THE UNIVERSITY OF BAMENDA (UBa)

Competitive entrance examination into first cycle E.N.S Bambili

Academic year 2013/2014

Series: Biology.

Paper: Biology. Duration: 3 hours. Coef: 4

Answer all questions and each question carries equal mark. Write the letter corresponding to the correct Answer in the answer booklet. You must submit your question paper together with the answer booklet. Nothing should be written on the question paper.

1. Which of the following is **NOT** a characteristic of prokaryotes?
   A. Simple internal structure B. Presence of genetic material
   C. Presence of mitochondria D. They have 70S Ribosomes.
2. Which of the following features are only found in animals cells?
   A. Tight and gap junction B. Desmosomes and plasmodesmata
   C. 80S Ribosomes and lysosomes D. None of the above.
3. Select the cell organelle that is closely associated with protein synthesis
   A. Plasma membrane B. Chloroplast
   C. Ribosomes D. Golgi apparatus.
4. The packing of proteins takes place in the following cell organelle
   A. Endoplasmic reticulum B. Golgi complex C. Mitochondria D. Nucleus.
5. Which of the following cells have the highest number of mitochondria in them?
   A. Nerve cells B. Fat cells C. Muscle cells D. Bone cells
6. Which tissue type is specialized for the detection and conduction of stimuli?
   A. Muscular tissue B. Nervous tissue
   C. Epithelial tissue D. Connective tissue.
7. Select the tissue type that is specialized in contraction A

A. Muscular tissue B. Nervous tissue C. Epithelial tissue D. Vascular tissue.

8. When two different species overlap in the same biological niche, they are
   A. Affected by one another
   B. Dependent on one another
   C. In co-operation with one another
   D. In competitive with one another.
9. Which of the following is characterized by parasitism?
   e) One organism kills and consumes another
   f) Two organisms live together and neither is harmed
   g) Two organisms feed side by side from the same food
   h) One organism lives in or on another and benefits.
10. Nitrogen gas returns to the atmosphere by the action of:
   A. Nitrogen fixing bacteria B. Denitrifying bacteria
   C. Nitrifying bacteria D. Nitrate fertilizer.
11. In a terrestrial ecosystem, the trophic level that would contain the largest biomass would be the
   A. producers B. Primary consumers
   C. Secondary consumers D. Highest order consumers.
12. The malaria parasite, plasmodium sp belong to which class?
   A. Class flagellate B. Class Mastigophora
   C. Class Rhizopoda D. Class Sporozoa
13. What type of mouthparts do mosquitoes have?
   A. Biting mouthpart
   B. Piercing and sucking mouthparts
   C. Sponging and lapping mouthparts
   D. Chewing mouthparts.
14. Animals which have the following two variations of the basic body plan, the sessile polyp and the floating medusa, belong to the phylum:
   A. Annelida
   B. Coelenterata
   C. Cnidaria
   D. Crustacea.
15. Dogs, wolves, cats and bears belong to the mammalian order--------

A. Cetacea B. Artiodactyla C. Canivora D. Lagomorpha.

16. The function of vacuoles in plant cells is
    A. To maintain turgor pressure
    B. To synthesize proteins
    C. To transport material
    D. To carry genetic information.
17. What is the name given to channels in plant cells by which substances can pass directly from one cell to the next?
    A. Thylodesmata
    B. Mitodesmata
    C. Chlorodesmata
    D. Plasmodesmata.
18. Which phase of both mitosis and meiosis includes DNA replication?
    A. Interphase
    B. Metaphase
    C. Anaphase
    D. Telophase.
19. Mycologists are specialized in the study of
    A. Protists B. Algae C. Bacteria D. Fungi.
20. Structurally unspecialized plant cells are called:
    A. Selerenchyma cells
    B. Collenchymas
    C. Parenchyma cells
    D. Sieve tube cells.
21. Most plants continue to grow for as long as they live. This condition is described as:
    A. Apical growth
    B. Biennial growth
    C. Indeterminate growth
    D. Perennial growth.
22. Mycorrhizae are
    A. Root hairs resembling the hyphae of fungi
    B. Symbiotic associations between roots and fungi

C. Nodules containing nitrogen-fixing bacteria found on the roots of legumes

D. Plants that use other plants as a substratum.

23. The life cycle of plants is characterized by an alternation of haploid and diploid generations. What is the haploid plant called?

A. Angiosperm

B. Gametophyte

C. Sporophyte

D. Monoecious.

24. A phenotypic ratio in a test cross indicates that

A. The dominant phenotype parent was homozygous

B. The dominant phenotype parent was heterozygous

C. The alleles are co-dominant

D. Intermediate inheritance is involved.

25. Which of the following is a pyrimidine base in RNA?

A. Adenine

B. Thymine

C. Guanine

D. Uracil.

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CHEMISTRY (BIOLOGY MINOR)

26. What is the hydration energy of rubidium chloride given that the lattice energy is -6574KJmol^{-1} and its heat of solution is +19KJmol^{-1}

