

1. HUMAN REPRODUCTIVE SYSTEM

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. **Humans are _____** [2]
 1) Oviparous 2) Viviparous 3) Ovoviviparous 4) Parthenogenetic
2. **The reason behind the presence of testes outside the abdomen is:** [1]
 1) To decrease the temperature up to 2°C to 2.5° C for spermatogenesis.
 2) To increase the temperature up to 2°C to 2.5° C for spermatogenesis.
 3) There is no sufficient space in abdominal cavity.
 4) To prevent excessive production of sperms.
3. **Which of the following depicts the correct pathway of transport of sperms?** [4]
 1) Vasa Efferentia → Rete Testis → Vas Deference → Epididymis
 2) Rete Testis → Epididymis → Vasa Efferentia → Vas Deference
 3) Rete Testis → Vas Deference → Vasa Efferentia → Epididymis
 4) Rete Testis → Vasa Efferentia → Epididymis → Vas Deferens
4. **Which of the following acts as temporary endocrine tissue after ovulation in human females?** [2]
 1) Corpus albicans 2) Corpus luteum 3) Graafian follicle 4) Tertiary follicle
5. **What is the site of fertilization in human beings?** [2]
 1) Uterus 2) Fallopian tube 3) Cervix 4) Ovary
6. **The correct sequence of milk passage in mammary gland beginning from alveoli would be:** [4]
 1) Mammary tubules → Mammary ampulla → Mammary ducts → Lactiferous ducts
 2) Lactiferous ducts → Mammary ducts → Mammary ampulla → Mammary tubules
 3) Lactiferous ducts → Mammary ampulla → Mammary ducts → Mammary tubules
 4) Mammary tubules → Mammary ducts → Mammary ampulla → Lactiferous ducts
7. **Assertion: The seminal plasma along with the sperms constitute the semen.** [3]
Reason: For normal fertility at least 40 per cent ejaculated sperms must have normal shape and size and at least 60 per cent of them must show vigorous motility.
 1) If both assertion and reason are true and reason is the correct explanation of assertion.
 2) If both assertion and reason are true but reason is not the correct explanation of assertion.
 3) If assertion is true but reason is false.
 4) If Assertion false and Reason is true.

8. The second meiotic division of oocyte is completed during [4]
1) child birth 2) Puberty 3) Ovulation 4) Fertilization
9. Most of the major organ systems in foetal stage are formed [3]
1) By the end of 1st month
2) By the end of 2nd month
3) By the end of 3rd month
4) By the end of 3rd week
10. The signal for foetal ejection reflex in human female originates from [3]
1) Progesterone 2) Differentiation of mammary glands
3) Fully developed foetus and placenta 4) Sudden drop of oxytocin
11. The act of delivering a foetus at the end of pregnancy is called [1]
1) Parturition 2) Gestation 3) Coitus 4) Lactation

II. FILL IN THE BLANKS(FIB)

1. Testes are situated outside the abdominal cavity within a pouch called Scrotum.
2. The seminiferous tubules of the testis open into the vasa efferentia through Rete testis.
3. The part of fallopian tube closer to the ovary with funnel-shaped structure called Infundibulum.
4. The process of release of ovum from a mature follicle is called Ovulation.
5. Ovulation is induced by a hormone called Luteinizing hormone (LH).
6. The uterine layer that exhibits strong contraction during delivery of the baby is Myometrium.
7. The fusion of male and female gametes is called Fertilization.
8. The first menstruation is called Menarche.
9. Zygote divides to form blastocyst which is implanted in uterus.
10. The structural and functional unit between foetus and uterus is called placenta.

III. ONE WORD ANSWER Q'S

1. How many seminiferous tubules are present in every testicular lobule in which sperms are produced?

A: 1 to 3

2. Name the hormones that are synthesized and secreted by Leydig cells.

A: Androgens

3. The fingerlike projections of infundibulum of fallopian tube are called as?

A: Fimbriae

4. What is the tiny finger-like structure which lies at the upper junction of the two labia minora above the urethral opening?

