銘傳大學八十八學年度管理科學研究所碩士班招生考試

（甲組）第一節

生物學 試題

I. Single Choice (Each question is worth <u>one</u> point, 50%)

1. Cell membranes consist mainly of a _____.
   a. carbohydrate bilayer and proteins
   b. protein bilayer and phospholipids
   c. phospholipid bilayer and proteins
   d. none of above
2. Organelles _____.
   a. are not membrane-bound compartments
   b. are typical of prokaryotic cells, not eukaryotic cells
   c. separate chemical reactions in time and space
   d. all of above are functions of organelles
3. Plant cells but not animal cells have _____.
   a. mitochondria b. a plasma membrane
   c. ribosomes d. a cell wall
4. _____ is the primary source of energy for life on earth.
   a. Food b. The sun
   c. Water d. ATP
5. Enzymes _____.
   a. enhance reaction rates b. act on specific substrates
   c. are affected by pH d. all are correct
6. Glycolysis stares and ends in the _____.
   a. nucleus b. plasma membrane
   c. mitochondrion d. cytoplasm
7. Which of the following does not form during glycolysis?
   a. NADH b. pyruvate
   c. FAD d. ATP
8. The pathway of electron transport chain is completed in the _____.
   a. nucleus b. plasma membrane
   c. mitochondrion d. cytoplasm
9. In the last stage of respiratory chain _____ is the final acceptor of electrons that originally resided in glucose.
   a. water b. hydrogen
   c. oxygen d. NADH

10. In the last stage of aerobic respiration, a flow of _____ in response to concentration and electric gradients drives the formation of ATP from ADP and phosphate.
    a. electrons b. hydrogen ions
    c. NADH d. $FADH_2$
11. _____ engage in lactate fermentation.
    a. Lactobacillus cells b. Sulfate-reducing bacteria
    c. Muscle cells d. a and c are correct
12. A eukaryotic chromosome consists of _____.
    a. DNA only b. DNA plus proteins
    c. DNA plus lipids d. DNA plus membrane
13. A cell that has two of each type of chromosome characteristic of the species is a(n) _____ cell.
    a. diploid b. mitotic
    c. abnormal d. a and c
14. A duplicated chromosome has -- chromatid(s).
    a. one b. two
    c. three d. four
15. Of a chromosome, a _____ is a constricted region with attachment sites for microtubules.
    a. chromatid b. centromere
    c. cell plate d. cleavage furrow
16. Only _____ is not a stage of mitosis.
    a. prophase b. interphase
    c. metaphase d. anaphase
17. Meiosis _____ the parental chromosome number.
    a. doubles b. reduces
    c. maintains d. corrupts
18. Before the onset of meiosis, all chromosomes are _____.
    a. condensed b. released from protein
    c. duplicated d. b and c
19. Each chromosome moves away from its homologue and ends up at the opposite spindle pole during _____.
    a. prophase I b. prophase II
    c. anaphase I d. anaphase II
20. A heterozygote has a _____ for the trait being studied.
    a. pair of identical alleles b. pair of non-identical alleles

c. haploid condition, in genetic terms d. a and c.

21. The observable traits of an organism are its _____.
    a. phenotype b. sociobiology
    c genotype d pedigree
22. Chromosome structure call be altered by _____.
    a. deletions b. duplications
    c. inversions d. all of the above
23. Genetic disorders can be caused by _____.
    a. gene mutations b. changes in chromosome structure
    c. changes in chromosome number d. all of the above
24. What is the base-pairing rules for DNA?
    a. A-T, T-C b. A-C T-G
    c. A-U, C-G d. A-T, C-G
25. mRNA is produced by _____.
    a. replication b. duplication
    c. transcription d. translation
26. DNA fragments result when _____ cut DNA molecules at specific sites.
    a. DNA polymerases b. DNA probes
    c. Restriction enzymes d. RFLPs
27. PCR stands for _____.
    a. polymerase chain reaction b. polyploid chromosome restriction
    c. polygraphed criminal rating d. politically correct research
28. A _____ is multiple, identical copies of collection of DNA fragments inserted into plasmid.
    a. DNA clone b. DNA library
    c. DNA probe d. Gene map
29. Gel electrophoresis, a standard laboratory procedure, can be used to separate DNA restriction fragments according to _____.
    a. size and shape b. length
    c. net surface charge d. all of above
30. In reverse transcription, _____ is assembled on _____.
    a. mRNA; DNA b. cDNA; mRNA
    c. DNA; enzymes d. DNA; agar
31. Tabacco plant leaves that produce hemoglobin are a result of _____.
    a. gene therapy b. genetic engineering
    c. pressure on tabacco growers d. a and b
32. The first cell emerged in the _____.
    a. Paleozoic b. Mesozoic

c. Archean d. Proterozoic

33. _____ was the first to obtain indirect evidence that organic molecules could have been formed on the early Earth.
    a. Darwin b. Miller
    c. Fox d. Margulis
34. _____ live in habitats much like those of the early Earth.
    a. Cyanobacteria b. Eubacteria
    c. Archasbacteria d. Protozoans
35. Viruses have a _____ and a _____.
    a. DNA core; carbohydrate coat b. DNA or RNA core; plasma membrane
    c. DNA-containing nucleus; lipid envelope d. DNA or RNA core; protein coat
36. A "mushroom" is _____.
    a. the food-absorbing part of a fungal body
    b. the part of the fungal body not constructed of hyphae
    c. a reproductive structure
    d. a nonessential part of the fungus
37. Parasitic fungi obtain nutrients from _____.
    a. tissues of living host b. nonliving organic matter
    c. only living animals d. none of the above
38. Jellyfish, sea anemones, and their relatives have _____ symmetry, and their cells forms _____.
    a. radial; mesoderm b. bilateral; tissues
    c. radial, tissues d. bilateral, mesoderm
39. The first vertebrates were _____.
    a. bony fishes b. jawless fishes
    c. jawed fishes d. both a and b
40. Xylem and phloem are _____ tissues.
    a. ground b. vascular
    c. dermal d. n both b and c
41. Buds give rise to _____.
    a. leaves b. flowers
    c. stems d. all of above
42. During the day, most plants lose _____ and take up _____.
    a. carbon dioxide; oxygen b. water, oxygen
    c. oxygen, water d. water, carbon dioxide
43. Male gametophytes produce _____, female gametophytes produce _____.

