salivary glands is found on either side of the cropin the thorax. The glandular cells of the midgut and hepatic or gastric caecae produce digestive juices. 1



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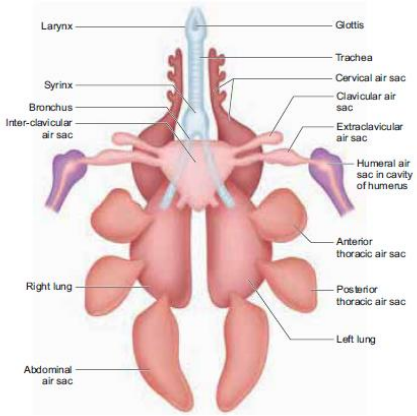
b) **Respiratory system of Pigeon**

- 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. 1
- 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 air-capillaries which lies intermingled with the capillaries of the pulmonary vessels. 1
- 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**. 2
- This complicated arrangement adds to the efficient respiratory function and maintenance of a high temperature



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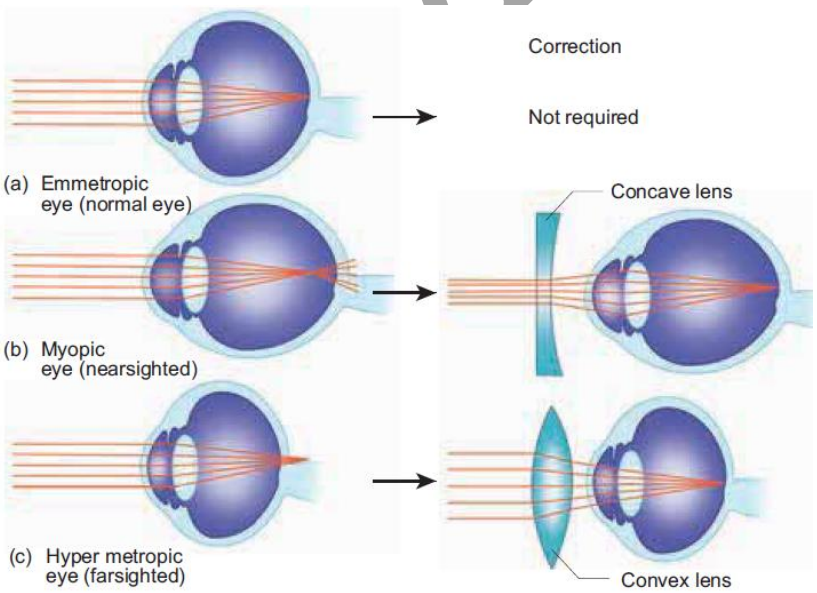
36. a) **Refractive errors of eye**

- **Myopia** (near sightedness): The affected person can see the nearby objects but not the distant objects. This condition may result due to an elongated eyeball or thickened lens; so that the image of distantobject is formed in front of the yellow spot. This error can be corrected using concave lens that diverge the entering light rays and focuses it on the retina. — 1
- **Hypermetropia** (long sightedness): the affected person can see only the distant objects clearly but not the objects nearby. This condition results due to a shortened eyeball and thin lens; so the image of closest object is converged behind the retina. This defect can be overcome by using convex lens that converge the entering light rays on the retina. — 1
- **Presbyopia:** Due to aging, the lens loses elasticity and the power of accommodation. Convex lenses are used to correct this defect. — 1
- **Astigmatism** is due to the rough (irregular) curvature of cornea or lens. Cylindrical glasses are used to correct this error — ½
- **Cataract:** Due to the changes in nature of protein, the lens becomes opaque. It can be corrected by surgical procedures. — ½