A: Clitoris

5. Which layer undergoes cyclic changes in menstrual cycle?

A: Endometrium

6. By the end of which month of gestation, the heart is formed in a human embryo?

A: After 1 month

7. The milk produced in the initial few days of lactation which is rich in antibodies called?

A: Colostrum

8. How many eggs do you think were released by the ovary of a female dog which gave birth to 6 puppies?

A: 6 (six)

9. What is the cessation of menstrual cycle called?

A: Menopause

6. HUMAN HEALTH AND DISEASE

I. MULTIPLE CHOICE Q'S (MCQ)

OMQ'S

1×1= 1 Mark

- Diseases are broadly grouped into infectious and non-infectious diseases. In the list given below, identify the infectious diseases. [2]

i) Cancer	ii) Pneumonia	iii) AIDS	iv) Arthritis
1) i and ii	2) ii and iii	3) iii and iv	4) ii and iv
- Find out the correct option with regards to the disease and its causative pathogen. [2]

a) Elephantiasis	i) Bacteria
b) Amoebiasis	ii) Plasmodium
c) Malaria	iii) Entamoeba histolytica
d) Pneumonia	iv) Wuchereria
1) a-i, b-ii, c-iii, d-iv	2) a-iv, b-iii, c-ii, d-i
3) a-ii, b-iii, c-I, d-iv	4) a-iii, b-I, c-iv, d-ii
- Which of the following is a pair of Viral Disease [3]

1) Ringworm and AIDS	2) Common cold and Pneumonia
3) AIDS and Common cold	4) Typhoid and Malaria
- The substance produced by a cell in viral infection that can protect other cells from further infection is: [3]

1) Serotonin	2) Histamine	3) Interferon	4) Lysozyme
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- The number of Heavy and Light peptide chains present in Antibody molecule is [1]

1) H ₂ , L ₂	2) H ₃ , L ₁	3) H ₁ , L ₃	4) H ₃ , L ₃
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- Which of the following is mainly responsible for graft rejection in transplantation of organs? [3]

1) Inflammatory immune response	2) Auto-immune response
3) Cell-mediate immune response	4) Humoral immune response
- Match List-I with List-II. [2]

List-I	List-II
a) Interferons	i) T-Lymphocytes
b) Colostrum	ii) Innate Immunity
c) Antibody mediated immunity	iii) Passive immunity
d) Cell-mediated immunity	iv) B-Lymphocytes
1) a-ii, b-iv, c-i, d-iii	2) a-ii, b-iii, c-iv, d-i
3) a-iii, b-i, c-iii, d-i	4) a-i, b-ii, c-iii, d-iv

8. The exaggerated response of the immune system to certain antigens present in the environment is called [4]
 1) Active Immunity 2) Passive Immunity 3) Auto Immunity 4) Allergy
9. Which of the following factor does not cause transmission of HIV – infection? [1]
 1) Sharing of house hold items 2) Transfusion of contaminated blood
 3) Sexual contact with infected person 4) Sharing of infected needles
10. The Cancer - causing genes are [2]
 1) Structural genes 2) Oncogenes 3) Functional genes 4) Expressor genes
11. The drug 'Heroin' is synthesized by, [4]
 1) Glycosylation of morphine 2) Nitration of morphine
 3) Methylation of morphine 4) Acetylation of morphine
12. Match List-I with List-II. [4]
- | List-I | List-II |
|--------------|----------------------------------|
| a) Cocaine | i) Effective sedative in surgery |
| b) Heroin | ii) Cannabis sativa |
| c) Morphine | iii) Erythroxylum coca |
| d) Marijuana | iv) Papaver somniferum |
- 1) a-iv, b-iii, c-i, d-ii 2) a-i, b-iii, c-ii, d-iv 3) a-ii, b-i, c-iii, d-iv 4) a-iii, b-iv, c-i, d-ii
13. Which one of the following pairs of disease can spread through blood transfusion [1]
 1) Hepatitis and AIDS 2) Ascariasis and malaria
 3) Hay fever and AIDS 4) Cholera and hepatitis

II. FILL IN THE BLANKS(FIB)

- Typhoid fever could be confirmed by Widal Test test.
- Common cold differs with pneumonia as that virus do not infects Lungs.
- Colostrum secreted by mother during the initial days of lactation has abundant Antibodies to protect the infant.
- The principle of immunisation or vaccination is based on the property Memory of the immune system.
- The antibodies produced to allergies are of IgE type.
- RNA genome of the HIV replicates to form viral DNA with the help of enzyme Reverse Transcriptase.
- Heroin commonly called Smack.
- Smoking increases Carbon monoxide (CO) content in blood and reduces the concentration of haem bound oxygen.

