



## COMMON HALF YEARLY EXAMINATION -2024

TIMING : 1.30 Hrs

PART – II – BIO- ZOOLOGY

TOTAL MARKS : 35

CLASS : XII

PART – I

TENTATIVE ANSWER KEY

CHOOSE THE CORRECT ANSWER

(8 × 1 = 8)

Q.NO	options	ANSWER	MARKS
1	b)	Distal centriole.	1
2	b)	AB	1
3	b)	August Weismann	1
4	a)	IgE	1
5	c)	Statins	1
6	b)	Insects	1
7	c)	Amphibians	1
8	a)	Copper	1

### PART – II

(4 × 2 = 8)

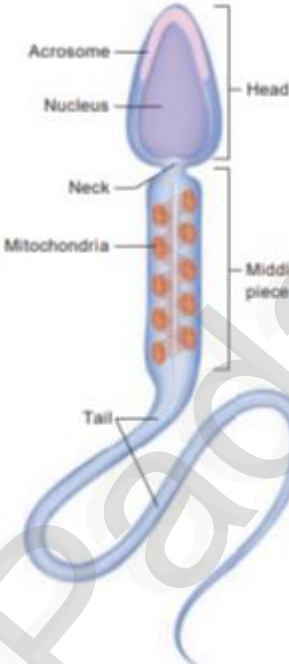
Answer any FOUR from the following question.

Q.NO	ANSWER	MARKS SPLIT	TOTAL MARKS				
9	<b>Plasmotomy</b> The division of multinucleated parent into many multinucleated daughter individuals with the division of nuclei	(2)	(2)				
10	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%; text-align: center;">spermatogenesis.</th> <th style="width: 50%; text-align: center;">Spermiogenesis</th> </tr> </thead> <tbody> <tr> <td>Spermatogenesis is the sequence of events in the seminiferous tubules of the testes that produce the male gametes, the sperms.</td> <td>The spermatids are transformed into mature spermatozoa (sperms) by the process called spermiogenesis.</td> </tr> </tbody> </table>	spermatogenesis.	Spermiogenesis	Spermatogenesis is the sequence of events in the seminiferous tubules of the testes that produce the male gametes, the sperms.	The spermatids are transformed into mature spermatozoa (sperms) by the process called spermiogenesis.	(1+1)	(2)
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11	<b>Holandric Genes</b> The genes present in the differential region of Y chromosome are called Y-linked or holandric genes	(2)	(2)				
12	<b>Coprolites</b> Hardened faecal matter termed as coprolites occur as tiny pellets.	(2)	(2)				
13	<b>Oenology</b> The science and study of wine and wine making.	(2)	(2)				

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14	<p><b>Endemism</b> The phenomenon in which the organism are exclusively restricted to a given area.</p> <p>(or)</p> <p>Endemism is an indicator of the health of the ecosystem. Endemism is a crucial indicator of richness.</p>	(2)	(2)

**PART – III****( 3 × 3 = 9)****Answer any THREE from the following question. (Q.NO.19 is compulsory Question)**

Q.NO	ANSWER	MARKS SPLIT	TOTAL MARKS
15	<p><b>STRUCTURE OF HUMAN SPERM</b></p>  <p>The diagram illustrates the structure of a human sperm cell. It is divided into three main regions: the head, the middle piece, and the tail. The head is at the top and contains the acrosome and the nucleus. The middle piece is the central region and contains several mitochondria. The tail is the long, wavy structure at the bottom, which is the flagellum.</p>	(Dia gram- 1)  Parts-2	(3)
16	<p><b>Placenta is an endocrine tissue-justify</b></p> <p>i) During pregnancy, the placenta acts as a temporary endocrine gland</p> <p>ii) It produces large quantities of human Chorionic Gonadotropin (hCG), human Chorionic Somatomammotropin (hCS) or human Placental Lactogen (hPL), oestrogens and progesterone which are essential for a normal pregnancy.</p> <p>iii) A hormone called relaxin is also secreted during the later phase of pregnancy which helps in relaxation of the pelvic ligaments at the time of parturition.</p> <p>iv) It should be noted that hCG, hPL and relaxin are produced only during pregnancy.</p> <p>v) In addition, during pregnancy the level of other hormones like oestrogen and progesterone, cortisol, prolactin, thyroxine, etc.,</p>	(1/2)  (1/2) (1/2) (1/2) (1/2) (1/2)	(3)

