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M.Phil./Ph.D. Entrance Examination, September - 2019**BIOCHEMISTRY/BIOTECHNOLOGY**

Day and Date : Friday, 20 - 09 - 2019

Total Marks : 100

Time : 4.00 p.m. to 6.00 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) If a rectangle were called a circle, a point, a point a triangle and a triangle a square, the shape of a wheel is
 - A) Rectangle
 - B) Circle
 - C) Point
 - D) Triangle

- 2) Which of the following is not a characteristic of Scientific method?
 - A) Objectivity
 - B) Verification
 - C) Speculation
 - D) Predictability

- 3) The most frequent proportion measure is the_____.
 - A) Mean
 - B) Standard deviation
 - C) Correlation
 - D) Percentage

P.T.O.

- 4) The following are the features of the good research student except
- A) Should be replicable
 - B) Should be systematic and objective
 - C) Should be ethical and unbiased
 - D) Should be unethical and biased
- 5) 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
- 6) 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
- 7) A research which follows case study method is called
- A) Clinical or diagnostic
 - B) Causal
 - C) Analytical
 - D) Qualitative

- 8) A tentative proposition subject to test is
- A) Variable
 - B) Hypothesis
 - C) Data
 - D) Concept
- 9) Which of the following is the first step in starting the research process?
- A) Searching sources of information to locate problem
 - B) Survey of related literature
 - C) Identification of problem
 - D) Searching for solutions to the problem
- 10) Bibliography means
- A) Foot notes
 - B) Quotations
 - C) List of references and books
 - D) Biography
- 11) Failure to acknowledge the borrowed material is called (Take and use of others as one's own)
- A) Acknowledgement
 - B) Foot note
 - C) Index
 - D) Plagiarism
- 12) Calculate the pH of a mixture of 0.10M acetic acid and 0.20M sodium acetate. The pK_a of acetic acid is 4.76.
- A) 5.1
 - B) 4.1
 - C) 6.1
 - D) 7.1

- 13) The degree of ionization does not depend on?
- A) Temperature
B) Current
C) Nature of solvent
D) Concentration
- 14) Which of the following is an isotonic solution?
- A) Oceans
B) 0.45% sodium chloride
C) 0.9% sodium chloride
D) 10% dextrose in water
- 15) Which of the following statement 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.
- 16) What is the unit of absorbance which can be derived from Beer Lambert's law?
- A) $\text{L mol}^{-1} \text{cm}^{-1}$
B) $\text{L gm}^{-1} \text{cm}^{-1}$
C) Cm
D) No unit
- 17) 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

M/P ENT - 37

- 18) Which of the following separation method is suited method for a protein sample with large differences in molecular mass
- A) dialysis
 - B) salting out process
 - C) density gradient centrifugation
 - D) rate zonal centrifugation
- 19) Radial Immunodiffusion is similar to
- A) double-diffusion
 - B) gel diffusion
 - C) Ouchterlony technique
 - D) all of these
- 20) The salt which produces salting out effect during extraction of proteins in
- A) NH_4SO_4
 - B) $(\text{NH}_4)_2\text{SO}_4$
 - C) $(\text{NH}_4)_3\text{SO}_4$
 - D) NaCl
- 21) Fructose and Glucose can be distinguished by
- A) Seliwanoffs's reagent
 - B) Benedict's reagent
 - C) Fehling's reagent
 - D) Barfoed's reagent
- 22) Sequencing of genomic DNA is included in
- A) Phenotypic function
 - B) Cellular function
 - C) Molecular function
 - D) Structural genomics

- 23) 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
- 24) In HPLC analysis, which of the following will not depend on the concentration of solute being analyzed by HPLC?
- A) Area under peak
 - B) Retention time
 - C) Peak height
 - D) Area percentage of the peak
- 25) Which one of the following is an example of non-covalent interaction in protein?
- A) Peptide bond
 - B) Disulphide bridge
 - C) Glycosidic bond
 - D) Phosphodiester bond
- 26) _____ proteins after hydrolysis yields prosthetic group.
- A) Simple
 - B) Conjugate
 - C) Filamentous
 - D) Trypsin
- 27) What is the preferred method for sterilization of air for fermentation?
- A) UV sterilization
 - B) Steam sterilization
 - C) Filter sterilization
 - D) Autoclave