A. -6555KJmol^{-1} B. +6555KJmol^{-1} C. -6593KJmol^{-1} D. +6593KJmol^{-1}.

27. Real gases show ideal gas behavior at

A. High temperatures and low pressures

B. High pressures and low temperatures

C. High temperatures and high pressures

D. Low temperature and low pressures.

28. Catenation is the ability of carbon to. :

A. Form covalent bonds of atoms of other elements

B. Be SP^1, $SP^2$and SP^3 hybridized

C. Exist in deferent structural forms

D. Form covalent bonds with itself.

29. In which of the following substances does sulphur exist in the +4 states?

A. $Na_2S_2O_3$ B. $NaSO_4$ C. $NaSO_3$ D. SO_3

30. Which of the following tetrachlorides of group IV will not react with water?

A. CCl_4 B. $SiCl_4$ C. $SnCl_4$ D. $SeCl_4$

31. An element X forms an oxide of formula X_2O_3. This oxide dissolves in water to form a colorless acidic solution. Element X could be

A. Aluminum B. Boron C. Phosphorus D. Calcium.

32. The coordination number of cobalt in the complex ion $[Co(en)_2Cl_2]^+$ is

A. 2 B. 4 C. 5 D. 6.

33. The oxidation state of iron in the complex ion $[Fe(CN)_6]^{4-}$ is:

A. +2 B. +3 C. -4 D. +4.

34. Which of the following statements is true about hydrogen halides?

A. Acidity decreases on moving from HF to HI

B. Boiling point decreases from HF to HI

C. The hydrogen halides are colorless gas

D. They all form intermolecular hydrogen bonds.

35. The chloride of an element in the period (Na-Ar) of the periodic Table is liquid at room temperature; it hydrolyses readily producing a gelatinous white precipitate. The formula of this chloride is

A. $ALCl_3$ B. PCl_3 C. PCl_5 D. $SiCl_4$.

36. Which of the following substance will not react with water?

A. NaCl B. $AlCl_3$ C. PCl_5 D. $BeCl_2$

37. For the sulphates of group II element, as the group is descended

A. Lattice energy increases

B. Hydration energy decreases

C. Solubility increases

D. Cationic size decreases

38. The inner pair effect is responsibly for the:

A. +4 oxidation state becoming more stable

B. Drop in the ability to catenate down group

C. +2 oxidation state becoming more stable

D. Increasing ionic character of XCl_2 chlorides

39. In determining the formula a nickel-ammonia complex ion using equimolar solutions of nickel (II) ion and aqueous ammonia, the maximum color intensity was observed for a mixture of $2cm^3$ of nickel (II) and $12cm^3$ of aqueous ammonia. The formula of the nickel ammonia complex is:

A. $[Ni(NH_3)_6]^{2+}$ B. $[Ni(NH_3)_3]^{2+}$ C. $[Ni(NH_3)_2]^{2+}$ D. $[Ni(NH_3)^{2+}$.

40. An S block element burns with a red flame, forms compounds with some covalent character and a nitrate that decomposes on heating. The element is most likely to be:

A. Calcium B. Potassium C. Lithium D. Strontium.

41. Which of the following carbonates will NOT decompose on eating?

A. $LiCO_3$ B. Na_2CO_3 C. $MgCO_3$ D. $CaCO_3$.

42. Which of the following substances is acidic in aqueous solution?

A. $FeCl_3$ B. $CaCl_2$ C. K_2CO_3 D. $CaCO_3$.

43. Which of the following spectroscopic methods can be used in identifying the bond types and functional groups in a compound?

A. Mass spectrometry

B. Infra-red spectroscopy

C. Nuclear Magnetic Resonance (NMR)

D. Ultra-violet spectroscopy.

44. Which of the following organic compound will form dense white fumes with thionyl chloride ($SOCl_2$)?

A. C_4H_5OH B.$CH_3OC_2H_5$ C. CH_3CHO D. $C_6H_5CH_2OH$.

45. State the type of hybridization for carbon 2 in the molecule below $CH_3{}^2CH_2C^3=^4CH\_$

A. SP B. SP^2 C. SP^3 D. SPd.

46. On ozonolysis followed by hydrolysis, a certain alkene gave acetone and ethanol as the only products. The possible structure of the alkene is

A. $CH_3C(CH_3)=CHCH_4$

B. $CH_3CH_2C(CH_3)=CH_2$

C. $CH_3CH_2CH=CHCH_3$

D.$CH_3CH_2CH_2CH=CH_2$

47. Which of the following substituent will exert a negative inductive effect on the benzene ring?

A. -OH B. $–CH_3$ C. $–NO_2$ D. $–NH_2$.

48. Name the type isomerism exhibited by the following pair of organic compound

CH_3CH_2-CH=0 and CH_3-CO-CH_3

A. Skeletal Isomerism

B. Position Isomerism

C. Tautomerism

D. Functional group Isomerism.

49. Which of the following organic compound will exhibit optical isomerism?

A. $CH_3CH(NH_2)$-CO_2H

B. CH_3CH_2-0-CH_3

C. $CH_3CH(OH)$-CH_3

D. HO_2C-CH=$CHCO_2H$.

50. Which of the following formula represent aminoethanoic acid in aqueous solution?
    A. H_2NCH_2COOH
    B. $H_3N^+CH_2COO^-$
    C. $H_3N^+CH_2COOH$
    D. $H_2NCH_2COO^-$

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