

**Meghalaya Board**  
**Class XII**  
**Bio-Zoology**  
**Sample Paper 2 – Solution**

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**GROUP A**

1. Lycopod were seen in the Jurassic period of Mesozoic Era.
2. Chikungunya is spread through Aedes mosquitoes which is a vector-borne disease.
3. The Italian bee (*Apis mellifera*) is docile, less swarming and produces a high yield of honey.
4. *Eichhornia crassipes* is a water hyacinth which was introduced unintentionally to the aquatic ecosystem, which leads to the extinction of native species and caused a decline in phytoplankton.
5. The phenomenon of failure of segregation of two homologous chromosomes of a particular pair during cell division as a result of gain or loss of chromosome(s) is called aneuploidy.
6. It is important that the ovum and sperm reach simultaneously to the ampullary-isthmic junction. As most of the sperms and ova fail to do so, each and every coitus does not result in fertilisation and pregnancy.

**GROUP – B**

7. Surgical procedures block gamete transport and thereby prevent conception. In human males, the sterilisation procedure is called vasectomy, i.e. a small part of the vas deferens is removed or tied up through a small incision on the scrotum.

**Or**

The operon is a functioning unit of genomic DNA which is regulated by a common promoter and regulatory genes.

The lac operon consists of three genes which are called structural genes lac Z, lac Y and lac A.

8. Cyanobacteria are the first oxygenic photoautotrophic organism. The effect of evolved oxygen on methane and ammonia of reducing atmosphere was oxygen oxidized methane to carbon dioxide and ammonia to nitrogen.

9. *Streptococcus* bacterium produces streptokinase. It is used for removing clots from the blood vessels of a patient suffering from myocardial infarction or in a heart patient.
10. Biopiracy refers to the use of bioresources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment. It can be prevented by developing laws to obtain proper authorisation and by paying compensatory benefits.

**GROUP – C**

11. The funnel-shaped proximal part of the fallopian tube is called infundibulum. Its margin bears motile, finger-like processes called fimbriae. The fimbriae bear cilia that beat towards the operature (called ostium) to direct the release of egg (from ovary) into the infundibulum.
12. Chorionic villus sampling (CVS) is a new technique which can be used during the 8th to 10th week of pregnancy when abortion is safe for the woman. For CVS, cells are sucked into a catheter passed through the vagina and cervix. This technique provides a mass of rapidly dividing foetal cells, thus facilitating the examination of chromosomal disorders.

**Or**

The three major classes of RNA include tRNA, mRNA and rRNA. The function of tRNA is to transfer specific amino acids to a growing polypeptide chain during the ribosomal site of protein synthesis. The main function of the mRNA is to send the information of how to assemble the amino acids found to form protein in the ribosomes. rRNA are involved in protein synthesis.

13. When more than one adaptive radiation appeared to have occurred in an isolated geographical area and two or more groups of unrelated animals resemble each other for similar mode of life or habitat is called convergent evolution. Example- Australian marsupials, placental mammals.
- The evolutionary process which produces new species diverged from a single ancestral form and adapted to new invaded habitats is known as divergent evolution or adaptive radiation. Example- Forelimbs of man, whales, bats, cheetah perform different functions as they have similar anatomical structure.

**GROUP - D**

**14.** The different population attributes which an individual does not possess are population density, population growth, mortality rate, natality rate, sex ratio and age distribution.

(i) Population density: It is the number of individuals of a species per unit area or volume.

(ii) Population growth: Increase in the number of population which resides in a particular geographical area.

(iii) Mortality rate: It is expressed as the number of deaths per 1000 individuals of a population per year.

(iv) Natality rate: It is expressed as the number of births per 1000 individuals of a population per year.

(v) Sex ratio: The ratio of males to females in a population.

(vi) Age distribution: The proportionate numbers of persons in different age categories in a given population.

(Any four)

**Or**

The chromosomal theory of inheritance was proposed independently by Walter Sutton and Theodore Boveri in 1902. According to this theory,

1. As the sperm and the egg cells serve as a connecting link from one generation to the other, all the hereditary characters must be carried in them.
2. The hereditary factors are present in the nucleus of cells.
3. Like Mendelian alleles, chromosomes are also found in pairs.
4. The sperm and egg having haploid sets of chromosomes fuse to re-establish the diploid state.
5. The genes are carried on the chromosomes.
6. Homologous chromosomes synapse during meiosis and get separated to pass into different cells. This forms the basis of segregation and independent assortment.

**15.** Reproductive health means total well-being in all aspects of reproduction, i.e. physical, emotional, behavioural, social and physiological.

Following measures are to be taken to make people aware of reproductively healthy society:

(i) Providing infrastructural facilities and professional expertise to attain reproductive health.

(ii) Educating people about birth control methods, care of pregnant mothers, importance of breast feeding, safe and hygienic sexual practices and safeguards against STDs.

(iii) Introduction of sex education in schools to give proper information to young minds about sex-related aspects.

**Sample Paper 2 – Solution**

- (iv) Help of audio-visual and print-media to create awareness among people about reproduction-related aspects.
- (v) Awareness of problems due to population explosion, social evils such as sex abuse and sex-related crimes.
- (vi) Statutory ban on amniocentesis to legally check female foeticides.

**16.** GEAC (Genetic Engineering Approval Committee) was set up by the Ministry of Environment and Forests to regulate research, testing and commercial release of GM crops, foods and organisms.

The objectives of GEAC are:

1. To permit the use of GM organisms and their products for commercial purposes
2. To adopt procedures for restriction, production, scale, import, export and applications of GM organisms
3. To approve for conduct of large scale field trials and release of transgenic crops in the environment
4. To authorise agencies or persons to have large scale production and release of GM organisms into the environment or curb and take strict actions against them