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	vi) It is increased several folds in the maternal blood. These hormones are essential for supporting foetal growth.				
17	<b>S.NO</b>	<b>CONVERGENT EVOLUTION</b>	<b>DIVERGENT EVOLUTION</b>	(1 1/2)	(3)
	1	Organs having different structural patterns but similar function are termed as analogous structures	Structures which are similar in origin but perform different functions		
	2	e.g. the wings of birds and insects are different structurally but perform the same function of flight	e.g. thorn of Bougainvillea and the tendrils of Curcubita and Pisum sativum represent homology		
18	<p><b>Amazon forest is considered to be the kings of the planet-justify</b></p> <p>The Amazon rainforest, a vast area, harbouring millions of species, also called “Lungs of the planet” is destroyed and being replaced for agriculture and human settlements.</p>			(3)	(3)
19 (C.Q)	<p><b>Amplification of gene sample of interest carried out using PCR</b></p> <p>There are three steps involved such as</p> <p>a) Denaturation, b) renaturation or primer annealing c) synthesis or primer extension</p> <p><b>a) Denaturation</b></p> <p>i) The double stranded DNA of interest is denatured to separate into two individual strands by high temperature . This is called denaturation. ii) Each strand is allowed to hybridize with a primer (renaturation or primer annealing). iii) The primer template is used to synthesize DNA by using Taq – DNA polymerase (isolated from the bacterium <i>Thermus aquaticus</i>). iv) During denaturation the reaction mixture is heated to 95° C for a short time to denature the target DNA into single strands that will act as a template for DNA synthesis.</p> <p><b>b) Renaturation or Primer annealing</b></p> <p>i) Annealing is done by rapid cooling of the mixture, allowing the primers to bind to the sequences on each of the two strands flanking the target DNA.</p> <p><b>c) Synthesis or primer extension</b></p> <p>i) During primer extension or synthesis the temperature of the mixture is increased to 75° C for a sufficient period of time to allow Taq DNA polymerase to extend each primer by copying the single stranded template. ii) At the end of incubation both single template strands will be made partially double stranded.</p>			(1)	(3)

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**PART – IV****(2 × 5 = 10)****Answer ALL from the following question**

Q.N O	ANSWER	MARK S SPLIT T	TOTA L MARK S
<b>20</b> <b>(a)</b>	<p><b>Phases of Menstrual cycle</b></p> <p>Menstrual cycle comprises of the following phases</p> <ol style="list-style-type: none"> <li>1. Menstrual phase</li> <li>2. Follicular or proliferative phase</li> <li>3. Ovulatory phase</li> <li>4. Luteal or secretory phase</li> </ol> <p><b>1. Menstrual phase</b></p> <p>i) The cycle starts with the menstrual phase when menstrual flow occurs and lasts for <b>3-5 days</b>.</p> <p>ii) Menstrual flow is due to the breakdown of endometrial lining of the uterus, and its blood vessels due to decline in the level of progesterone and oestrogen.</p> <p>iii) Menstruation occurs only if the released ovum is not fertilized. Absence of menstruation may be an indicator of pregnancy. However it could also be due to stress, hormonal disorder and anaemia.</p> <p><b>2. Follicular or proliferative phase</b></p> <p>i) The follicular phase extends from the <b>5th day</b> of the cycle until the time of ovulation.</p> <p>ii) During this phase, the primary follicle in the ovary grows to become a fully mature Graafian follicle and simultaneously, the endometrium regenerates through proliferation.</p> <p>iii) These changes in the ovary and the uterus are induced by the secretion of gonadotropins like FSH and LH, which increase gradually during the follicular phase.</p> <p>iv) It stimulates follicular development and secretion of oestrogen by the follicle cells.</p> <p><b>3. Ovulatory phase</b></p> <p>i) Both LH and FSH attain peak level in the middle of the cycle (<b>about the 14th day</b>).</p> <p>ii) Maximum secretion of LH during the mid cycle called LH surge</p> <p>iii) It induces the rupture of the Graafian follicle and the release of the ovum (secondary oocyte) from the ovary wall into the peritoneal cavity. This process is called as ovulation.</p> <p><b>4. Luteal or secretory phase</b></p> <p>i) During luteal phase, the remaining part of the Graafian follicle is transformed into a transitory endocrine gland called corpus luteum.</p> <p>ii) The corpus luteum secretes large amount of progesterone which is essential for the maintenance of the endometrium. If Fertilization takes place.</p> <p>iii) it paves way for the implantation of the fertilized ovum.</p> <p>iv) The uterine wall secretes nutritious fluid in the uterus for the foetus. So, this phase is also called as secretory phase.</p>	<p>(1)</p> <p>(5)</p> <p>(1 1/2)</p> <p>(1)</p> <p>(1 ½)</p>	<p>(5)</p>

