VIRTUAL UNIVERSITY SCIENCE

Exam Answers: Mendelian Genetics

1) Gregor Mendel was:
   a. A Geneticist who studied genetics and the pea plant his entire life.
   b. A priest who studied the traits of pea plants, and came up with the laws of Genetics.
   c. An assistant who worked for a Geneticist, and stole his ideas.
   d. A farmer that stumbled across what we know as Genetics.

2) The cross between parent alleles, which involves a pair of contrasting alleles.
   a. Monohybrid cross
   b. Heredity
   c. True breeding
   d. Genetics

3) When the offspring is exactly like the parent, this is called _____.
   a. **True Breeding**.
   b. Identical Offspring.
   c. Replicated alleles.
   d. Heredity.

4) _____ is the first two individuals that are crossed in a breeding experiment.
   a. F_1
   b. F_2
   c. F_3
   d. P Generation

5) The passing of characters from parents to offspring is called?
   a. Monohybrid cross
   b. Heredity
   c. True breeding
   d. Genetics

6) What are alleles?
   a. The letters that designate the different versions of a gene.
   b. The genotype of an individual.
   c. The phenotype of an individual.

d. Both A and B
e. All the above.

7) What are homozygous alleles?
   a. The physical appearance of a character.
   b. The set of alleles that an individual has for a character.
   c. The genotype expressed when two alleles of a particular gene are the same in an individual.
   d. The genotype expressed when two alleles of a particular gene are different in an individual.

8) What are heterozygous alleles?
   a. The physical appearance of a character.
   b. The set of alleles that an individual has for a character.
   c. The genotype expressed when two alleles of a particular gene are the same in an individual.
   d. The genotype expressed when two alleles of a particular gene are different in an individual.

9) The discipline of Biology that incorporates the mechanics of heredity is called _____?
   a. Monohybrid cross
   b. Heredity
   c. True breeding
   d. Genetics

10) Why are garden peas good to experiment on in a monohybrid cross?
   a. The garden pea was small and east to obtain and grow.
   b. The garden pea was a simple plant with very little traits.
   c. The garden pea was abundant in variety, and could be bred true for clear-cut, qualitative traits.
   d. The garden pea has a short life, so after it dies after offspring is created.

11) The stamen is the _____ reproductive part of the flower, while the carpel is the _____ part.
   a. Male; Female
   b. Female; Male
   c. Dominant; Recessive
   d. Recessive; Dominant

12) When 2 heterozygous parents (Rr) are crossed, what are the alleles of the offspring?
   a. 100% Rr

b. 50% RR, 50% Rr
c. 25% RR, 50% Rr, 25% rr
d. 50% Rr, 50% rr
e. None of the above

13) Which is true about recessive alleles?
a. Recessive alleles are displayed when one recessive allele is present.
b. Recessive alleles are randomly expressed.
c. Recessive alleles can never be expressed.
d. Recessive alleles are only expressed when the alleles are homozygous recessive.

14) What was Mendel's first conclusion?
a. It states that one factor in a pair may mask the other, preventing the other from having an effect.
b. It is translated as seed color, for instance, and does not have any connection with the height of the pea plant.
c. It is the inherited characteristics that are controlled by factors that occur in pairs.
d. It states that a pair of factors is segregated during the formation of gametes.

15) What was Mendel's third conclusion (known as Mendel's First law or the Law of Segregation)?
a. It states that one factor in a pair may mask the other, preventing the other from having an effect.
b. It is translated as seed color, for instance, and does not have any connection with the height of the pea plant.
c. It is the inherited characteristics that are controlled by factors that occur in pairs.
d. It states that a pair of factors is segregated during the formation of gametes.

16) True or **False**: Mendel discovered the basic rules of inheritance by accidentally planting garden peas too close to each other?

17) What is the difference between dominant and recessive alleles?
a. Dominant alleles are the expressed form of a character, where the recessive allele is the trait that is not expressed.
b. When a dominant allele is expressed, not recessive alleles can be present.
c. Recessive alleles are always expressed, while the dominant allele is not.
d. Both dominant and recessive alleles are always expressed equally.

18) A genotype is the _____ that an individual has for a character, while the phenotype is the _____ of a character.
    a. Physical traits; alleles
    b. Expressed alleles; unexpressed alleles
    c. Alleles from mom; alleles from dad
    d. Set of alleles; physical appearance

19) When Mendel crossed a Pure-breed, round-seeded pea (RR) with a pure-breed wrinkled-seeded one (rr), what were the genotypes expressed in the offspring?
    a. 100% RR
    b. 50% RR, 50% Rr
    c. 100% Rr
    d. 25% RR, 50% Rr, 25% rr
    e. None of the above

20) **Essay**:
    Professor Paul did a dihybrid cross during his lecture, and used the genotypes: **RY Ry rY rr X RY Ry rY rr.** What is the genotypic ratio of this cross?

    9/16 Round and yellow
    3/16 Round and green
    3/16 Wrinkled and yellow
    1/16 Wrinkled and green