

Seat No.	
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**M.Phil./Ph.D. Entrance Examination, August- 2018**  
**BIOCHEMISTRY/ BIOTECHNOLOGY/ ENVIRONMENTAL**  
**BIOTECHNOLOGY**

Day and Date : Saturday, 11 - 08 - 2018

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) One of the method of logical reasoning process is called
  - A) Induction
  - B) Deduction
  - C) Research
  - D) Experiment
  
- 2) A literature review requires:
  - A) Planning
  - B) Lot of rewriting
  - C) Internet surfing
  - D) All of the above
  
- 3) You are guilty of plagiarism if you:
  - A) Make use of the works of others to gather information.
  - B) Use the work of another and misrepresent it as your own
  - C) Make use of the works of others to support your own arguments.
  - D) Examine the ideas and arguments of others to help you shape your own thoughts or views on a particular issue.

**P.T.O.**

## M/P ENT - 129

- 4) This is a must before research participants can participate in a Clinical study?
- A) Guidelines
  - B) A commitment
  - C) Informed consent
  - D) Private information
- 5) If the theory is correct, then the same findings should emerge if a study is repeated. This is known as \_\_\_\_\_.
- A) Propagation
  - B) Reproduction
  - C) Replication
  - D) Duplication
- 6) If  $(9^4)^2 = 3^x$  then value of 'x' is
- A) 14
  - B) 16
  - C) 15
  - D) 17
- 7) The term SMART goals in Research stands for
- A) Specific, Measurable, Achievable, Realistic, Timely
  - B) Sustainable, Measurable, Achievable, Realistic, Timely
  - C) Specific, Measurable, Achievable, Realistic, Tentative
  - D) Specific, Measurable, Adjustable, Realistic, Timely
- 8) What is a research design?
- A) The choice between using qualitative and quantitative methods
  - B) The study in which you present research findings
  - C) A framework for every stage of collection and analysis of data
  - D) A way of conducting research that is not grounded in theory

- 9) Quality of a good thesis is judged by three of the following four qualities
- 1) Coherence across objectives and findings
  - 2) Consistency between data, analysis and interpretation
  - 3) A comprehensive review of literature
  - 4) Number of references cited in the thesis
- A) (1) (2) (3)  
B) (1) (2) (4)  
C) (2) (3) (4)  
D) (1) (3) (4)
- 10)  $(2/3) \div (4/3) \times (1/2) =$
- A)  $1/4$   
B)  $4/9$   
C)  $9/4$   
D)  $4/3$
- 11) Suppose that in an organization every teacher is a scientist; every scientist who is not a teacher is an engineer. Therefore :
- A) every engineer is a scientist  
B) every teacher is an engineer  
C) every scientist is either a teacher or an engineer  
D) no teacher is an engineer
- 12) What is the average of the numbers: 0, 0, 4, 10, 5, and 5?
- A) 2  
B) 3  
C) 4  
D) 5
- 13) In a class of 40 students 20% are girls. How many boys are there in the class?
- A) 26  
B) 28  
C) 30  
D) 32

## M/P ENT - 129

- 14) How many ml of 2.50% (m/v) sucrose solution would contain 1.80g of sugar?
- A) 105 ml
  - B) 104 ml
  - C) 45 ml
  - D) 72 ml
- 15) As the pKa of an acid increases, the acid will be \_\_\_\_\_.
- A) More weaker
  - B) More stronger
  - C) Converted to neutral solution
  - D) Converted to basic solution 3
- 16) Which of the following is the correct representation of Henderson-Hasselbalch equation?
- A)  $\text{pH} = \text{pKa} + \log \frac{[\text{A}^-]}{[\text{HA}^-]}$
  - B)  $\text{pH} = \text{pKa} + \log \frac{[\text{proton acceptor}]}{[\text{proton donor}]}$
  - C)  $\text{pH} = \text{pKa} - \log \frac{[\text{proton donor}]}{[\text{proton acceptor}]}$
  - D) All of the above
- 17) Which of the following tests is not based on reaction of carbohydrates with strong acid?
- A) Molisch Test
  - B) Benedict's Test
  - C) Bials Test
  - D) Seliwanoff's Test
- 18) Presence of nucleic acid in a protein solution can be identified by measuring optical density at absorption maxima at \_\_\_\_\_.
- A) 280 nm
  - B) 260 nm
  - C) 340 nm
  - D) 360 nm

