



Previous Year Solved Question Paper  
of

**G.A.T.E. (XL) 2009**

**LIFE SCIENCES**

**XL: Zoology**

**Examination**

*(Original Question Paper with Answer Key)*

**GRADUATE APTITUDE TEST IN ENGINEERING**



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**M : ZOOLOGY**

**Q. 1 – Q. 7 carry one mark each.**

- Q.1 In an normal animal cell, the extra-chromosomal DNA is
- (A) Single stranded circular (B) Single stranded linear  
(C) Double stranded circular (D) Double stranded linear
- Q.2 Which of the following is NOT a somite derivative ?
- (A) Cardiac muscle (B) Skeletal muscle  
(C) Cartilage (D) Tendons
- Q.3 During hibernation in a hibernating mammal, its body temperature would be
- (A) Lower than normal state (B) Same as normal state  
(C) Higher than normal state (D) Fluctuate between high and low points
- Q.4 Mendel's principle of segregation means that the germ cells (egg or sperm) always receive
- (A) One of the paired alleles (B) One pair of alleles  
(C) One quarter of the genes (D) Any pair of alleles
- Q.5 Cholera toxin acts by
- (A) Activating a G-protein (B) Blocking an ion channel  
(C) Activating synaptic transmission (D) Blocking glycolysis
- Q.6 Which of the following statements does NOT describe the characteristics of human population in industrialized countries ?
- (A) Relatively small family size (B) Relatively even age structure  
(C) Rapid reproduction rate (D) Delayed reproduction
- Q.7 Sex-linkage refers to
- (A) Inheritance of genes linked to sex determination  
(B) The ratio of genes on the autosome and sex chromosomes  
(C) Inheritance of genes carried on the sex chromosomes  
(D) Linkage of genes present on the sex chromosomes

**Q. 8 to Q.21 carry two marks each.**

- Q.8 Increase in the emission of fossil fuels is thought to result in global warming. This is possible because an increase in atmospheric CO<sub>2</sub> level would
- (A) Increase the amount of sun light entering the earth atmosphere
  - (B) Increase the amount of infrared radiation entering the earth
  - (C) Absorb the infrared radiation reflected by the earth
  - (D) Insulate earth from cold breeze coming from the space
- Q.9 Anabolic steroids, taken illegally by sportspersons to enhance their physical strength, are synthetic analogues for natural \_\_\_\_\_ from the \_\_\_\_\_.
- (A) testosterone ..... anterior pituitary
  - (B) FSH and LH ..... posterior pituitary
  - (C) cortisol ..... thyroid
  - (D) androgen ..... gonads
- Q.10 Holometabolous insects go through a series of larval instars before molting into pupal stage, and into an adult. This developmental is regulated by three key hormones namely, brain hormone, ecdysone, and juvenile hormone. The main function of brain hormones is to
- (A) Stimulate the prothoracic gland to secrete ecdysone
  - (B) Stimulate the corpus allatum to secrete juvenile hormone
  - (C) Arrest the release of ecdysone by prothoracic gland
  - (D) Stimulate the release of juvenile hormone by prothoracic gland
- Q.11 Homology in anatomical parts helps in determining evolutionary kinship because
- (A) Homologous body parts invariably perform similar functions
  - (B) Display evolutionary adaptations
  - (C) Undergo similar genetic changes
  - (D) Have common embryological origin
- Q.12 Which of the following does NOT explain the term "survival of the fittest" ?
- (A) Fittest animals leave higher number of progeny than those which perish.
  - (B) Fittest group of animals out populates its competitors.
  - (C) Fittest animals are best predators.
  - (D) Fittest group is rich in genetic variations.
- Q.13 In a coral island in Atlantic Ocean, a natural calamity killed most of its population. The island is repopulated with the surviving individuals and their progeny. The present day population in the island shows high incidence of a rare recessive genetic disorder. What could be the most probable evolutionary force responsible for this phenomenon ?
- (A) Geographical isolation
  - (B) Genetic drift
  - (C) Selective advantage of the recessive disorder
  - (D) Natural selection

