

## EXERCISE

## 1. Multiple Choice Questions

- i. *The wall of the trachea (windpipe) and bronchi of man is furnished with a series of incomplete:*
- (a) cartilaginous plates (b) chitinous rings  
(c) cartilaginous rings (d) muscular rings
- ii. *What does not happen during inspiration in man?*
- (a) intercostals muscles contract (b) ribs are elevated  
(c) diaphragm becomes dome-shaped (d) ribs move forwards
- iii. *The lateral walls of the chest cavity of man are composed of the:*
- (a) ribs  
(b) intercostals muscles  
(c) ribs & Intercostals muscles  
(d) ribs, Intercostals muscles & diaphragm
- iv. *When the human blood leaves the capillary bed of the tissue, most of the carbon dioxide is in the form of:*
- (a) carbonic acid (b) bicarbonate ions  
(c) carboxylic acid (d) none of them
- v. *Which sequence of organs is correct in air passageway of man?*
- (a) nasal cavities larynx pharynx trachea bronchi  
(b) nasal cavities pharynx trachea larynx bronchi  
(c) nasal cavities pharynx larynx bronchi trachea  
(d) nasal cavities pharynx larynx trachea bronchi
- vi. *Which part of the air passage way possesses cartilage plates in its wall?*
- (a) bronchioles (b) distal region of bronchi  
(c) proximal region of bronchi (d) trachea
- vii. *Human lungs are spongy due to the presence of million of:*
- (a) bronchi (b) alveoli  
(c) bronchioles (d) trachea

**EXERCISE ?**

- viii. *Which event is not associated with the activity of expiration?*
- (a) contraction of diaphragm
  - (b) more dome like shape of diaphragm
  - (c) back ward & down ward movement of rib cage
  - (d) relaxation of intercostals muscles
- ix. *Oxygen carrying capacity of blood does not depend upon:*
- (a) partial pressure of  $\text{CO}_2$
  - (b) partial pressure of  $\text{O}_2$
  - (c) height from sea level
  - (d) quantity of blood
- x. *When haemoglobin of the blood is fully saturated with oxygen, the 100cc of blood contains.*
- (a) 15cc of oxygen
  - (b) 20cc of oxygen
  - (c) 25cc of oxygen
  - (d) 10cc of oxygen

**2. Short Questions**

# EXERCISE ?

## 1- Multiple choice questions.

- (i) *Shifts in water-solute balance are managed primarily by*
- (a) respiratory system  
(b) **the urinary system**  
(c) endocrine adjustments  
(d) the circulatory system
- (ii) *Which is the most important mechanism for water loss from the body?*
- (a) **excretion in urine**  
(b) sneezing  
(c) sweating  
(d) elimination in feces
- (iii) *The process that normally exerts the greatest control over the water balance of an individual is*
- (a) sweating.  
(b) **kidney function.**  
(c) evaporation through the skin.  
(d) respiratory loss.
- (iv) *Which of the following does NOT dispose off a type of waste directly to the environment?*
- (a) digestive system  
(b) respiratory system  
(c) **circulatory system**  
(d) urinary system
- (v) *The most toxic substances routinely found in the blood are metabolites of what type of molecules?*
- (a) **proteins**  
(b) carbohydrates  
(c) nucleic acids  
(d) Fats
- (vi) *Which of the following is the last structure that urine passes through during its excretion from body?*
- (a) distal tubule  
(b) **urethra**  
(c) urinary bladder  
(d) ureter
- (vii) *The process during which potassium and hydrogen ions and some toxic substances are put into urine is called*
- (a) **tubular secretion.**  
(b) reabsorption.  
(c) filtration.  
(d) countercurrent multiplication.

# EXERCISE ?

- (viii) *Kidney health is described in terms of*
- (a) the number of kidney stones.
  - (b)  rate of filtration.
  - (c) water retention.
  - (d) blood clot
- (ix) *Why is there no glucose present in the filtrate in the distal tubule of a nephron?*
- (a) its molecules are too large to pass across the basement membrane
  - (b) it is removed by osmosis from the tubule
  - (c) it is passively absorb by the cells lining the descending the loop of Henle
  - (d)  it is actively absorb by the proximal tubule cells
- (x) *In case of overheating, the body temperature is regulated by:*
- (a) more sweating and more urination
  - (b)  more sweating and less urination
  - (c) less sweating and more urination
  - (d) less sweating and less urination
- (xi) *An animal that warms itself mainly by absorbing heat from its surroundings is known as:*
- (a) homiotherm
  - (b)  ectotherm
  - (c) endotherm
  - (d) none of them

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## 2- Short Questions.

