

- (d) transfecting embryonic stem cells with an altered gene sequence
623. Which of the following genetic diseases would be amenable to genetic engineering?
- (a) Down's syndrome                      (b) Muscular dystrophy  
(c) Cystic fibrosis                          (d) Cri du Chat
624. Plant transformation can be obtained by
- (a) combining plant and animal cells in culture  
(b) shooting DNA into plant cells with a gun  
(c) using the *E. coli* bacterium to infect plant roots  
(d) infecting plants with a tobacco mosaic virus
625. Under which of the following conditions would population gene frequencies remain the same?
- (a) Selection for homozygotes  
(b) Small population size  
(c) Active migration between groups  
(d) Random mating
626. When populations are small, gene frequencies can change from generation to generation and some alleles may become fixed in a population. This is called \_\_\_\_\_.  
(a) assortative mating                      (b) inbreeding  
(c) heterosis                                  (d) genetic drift
627. Which of the following is not true of small inbreeding populations?
- (a) They tend to lose genetic diversity  
(b) There is an increased incidence of recessive diseases  
(c) Alleles may become fixed  
(d) Mutation is increased
628. A plasmid
- (a) is a circular DNA molecule  
(b) always contains an origin of replication  
(c) usually contains one or more restriction sites  
(d) all of the above
629. An expression vector
- (a) always contains an origin of replication  
(b) usually contains a gene that confers antibiotic resistance to the bacterial host  
(c) always contains DNA segments for the regulation of mRNA production  
(d) all of the above

- (a) Because it produces a thick shell which acts as a shield from the radiation
  - (b) Because it has unique DNA repair mechanisms
  - (c) Because its cellwall contains radioactive elements
  - (d) Because it has many copies of genes encoding DNA repair
- 378.** Which of the following theory is supported by the genomic sequence of the obligate intracellular parasite *Rickettsia prowazekii* ?
- (a) Parasitic bacteria have very large genomes
  - (b) Parasites have a definite genomic sequence similar to viruses
  - (c) Mitochondria have evolved from endosymbiotic bacteria
  - (d) All bacteria evolved from viruses
- 379.** Why the bacterium *Treponema pallidum* is difficult to culture?
- (a) Because it requires a great deal of water to reproduce
  - (b) Because it is unable to use carbohydrates as an energy source
  - (c) Because it lacks the genes needed for TCA cycle and oxidative phosphorylation
  - (d) Because it requires extremely low temperature at which water freezes
- 380.** The species of bacteria, which possesses 250 genes for lipid biosynthesis is
- (a) *M. genitalium*
  - (b) *M. tuberculosis*
  - (c) *E. coli*
  - (d) *H. influenzae*
- 381.** In the time since *E. coli* and *Salmonella* diverged evolutionarily
- (a) there has been little change in either genome
  - (b) *E. coli* has acquired many genes via horizontal transfer
  - (c) *E. coli* has lost approximately 50% of its genome
  - (d) none of these
- 382.** The word, used for the small solid supports onto which are spotted hundreds of thousands of tiny drops of DNA that can be used to screen gene expression, is
- (a) southern blot
  - (b) cloning library
  - (c) DNA microarrays
  - (d) northern blot
- 383.** Proteomics is
- (a) the study of algal genomes
  - (b) a branch of quantum physics dealing with proteins
  - (c) the study of formation of lipo-protein in animals
  - (d) the study of the entire collection of proteins expressed by an organism

868. Lysozyme (an endolysin) which will lyse the bacterial cell, releasing the mature virions is present in  
 (a) immediate early phage genes (b) late genes  
 (c) delayed early genes (d) all of these
869. The phage components begin to assemble into mature phages only after the synthesis of  
 (a) structural protein (b) nucleic acid  
 (c) Both (a) and (b) (d) amino acids
870. During the first 10 minutes after injection of phage DNA, no phage can be recovered by disrupting the infected bacterium. This is termed as  
 (a) eclipse period (b) rise period  
 (c) latent period (d) burst size
871. The time from infection until lysis is called as  
 (a) eclipse period (b) rise period  
 (c) latent period (d) burst size
872. The temperate phage possesses a gene that codes for a repressor protein which makes the cell resistant to lysis initiated by  
 (a) the prophage  
 (b) lytic infection by other viruses  
 (c) Both (a) and (b)  
 (d) none of these
873. The repressor protein, since the cell is resistant to lysis from externally infecting phage, is also called  
 (a) immunity repressor (b) immunity operon  
 (c) operon repressor (d) none of these
874. The lysogenic state is governed by the activity of the regulatory region of the lambda phage genomes; this region is termed as  
 (a) immunity repressor (b) immunity operon  
 (c) operon repressor (d) none of these
875. The temperate phage that have no site specificity for insertion and may even be able to insert multiple copies of their DNA into a single bacterial chromosome is  
 (a)  $\lambda$  phage enzyme (b)  $\lambda$  DNA  
 (c) Phage Mu (d) Phage Mn
876. Which of the following is not true of virions?  
 (a) Reproduce independently (b) Contain DNA

- (a) Rabies
  - (b) Vaccinia
  - (c) Simian virus 40
  - (d) Cytomegalovirus
897. Which of the following are obligate intracellular parasites?
- (a) *Chlamydia*
  - (b) Viruses
  - (c) *Rickettsia*
  - (d) All of these
898. Plant viruses may be cultivated in
- (a) tissue culture
  - (b) cultures of separated cells
  - (c) whole plants
  - (d) all of these
899. Viruses can be purified based on their size and density by using
- (a) gradient centrifugation
  - (b) differential centrifugation
  - (c) precipitation
  - (d) none of these
900. Which of the following may affect proteins and nucleic acids, but not viruses?
- (a) Denaturation
  - (b) Enzyme treatment
  - (c) Pressure
  - (d) All of these
901. The viruses in an attenuated vaccine
- (a) have no genome
  - (b) continue to replicate
  - (c) are usually larger than bacteria
  - (d) is altered with chemicals
902. When a virus enters a cell but does not replicate immediately, the situation is called
- (a) lysogeny
  - (b) fermentation
  - (c) symbiosis
  - (d) synergism
903. The viral nucleocapsid is the combination of
- (a) genome and capsid
  - (b) capsid and spikes
  - (c) envelope and capsid
  - (d) capsomere and genome
904. The oncogene theory refers to
- (a) how chemicals inactivate viruses when applied
  - (b) how viruses replicate in host cells
  - (c) how viruses transform normal cells into tumor cells
  - (d) none of these
905. Which of the following oncogenic viruses was first detected?
- (a) Rous sarcoma virus.
  - (b) Epstein-Barr virus
  - (c) Herpes simplex virus type 2
  - (d) Human T cell leukaemia virus