

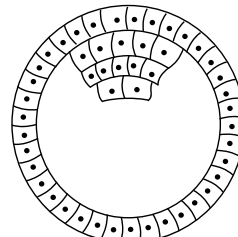


ZOOLOGY

SECTION-A

1. Which of the following has same ploidy as that of spermatid?
(A) Secondary oocyte
(B) Secondary spermatocyte
(C) Ootid
(D) Ova
(1) (C) and (D)
(2) (A) and (D)
(3) Only (D)
(4) (A), (B), (C) and (D)
2. Female external genitalia includes;
(A) mons pubis.
(B) labia majora.
(C) labia minora.
(D) hymen.
(E) clitoris.
(1) (A) and (B)
(2) (A), (C) and (E)
(3) (A), (B), (C), (D) and (E)
(4) (A), (B) and (D)
3. At which phase, both LH and FSH attain a peak level?
(1) Menstrual phase
(2) Follicular phase
(3) Ovulatory phase
(4) Luteal phase
4. Which of the following does **not** occur during implantation?
(1) The embryo secretes enzymes that digest away part of the endometrium.
(2) The embryo is drawn into the endometrium and becomes surrounded by it.
(3) The embryo forms finger like projections that burrow into the uterine wall.
(4) The embryo develops into a hollow ball with a fluid filled interior.

5. Identify the human development state shown below as well as the related right place of its occurrence in a normal pregnant woman, and select the **correct** option for the two together.



Development stage		Site of occurrence
(1)	Late morula	Middle part of fallopian tube
(2)	Blastula	End part of fallopian tube
(3)	Blastocyst	Uterine wall
(4)	8-celled morula	Starting point of fallopian tube

6. The family planning programs in India were initiated in;
(1) 1951.
(2) 1965.
(3) 1971.
(4) 1987.
7. Which of the following is **not** a mechanism of the action of IUDs in preventing unwanted pregnancies?
(1) Increased phagocytosis of sperms
(2) Suppression of motility of sperms
(3) Prevention of implantation of the blastocyst
(4) Prevention of ovulation
8. To avoid transmission of STDs;
(A) avoid sex with multiple partners.
(B) always have unprotected sex.
(C) use condoms during coitus.
(D) avoid sex with unknown partners.
(E) avoid sharing needles.
(1) (A), (B) and (D)
(2) (A), (C), (D) and (E)
(3) (A), (B) and (C)
(4) All of these



9. Match the ARTs in **List-I** with their descriptions in **List-II** and select the **correct** option.

List-I		List-II	
(I)	GIFT	(A)	Collected gametes are made to form the zygote in the laboratory
(II)	ZIFT	(B)	Zygote or early embryo with upto 8 blastomeres is transferred into the oviduct
(III)	AI	(C)	Zygote with more than 8 blastomeres is transferred into the uterus
(IV)	ICSI	(D)	Semen introduced in vagina
(V)	IUT	(E)	Transfer of ovum from a donor to the oviduct of the recipient
(VI)	IVF	(F)	Sperm is injected into the ovum in vitro

- (1) (I) – (C); (II) – (B); (III) – (F); (IV) – (E); (V) – (A); (VI) – (D)
- (2) (I) – (F); (II) – (B); (III) – (A); (IV) – (E); (V) – (C); (VI) – (D)
- (3) (I) – (E); (II) – (B); (III) – (D); (IV) – (F); (V) – (C); (VI) – (A)
- (4) (I) – (F); (II) – (B); (III) – (D); (IV) – (A); (V) – (C); (VI) – (E)
10. Atmosphere of primitive earth was devoid of which of the following gases?
- (1) Free oxygen (2) Free hydrogen
(3) Ammonia (4) Carbon dioxide
11. Neo-Darwinism is more close to;
- (1) natural selection theory.
(2) modern mutation theory.
(3) modern synthetic theory.
(4) population theory.
12. What is alpha-1 antitrypsin?
- (1) An antacid
(2) An enzyme
(3) Used to treat arthritis
(4) Used to treat emphysema
13. The chance of elimination of genes from a small population is an example of;
- (1) selection pressure.
(2) speciation.
(3) adaptation.
(4) genetic drift.