- (i) Why it is necessary for a living being to maintain its internal environment at a fairly constant level?
- (ii) How positive feedback can be harmful at times?
- (iii) Describe mechanism of ultrafiltration.
- (iv) How regulation of blood flow to skin is meaningful to maintain body temperature?

## EXERCISE ?

## Multiple Choice Questions

The disorder in which bones are porous and thin but bone composition normal is;

- (a) osteomalacia (b) osteoporosis  
(c) rickets (d) arthritis

The organic portion of bone's matrix is important in providing all but;

- (a) tensile strength (b) hardness  
(c) to resist stretch (d) flexibility

The remodeling of bone is a function of which cells?

- (a) chondrocytes and osteocytes (b) osteoblasts and osteoclasts  
(c) chondroblasts and osteoclasts (d) osteoblasts and osteocytes

In skeletal muscle, calcium facilitates contraction by binding to

- (a) tropomyosin (b) actin.  
(c) troponin. (d) myosin.

Which of the following statements concerning the role of  $\text{Ca}^{+2}$  in the contraction of skeletal muscle is correct?

- (a) The mitochondria act as a store of  $\text{Ca}^{+2}$  for the contractile process  
(b)  $\text{Ca}^{+2}$  entry across the plasma membrane is important in sustaining the contraction of skeletal muscle  
(c) A rise in intracellular  $\text{Ca}^{+2}$  allows actin to interact with myosin  
(d) The tension of a skeletal muscle fibre is partly regulated by G proteins

The function of the T tubules in muscle contraction is to

- (a) make and store glycogen  
(b) release  $\text{Ca}^{+2}$  into the cell interior and then pick it up again  
(c) make the action potential deep into the muscle cells  
(d) to hamper the the nerve impulse

The sites where the motor nerve impulse is transmitted from the nerve endings to the skeletal muscle cell membranes are the:

- (a) neuromuscular junctions (b) sarcomeres  
(c) myofilaments (d) Z discs

# EXERCISE ?

(viii) *Myoglobin has a special function in muscle tissue.*

- (a) it breaks down glycogen
- (b) it is a contractile protein
- (c) it holds a reserve supply of oxygen in the muscle
- (d) none of these

## 2- Short Questions

- (i) Name the cranial and facial bones
- (ii) What is the function of the intervertebral discs?

(iv) Briefly describe the impairment of function seen in cleft palate.

## 3- Long Questions

- (i) Describe the structure of bone.
- (ii) Describe major divisions of human axial skeleton
- (iii) What are types of fractures? Describe the repair process of a simple fracture.

## EXERCISE ?

## 1- Multiple choice questions.

- (i) Which of the following is common to all neurons?
- (a) A cell body which contains a nucleus  
 (b) A thick myelin sheath  
 (c) Presence of nodes of Ranvier  
 (d) Presence of Schwann cells
- (ii) What will occur if a drug at the neuromuscular junction blocks the receptor sites on the post-synaptic membrane?
- (a) Inhibition of Acetylcholine release  
 (b) Muscle contraction  
 (c) Muscle paralysis  
 (d) Release of calcium ions
- (iii) The groups of ribosomes present in the cell body of the neuron, which are associated with rough endoplasmic reticulum are called:
- (a) Meissner's corpuscles  
 (b) Pacinian corpuscles  
 (c) Nissl's granules  
 (d) Lysosome granules
- (iv) The mammalian forebrain is differentiated into the thalamus, limbic system and the:
- (a) Cerebellum  
 (b) Cerebrum  
 (c) Hippocampus  
 (d) Hypothalamus
- (v) Information back from the control center to the effectors as done by \_\_\_\_\_ nerve path way.
- (a) afferent  
 (b) efferent  
 (c) both  
 (d) none
- (vi) The number of human spinal nerves is:
- (a) 24  
 (b) 50  
 (c) 62  
 (d) 64
- (vii) The electrical potential of cell membrane of neuron when it is not transmitting any signal is called \_\_\_\_\_.
- (a) resting membrane potential  
 (b) action potential  
 (c) propagation of impulse  
 (d) synapse



# EXERCISE?

## 1- Multiple Choice Questions

(i) Which one of the following condition is resulted from excess GH in adults?

