**These review questions are for the Bio 1 Chromosomes topic. These questions were adapted from several sources, including the textbook’s review questions.**

**Multiple choice review questions:**

1) In his transformation experiments, what did Griffith observe?

A) Mutant mice were resistant to bacterial infections.

B) Mixing a heat-killed pathogenic strain of bacteria with a living nonpathogenic strain can convert some of the living cells into the pathogenic form.

C) Mixing a heat-killed nonpathogenic strain of bacteria with a living pathogenic strain makes the pathogenic strain nonpathogenic.

D) Infecting mice with nonpathogenic strains of bacteria makes them resistant to pathogenic strains.

E) Mice infected with a pathogenic strain of bacteria can spread the infection to other mice.

2) In his work on transfer of genes from one bacterial cell to another, Avery found that pathogenic (disease causing) bacteria could pass their genes to non-pathogenic bacteria. Furthermore, he found that…

A) the protein coat from pathogenic cells was able to transform nonpathogenic cells into pathogenic cells.

B) heat-killed pathogenic cells caused disease.

C) DNA from pathogenic cells was transferred to nonpathogenic cells, making them pathogenic.

D) the polysaccharide coat of bacteria caused disease.

E) viruses inject DNA into bacteria.

3) Who mixed viruses with bacteria and then, using a blender, showed that viral DNA (not the viral proteins) was the molecule that entered the bacteria and contained the genes of the virus?

A) Thomas Morgan

B) Gregor Mendel

C) Hershey and Chase

D) Roseland Franklin

E) Watson and Crick

4) Who performed X-ray crystalography to discover the helical shape of DNA?

A) Thomas Morgan

B) Gregor Mendel

C) Hershey and Chase

D) Roseland Franklin

E) Watson and Crick

5) Which of the following statements describes the eukaryotic chromosome?

A) It is composed of DNA alone.

B) The centromere is located in the middle of the chromosome.

C) The number of genes on each chromosome is different in different cell types of an organism.

D) It consists of a single linear molecule of double-stranded DNA plus proteins.

E) It is circular in shape.

6) The centromere is a region where…

A) the cell attaches proteins that move the chromosome during cell division

B) the genes of the chromosome are clustered

C) chromosomes attach to the wall of the nucleus

D) the ribosomes bind to the DNA

E) the histones wind around the DNA

7) What is the function of histone proteins?

A) They transcribe genes on the chromosome into mRNA.

B) They form the centromere of the chromosome.

C) They help the chromosome divide during cellular reproduction.

D) They condense the chromosome by wrapping the DNA around themselves.

E) They bind to spindle fibers to move chromosomes during cell division.

8) In the human species, all cells have 46 chromosomes. Which of the following may also be true?

A) A plant species may also have 46 chromosomes in each cell.

B) Some adult humans may have 69 chromosomes in each cell.

C) Some adult humans may have 23 chromosomes in each cell.

D) A certain archaea species may have 23 chromosomes.

E) A certain bacterial species may have 23 chromosomes.

9) A triploid cell contains three sets of chromosomes. If a cell of a usually diploid species with 42 chromosomes per cell somehow became triploid, this cell would be expected to have which of the following?

A) 63 chromosomes in 31 1/2 pairs

B) 63 chromosomes in 3 sets of 21

C) 63 chromosomes, each with three chromatids

D) 21 chromosome homologous pairs and 21 unique chromosomes (containing entirely different genes)

10) The human genome (all the genes that a human being has) is found in…

A) every human cell

B) each human chromosome

C) the body, but each cell only contains some of our genes.

D) reproductive cells (sperm and eggs) only

E) each human gene

11) The cells of a certain plant contain 46 chromosomes, the same number as human beings have. To be as different as they are from human cells, which of the following must be true about the plant?

A) The plant cells cannot reproduce sexually.

B) The plant cells have chromosomes that can exchange DNA with human chromosomes in the

 laboratory.

C) The genes of the plant chromosomes are significantly different than those in humans.

D) The plant must be metabolically more like animals than like other shrubs.

E) Genes on a particular plant chromosome, such as the X, must be on a different human chromosome,

 such as number 18.

12) If we choose one of homologous pair of chromosomes, such as chromosome pair 14, which of the following do the two chromosomes of the pair have exactly in common?

A) Length and position of the centromere only.

B) Length, centromere position, and alleles.

C) Length, centromere position, and genes.

D) They have nothing in common except their shape.

13) When an organism that, in each of its cells, has two sets of chromosomes (in other words, in each cell the chromosomes occur in homologous pairs), that organism is said to be…

A) Diploid

B) Pairous

C) Haploid

D) Dizygotic

E) Heterozygous

14) When an organism that, in each of its cells, has two sets of chromosomes (in other words, in each cell the chromosomes occur in homologous pairs), that organism is said to be…

A) Homozygous

B) 2n

C) n

D) Allelic

E) Replicated

15) Which of the following is *true* of a species that has a chromosome number of 2*n* = 16?

A) The species is diploid with 32 chromosomes per cell.

B) The species has 16 pairs of chromosomes per cell.

C) Each cell has eight homologous pairs.

D) Each cell has 32 separate chromosomes.

E) A sperm or egg cell from this species has four chromosomes.

16) When an organism that, in each of its cells, has only one of each chromosome (in other words, in each cell the chromosomes do not occur in homologous pairs), that organism is said to be…

A) Diploid

B) Pairous

C) Haploid

D) Monozygotic

E) Homozygous

17) When an organism that, in each of its cells, has only one of each chromosome (in other words, in each cell the chromosomes do not occur in homologous pairs), that organism is said to be…

A) Heterozygous

B) 2n

C) n

D) Non-allelic

E) Pre-replicated

18) Genes often occur in more than one version. For example, the gene that controls eye color has a version that causes brown eyes and a version that causes blue eyes. The different versions of a gene are called

A) Diploids

B) Haploids

C) Alleles

D) 2n

E) Heterozygous

19) An organism that has two different versions of a gene is said to be \_\_\_\_\_\_ for that gene.

A) Diploid

B) Haploid

C) Di-allelic

D) 2n

E) Heterozygous

20) An organism that has two of the same version of a gene is said to be \_\_\_\_\_\_ for that gene.

A) Diploid

B) Haploid

C) Mono-allelic

D) n

E) Homozygous

**Answers to multiple choice questions:**

1 = B

2 = C

3 = C

4 = D

5 = D

6 = A

7 = D

8 = A

9 = B

10 = A

11 = C

12 = C

13 = A

14 = B

15 = C

16 = C

17 = C

18 = C

19 = E

20 = E