14. When more than one adaptive radiation appears to have occurred in an isolated geographical area, it is called;
- (1) divergent evolution.
(2) convergent evolution.
(3) anthropogenic evolution.
(4) saltation.
15. The concept of chemical evolution is based on;
- (1) crystallisation of chemicals.
(2) effect of solar radiation on chemicals.
(3) interaction of water, air and clay under intense heat.
(4) possible origin of life by combination of chemicals under suitable environmental conditions.
16. Consider the following statements.
Health is a combination of;
(A) complete physical health.
(B) mental health.
(C) social health.
Which of the statements given above are **correct**?
- (1) (A) and (B)
(2) (A) and (C)
(3) (B) and (C)
(4) (A), (B) and (C)
17. Plasmodium parasite reproduces in liver by _____ and in female anopheles by _____.
(1) sexual reproduction; asexual reproduction
(2) asexual reproduction; sexual reproduction
(3) spore formation; sexual reproduction
(4) sexual reproduction; spore formation
18. Fill in the blanks by choosing the **correct** option.
(A) An antiviral protein called _____ is released by the _____ infected cells. (B) _____ immunity is also known as inborn immunity. (C) _____ in the stomach prevents microbial growth.
Choose the **correct** option.
- (1) (A) – interferon, virus; (B) – Passive; (C) – Acid
(2) (A) – interferon, virus; (B) – Innate; (C) – Acid
(3) (A) – antibody, bacteria; (B) – Active; (C) – Acid
(4) (A) – antibody, virus; (B) – Acquired; (C) – Hormone



19. Metastasis is the process of;
- (1) excessive cell proliferation.
 - (2) transformation of benign tumour into a malignant tumour.
 - (3) transformation of normal cells in cancerous cells.
 - (4) movement of cancerous cells from one organ to another.

20. LSD is;
- (1) Lauric acid dimethyl amide.
 - (2) Lysergic acid dimethyl amide.
 - (3) Lysergic acid diethyl amide.
 - (4) Lysergic acid dimethyl amide.

21. Given below are two **statements**: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Polymerase chain reaction is used in DNA amplification.

Reason (R): The ampicillin resistant gene is used as a selectable marker to check transformation.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) Both **Assertion (A)** and **Reason (R)** are correct and **Reason (R)** is the correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are correct but **Reason (R)** is not the correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is correct but **Reason (R)** is not correct.
- (4) **Assertion (A)** is not correct but **Reason (R)** is correct.

22. *Gambusia* fish have been introduced to lakes and ponds in India to control a deadly disease. They consume larvae of?

- (1) *Fasciola*
- (2) *Anopheles*
- (3) *Rana*
- (4) *Musca*

23. Which of these is **not** a living fossil?

- (1) *Archaeopteryx*
- (2) *Ornithorhynchus*
- (3) *Coelacanth*
- (4) *Limulus*

24. Match **List I** with **List II**.

List I		List II	
A	Vasectomy	I	Oral method
B	Coitus interruptus	II	Barrier method
C	Cervical caps	III	Surgical method
D	Saheli	IV	Natural method

Choose the **correct** answer from the options given below.

- (1) A-III, B-IV, C-II, D-I
- (2) A-II, B-III, C-I, D-IV
- (3) A-IV, B-II, C-I, D-III
- (4) A-III, B-I, C-IV, D-II

25. Select the **incorrect** statement.

- (1) Selection of recombinants due to inactivation of antibiotic is a cumbersome procedure.
- (2) Insertional inactivation of beta-galactosidase leads to colourless colonies.
- (3) Insertional inactivation of beta-galactosidase leads to blue coloured colonies.
- (4) In insertional inactivation, the rDNA is inserted within the coding sequence of an enzyme beta-galactosidase.

26. In recombinant DNA technology, the term vector refers to;

- (1) plasmids that can transfer foreign DNA into a living cell.
- (2) plasmids that can cut DNA at specific bases.
- (3) plasmids that can join DNA at specific bases.
- (4) plasmids that can degrade harmful proteins.

