

Genetic Engineering (Biological Sciences), Model Answers, CET-2018

SECTION I- Chemistry

- The Osmotic pressure of a solution at 0°C is 4 atmospheres. What will be its Osmotic pressure of 546K under similar conditions?
 - 4 atm
 - 2 atm X
 - 8 atm
 - 1 atm
 - 10 atm
- 'Gold number' is minimum in case of:
 - Gelatin X
 - Egg albumin
 - Gum Arabic
 - Starch
 - No option is correct
- Camphor can be purified by
 - distillation
 - vacuum distillation
 - sublimation X
 - steam distillation
 - fractional distillation
- Which pair has both numbers from same period of periodic table?
 - Na, Ca
 - Na, Cl X
 - Ca, Cl
 - Cl, Br
 - No option is correct
- Haloform reaction is shown by-
 - Methyl alcohol
 - Acetone X
 - Formaldehyde
 - n-Propyl alcohol
 - Ethyl Alcohol

6. Isotopes have-

- A. Same number of protons X
- B. Same number of neutrons
- C. Different number of electrons
- D. Different atomic numbers
- E. No option is correct

7. Wave number is-

- A. λ
- B. $\frac{1}{\lambda}$ X
- C. $\frac{c}{\lambda}$
- D. $\lambda \nu$
- E. $\lambda \nu$

8. Bohr theory is not applicable for-

- A. He^+
- B. Li^{2+}
- C. Be^+ X
- D. H
- E. No option is correct

9. Element having no neutron is-

- A. H X
- B. Mg
- C. He
- D. Ag
- E. Ar

10. Which of the following is transition element-

- A. P
- B. Zn
- C. Cu X
- D. Na
- E. No option is correct

11. The molecule that has linear structure is

- A. CO_2 X
- B. NO_2
- C. SO_2
- D. SiO_2
- E. H_2O

12. A reversible chemical reaction is having two reactants in equilibrium. If the concentration of the reactants are doubled, then the equilibrium constant will-----.

- A. also be doubled
- B. be halved
- C. become one-fourth
- D. become one-third
- E. remain the same X

13. Cation and anion combines in a crystal to form following type of compound-

- A. Ionic X
- B. Metallic
- C. Covalent
- D. Dipole - Dipole
- E. No option is correct

14. Which one of the following molecule contains no π bond?

- A. H_2O X
- B. SO_2
- C. NO_2
- D. CO_2
- E. No option is correct

15. Van der waal's constant 'a' has the dimensions of-

- A. Mol L^{-1}
- B. $\text{Atm L}^2 \text{Mole}^{-2}$ X
- C. Litre Mole^{-1}
- D. Atm L Mole^{-2}
- E. No option is correct

16. Which of the following relation is correct for an ideal gas?

A. $\frac{V}{n} = \frac{P}{RT}$

B. $\frac{MV}{m} = \frac{P}{RT}$

C. $\frac{d}{M} = \frac{P}{RT}$ X

D. All options are correct

E. No option is correct

17. The specific heat of a gas is found to be 0.075 calories at constant volume and its formula wt is 40. The atomicity of the gas would be-

A. One

B. Two

C. Three

D. Four X

E. Five

18. Vapour density of a gas is 8. Its molecular mass will be-

A. 8

B. 16 X

C. 32

D. 64

E. 128

19. The pH of a solution is zero. The solution is

A. Neutral

B. Normal Acid X

C. Deci normal acid

D. strongly alkaline

E. Normal Alkaline

20. Which of the following is the most reactive metal?

A. K X

B. Zn

C. Ni

D. Ag

E. Cu

21. The process in which oxidation number increases-

- A. Reduction
- B. Hydrolysis
- C. Oxidation X
- D. Decomposition
- E. Condensation

22. Which compound acts as oxidising agent only-

- A. SO_2
- B. H_2S
- C. H_2SO_4 X
- D. HNO_2
- E. Cl_2

23. Among the following compounds the one that is most reactive towards electrophilic nitration is-

- A. Toluene X
- B. Benzene
- C. Benzoic Acid
- D. Nitro benzene
- E. Di Nitro Benzene