III. ONE WORD ANSWER Q'S

1. The overall ability of the host to fight the disease-causing organisms is called?

A: Immunity

2. Which toxic substance is responsible for the chill and high fever recurring every three to four days in malarial fever?

A: "Haemozoin"

3. Among non-infectious diseases which disease is a major cause of death?

A: Cancer

4. Subsequent encounter with the same pathogen elicits a highly intensified response in the body. This response is called?

A: Secondary or Anamnestic Response

5. Which technique accurately detects pathological and physiological changes in the living tissue by using strong magnetic field and non-ionizing radiation?

A: Magnetic Resonance Imaging (MRI)

6. Name the drug which is a very effective sedative and painkiller, and is very useful in patients who have undergone surgery?

A: Morphine

7. A psychological attachment to certain effects such as euphoria and temporary feeling of well-being associated with drugs and alcohol is called?

A: Addiction

7. BIOTECHNOLOGY & ITS APPLICATIONS

I. MULTIPLE CHOICE Q'S (MCQ)

OMQ'S

1×1= 1 Mark

1. **What is a significant advantage of recombinant therapeutics over products isolated from non-human sources.** [3]
 - 1) They are less effective.
 - 2) They induced unwanted immunological responses.
 - 3) **They do not induce unwanted immunological responses.**
 - 4) They are more expensive to produce.
2. **Why was insulin from animal sources is less ideal for human use.** [1]
 - 1) **It was less effective and caused allergic reactions.**
 - 2) It was more effective than human insulin.
 - 3) It was not available in large quantities.
 - 4) It was orally administered.
3. **What is the role of C peptide in insulin synthesis.** [2]
 - 1) It is a part of the mature insulin hormone.
 - 2) **It is removed during the maturation of proinsulin into insulin.**
 - 3) It links chain A and B together.
 - 4) It is added to mature insulin for stability.
4. **What is the primary goal of gene therapy.** [2]
 - 1) To replace defective organs with healthy ones.
 - 2) **To insert a normal gene to compensate for non-functional gene.**
 - 3) To remove defective genes from the body.
 - 4) To enhance physical trials in healthy individuals.
5. **What is the role of the adenosine deaminase (ADA) enzyme in the body.** [2]

1) It regulates blood sugar levels.	2) It is crucial for immune system function.
3) It aids in muscle development.	4) It supports digestion.
6. **Assertion : PCR use for the early diagnosis of HIV infection and cancer in suspected patients.** [1]
Reason : PCR amplifies nucleic acids to detect very low concentration of pathogens before appearance of symptoms.
 - 1) **If both assertion and reason are true and reason is the correct explanation of assertion.**
 - 2) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - 3) If assertion is true but reason is false.
 - 4) If Assertion false and Reason is true.

