ENTRANCE TEST FOR Ph.D. PROGRAMME, 2023

ZOOLOGY

Time	•	Three	Hours
	•		TIVUIS

Maximum: 100 Marks

Part A

Answer all questions. Each question carries 1 mark.

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	<b>A</b> )	Endoskeleton composition.	<b>B</b> )	Fins.
	C)	Type of blood.	D)	Type of jaws.
2		is an example of an ex-s	itu co	onservation.
	<b>A</b> )	Sacred groves.	B)	Wildlife sanctuary.
	<b>C</b> )	Seed bank.	<b>D</b> )	National park.
3. (	Global	warming can significantly be contr	olled	by
	<b>A</b> )	Increasing solid waste.		
	B)	Reducing water wastage.	. • •	
	C)	Burning human-generated waste.		
	<b>D</b> )	Reducing fossil fuel consumption.		
L	<u> </u>	———— is the basic unit of classi	ficati	on and a taxonomic rank.
	<b>A</b> )	Species.	<b>B</b> )	Genus.
	<b>C</b> )	Class.	D)	Order.
5. J	Which (	of the following animals is now exti	nct?	
	A)	Tasmanian tiger.	B)	Tasmanian devil.
	.C)	Pademelon.	D)	Quol.

Turn over

	A)	Low endemicity and low threat of e	xtin	ction.
	B)	Low endemicity and high threat of	exti	nction.
	<b>C</b> )	High endemicity and low threat of	extir	nction.
	D)	High endemicity and high threat of	f ext	inction.
7.	Which	of these is related to Ex-situ conserv	atio	n of threatened plants and animals :
	A)	Biodiversity hotspots.	<b>B</b> )	Wildlife safari parks.
	<b>C</b> )	Amazon rainforest.	D)	Himalayan region.
8.	Name t	he site where digestion of proteins of	ccur	s :
	A)	Pancreas.	В)	Rectum.
	<b>C</b> )	Liver.	D) '	Ileum.
9.	Night b		rally	conditions associated with the deficiency of whic
	A)	Vitamin B.	B)	Vitamin K.
	<b>C</b> )	Vitamin B2.	D)	Vitamin A.
10.	Where	are the parotid glands located ?		
	A)	Below the stomach.		
	В)	Behind and above the pancreas.		
	<b>C</b> )	Below and in front of the ear canal	•	
	D)	Underneath the armpits.		
11.	The ma	ximum amount of carbon dioxide in	the	human body is transported as:
	<b>A</b> )	Bicarbonate.	<b>B</b> )	Carbide.
	100	Amylase.		None of the above.

12. Altitude sickness is typically caused due to:

	A)	The partial pressure of oxygen.	
	<b>B</b> )	Increased levels of $CO_2$ in blood.	
	C)	Cold temperatures.	
	D)	None of the above	
13.	Нурор	nea is a condition where :	
	A)	The airway becomes partially obstructed.	
	<b>B</b> )	The blood does not clot properly.	
,	<b>C</b> )	The lungs cannot eliminate the excess carbon dioxide from the body	•
	<b>D</b> )	The blood oxygen levels are abnormally low.	
14.	The lu	ngs are protected by :	
	<b>A</b> )	Sternum. B) Rib cage.	
	<b>C</b> )	Backbone. D) All of the above.	
<b>15</b> .	The pr	imary function of the cerebrospinal fluid is to:	
	<b>A</b> )	Protect the brain.	
	<b>B</b> )	Provide nutrients to the surrounding tissues.	
	C)	Remove waste products.	
	D)	All of the above.	
16.	Which	of the following organs is known as the "graveyard" of RBCs?	,
	<b>A</b> )	Spleen. B) Kidney.	
	<b>C</b> )	Liver. D) Gall bladder.	
17.	Single	uriniferous tubule does not contain:	
	<b>A</b> )	Loop of Henle. B) Collecting duct.	
	<b>C</b> )	Distal convoluted tubule. D) Bowman's capsule.	