24. Baeyer's reagent is-

- A. 1% Alkaline KMnO_4 X
- B. Acidic KMnO_4
- C. Neutral KMnO_4
- D. Aq. Br_2 Solution
- E. No option is correct

25. Gammexane is-

- A. Bromo benzene
- B. Benzyl Chloride
- C. Chloro benzene
- D. Benzene Hexachloride X
- E. Iodo Benzene

SECTION II- Biological Sciences

26. In sequential reactions of respiration, the product after α -ketoglutarate is ____.

- A. succinate
- B. succinyl Co-A X
- C. malate
- D. cis-aconitate
- E. isocitrate

27. DNA strand was found to contain 26% of thymine bases. The percentage of guanine will be ____.

- A. 48
- B. 24 X
- C. 52
- D. 74
- E. 76

28. Gymnosperms have phloem without ____.

- A. parenchyma
- B. sieve tubes
- C. sclerenchyma
- D. companion cells X
- E. xylem

29. Cat- cry syndrome is an example of ____.

- A. criss-cross inheritance
- B. sex linked disease
- C. chromosomal aberration X
- D. gene mutation
- E. No option is correct

30. Analysis of a DNA sample showed that it is with nucleotide bases in following proportion :- A : T : G : C :: 1 : 1.34 : 0.96 : 0.69 This indicate that, _____.

- A. DNA sample is from prokaryote
- B. DNA is single stranded X
- C. DNA is highly thermolabile
- D. more data is required for any conclusion
- E. DNA is double stranded

31. ____ noted for the first time that chromosome number is fixed for each species.
- A. Boveri
 - B. Van Beneden X
 - C. Walter Flemming
 - D. Strasburger
 - E. Gregor Mendel
32. ____ introduced the term 'antibiotic'.
- A. Babes
 - B. Selman Waksman X
 - C. Paul Vuillenin
 - D. Florey
 - E. Fleming
33. BCG vaccine is against ____.
- A. small pox
 - B. polio
 - C. tuberculosis X
 - D. tetanus
 - E. mumps
34. Which hormone influences the force of contraction of cardiac muscle cells?
- A. Aldosterone
 - B. Epinephrine X
 - C. Triiodothyronine
 - D. Serotonin
 - E. Parathromone
35. If sucrose and monosodium glutamate (MSG) are added to a vinegar and oil salad-dressing and shaken, the mixture will eventually separate into two phases of different density and polarity. Where will most of the sucrose and the MSG be located following phase separation?
- A. Both will concentrate in the vinegar. X
 - B. Both will concentrate in the oil.
 - C. Both will concentrate at the interface.
 - D. Sucrose will concentrate in the oil and MSG will concentrate in the vinegar.
 - E. Sucrose will concentrate in the vinegar and MSG will concentrate in the oil.

36. Biogas is a mixture of

- A. methane, carbon dioxide, hydrogen sulphide and hydrogen X
- B. ethane, methane, butane and propane
- C. oxygen, nitrogen, argon, nitrogen
- D. carbon dioxide, propane, nitrogen and oxygen
- E. methane, ethane, nitrogen and oxygen

37. Most cells are very small. A typical eukaryotic cell, both plant and animal, will occur in which of the following size range?

- A. 1 mm to 100 μm
- B. 100 μm to 10 μm X
- C. 10 μm to 1 μm
- D. 1 μm to 100 nm
- E. 1nm to 100 μm

38. In human, brown eye is dominant over blue eye. A lady with brown eyes, whose father was blue eyed, is married to a man with blue eyes, what percentage of her progeny will be blue eyed?

- A. 75%
- B. 25%
- C. 100%
- D. 50% X
- E. 10 %

39. Which hormone would best fit this description? ----"affects metabolism of cells; necessary for the CNS to develop properly; necessary for normal bone growth; stored extracellularly."