	v) During pregnancy all events of menstrual cycle stop and there is no menstruation.							
<b>20</b> <b>(b)</b>	<b>Why the Human Genome Project is called a Mega project</b> i) The international human genome project was launched in the year 1990. ii) It was a mega project and took 13 years to complete. iii) The human genome is about 25 times larger than the genome of any organism sequenced to date and is the first vertebrate genome to be completed. iv) Human genome is said to have approximately $3 \times 10^9$ bp. v) HGP was closely associated with the rapid development of a new area in biology called bioinformatics						(1) (1) (1) (1) (1)	(5)
<b>21</b> <b>(a)</b>	<b>Human Insulin Production</b> i) Insulin controls the levels of glucose in blood. ii) Production of insulin by recombinant DNA technology started in the late 1970s. iii) This technique involved the insertion of human insulin gene on the plasmids of E.coli. iv) The polypeptide chains are synthesized as a precursor called pre-pro insulin, which contains A and B segments linked by a third chain (C) and preceded by a leader sequence. v) The leader sequence is removed after translation and the C chain is excised, leaving the A and B polypeptide chain						(1) (1) (1) (1) (1)	(5)
<b>21</b> <b>(b)</b>	<b>S.no</b>	<b>TYPES OF INTERACTION</b>	<b>SPECIES 1</b>	<b>SPECIES 2</b>	<b>GENERAL NATURE OF INTERACTION</b>	<b>EXAMPLES</b>		
	1	Amensalism	-	0	large organisms inhibits the growth of other lower organisms	Animals destroyed at the feet of elephants	(1)	(5)
	2	Mutualism	+	+	Interaction favourable to both and obligatory	Between crocodile and bird	(1)	
	3	Commensalism	+	0	Population 1, the commensal benefits, while 2 the host is not affected	Sucker fish on shark	(1)	
	4	Competition	-	-	Direct inhibition of each species by the other	Birds compete with squirrels	(1)	

						for nuts and seeds		
	5	Parasitism	+	-	Population 1, the parasite, generally smaller than 2, the host	Ascaris and tapeworm in human digestive tract	(1)	

(2)

XII BIOLOGY

(Part - II Bio-Zoology)

Marks: 35

Section - A

I. Choose the best answer:-

8×1=8

- 1) What is used to form the axial filament of the sperm cell?
  - a) Proximal centriole
  - b) Distal Centriole
  - c) Acrosome
  - d) Nebenkern
- 2) Co-dominant blood group is
  - a) A
  - b) AB
  - c) B
  - d) O
- 3) Who proposed the Germplasm theory?
  - a) Darwin
  - b) August Weismann
  - c) Lamarck
  - d) Alfred Wallace
- 4) Allergy involves
  - a) IgE
  - b) IgG
  - c) IgA
  - d) IgM
- 5) What is used to lower blood cholesterol levels?
  - a) Cyclosporin-A
  - b) Insulin
  - c) Statins
  - d) Protease
- 6) Which of the following is an r-species?
  - a) Human
  - b) Insects
  - c) Rhinoceros
  - d) Whale
- 7) Which is one of the following are at high risk extinction due to habitat destruction?
  - a) Mammals
  - b) Birds
  - c) Amphibians
  - d) Echinoderms
- 8) In the E-waste generated by the mobile phones, which among the following metal is most abundant?
  - a) Copper
  - b) Silver
  - c) Palladium
  - d) Gold

Section - B

II. Answer any four of the following:

4×2=8

- 9) What is Plasmotomy?
- 10) Mention the differences between spermiogenesis and Spermatogenesis
- 11) What are holandric gene?
- 12) Write a note on - Coprolites
- 13) What is Oenology?
- 14) Define: Endemism.

Section - C

III. Answer any three of the following

Question number 19 is compulsory:-

3×3=9

- 15) Draw a labelled sketch of a Spermatozoan
- 16) Placenta is an endocrine tissue. Justify
- 17) Differentiate between divergent evolution and convergent evolution with one example for each.
- 18) "Amazon Forest is considered to be the lungs of the planet" - Justify it belongs to?
- 19) How is the amplification of a gene sample of Intercot carried out using PCR?

Section - D

IV. Answer all the questions:-

2×5=10

- 20) a) Explain the various phases of the Menstrual cycle? [OR]
- b) Why the human genome project is called a mega project?
- 21) a) Explain how recombinant insulin can be produced. [OR]
- b) Tabulate and analysis of two species population interaction.

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