All science problems address TEKS 130.142 Principles in Education and Training.

Principles of Education and Training.

**Biology. (6)** Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to:

- (A) identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DNA
- (B) recognize that components that make up the genetic code are common to all organisms
- (D) recognize that gene expression is a regulated process
- (E) identify and illustrate changes in DNA and evaluate the significance of these changes
- (F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance
- (G) recognize the significance of meiosis to sexual reproduction; and
- (H) describe how techniques such as DNA fingerprinting, genetic modifications, and chromosomal analysis are used to study the genomes of organisms

**Biology. (10)** Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to:

- (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals
- (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system
1. Which statement below is NOT true regarding the embryo stage of development?
   a. This stage lasts approximately eight weeks during which the placenta begins formation
   b. During this stage, the embryo travels down the fallopian tube, and attaches to the endometrial lining in the uterus
   c. During this stage, all of the systems begin to develop
   d. This stage is considered the later part of the pregnancy

2. The male and female reproductive cells needed to produce viable offspring are known as:
   a. The testes and the ovaries
   b. The gametes
   c. The zygote
   d. The embryo

3. Which structure below provides food and oxygen to the fetus?
   a. The uterus
   b. The fallopian tube
   c. The ovary
   d. The placenta

4. The purpose of fertilization of the egg is to:
   a. Ensure the resulting baby has 46 chromosomes
   b. Ensure the egg is protected during development and growth
   c. Ensure the egg doesn’t implant in the fallopian tube
   d. Ensure the male has a role in the creation of a baby

5. A male carries the X and Y sex chromosomes. A female carries two X sex chromosomes. What is true regarding the conception of a male child?
   a. He carries two X sex chromosomes
   b. His mother provided him with a Y chromosome
   c. His father determined his sex
   d. His mother determined his sex

6. In its early infancy, a baby exhibits symptoms of tiredness, shortness of breath, and pain. The doctors believe he has which of the following genetic disorders?
   a. PKU
   b. Tay-Sachs Disease
   c. Sickle Cell Anemia
   d. Down Syndrome
7. A child is producing thick, sticky mucous that affects breathing and digestion. Which of the following genetic conditions is the most likely diagnosis?
   a. PKU
   b. Tay-Sachs Disease
   c. Sickle Cell Anemia
   d. Cystic Fibrosis

8. Color blindness is a sex-linked trait determined by recessive genes on the X sex chromosome. A non-color blind female marries a non-color blind male. Their first child is color blind. Based on the information provided, which statement below is true?
   a. The father is carrying the recessive gene and he has given his son color blindness
   b. The first child is a female
   c. The mother is heterozygous for color blindness and passes the gene on to her daughter
   d. The mother is heterozygous for color blindness and passes the gene on to her son

9. A child presents mental retardation, has a short stature, stubby hands and feet. This child has a genetic disorder. Which genetic disorder is it most likely to be?
   a. PKU
   b. Tay-Sachs Disease
   c. Sickle Cell Anemia
   d. Down’s Syndrome

10. Which structure is primarily responsible for removing waste products from the developing fetus?
    a. Fallopian tube
    b. Amniotic fluid
    c. Uterus
    d. Umbilical cord
Answer Key

1) D
2) B
3) D
4) A
5) C
6) C
7) D
8) D
9) D
10) D