- A. cortisol
- B. growth hormone
- C. T4/T3 X
- D. thyrocalcitonin
- E. epinephrine

40. What is true about the distribution of genes among the human chromosomes?
- A. Genes are distributed proportionately among the chromosomes; the larger the chromosome, the more genes it contains
 - B. Genes are not distributed evenly among chromosomes X
 - C. Genes are clustered about the centromeres of most chromosomes, but scattered randomly along the rest of a given chromosome.
 - D. The autosomes have few genes compared to the sex chromosomes.
 - E. The genes in the sex chromosome are the same in both the sexes.
41. Reduction of supporting and protective tissues and presence of rudimentary vascular tissue characterize
- A. hydrophytes X
 - B. xerophytes
 - C. physiological xerophytes
 - D. mesophytes
 - E. All options are correct
42. Which statement is true ?
- A. NADPH and ATP are reducing powers in photosynthesis
 - B. NADPH and ADP are reducing powers in photosynthesis
 - C. NADPH and ATP are oxidizing powers
 - D. NADPH is a reductant in photosynthesis X
 - E. NADH is an oxidant in photosynthesis
43. Which statement is NOT true?
- A. Mitosis is otherwise known as equational cell division
 - B. Mitosis takes place in all somatic cells
 - C. Mitosis is concerned with genetic transfer from one generation to the other generation X
 - D. Mitosis is also called somatic cell division
 - E. No option is correct
44. Variations within a species are most likely the result of:
- A. Mutations and sexual reproduction X
 - B. Synapsis and dysjunction
 - C. Mitosis and asexual reproduction
 - D. Overpopulation and recombination
 - E. Asexual reproduction

45. All the plants, animals, and protists living in a forest make up a:

- A. Population
- B. Community X
- C. Species
- D. Phylum
- E. Genus

46. The first bioinformatics database was created by:

- A. Richard Durbin
- B. Margaret Dayhoff X
- C. Michael J. Dunn
- D. Pearson
- E. James Watson

47. Which year was the human genome project completed:

- A. 2000
- B. 2001
- C. 2003 X
- D. 2004
- E. 2005

48. A child who has had one previous immunization against tetanus is given the second immunization in the recommended series, three months later. In what way would you expect the immune response to the second immunization to differ most significantly from the response to the first?

- A. The second response will be slower, but more prolonged.
- B. The second response will be larger and everlasting
- C. The second response will be larger, but shorter.
- D. The second response will produce more antibody, but after a longer lag.
- E. The second response will produce a higher ratio of IgG to IgM X

49. Wavelength of any radiations from electromagnetic spectrum is

- A. Directly proportional to its frequency
- B. Inversely proportional to its frequency X
- C. Inversely proportional to its velocity
- D. Directly proportional to its velocity
- E. Wavelength has no relationship with frequency or velocity

50. Which of the hemoglobin designations below best describes the relationship of subunits in the quaternary structure of adult hemoglobin?

- A. $(\alpha_1-\alpha_2)(\beta_1-\beta_2)$
- B. $\alpha_1-\alpha_2-\alpha_3-\alpha_4$
- C. $(\beta_1-\beta_2-\beta_3-\alpha_1)$
- D. $(\beta_1-\beta_2-\alpha_1-\alpha_1)$
- E. $(\alpha_1-\beta_1)-(\alpha_2-\beta_2)$ X

51. Isoelectric focusing method separates protein molecules according to their

- A. net content of glutamic acid
- B. molecular weight
- C. net charge X
- D. charge/ mass ratio
- E. number of polypeptide chains

52. One function of the telomeres in a chromosome is to

- A. 'seal' the ends of chromosomes X
- B. Start RNA synthesis
- C. Identify the correct member of the homologous pair of chromosomes
- D. Help two chromatids to move towards poles
- E. 'seal' the okazaki fragments

53. 'Hormone whose receptors are located in the nucleus of the cell include

- A. NGF
- B. Insulin
- C. FSH
- D. LH
- E. Thyroxine X

54. Nif genes occur in

- A. Rhizobium X
- B. Penicillium
- C. Aspergillus
- D. Streptococcus
- E. Rhizome

55. Apical dominance in plant is governed by

- A. Ethylene
- B. Auxin X
- C. Gibberellin
- D. Abscisic acid
- E. Ascorbic acid

56. Reticulocytes refer to:

- A. white blood cells
- B. blood platelets
- C. lymphocytes
- D. immature erythrocytes X
- E. endoplasmic reticulum

57. Antidiuretic hormone (ADH) is produced by:

- A. hypothalamus
- B. posterior pituitary X
- C. adrenal
- D. thyroid
- E. anterior pituitary