- (a) Cushing's disease  
 (b) **acromegaly**  
 (c) hyperthyroidism  
 (d) diabetes mellitus

(ii) \_\_\_\_\_ regulates the kidney's retention of water.

- (a) prolactin  
 (b) oxytocin  
 (c) thyroxine  
 (d) **vasopressin (ADH)**

(iii) Which of the following hormones is not released by the anterior pituitary?

- (a) **melanocyte-stimulating hormone**  
 (b) gonadotropin-releasing hormone  
 (c) thyroid-stimulating hormone  
 (d) growth hormone

Posterior Pituitary  
 1. ADH  
 2. Oxytocin

(iv) Parathyroid hormone acts to ensure that

- (a) **calcium levels in the blood never drop too low**  
 (b) sodium levels in urine are constant  
 (c) potassium levels in the blood don't escalate  
 (d) the concentration of water in the blood is sufficient

(v) The adrenal cortex produces \_\_\_\_\_.

- (a) adrenaline  
 (b) calcitonin  
 (c) epinephrine  
 (d) **aldosterone**

(vi) Oxytocin is secreted by the endocrine gland named:

- (a) **pituitary gland**  
 (b) thyroid gland  
 (c) parathyroid gland  
 (d) adrenal gland

(vii) Deficiency of vasopressin or ADH by the pituitary gland leads to a disorder in which the patients kidneys have lessened ability to absorb water is:

- (a) diabetes mellitus  
 (b) **diabetes insipidus**  
 (c) goiter  
 (d) exophthalmic goiter

## EXERCISE ?

- (viii) The function(s) of oxytocin is/are to \_\_\_\_\_.
- (a) cause the uterus to contract
  - (b) induce labor
  - (c) stimulate the release of milk from the mother's mammary glands when her baby is nursing.
  - (d) all of the above
- (ix) In humans, MSH (melanocyte-stimulating hormone) \_\_\_\_\_.
- (a) regulates primary skin color
  - (b) causes the thyroid to produce thyroxin
  - (c) governs the rate of tanning
  - (d) concentration is very low

## 2- Short Questions

- (i) Differentiate between endocrine and exocrine glands.
- (ii) Why anterior pituitary gland is called master gland?
- (iii) List down the effects of Hyperthyroidism.
- (iv) Why pancreas is known as double gland?
- (v) Why insulin is so vital for normal survival?

## 3- Long Questions

- (i) Describe the chemical nature of hormone by giving the examples of important hormones.
- (ii) Explain the role of hormones secreted by anterior lobe of pituitary.
- (iii) Discuss the effects of

## EXERCISE ?

## Multiple Choice Questions

Innate behavior is all but;

- (a) Heritable  
(c) Stereotypic

- (b) Intrinsic  
~~(d)~~ Flexible

Innate behavior is all except:

- (a) Coded in DNA  
~~(b)~~ Modified in individuals' life span  
(c) Modified with species evolution  
(d) Programmed responses to external stimuli

Which one is non-directed orientation?

- (a) Taxis  
(c) Tropism

- ~~(b)~~ Kinesis  
~~(d)~~ Imprinting

Trial and error learning has no role in

- (a) Operant learning  
(c) Insight

- (b) Classical conditioning  
(d) Imprinting

Advantage of pecking orders is to

- (a) avoids injury to the stronger animals  
(b) protect territory  
(c) find suitable mate  
~~(d)~~ Assign specific role to individual subordinates.