18.		the reasons why some people cough a	ıfter e	ating a meal may be due to the improper movement
	of —— A)	Larynx.	B)	Diaphragm.
	<b>C</b> )	Neck.	<b>D</b> )	Epiglottis.
19.	The ba	lancing organ of the ear is :		
-	<b>A</b> )	Organ of Corti.	B)	Vestibular apparatus.
	C)	Tectorial membrane.	D)	Cochlea.
20.	Glycoly	ysis is the conversion of :		
	<b>A</b> )	Fructose into phosphoenolpyruva	te.	
	B)	Fructose into pyruvate.		
	C)	Glucose into phosphoenolpyruvat	e.	
	D)	Glucose into pyruvate.		
21.	The El	MP pathway in eukaryotes usually	takes	place in:
	A)	Nucleus.	B)	Lysosome.
	<b>C</b> )	Golgi apparatus.	D)	Cytosol.
22.	Which	of the following is used by cells to i	ntera	ct with other cells ?
	A)	Cell tubules.	<b>B</b> )	Cell junctions.
	<b>C</b> )	Cell adhesions.	D)	Cell detectors.
23.		of the following cell organelle is rand lipids?	espon	sible for transporting, modifying, and packaging
	A)	Mitochondria.	B)	Endoplasmic Reticulum.
	<b>C</b> )	Golgi Complex.	D)	DNA.
24.	DNA is	s stored in which of the following co	ell org	anelle ?
	A)	Cell wall.	<b>B</b> )	Cell Membrane.
	C)	Nucleus.	D)	Cytoplasm.

25.	A cell o	organelle that is present in animal c	ells b	ut not present in plant cells is?
	<b>A</b> )	Cytoplasm.	B)	Centrosome.
	C)	Mitochondrial.	D)	Golgi complex.
26.	Which	of the following cells release insulin	whe	n glucose levels elevate in the body?
1	<b>A</b> )	Gamma cells.	<b>B</b> )	Beta cells.
	<b>C</b> )	Alpha cells.	D)	Zeta cells.
27.	Which	of the following cells do not lack the	abili	ity to divide?
	A)	Red blood cells.	<b>B</b> )	Muscle cells.
	C)	Skin cells.	D)	Nerve cells.
28.	Which	of the following part of a neuron red	ceive	s information from other neurons?
	A)	Myelin sheath.	<b>B</b> )	Dendrites.
	C)	Cell body.	<b>D</b> )	Axon.
29.	Which	of the following is not a component	of cel	l membranes?
	A)	Phosphotriglycerides.	В)	Cholesterol.
	<b>C</b> )	Sphingolipids.	<b>D</b> )	Phosphodiglycerides.
30.	Lysoso	mes are produced by which of the fo	llowi	ng cell organelles ?
	A)	Mitochondria.	B)	Endoplasmic Reticulum.
	C)	Golgi Complex.	<b>D</b> )	DNA.
31.	What i	s the net gain of ATP during the cor	nvers	ion of glucose to pyruvate?
	A)	2 ATP.	B)	4 ATP.
	<b>C</b> )	6 ATP.	D)	1 ATP + 1 GTP.
32.		cycle begins with the creation of six compounds namel:	carbo	n compounds as a result of a reaction between two
,	<b>A</b> ).	Succinic Acid and pyruvic acid.	· · · ·	
	В)	Acetyl CoA and Oxaloacetic Acid.	•	
	<b>C</b> )	Fumaric acid and Pyruvic acid.	•	
	<b>D</b> )	Maleic acid and acetyl CoA.		
				Turn over

33.	The pro	ocess of cell respiration is carried o	ut by -	
	A)	Mitochondria.	<b>B</b> )	Chloroplast.
	C)	Nucleus.	D)	None of the above.
34.	ELISA	is:		
	<b>A</b> )	Using radiolabelled second antib	ody.	
	<b>B</b> )	Usage of RBCs.		
	C)	Using complement-mediated cell	lysis.	
* * * * * * * * * * * * * * * * * * * *	D)	Addition of substrate that is conv	verted i	into a coloured end product.
35.	Plasmi	ds are used as cloning vectors for v	which o	of the following reasons?
• • •	<b>A</b> )	Can be multiplied in culture.		
• .	· B)	Self-replication in bacterial cells.		
	<b>C</b> )	Can be multiplied in laboratories	with t	he help of enzymes .
	D)	Replicate freely outside bacterial	cells.	
36.	The va	ccines prepared through recombin	ant DI	NA technology are :
	A)	Third generation vaccines.	B)	First-generation vaccines.
	C)	Second-generation vaccines.	D)	None.
<b>37</b> .	RNA ir	nterference helps in :		
	A)	Cell proliferation.	B)	Micropropagation.
	<b>C</b> )	Cell defence.	<b>D</b> )	Cell differentiation.
38.	The Go	olden Rice variety is rich in :		
	<b>A</b> )	Vitamin C.	B)	B-carotene and ferritin.
	<b>C</b> )	Biotin.	D)	Lysine.
39.	Which	bacterium is used in the production	on of in	sulin by genetic engineering?
	A)	Saccharomyces.	B)	Rhizobium.
	<b>C</b> )	Escherichia.	D)	Mycobacterium.