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b)	**Parathyroid hormone** • PTH is a **hypercalcemic hormone**. It is a peptide hormone involved in controlling the calcium and phosphate homeostasis. The secretion of PTH is controlled by calcium level in the blood. It increases the blood calcium level by stimulating osteoclasts to dissolve the bone matrix. As a result calcium and phosphate are released into the blood. • PTH enhances the reabsorption of calcium and excretion of phosphates by the renal tubules and promotes activation of vitamin D to increase calcium absorption by intestinal mucosal cells. • **Tetany** is caused due to the hyposecretion of parathyroid hormone (PTH). Due to hyposecretion of PTH serum calcium level decreases (Hypocalcemia), as a result serum phosphate level increases. Calcium and phosphate excretion level decreases. • Generalized convulsion, locking of jaws increased heart beat rate, increased body temperature, muscular spasm are the major symptoms of tetany. • **Hyperparathyroidism** is caused due to excess PTH in blood. Demineralisation of bone, cyst formation, softening of bone, loss of muscle tone, general weakness, renal disorders are the symptoms of hyperparathyroidism.	1 1 1 1 1
37. (a)	**Economic importance of products of apiculture** • **Honey** is the healthier substitute for sugar. The major constituents of honey are: levulose, dextrose, maltose, other sugars, enzymes, pigments, ash and water. It is an aromatic sweet material derived from nectar of plants. It is a natural food, the smell and taste depends upon the pollen taken by the honey bee. • It is used as an antiseptic, laxative and as a sedative. It is generally used in Ayurvedic and Unani systems of medicine. It is also used in the preparation of cakes, breads and biscuits • **Bee wax** is secreted by the abdomen of the worker bees at the age of two weeks. The wax is masticated and mixed with the secretions of the cephalic glands to convert it into a plastic resinous substance. • The resinous chemical substance present in the wax is called **propolis** which is derived from pollen grains. The pure wax is white in colour and the yellow colour is due to the presence of carotenoid pigments. • It is used for making candles, water proofing materials, polishes for floors, furniture, appliances, leather and taps. It is also used for the roduction of comb foundation sheets in bee keeping and used in pharmaceutical industries.	1 1 1 1 1
(b)	**Characteristics of cultivable fishes** The special characteristic features of cultivable fishes are: i. Fishes should have high growth rate in short period for culture. ii. They should accept supplementary diet. iii. They should be hardy enough to resist some common diseases and infection of parasites. iv. Fishes proposed for polyculture should be able to live together without interfering or attacking other fishes. v. They should have high conversion efficiency so that they can effectively utilize the food.	 1 1 1 1 1
38. (a)	**Haemodialysis** • Malfunctiong of the kidneys can lead to accumalation of urea and other toxic substances, leading to kidney failure. In such patients toxic urea can be removed from the blood by a process called haemodialysis. • A dialyzing machine or an artificial kidney is connected to the patient's body. A dialyzing machine consists of a long cellulose tube surrounded by the dialysing fluid in a water bath.	 1

- The patient's blood is drawn from a convenient artery and pumped into the dialysing unit after adding an anticoagulant like heparin. The tiny pores in the dialysis tube allows small molecules such as glucose, salts andurea to enter into the water bath, whereas blood cells and protein molecules do not enter these pores. 1
- This stage is similar to the filtration process in the glomerulus. The dialysing liquid in the water bath consists of solution of salt and sugar in correct proportion in order to prevent loss of glucose and essential salts from the blood. The cleared blood is then pumped back to the body through a vein. 1

Kidney Transplantation

- It is the ultimate method for correction of acute renal failures. This involves transfer of healthy kidney from one person (donor) to another person with kidney failure. 1
- The donated kidney may be taken from a healthy person who is declared brain dead or from sibling or close relatives to minimise the chances of rejection by the immune system of the host. Immunosuppressive drugs are usually administered to the patient to avoid tissue rejection. 1

(b)

- Depending on the presence or absence of surface antigens on the RBCs, blood group in individual belongs to four different types namely, A, B, AB and O. The plasma of A, B and O individuals have natural antibodies (agglutinins) in them. Surface antigens are called agglutinogens. 1
- The antibodies (agglutinin) acting on agglutinogen A is called anti A and the agglutinin acting on agglutinogen B is called anti B. Agglutinogens are absent in O blood group. Agglutinogens A and B are present in AB blood group and do not contain anti A and anti B in them. Distribution of antigens and antibodies in blood groups are shown in the table .A, B and O are major allelic genes in ABO systems. 1
- All agglutinogens contain sucrose, D-galactose, N-acetyl glucosamine and 11 terminal amino acids. The attachments of the terminal amino acids are dependent on the gene products of A and B. The reaction is catalysed by glycosyl transferase. 1
- Rh factor is a protein (D antigen) present on the surface of the red blood cells in majority (80%) of humans. This protein is similar to the protein present in Rhesus monkey, hence the term Rh. Individualswho carry the antigen D on the surface of the red blood cells are Rh^+ (Rh positive) and the individuals who do not carry antigen D, are Rh^- (Rh negative). Rh factor compatibility is also checked before blood transfusion. 1

Blood group	Agglutinogens (antigens) on the RBC	Agglutinin (antibodies) in the plasma
A	A	Anti B
B	B	Anti A
AB	AB	No antibodies
O	No antigens	Anti A and Anti B

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