## EXERCISE ?

## 1- Multiple Choice Questions

- (i) *Gonadotropin releasing hormone is responsible for the stimulation/release of which hormone?*
- (a) **LH**
  - (b) Progesterone
  - (c) Secretin
  - (d) Insulin
- (ii) *Fertilization of the ovum normally occurs:*
- (a) In the upper third of the oviduct
  - (b) In the uterus
  - (c) **In the lower third of the oviduct**
  - (d) Can take place successfully in vagina
- (iii) *The human egg is swept through the oviduct toward the uterus by*
- (a) The beating of the eggs' cilia.
  - (b) Rhythmic contraction of the oviduct.
  - (c) Rhythmic contraction of the uterus.
  - (d) **The beating of the cilia in the oviduct.**
- (iv) *Embryo implants in the \_\_\_\_\_ of the uterus*
- (a) Perimetrium
  - (b) Myometrium
  - (c) **Endometrium**
  - (d) Cervix
- (v) *Which will occur as a result of nondescent of the testes?*
- (a) Male sex hormones will not be circulated in the body.
  - (b) Sperm will have no means of exit from the body.
  - (c) Inadequate blood supply will retard the development of the testes.
  - (d) **Viable sperm will not be produced.**
- (vi) *The corpus luteum is formed at the site of*
- (a) Fertilization
  - (b) **Ovulation**
  - (c) Menstruation
  - (d) Implantation
- (vii) *Within the ovary, progesterone is produced by the*
- (a) corpus albicans.
  - (b) **corpus luteum.**
  - (c) tertiary follicles
  - (d) primary follicles.

# EXERCISE ?

- viii) *The basic difference between spermatogenesis and oogenesis is that*
- (a) during spermatogenesis two more polar bodies are produced.
  - (b) the mature ovum is haploid while the sperm is  $2n$ .
  - (c) spermatogenesis involves mitosis and meiosis, but oogenesis involves meiosis only.
  - (d) in oogenesis, one mature ovum is produced, and in spermatogenesis four mature sperm are produced.

- (ix) *The uterine layer which is shed with each monthly cycle is*
- (a) endometrium.
  - (b) perimetrium.
  - (c) tunica albuginea.
  - (d) myometrium.

## Short Questions

- 2- (i) List down the functions of glands associated with the male

# EXERCISE ?

## 1. Multiple Choice questions

- i. *The protective coat which surrounds the embryo is known as:*
- (a) **amnion** (b) chorion  
(c) allantosis (d) chorio allantoic
- ii. *The outer layer of the blastocyst, which later attaches to the uterus, is the*
- (a) Deciduas (b) **Trophoblast**  
(c) Amnion (d) inner cell mass
- iii. *Identical twins result from the fertilization of;*
- (a) **one ovum by one sperm sperms** (b) one ovum by two  
(c) two ova by two sperms (d) two ova by one sperm
- iv. *The most important hormone in initiating and maintaining lactation after birth is;*
- (a) estrogen (b) FSH  
(c) **Prolactin** (d) Oxytocin

## 2. Short questions

Corpus luteum is extended for nearly three  
... deteriorates.

## EXERCISE ?

## 1- Multiple Choice Questions

- (i) Blood group B phenotype contains anti-A antibodies in the serum and agglutinates any RBC with antigen:
- (a) AB (b) O  
(c) A (d) B
- (ii) Chances for a son or daughter in human birth are:
- (a) 3:1 between son and daughter (b) 1:3 between son and daughter  
(c) 1:1 between son and daughter (d) None of them
- (iii) The number of linkage group in man is:
- (a) 02 (b) 23  
(c) 46 (d) 92
- (iv) A man of blood group A marries a woman of blood group B and they have one child. Which one of the following statements about the child's blood is correct?
- (a) It could be group A only  
(b) It could be group AB only  
(c) It could be group A or Group B only  
(d) It could be any of the groups A, B, AB, O.
- (v) How many different kinds of gametes will be formed by an individual, who is heterozygous for four gene pairs:
- (a) 8 (b) 16  
(c) 20 (d) 30
- (vi) A woman with normal colour vision, whose father was red-green colour blind, married a red-green colour-blind man. What is the probability of her first-born child being red-green colour blind?
- (a) 1.0 (b) 0.75  
(c) 0.50 (d) 0.025
- (vii) Two parents, each of blood groups A, have a daughter of blood group O. What is the probability that their next child who has blood group O?
- (a) 0.125 (b) 0.25  
(c) 0.50 (d) 0.75
- (viii) What are the phenotypes of the parent of a colour-blind son and non-carrier daughter with normal colour vision?

