

Seat No.	
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M.Phil/Ph.D. Entrance Examination, October - 2021
Bio-chemistry/Bio-technology
(For M.Sc. Students)

Day and Date : Tuesday, 26 - 10 - 2021

Total Marks : 100

Time : 04.00 p.m. to 06.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR Answer Sheet.
 - 5) Follow the instructions given on OMR Sheet.
 - 6) Rough work shall be done on the sheet provided at the end of question paper.
 - 7) Only non programmable calculators are allowed.

- 1) The acceptable way of expressing the variation between replicate measurements is
 - (A) Sum
 - (B) T test
 - (C) ANOVA
 - (D) Standard deviation

- 2) Which of the following is not publisher of scientific paper/journal?
 - (A) Elsevier
 - (B) Springer
 - (C) Scopus
 - (D) Wiley

P.T.O.

- 3) In an experiment, plasmids are isolated from bacterium which contain multiple copies of plasmids of different sizes ($>4\text{kb}$). Which of the following technique will be suitable for the separation and size estimation of plasmids?
- (A) DGGE
 - (B) PAGE
 - (C) RT-PCR
 - (D) Real Time PCR
- 4) E is the son of A and D is the son of B. C is the daughter of A and is married to D. How D is related to E?
- (A) Brother
 - (B) Brother in law
 - (C) Uncle
 - (D) Father
- 5) A researcher is generally expected to
- (A) Study the existing literature in a field
 - (B) Generate new principles, theories and validate
 - (C) Synthesize the ideas given by others
 - (D) Evaluate the findings of a study
- 6) A research which follows case study method is called
- (A) Clinical or Diagnostic
 - (B) Causal
 - (C) Analytical
 - (D) Qualitative
- 7) Scientific method is committed to
- (A) Objectivity
 - (B) Ethics
 - (C) Proposition
 - (D) Neutrality

- 8) Third step in problem formulation is
- (A) Statement of the problem
 - (B) Understanding the nature of the problem
 - (C) Survey the available literature
 - (D) Discussion
- 9) A tentative proposition subject to test is
- (A) Variable
 - (B) Hypothesis
 - (C) Data
 - (D) Concept
- 10) Which of the following statements is correct?
- (A) Infrared radiation has a shorter wavelength than visible light
 - (B) Microwave radiation possesses more energy than infrared radiation
 - (C) Infrared radiation has a lower wavenumber than visible light
 - (D) Ultraviolet radiation has a longer wavelength than infrared radiation
- 11) Which of the following cannot be used as an adsorbent in column adsorption chromatography?
- (A) Magnesium oxide
 - (B) Silica gel
 - (C) Activated alumina
 - (D) Potassium permanganate
- 12) Of the following, what is the best method for sterilizing vitamins and phytohormones?
- (A) Sonication
 - (B) Autoclaving
 - (C) Filter sterilization
 - (D) Using microwave/hot air Oven
- 13) Radial Immunodiffusion is similar to
- (A) double-diffusion
 - (B) gel diffusion
 - (C) Ouchterloney technique
 - (D) all of these

- 14) The salt which produces salting out effect during extraction of proteins is
- (A) $\text{NH}_4 \text{SO}_4$ (B) $(\text{NH}_4)_2 \text{SO}_4$
(C) $(\text{NH}_4)_3 \text{SO}_4$ (D) NaCl
- 15) Which of the following statements is true about two-dimensional electrophoresis?
- (A) Separates proteins of identical molecular weight, same pI but different charge
(B) Separates proteins of different molecular weight and different pI
(C) Separates proteins of identical molecular weight that differ in pI
(D) Isoelectric focusing is also termed as two-dimensional electrophoresis
- 16) What is the ELISA test intended to measure?
- (A) Antibody to HIV only
(B) Antigen to HIV only
(C) Presence of free, circulating virus in the patient
(D) Antibodies directed against HLA molecules
- 17) Northern blotting is performed for _____
- (A) Determining the size of DNA (B) Determining the size of RNA
(C) Quantification of RNA (D) Quantification of protien
- 18) The principle of paper chromatography technique is
- (A) adsorption (B) charge
(C) affinity (D) partition
- 19) Which of the following chromatographic method is most suitable for analysis of fatty acids
- (A) TLC (B) HPLC
(C) GC (D) Calorimetry

- 20) Which of the following is not publisher of scientific paper/journal?
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- 21) Which of the following type of cuvette is preferably used while estimating DNA concentrations and purity by spectrophotometrically?
- (A) Glass
 - (B) Quartz
 - (C) Silica
 - (D) Fiber
- 22) If the mean and median of the data are 10 and 11 then the approximate value of mode is
- (A) 7
 - (B) 13
 - (C) 11
 - (D) 50
- 23) Which type of study is loosely structured and designed to expand understanding of a topic and provide insights?
- (A) Formal
 - (B) Casual
 - (C) Exploratory
 - (D) Experimental
- 24) “Controlled Group” is a term used in
- (A) Survey research
 - (B) Historical research
 - (C) Experimental research
 - (D) Descriptive research