27. Match **List-I** with **List-II** and select the **correct** option.

List-I		List-II	
(A)	Restriction endonuclease	(I)	Separation of DNA fragments on gel
(B)	Gel electrophoresis	(II)	Joining of DNA
(C)	Ligase	(III)	Nitrocellulose sheet
(D)	Southern blotting	(IV)	Molecular scissor

- (1) (A) – (IV); (B) – (I); (C) – (II); (D) – (III)
- (2) (A) – (III); (B) – (I); (C) – (II); (D) – (IV)
- (3) (A) – (IV); (B) – (I); (C) – (III); (D) – (II)
- (4) (A) – (I); (B) – (IV); (C) – (II); (D) – (III)

28. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Endometrium is necessary for implantation of blastocyst.

Reason (R): In the absence of fertilisation, the corpus luteum degenerates that causes disintegration of endometrium.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) Both **Assertion (A)** and **Reason (R)** are correct and **Reason (R)** is the correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are correct but **Reason (R)** is not the correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is correct but **Reason (R)** is not correct.
- (4) **Assertion (A)** is not correct but **Reason (R)** is correct.



29. Silencing of a gene could be achieved through the use of;

- (1) RNAi.
- (2) antisense RNA.
- (3) Both (1) and (2).
- (4) None of these.

30. Which one of the following statements is **correct**?

- (1) The concerned *Bacillus* has antitoxins.
- (2) The inactive protoxin gets converted into active form in the insect gut.
- (3) Bt protein exists as active toxin in the *Bacillus*.
- (4) The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication.

31. Humulin is a;

- (1) natural insulin.
- (2) human insulin synthesised by genetically engineered *E. coli*.
- (3) human insulin synthesised in pancreas.
- (4) chemically synthesised insulin.

32. Which enzyme was targeted during the first clinical gene therapy given in 1990 to a 4-year old girl?

- (1) Monoamine oxidase
- (2) Tyrosine oxidase
- (3) Pyruvate dehydrogenase
- (4) Adenosine deaminase

33. Transgenic animals are produced for which of the following purposes?

- (A) To study how genes are regulated and how they affect the normal functions of the body and its development.
 - (B) To study the diseases.
 - (C) To obtain useful biological products.
 - (D) To test vaccine safety and chemical safety.
- (1) Only (A)
 - (2) (A) and (D)
 - (3) (B) and (D)
 - (4) All of these

34. **Assertion (A):** Primary spermatocytes of testes are diploid.

Reason (R): Primary spermatocytes are formed by mitosis in the spermatogonia.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (3) Only (A) is true but (R) is false.
- (4) Both (A) and (R) are false.

35. **Assertion (A):** *Wuchereria bancrofti* causes elephantiasis.

Reason (R): It is transmitted by female *Anopheles* mosquito.

- (1) Both **Assertion (A)** and **Reason (R)** are correct and **Reason (R)** is the correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are correct but **Reason (R)** is not the correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is correct but **Reason (R)** is not correct.
- (4) **Assertion (A)** is not correct but **Reason (R)** is correct.

SECTION-B

36. Given below is a statement with some blanks. Fill up the blanks **correctly**.

The male reproductive system consists of two testes. Each testis contains thin-folded tubes called the ____ (a) ____ in which meiosis takes place to produce the male gametes, the sperms. These sperms move to the ____ (b) ____ (a highly coiled tube formed from the merging of the seminiferous tubules) and then to the ____ (c) ____ or sperm duct. The two vasa deferentia merge to form the urethra, which travels to the outside of the body through the penis. The cells located between the seminiferous tubules are called ____ (d) ____ cells and they are responsible for the formation of the male hormone ____ (e) ____.

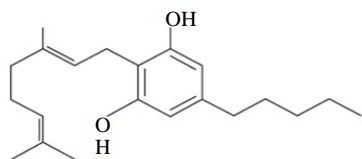
- (1) (a) – seminiferous tubules; (b) – epididymis; (c) – vas deferens; (d) – interstitial cells; (e) – testosterone
- (2) (a) – seminiferous tubules; (b) – epididymis; (c) – ejaculatory duct; (d) – interstitial cells; (e) – testosterone
- (3) (a) – seminiferous tubules; (b) – epididymis; (c) – vas deferens; (d) – interstitial cells; (e) – progesterone
- (4) (a) – uriniferous tubules; (b) – epididymis; (c) – vas deferens; (d) – interstitial cells; (e) – testosterone