- 28) Linkage between the CPU and users is provided by
- A) peripheral devices
 - B) storage
 - C) control unit
 - D) mouse
- 29) _____ is the most commonly used graphic device to illustrate statistical distribution.
- A) Histogram
 - B) Bar Diagram
 - C) Frequency Polygon
 - D) Line graph
- 30) The beta-oxidation of fatty acids occurs mainly in the _____.
- A) absence of ATP
 - B) cytosol
 - C) cell membrane
 - D) mitochondria
- 31) Transamination reaction belongs to _____.
- A) ordered bi-bi reaction
 - B) random bi-bi reaction
 - C) ping-pong reaction
 - D) sequential ordered reaction

- 32) The triple point of water is _____.
- A) -20° C B) 10° C
C) 4° C D) 0° C
- 33) Plant derived, antitumor agent that inhibits Topoisomerase I is _____.
- A) nalidixic acid B) shikonin
C) camptothecin D) anthocyanin
- 34) Among following _____ method is used to predict tertiary structures of proteins?
- A) Homology modeling B) Chromatography
C) Edman degradation D) Chou Fasman
- 35) In polypeptide chain _____ is the torsion angle around the bond N - C α ?
- A) ϕ
B) ψ
C) α
D) β
- 36) BLAST stands for _____.
- A) Basic Local Alignment Search Tool
B) Basic local alignment sequence tool
C) Basic locally aligned similar tool
D) Basic lower alignment sequence tool

- 37) DNA fingerprinting is useful in crime detection is based upon
- A) Northern Blotting
 - B) Restriction fragment length polymorphism
 - C) DNA hybridization
 - D) Use of cDNA library
- 38) In mammals, the major fat in adipose tissues is
- A) Phospholipid
 - B) Cholesterol
 - C) Sphingolipids
 - D) Triacylglycerol
- 39) Interferon
- A) Is virus specific
 - B) Is a bacterial product
 - C) Is a synthetic antiviral agent
 - D) Requires expression of cellular genes
- 40) In case of competitive enzyme inhibition _____.
- A) V_{\max} increase K_m decreases
 - B) V_{\max} remains same K_m increases
 - C) V_{\max} remains same K_m decreases
 - D) V_{\max} decrease K_m also decreases
- 41) The sedimentation rate of spherical particle in the medium is inversely proportional to _____.
- A) density of the particle
 - B) viscosity of medium
 - C) density of the medium
 - D) radius of rotor

- 42) Growth hormone producing apical dominance is _____.
- A) auxins
 - B) gibberellins
 - C) ethylene
 - D) cytokinin
- 43) Which of the following method is used to provide a secure cell stock to protect against accidental loss and genetic and phenotypic instability?
- A) Cryopreservation
 - B) Serial dilution
 - C) Storage in medium
 - D) Continuous culture
- 44) Which of the following enzymes is used for detaching the grown cells for the culture vessel?
- A) Amylase
 - B) Pepsin
 - C) Trypsin
 - D) Chymotrypsin
- 45) Local anaesthetic agents such as procaine bind to _____.
- A) GABA A receptors
 - B) GABA B receptors
 - C) Voltage gated Sodium Channels
 - D) Nicotinic acetyl choline receptors

- 46) The drug of abuse cocaine binds to _____.
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|--------------------------------|--------------------------|
| A) Mew receptors | B) Kappa receptors |
| C) 5HT _{2a} receptors | D) Dopamine transporters |
- 47) The disease Farmer’s lung is an example of _____.
- A) type II hypersensitivity
B) type III hypersensitivity
C) autoimmune disorder
D) drug induced immunodeficiency
- 48) The monoclonal antibody which is a B7 blocker is useful in _____.
- A) treatment of Systemic Lupus Erythematosus
B) treatment of ankylosing spondylitis
C) in tissue transplantation
D) studies of B lymphocyte maturation
- 49) Prairies is a _____.
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| A) Aquatic ecosystem | B) Grassland ecosystem |
| C) Desert ecosystem | D) Mountain ecosystem |
- 50) For dry cleaning of cloths which chemical is used?
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| A) Trichloroethylene | B) Petrol |
| C) Trichlorobutane | D) Kerosene |



Rough Work