- 25) In Counter immunoelectrophoresis
- (A) electrophoresis will drive the antibody and antigen parallel to each other
 - (B) electrophoresis will drive the antibody and antigen toward each other
 - (C) the antibody will migrate towards anode
 - (D) the antibody will migrate towards cathode
- 26) Which scientists first gave experimental evidence that DNA is the genetic material?
- (A) Avery, MacLeod, and McCarty who repeated the transformation experiments
 - (B) Griffith who chemically characterized the transforming principle
 - (C) Beadle and Tatum, who used a mutational and biochemical analysis of the bread mold *Neurospora* to establish a direct link between genes and enzymes
 - (D) Meselson and Stahl who showed that DNA is replicated semiconservatively
- 27) To obtain virus free plant, what type cultures are raised?
- (A) Protoplast culture
 - (B) Meristem culture
 - (C) Anther culture
 - (D) Pollen culture
- 28) Which of the following assay of estimating the cell viability is based on the capacity of mitochondrial dehydrogenase enzymes in living cells to convert the yellow water-soluble substrate 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide into a dark blue formazan product that is insoluble in water?
- (A) FACS
 - (B) MTT
 - (C) Trypan blue and haemocytometer
 - (D) Neutral red assay

- 29) Among following is true about molecular chaperone.
- (A) Helps in folding to newly synthesized proteins
 - (B) Perform degradation of proteins
 - (C) Helps in unfolding to newly synthesized proteins
 - (D) Stabilizes protein
- 30) TrEMBL is a
- (A) Secondary protein sequence Database
 - (B) Primary protein sequence Database
 - (C) Composite Database
 - (D) Structural Database
- 31) In $H\psi = E\psi$ equation; ψ stands for -----
- (A) Wavefunction
 - (B) Heisenberg
 - (C) Hamiltonian
 - (D) none of the above
- 32) Super infection is due to the existence of
- (A) single drug resistant viruses
 - (B) multiple drug resistant bacteria
 - (C) single drug resistant bacteria
 - (D) multiple drug sensitive bacteria
- 33) The Michaelis Menten's constant of an enzyme is
- (A) independent of pH
 - (B) independent of temperature
 - (C) is a constant under any conditions
 - (D) varying with assay conditions
- 34) If an inhibitor initiates the enzyme reaction and then inhibits it is
- (A) a suicide inhibitor
 - (B) a transition state analog
 - (C) an affinity label
 - (D) not an inhibitor

- 35) The colloidal nature of milk is due to
- (A) kappa casein (B) alpha casein
(C) beta casein (D) lactoglobulin
- 36) The flavouring compound of cheese is
- (A) acetooin (B) ethanol
(C) diacetyl (D) ethyl methyl ester
- 37) The cold sterilization is done by
- (A) radiation (B) moist heat
(C) dry heat (D) toxic gases
- 38) All the statements are true regarding RFLP and RAPD except
- (A) RAPD is a quick method compared to RFLP
(B) RFLP is more reliable than RAPD
(C) Species specific primers are required for RAPD
(D) Radioactive probes are not required in RAPD
- 39) Which of the following methods is not used for single cell culture of plant origin?
- (A) Bergmann's technique of cell plating
(B) Microchamber technique
(C) Microdroplet technique
(D) Fluorescent activated cell sorter technique
- 40) The best-defined criteria for identifying cell lines and relating them to the species and sex from which they were derived is
- (A) karyotyping
(B) MAS
(C) staining
(D) micro array

- 41) Action potential is initiated when
- (A) neuron receives many messages
 - (B) excitory neurotransmitters interact with the neuron
 - (C) K^+ ion channels open up
 - (D) voltage gated Na^+ channels open at hillock region
- 42) The MHC demonstrates diversity because
- (A) they have multiple gene segments
 - (B) they have multiple alleles on the same gene locus
 - (C) they show junction flexibility
 - (D) there is co-dominant expression of both maternal and paternal haplotypes
- 43) Which of the following is not a cause of autoimmunity?
- (A) Molecular mimicry
 - (B) MHC polymorphism
 - (C) Release of sequestered antigens
 - (D) Deposition of Ag-Ab complex in basement membrane
- 44) Which is not a scavenger?
- (A) Camel
 - (B) Vulture
 - (C) Hyaena
 - (D) Crow
- 45) A high BOD value in aquatic environment is indicative of -
- (A) a pollution free system
 - (B) a highly polluted system due to excess of nutrients
 - (C) a highly polluted system due to abundant heterotrophs
 - (D) a highly pure water with abundance of autotrophs

- 46) Plants that grows in saline water lodged habitat are called -
(A) Xerophytes (B) Halophytes
(C) Mangrooves (D) Mesophytes
- 47) Shaking Palsy is symptoms of
(A) Alzheimer disease (B) Multiple Sclerosis
(C) Parkinson's disease (D) Myasthenia gravis
- 48) Klenow fragment has
(A) 3'-5' exonuclease activity
(B) 5'-3' exonuclease activity
(C) 3'-5' exonuclease and polymerase activity
(D) 5'-3' exonuclease and polymerase activity
- 49) The rate-limiting step in the extramitochondrial synthesis of fatty acid is
(A) condensing enzyme
(B) acetyl CoA carboxylase
(C) hydratase
(D) acyl transferase
- 50) The marker enzyme for chloroplast is
(A) RuBP carboxylase
(B) DNase
(C) Transaldolase
(D) Transketolase



Rough Work

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