37. Which one of the following events is matched with the time period in a normal menstrual cycle?
- Release of egg – 5th day
 - Endometrium regenerates – 5–10 days
 - Endometrium secretes nutrients for implantation – 11–18 days
 - Rise in progesterone level – 1–15 days
38. The first sign of the growing foetus may be noticed by listening to the heart sound carefully through the stethoscope. Embryo's heart is formed;
- by the end of the second month of pregnancy.
 - by the end of first trimester.
 - after one month of pregnancy.
 - during fifth month.
39. Vasectomy has no effect on the sexual life of male because;
- he can also ejaculate and has normal secretion of sex hormones in blood.
 - vasectomy affects the hormonal secretion but the person can ejaculate semen with normal number of sperms.
 - he cannot ejaculate but the hormone levels are normal.
 - vasectomy does not affect the sexual desire but can cause impotency.
40. Select the option which **correctly** fills up the blanks in the following statements.
- Baby produced by conceiving in a culture dish and nursing in the uterus is called a _____.
 - Family planning programmes were initiated in _____.
 - Permanent methods of birth control are _____ in male and _____ in females.
 - ART means _____.
- (a) – test tube baby; (b) – 1951; (c) – vasectomy, tubectomy; (d) Assisted reproductive technology
 - (a) – vial baby; (b) – 1949; (c) – tubectomy, vasectomy; (d) Artificial reproductive technology
 - (a) – tube baby; (b) – 1952; (c) – vasectomy, tubectomy; (d) – Associated reproductive technology
 - (a) – test baby; (b) – 1950; (c) – tubectomy, vasectomy; (d) – Attractive reproductive technology
41. Mutations are mainly responsible for;
- increasing population rate.
 - maintaining genetic continuity.
 - variation in organisms.
 - extinction of organisms.
42. Viviparity is considered to be more evolved because;
- The young ones are left on their own.
 - The young ones are protected by a thick shell.
 - The young ones are protected inside the mother's body and are looked after they are born leading to more chances of survival.
 - The embryo takes a long time to develop.
43. Which of the following has evolved mainly as a result of artificial selection?
- Darker colouring of the peppered moth near industrial areas.
 - Increased production of antibiotics by the fungus *Penicillium* sp.
 - Increased resistance of houseflies to the insecticide DDT.
 - Increased tolerance of lichens of heavy metals on tree bark around mine workings.
44. Except skin, other physical barriers which also help to prevent the entry of the microorganisms are;
- mucus coating of the epithelium lining the respiratory tract.
 - gastrointestinal tracts.
 - urogenital tracts.
- Choose the **correct** option.
- (a) and (b)
 - (a) and (c)
 - (b) and (c)
 - (a), (b) and (c)
45. At which stage of HIV infection does one usually show symptoms of AIDS?
- Within 15 days of sexual contact with an infected person.
 - When the infecting retrovirus enters host cells.
 - When viral DNA is produced by reverse transcriptase.
 - When HIV replicates rapidly in helper T-lymphocytes and damages large numbers of these.



46. The chemical shown below is the structure of _____.



- (1) cannabinoids (2) cocaine
(3) opioids (4) morphine

47. Production of a human protein in bacteria by genetic engineering is possible because;

- (1) the human chromosome can replicate only in bacterial cell.
(2) the genetic code is universal.
(3) bacterial cells can carry out the RNA splicing reactions.
(4) the mechanism of gene regulation is identical in humans and bacteria.

48. *Agrobacterium tumefaciens*;

- (A) acts as natural genetic engineer.
(B) can deliver a piece of T-DNA in the plant genome.
(C) Has been used to transfer genes for RNA interference in plant.

Mark the **correct** statements.

- (1) Only (A) (2) (A) and (B)
(3) (B) and (C) (4) (A), (B) and (C)

49. Manipulation in gene has been made possible because of the;

- (1) discovery of restriction endonuclease.
(2) development of methods for production of rDNA.
(3) development of method for production of the desired gene.
(4) all of these.

50. The applications of biotechnology include;

- (A) Therapeutics
(B) Diagnostics
(C) GM crops for agriculture
(D) Processed food
(E) Bioremediation
(F) Waste treatment
(G) Energy production
(1) (A), (B), (C) and (E)
(2) Only (C)
(3) (B), (C), (D) and (E)
(4) All of these