a. megaspores; eggs b. sperm, microspores
c. eggs; sperm d. sperm, eggs

44. After meiosis within pollen sacs, haploid _____ form.
a. megaspores b. microspores
c. stamens d. sporophytes

45. The seed coat forms from which structure(s)?
a. integuments b. ovaty
c. endosperm d. residues of sepals

46. The flowering process is commonly a _____ response.
a. phototropic b. gravitropic
c. photoperiodic d. thigmotropic

47. _____ tissues have closely linked cells and one free sarface.
a. Muscle b. Nervous
c. Connective d. Epithelial

48. Blood cells form in _____.
a. red marrow b. all bones
c. certain bones only d. a and c

49. In the pulmonary circuit, the heart's _____ half pumps blood to lungs, then _____ blood flows to the heart.
a. right; oxygen-poor b. left; oxygen-poor
c. right; oxygen-rich d. led, oxygen-rich

50. Blood pressure is high in _____ and lowest in _____.
a. arteries; veins b. arteries; relaxed atria
c. arteries; ventricles d. arterioles, veins

II. Single Choice (Each question is worth <u>two</u> point, 50%)

51. $NADP^+$ and NAD^+ are _____ of a type called _____.
a. cofactors; coenzymes b. organic compounds; enzymes
c. cofactors; metal ions d. energy carriers; enzymes

52. The main energy carriers in cells are _____.
a. NAD^+ & $NADP^+$ b. enzyme molecules
c. ATP molecules d. metal ions

53. In alcoholic fermentation _____ is the final acceptor of electrons stripped from glucose.
a. oxygen b. pyruvate
c. acetaldehyde d. sulfate

54. In certain organisms and under certain conditions, _____ can be used as an energy alternative to glucose.

a. fatty acids b. glycerol
c. amino acids d. all are correct

55. Interphase is the part of the cell cycle when _____.
a. a cell ceases to function b. a germ cell forms its spindle apparatus
c. a cell grows bald duplicates its DNA d. mitosis proceeds

56. Sexual reproduction requires _____.
a. meiosis b. gamete formation
c. fertilization d. all are correct

57. Crosses between F_1 individuals resulting from the cross AABB x aabb lead to F_2 phenotypic ratios close to _____.
a. 1:2:1 b. l:l:l
c. 3:1 d. 9:3:3:1

58. X-chromosome inactivation in mammalian females may result in a _____ for some traits.
a. male phenotype b. mosaic tissue effect
c. rise in transcription rates d. rise in translation rate

59. A _____ is a collection of DNA fragments, produced by restriction enzymes and incorporated into plasmids.
a. DNA clone b. DNA library
c. DNA probe d. Gene map

60. _____ is the transfer of normal genes into body cells to correct a gene defect.
a. Reverse transcription b. Nucleic acid hybridization
c. Gene mutation d. Gene therapy

61. In an evolutionary tree diagram, a branch point represents _____, and a branch that ends represents _____.
a. a single species; incomplete data on lineage
b. a single species; a time of extinction
c. a time of divergence; extinction
d. a time of givergence; speciation complete

62. Which is not characteristic of the animal kingdom?
a. multicellularity; cells form tissues, organs
b. exclusive reliance on sexual reproduction
c. motility at some stage of the life cycle
d. embryonic development during the life cycle

63. Water evaporation from plant parts is called _____.
a. translocation b. expiration

c. transpiration d. tension

64. Seeds are mature _____ and fruits are mature _____.
    a. ovaries; ovules b. ovules; atamens
    c. ovaries, ovaries d. atamens; ovaries
65. Light of _____ wavelengths causes phytochrome to switch from inactive to active form, light of _____ wavelengths haggle opposite effect.
    a. red, far-red b. red, blue
    c. far-red, red d. far-red, blue
66. Most _____ tissues have cells that secrete fibers of collagen and elastin.
    a. muscle b. nervous
    c. connective d. epithelial
67. Which is not the function of skin?
    a. resist abrasion b. resist dehydration
    c. initiate movement d. help control temperature
68. Muscle conduction requires _____.
    a. calcium ions b. action potential arrival
    c. ATP d. all of the above
69. Macrophases are derived from _____.
    a. lymphocytes b. basophils
    c. neutrophils d. monocytes
70. Activated complement functions in defense by _____.
    a. neutralizing toxins b. enhancing resident bacteria
    c. promoting inflammation d. forming holes in memory lymphocyte membranes
71. The most important antigens are _____.
    a. nucleotides b. triglycerides
    c. steroids d. proteins
72. _____ would be a target of an effector cytotoxic T cell.
    a. Extracellular virus particles in blood b. A virus-infected cell
    c. Parasitic flukes in the liver d. Bacteria cells in pus
73. _____ secretions do not assist in digestion and absorption.
    a. Salivary gland b. Thymus gland
    c. Liver d. Pancreatic
74. Bile has roles in _____ digestion and absorption.
    a. carbohydrate b. fat
    c. protein d. amino acid
75. ADH and oxytocin are hypothalamic hormones secreted from the pituitary's _____ lobe.

a. anterior　　b. posterior
c. intermediate　　d. secondary

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