**EXERCISE ?**

	<i>Father</i>	<i>Mother</i>
(a)	Carrier	Normal
(b)	Colour-blind	Carrier
(c)	Normal	Carrier
(d)	Normal	Colour-blind

(ix) *When expression of a biological character is observed in variable intensity it is due to the affect of:*

- |                      |                           |
|----------------------|---------------------------|
| (a) multiple alleles | (b) codominance           |
| (c) epistasis        | (d) polygenic inheritance |

(x) *Inheritance of skin colour in man is controlled by eight pairs of genes, which are:*

- |                      |                             |
|----------------------|-----------------------------|
| (a) linked           | (b) codominant              |
| (c) multiple alleles | (d) assorting independently |

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**Short Questions**

(i) ... most suitable plant for Mendel's experiments.



## EXERCISE ?

## Multiple Choice Questions

- (i) A chromosome with unequal length of its arms is called:
- (a) Metacentric  
(b) **Sub metacentric**  
(c) Acrocentric  
(d) Telocentric
- (ii) In Hershey & Chase experiment,  $^{32}\text{P}$  labeled bacteriophages allowed to infect the bacteria. During analysis  $^{32}\text{P}$  activity was detected:
- (a) In culture medium  
(b) On the surface of bacterial cell  
(c) **Inside the bacterial cell**  
(d) Both a & b
- (iii) In Meselson & Stahl experiment, the DNA from sample at 20 minutes, after centrifugation it made sediments at the:
- (a) Top  
(b) Bottom  
(c) **Intermediate**  
(d) Top & intermediate
- (iv) Which of the following act as a stop codon?
- (a) UGG  
(b) UGC  
(c) **UAG**  
(d) UGU
- (v) In mitochondria UGA codon act to specify ----- instead stop codon:
- (a) Argenine  
(b) Valine  
(c) **Glutamic acid**  
(d) **Tryptophan**
- (vi) If the amount of adenine in DNA of a bacterial cell is 36% of the total nitrogenous bases, what will be the amount of guanine in the DNA of a cell in next generation:
- (a) **14%**  
(b) 28%  
(c) 36%  
(d) 64%
- (vii) If an mRNA is synthesized with all the different codons, what is the minimum number of amino acids in the protein that is formed by mRNA:
- (a) **64 Amino acids**  
(b) ~~62~~ 62 Amino acids  
(c) 60 Amino acids  
(d) None of them
- (viii) In eukaryotic mRNA molecule there are 90 nucleotide involved in translation process. What is the number of amino acid in the protein formed by this mRNA molecule?
- (a) 29 amino acids  
(b) **30 amino acids**  
(c) 45 amino acids  
(d) ~~90~~ 90 amino acids

# EXERCISE ?

(ix) In Griffith experiment mice developed pneumonia when they were injected with:

- (a) R-type bacteria
- (b) heat killed S-type bacteria
- (c) heat killed R-type bases
- (d) heat killed S-type bacteria along with live R-type bacteria.

(x) If the codon consisted of only two nucleotides, there would be how many possible codons?

- (a) 4
- (b) 8
- (c) 20
- (d) 16

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## 2- Short Questions

- (i) Differentiate the concept of monoploid and haploid.
- (ii) List the types and role of histone proteins in chromosome?