- Q.14 The human immune system is able to mount a response when it encounters a novel microorganism for the first time because
- White blood cells are able to change their antigen specificity depending upon the microorganism they interact with.
  - Our body contains millions of different kinds of white blood cells, each with a unique type of antigen receptor.
  - Bone marrow cells make different antigen receptors depending upon the kind of invading microorganism.
  - Bone marrow cells are able to change their antigen specificity upon physical interaction with the microorganism.
- Q.15 Acetylcholinesterase is an enzyme that degrades acetylcholine. What would be the effect of administration of an inhibitor of acetylcholinesterase on nerve transmission ?
- No effect.
  - Synaptic transmission will be prevented.
  - Extra excitatory postsynaptic potentials would occur in the postsynaptic neuron.
  - The presynaptic neuron will be inactivated.
- Q.16 Which one of the following comparisons between oogenesis and spermatogenesis in human is NOT correct ?
- FSH promotes development of both eggs as well as sperms.
  - LH triggers ovulation in ovary and androgen production in testis.
  - Primary oocytes and primary spermatocytes follow similar pattern of development through meiosis.
  - An ovum is not produced until it fuses with the sperm whereas sperm is produced even in the absence of the ovum.
- Q.17 Match the parasitic species with their correct hosts.
- |                                |             |
|--------------------------------|-------------|
| P. <i>Schistosoma mansoni</i>  | 1. snails   |
| Q. <i>Trichinella spiralis</i> | 2. human    |
| R. <i>Plasmodium</i>           | 3. mosquito |
| S. <i>Taenia solium</i>        | 4. pig      |
- (A) P-1, Q-2, R-3, S-4      (B) P-4, Q-3, R-2, S-1  
(C) P-2, Q-1, R-3, S-4      (D) P-3, Q-4, R-1, S-2
- Q.18 Match the embryonic cleavage patterns with the corresponding organisms
- |                   |               |
|-------------------|---------------|
| P. Isolecithal    | 1. Chick      |
| Q. Mesolecithal   | 2. Drosophila |
| R. Telolecithal   | 3. Human      |
| S. Centrolecithal | 4. Frog       |
- (A) P-1, Q-2, R-3, S-4      (B) P-2, Q-1, R-3, S-4  
(C) P-3, Q-4, R-1, S-2      (D) P-2, Q-4, R-1, S-3

- Q.19 Which combination of the following statements with regard to gene expression is true ?
1. Heteronuclear RNA represents contiguous segment of genomic DNA.
  2. UTRs are part of heteronuclear RNA but not of mRNA.
  3. UTRs are part of exons.
  4. Translation start codon MUST be in the first exon.
- (A) 1 – true, 2 – false, 3 – false, 4 – false  
(B) 1 – true, 2 – false, 3 – true, 4 – false  
(C) 1 – true, 2 – true, 3 – false, 4 – true  
(D) 1 – false, 2 – true, 3 – true, 4 – true
- Q.20 Which of the following combination of statements regarding Maturation Promoting Factor (MPF) is TRUE ?
1. MPF in amphibians regulates cell cycle.
  2. MPF in amphibians is composed of cyclins and CDKs.
  3. MPF in amphibians undergoes periodic degradation.
  4. MPF in amphibians undergoes periodic phosphorylation.
- (A) 1, 2 and 3 only  
(B) 1 and 4 only  
(C) 2 and 3 only  
(D) 1, 2, 3 and 4
- Q.21 Which of the following combination of statements regarding gastrulation is TRUE ?
1. It is marked by coordinated mass cell movement.
  2. It results in the formation of organizer.
  3. It results in the formation of three germ layers.
  4. It marks the end of neurulation.
- (A) 1 and 3 only  
(B) 1 and 2 only  
(C) 2 and 3 only  
(D) 1, 2, 3 and 4

**END OF THE QUESTION PAPER**

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