7. **Assertion : Genetically engineered insulin is produced using recombinant DNA technology in bacteria like E coli.**
- Reason : The insulin produced is identical to human insulin and does not induce immunological responses.** [1]
- 1) If both assertion and reason are true and reason is the correct explanation of assertion.
 - 2) If both assertion and reason are true but reason is not the correct explanation of assertion.
 - 3) If assertion is true but reason is false.
 - 4) If Assertion false and Reason is True.
8. **How does the milk from the transgenic cow Rosie benefit human babies.** [3]
- 1) It is less expensive than natural cow milk.
 - 2) It contains higher levels of insulin.
 - 3) **It is nutritionally more balanced than natural cow milk.**
 - 4) It prevents allergic reactions in infants.
9. **What advantage do transgenic animals provide in toxicity testing compared to non-transgenic animals.** [2]
- 1) They require less exposure to toxic substances.
 - 2) **The yield results in less time.**
 - 3) They are immune to toxic substances.
 - 4) They produce their own antibodies.
10. **What defines a transgenic animal?** [2]
- 1) An animal with enhanced physical traits through selective breeding.
 - 2) **An animal with manipulated DNA to express a foreign gene.**
 - 3) An animal cloned from another species.
 - 4) An animal with naturally occurring genetic mutations.
11. **What is the primary purpose of organizations like GEAC (Genetic Engineering Approval Committee) in India?** [2]
- 1) To promote unrestricted genetic modification of organisms.
 - 2) **To evaluate the validity and safety of GM research and organisms for public use.**
 - 3) To grant patents for all genetic engineering projects.
 - 4) To ban all genetic modification activities.
12. **What is biopiracy?** [2]
- 1) The legal use of bio resources with proper authorization.
 - 2) **To unauthorised use of bio resources by organization without compensatory payment.**
 - 3) The development of new bio resources by indigenous communities.
 - 4) The sharing of traditional knowledge between countries.

II. FILL IN THE BLANKS(FIB)

1. Insulin consists of two polypeptide chains, A and B, linked by Disulphide bridges.
2. In humans, insulin is synthesized as a Pro-hormone that requires processing to become mature.
3. ELISA detects infections based on the principle of Antigen-Antibody interaction.
4. The first clinical gene therapy was performed in 1990 to treat a 4-year-old girl with Adenosine deaminase (ADA) deficiency.
5. In ADA deficiency treatment, functional ADA cDNA is introduced into Lymphocytes using a retroviral vector before being returned to the patient.
6. The human protein α -1-antitrypsin, produced by transgenic animals, is used to treat Emphysema.
7. The Indian Government has established the GEAC (Genetic Engineering Approval Committee) to regulate the safety and validity of introducing GM organisms for public use.
8. In 1997, an American company obtained patent rights on Basmati rice through the US Patent and Trademark Office.
9. India is home to an estimated 200,000 varieties of rice, showcasing its rich agricultural diversity.
10. Patents on products like turmeric and neem are based on India's traditional Herbal medicines.

III. ONE WORD ANSWER Q'S

1. What is the name of the company that prepared DNA sequences for human influence chains in 1983?

A: Eli Lilly

2. Which bacterium was used to produce human insulin chains A and B?

A: E. coli

3. What vector was used to introduce functional ADA, cDNA into lymphocytes?

A: Retroviral

4. What technique amplifies nucleic acids for early detection of pathogens?

A: Polymerase Chain Reaction (PCR)

5. What assay is based on antigen-antibody interaction for pathogen detection?

A: Enzyme Linked Immune Sorbent Assay (ELISA)

6. What human protein was in Rosie's milk for better nutrition?

A: alpha-lactalbumin

7. What organization in India approves GM research and safety?

A: Genetic Engineering Approval Committee (GEAC)

8. What term refers to unauthorized use of bio-resources without compensation?

A: Biopiracy

9. In which year did an American company got patent on basmati rice?

A: 1997

10. What traditional Indian plants has faced patent attempts?

A: Neem and Turmeric

I.MULTIPLE CHOICE Q'S(MCQ)

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- ## II. FILL IN THE BLANKS(FIB)

1. The intrinsic rate of natural increase is denoted by r .
2. In predation, one organism is benefited and the other is **Harmed**.
3. The interaction between algae and fungi in lichen is **Mutualism**.
4. Removal of predators from an ecosystem can lead to **Over population** of prey population.
5. **Ecology** is the study of relationships of organisms with their environment.
6. The population growth curve with an S-shape is called **Logistic** growth curve.

III. ONE WORD ANSWER Q'S

1. What is the term used for number of individuals per unit area?

A: Density

2. In which biological interspecies relationship where both species are in benefit?

A: Mutualism

3. In what type of biological relationship one organism that lives inside another?

A: Endoparasite

4. Name the term used for “The gradual change in population size over time”.

A: Population growth

5. What is the process known as when an organism is transferred from its natural habitat to a different one?

A: Emigration

6. What does the term ‘r’ in population growth represent?

A: Intrinsic rate of natural increase