- (i) *The random loss of alleles in a population is called*
- (a) Mutation (b) Selection  
(c) Gene flow (d) Genetic drift
- (ii) *Human appendix, coccyx and nictitating membrane of the eye are:*
- (a) vestigial organs (b) homologous organs  
(c) analogous organs (d) embryonic organs
- (iii) *The existing species are the modified descendants of pre-existing ones according to:*
- (a) Theory of special creation (b) theory of organic evolution  
(c) uniformitarianism (d) theory of catastrophe
- (iv) *Using the Hardy-Weinberg Principle, which expression represents the frequency of the homozygous recessive genotype?*
- (a)  $P^2$  (b)  $2pq$   
(c)  $q^2$  (d)  $q$
- (v) *Which one of the following would cause the Hardy-Weinberg principle to be inaccurate?*
- (a) The size of the population is very large.  
(b) Individuals mate with one another at random.  
(c) Natural selection is present.  
(d) There is no source of new copies of alleles from outside the population.
- (vi) *The study of birds is:*
- (a) ornithology (b) ichthyology  
(c) herpetology (d) entomology
- (vi) *Similarity in characteristics resulting from common ancestry is known as:*
- (a) Analogy (b) Homology  
(c) Evolutionary relationship (d) Phylogeny
- (vii) *The parts of the body use extensively to cope with the environment become larger and stronger, while those that are not used deteriorate was argued by:*
- (a) Charls Darwin (b) Alfred Wallace  
(c) Carolus

## EXERCISE ?

(viii) Which one of the following pairs represents analogous features?

- (a) Elephant tusks & Human incisors  
 ✓ (b) Insects wings & bat wings  
 (c) Mammal fore limb & bird wing  
 (d) ~~Reptilian heart & mammalian heart~~

(ix) In which of the following situations would evolution be slowest for an inter breeding population?

	Migration	Selection Pressure	Variation due to Mutation
✓ (a)	Absent	Low	Low
(b)	<del>Absent</del>	High	High
(c)	High	Low	High
(d)	High	High	Low

(x) Which of the following ideas was not part of Charles Darwin's theory of evolution by natural selection?

- (a) ~~Organisms produce more offspring than the environment can support.~~  
 (b) Variation between individuals arises by gene mutation.  
 (c) Only those individuals that are best adapted to the environment survive and reproduce.  
 (d) Individuals compete for space and resources.

# EXERCISE ?

1. Multiple choice questions

- i. *A change in the community structure of an ecosystem over a period of time is:*
- |                      |                         |
|----------------------|-------------------------|
| (a) Ecological niche | (b) Ecological mutation |
| (c) Succession       | (d) Genetic drift       |
- ii. *In succession lithoseres takes place on:*
- |                  |                |
|------------------|----------------|
| (a) Sand         | (b) Water      |
| (c) forest floor | (d) Bare rocks |
- iii. *The amount of energy left after plants have met their respiratory needs is net sprimary production, which shows up as plant:*
- |                      |                         |
|----------------------|-------------------------|
| (a) Respiration rate | (b) Photosynthesis rate |
| (c) Biomass          | (d) Food reserve        |
- iv. *Which statement defines the net primary production in an ecosystem over a given time period?*
- |  |
|--|
| (a) The total amount of organic matter in all organisms present.                           |
| (b) The total amount of organic matter in the plants in excess of that used in respiration |
| (c) The total amount of organic matter used in respiration by all the organisms present    |
| (d) The total amount of photosynthetic product from all plants                             |
- v. *What would be expected to happen if all the nitrogen- fixing organisms ceased to exist?*
- |  |
|--|
| (a) There would be no significant change in numbers of animals |
| (b) The total biomass would be reduced.                        |
| (c) All organisms would die out.                               |
| (d) The nitrogen level of the atmosphere would be increase.    |
- vi. *Which of the following is NOT recycled in ecosystems?*
- |            |             |
|------------|-------------|
| (a) Carbon | (b) Sulphur |
| (c) Energy | (d) Water   |
- vii. *The best way to increase food production from ecosystem view point is.*
- |  |
|--|
| (a) to increase cultivable land by clearing forest |
| (b) use of excessive fertilizers                   |
| (c) use of high quality pesticides                 |
| (d) use of genetically improved varieties of seeds |

# EXERCISE ?

- viii. *The total energy from the sun is trapped by the producers in an ecosystem is about:*
- |         |         |
|---------|---------|
| (a) 20% | (b) 10% |
| (c) 5%  | (d) 1%  |
- ix. *The study of human populations and things that affect them is called:*
- |                 |                |
|-----------------|----------------|
| (a) Angiography | (b) Demography |
| (c) Mammography | (d) Homography |
- x. *The causes of greenhouse effect are:*
- |                       |                   |
|-----------------------|-------------------|
| (a) Over urbanization | (b) Deforestation |
| (c) Industrialization | (d) All of them   |

### 3. Short questions

- i. Summarize the significance of biogeochemical cycles?
- ii. What is nitrogen fixation? Also mention different methods of nitrogen fixation.
- iii. Give the names of organisms involved in biological nitrogen fixation.
- iv. Write down the advantages of conventional sources of energy?