40.	The DNA fragments have sucky ends due to:	4.1 ·
	A) Endonuclease. B) Unpaired bases.	
	C) Calcium ions. D) Free methylation	
41.	Which is a genetically modified crop?	
	A) Bt-cotton.  B) Bt-brinjal.	
	C) Golden rice. D) All the above.	e e i e i e i e i e i e i e i e i e i e
42.	Capillary hydrostatic pressure during filtration is built in the glomerulus as:	
	A) Size of Bowman's capsule is significantly large.	
	B) An afferent arteriole is narrow compared to efferent.	
	C) Bowman's capsule is cup-shaped.	
	D) An efferent arteriole is narrow compared to afferent.	
43.	This happens if the proximal convoluted tubule is removed from nephron:	•
	A) Urine is not formed.	
	B) Quality and quantity of urine is unaffected.	· ·.
	C) Urine is more concentrated.	
	D) Urine is more diluted.	•
44.	A decrease in blood pressure/volume will not cause the release of:	
•	A) ADH. B) Renin.	
* £.	C) Atrial natriuretic factor. D) Aldosterone.	
45.	This is a common characteristic observed in both human beings and adult frogs:	
	A) Ureotelic mode of excretion. B) Internal fertilization.	) )
	C) Nucleated RBCs. D) Four-chambered heart.	
46.	The walls of the ventricles possess thick muscular projections, they are known as:	
	A) Conus arteriosus.  B) Truncus arterosus.	
	C) Chordae tendineae. D) Columnac carneae.	

47. Bundle of His is a network of						
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- A) Muscle fibres present only in the ventricle wall.
- B) Nerve fibres distributed in ventricles.
- C) Muscle fibres distributed throughout the heart walls.
- D) Nerve fibres found throughout the heart.

### 48. The tricuspid valve is present between:

- A) Ventricle and pulmonary artery.
- B) Ventricle and aorta.
- C) Left auricle and left ventricle
- D) Right auricle and right ventricle.
- 49. Which of the following cells are found in liver?
  - A) Kupffer Cells.

B) Neurons.

C) Sperm Cells.

- D) None of the above.
- 50. "Glisson's Capsules" is seen in
  - A) Kidneys.

B) Pancreas.

C) Liver.

D) Stomach.

 $(50 \times 1 = 50 \text{ marks})$ 

#### Part B

Answer any ten questions.

Each question carries 5 marks.

- 51. Explain the role of cortical granules in fertilization and add note on species specificity of fertilization.
- 52. Describe different phases of cell cycle.
- 53. Explain the process of electrophoresis and its applications.
- 54. Define gene therapy. Explain ex-vivo and in-vivo methods of gene therapy.
- 55. List the data collection tools used in quantitative designs and write in detail about questionnaire.
- 56. What are Antibodies? Explain the structure of antibody molecules and comment on classes and subclasses of immunoglobulins.

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- 57. Describe the process of translation.
- 58. Explain the structure of proteins and highlight the factors that affect the stability of the proteins.
- 59. Discuss various data collection methods with suitable examples.
- 60. Write in detail about the essential components of good research proposal and what are the factors affecting the research design?
- 61. Explain Lotka-voltera equations and its applications in advance ecological theory.
- 62. What is scientific research and write in brief about ethics involved?
- 63. Describe the necessity and importance of wildlife conservation.
- 64. Explain the role of bees in pollination. Describe how bees are structurally and behaviourally efficient pollinators.

 $(10 \times 5 = 50 \text{ marks})$