58. An endemic species is

- A. A species having endosperm
- B. A species found uniquely in one place X
- C. A species carrying an epidemic disease
- D. A species at an early phase of its evolution
- E. A taxonomist's mistake

59. The physical similarity of body shape in dolphins, sharks, and penguins results from:

- A. Parallel evolution.
- B. Divergent evolution
- C. Geographic isolation
- D. Convergent evolution X
- E. A property of a common ancestor

60. Continental drift is caused by

- A. The dispersal of seeds and spores from one continent to another
- B. The random loss of genes from populations isolated on a continent
- C. The upwelling and subsequent movement of marine sediments
- D. Tsunami
- E. The movement of tectonic plates on the Earth's crust X

61. Viruses are exceptions to the cell theory, but they have some characteristics of living things. What is one of these characteristics?

- A. They are made up of many specialized cells
- B. They move from one place to other
- C. They contain genetic material X

- D. They reproduce by mitosis
- E. They contain chlorophyll

62. Which are the four most abundant elements in living cells?

- A. carbon, oxygen, nitrogen, sulfur
- B. carbon, oxygen, hydrogen, nitrogen X
- C. carbon, oxygen, sulfur, phosphorus
- D. carbon, sulfur, hydrogen, magnesium
- E. carbon, iron, oxygen, hydrogen

63. Which of the following is **not** an amino acid?

- A. Glutamic acid
- B. Aspartic acid
- C. Glutamine
- D. Histidine
- E. Palmitic acid X

64. Plants growing in and around a pond eventually filling in the pond and changing it to terrestrial habitat is known as :

- A. Succession X
- B. Expansion
- C. Dispersion
- D. Fertilization
- E. Speciation

65. Macrophages are directly involved in immune responses in which of the following ways.

- A. Production of IL-2
- B. Presentation of antigens X
- C. Specific killing of tumor cells
- D. Production of antibodies
- E. Production of TGF

66. Okazaki segments are

- A. Segments of DNA capable of replication
- B. Segments of chain nucleotides
- C. Segments of chain of nucleotides formed during replication of DNA X
- D. Segments of gene under recombination
- E. Segments of RNA capable of replication

67. Substrate level phosphorylation occurs when

- A. Glucose is converted to Glucose 6-phosphate
- B. Succinate changes to fumarate
- C. Fumarate changes to malate
- D. Succinyl CoA changes to succinate X
- E. Oxaloacetate changes to α -keto glutarate

68. Functions of hepatocytes include which of the following

- A. Synthesis of immunoglobulin
- B. Concentration of bile
- C. Storage of vitamin A
- D. Storage of pigments and salts
- E. Synthesis of albumin & fibrinogen X

69. The first step in the degradation of all amino acids is a:

- A. Oxidation
- B. Reduction
- C. Transamination X
- D. Decarboxylation
- E. Methylation

70. Disulfide bonds are broken by _____ with reagents such as β -mercaptoethanol:

- A. Alkylation
- B. Reduction X
- C. Oxidation
- D. Proteolysis
- E. halogenation

71. Organic solvents denature proteins primarily by :

- A. Increasing the free energy of hydrophilic residues
- B. Lowering the free energy of hydrophobic residues X
- C. Aggregation of hydrophobic regions of the protein
- D. Dissociation of the disulphide bonds
- E. Deamination of amino acids

72. Barbara McClintock discovered transposable elements in the late 1940s in which of the species

- A. Rice
- B. Drosophila
- C. Maize X
- D. *C. elegans*
- E. *E. coli*

73. Proline disrupts α -helical structure in proteins because it is

- A. An acidic amino acid
- B. An aromatic amino acid
- C. A neutral amino acid
- D. An imino acid X
- E. A basic amino acid

74. Cell theory was propounded by

- A. Schleiden and Schwann X
- B. Watson and Crick
- C. Mendel and Morgan
- D. Wallace and Darwin
- E. Christian de Duve

75. When pH falls by 1 unit, what is the change in the hydrogen ion concentration?

- A. Decreases by 1 time
- B. Increases by 10 times X
- C. Decreases by 10 times
- D. Increases by 100 times
- E. Decreases by 100 times