## EXERCISE ?

## 1. Multiple choice questions

- i. The type of gel most commonly used for short fragment DNA electrophoresis is:
- (a) agarose (b) DNA polymerase  
(c) polyacrylamide (d) DNA ligase
- ii. Cell suspension culture of *Cinchona ledgeriana* produce:
- (a) Quinine (b) Digitoxin  
(c) Polludrin (d) Anti toxin
- iii. Dideoxy ribonucleoside triphosphates are used to terminate DNA synthesis at different site. Which method involves this procedure?
- (a) Maxam-Gilbert's method (b) Sangar's method  
(c) K.B. Mullis's Method (d) Gottlieb's method
- iv. The gene of choice can also be synthesized in the laboratory from mRNA, using reverse transcriptase. This DNA molecule is called:
- (a) Complementary DNA (b) Replicative DNA  
(c) Synthetic DNA (d) ssDNA
- v. The gene of interest is joined with the sticky ends produced after cutting the plasmid with the help of another special enzyme known as:
- (a) DNA ligase (b) DNA polymerase  
(c) Restriction endonuclease (d) Reverse transcriptase
- vi. The enzyme DNA polymerase can work only in
- (a) 3'  $\perp$  5' direction (b) 5'  $\perp$  3' direction  
(c) Both the direction (d) 5'  $\perp$  5' direction
- vii. In recombinant DNA technology a plasmid vector is cleaved by
- (a) Modified DNA ligase  
(b) A heated alkaline solution  
(c) The same enzyme that cleave the donor DNA  
(d) The different enzyme other than that cleave the donor DNA
- viii. *Thermus aquaticus* is the source of
- (a) Taq polumerase (b) vent polymerase  
(c) both a and b (d) primase enzyme
- ix. The complete set of chromosomal and extrachromosomal genes of an organism is called:
- (a) Genome (b) Gene pool  
(c) Gene bank (d) Gene library

# EXERCISE ?

- x. **Atotipotent cell means:**
- (a) An undifferentiated cell capable of developing into a system or entire plant
  - (b) An undifferentiated cell capable of developing into an organ
  - (c) An undifferentiated cell capable of developing into complete embryo
  - (d) Cell which lacks the capability differentiate into an organ or system

## 2. Short Questions

- i. Why don't the restriction enzymes destroy the DNA of the organism in which they are produced?
- ii. What are the essential features of a vector?
- iii. What are monoclonal antibodies?
- iv. Name two conditions necessary for maintaining animal cells in culture which are different from plant cell culture
- v. Give any two human proteins and their function which are produced biotechnologically.
- vi. What are probes?
- vii. What were the aims and objectives of human genome project?
- viii. Differentiate between Maxam-Gilbert method & Sanger's method of gene sequencing.



# EXERCISE ?

## 1. Multiple choice questions

- i. Which of the following is not included in integrated disease management?
- (a) awareness through media      (b) vaccination and medication  
(c) both a & b      (d) none of them
- ii. BCG vaccine is a type of:
- (a) live attenuated vaccine      (b) killed vaccine  
(c) subunit vaccine      (d) conjugated vaccine
- iii. Study of proper utilization of economically important domestic animals, it is called:
- (a) Animal Husbandry      (b) Wild life Management  
(c) Livestock Management      (d) none of them
- iv. **Holstein Friesian was imported from Holland.** This is by far the best diary breed among exotic cattle regarding milk yield. On an average it gives:
- (a) 10 liter of milk per day      (b) 15 liter of milk per day  
(c) 20 liter of milk per day      (d) 25 liter of milk per day.

## 2. Short Questions

- i. Differentiate between animal husbandry and livestock management.
- ii. What is the importance of artificial insemination?
- iii. What is biogas?