## M/P ENT - 129

- 19) Poly Acrylamide Gel Electrophoresis is carried out at the following pH
- A) 7.0
  - B) 6.4
  - C) 8.3
  - D) Depends on the protein
- 20) Which would be the best method to separate a protein that binds strongly to its substrate?
- A) Gel filtration
  - B) Affinity chromatography
  - C) Cation exchange
  - D) Anion exchange
- 21) If 15 mg of product is formed in 5 minutes per 0.2 ml of enzyme what is the velocity of the enzyme per min per ml of enzyme
- A) 21
  - B) 15
  - C) 0.6
  - D) 75
- 22) What is the charge on the peptide - Asp-Glu-Gly-Arg-Phe ala at pH 7?
- A) -1
  - B) -2
  - C) +2
  - D) 0
- 23) The highest value that optical density can attain is
- A) 1
  - B) 100
  - C) 2
  - D) Infinite

- 24) Which of the following statement about binding energy is not true?
- A) It decreases entropy
  - B) It desolvates the substrate
  - C) It leads to proximity and orientation effects
  - D) It enhances energy of activation
- 25) A water molecule forms a maximum of
- A) 4 hydrogen bonds
  - B) 2 hydrogen bonds
  - C) 1 hydrogen bond
  - D) None of the above
- 26) Un-competitive inhibitor differs from competitive inhibitor in that it binds to
- A) To the active site
  - B) To site other than active site
  - C) To ES complex
  - D) Either to ES complex or to ESI complex
- 27) Which would be the best method to separate a protein that is basic in nature
- A) Gel filtration
  - B) Affinity chromatography
  - C) Cation exchange
  - D) Anion exchange
- 28) The Pasteur effect refers to \_\_\_\_\_.
- A) an increase in hexokinase activity due to increased oxidative phosphorylation
  - B) a decrease in the respiratory quotient upon changing from carbohydrate to fat as the major metabolic fuel
  - C) an increase in glucose utilization via the pentose phosphate pathway upon changing from an anaerobic to aerobic metabolism
  - D) a decrease in glucose utilization upon changing from an anaerobic to aerobic metabolism

- 29) Secretory proteins are synthesised in
- A) Cytosol
  - B) Rough endoplasmic reticulum
  - C) Smooth endoplasmic reticulum
  - D) Golgi bodies
- 30) The equation  $H\Psi = E\Psi$  is discovered by \_\_\_\_\_.
- A) Schrodinger
  - B) Newton
  - C) C V Raman
  - D) None of the above 3
- 31) Which of the following is categorized under declarative memory?
- A) Walking
  - B) Talking
  - C) Remembering words and their meaning
  - D) Puzzle solving ability
- 32) In the pentose phosphate pathway, glucose is first converted to ribulose-5-phosphate by oxidative decarboxylation. Then, ribulose-5-phosphate \_\_\_\_\_ undergoes
- A) further oxidation
  - B) reduction
  - C) further decarboxylation
  - D) only rearrangements of carbon skeleton
- 33) Protoplasts can be produced from suspension culture, callus tissues or intact tissues by enzymatic treatment with
- A) cellulolytic enzymes
  - B) pectolytic enzymes
  - C) proteolytic enzymes
  - D) both cellulolytic and pectolytic enzymes

- 34) SV40 is highly oncogenic
- A) dsRNA virus
  - B) DNA virus
  - C) RNA virus
  - D) ssRNA virus
- 35) \_\_\_\_\_ is called a 4 bit data unit
- A) Byte
  - B) Nibble
  - C) Number
  - D) None of the above
- 36) The enzyme phosphoenol pyruvate carboxylase catalyses the combination of  $\text{CO}_2$  and phosphoenol pyruvate to form oxaloacetic acid in \_\_\_\_\_.
- A) pea
  - B) sugarcane
  - C) pinus
  - D) apple
- 37) Shaking palsy is a symptom of
- A) Alzheimer disease
  - B) Multiple Sclerosis
  - C) Parkinson's disease
  - D) Myasthenia gravis
- 38) Erythroblastosis fetalis is an example of
- A) Type I hypersensitivity
  - B) Type II hypersensitivity
  - C) Type III hypersensitivity
  - D) Type IV hypersensitivity



- 39) Refractory period in action potential in a neuron is due to
- A)  $\text{Na}^+ - \text{K}^+$  ATPase action
  - B) Opening of Voltage gated  $\text{K}^+$  channels
  - C) Gating mechanism of Voltage gated  $\text{Na}^+$  channels
  - D) Entry of  $\text{Cl}^-$  ions
- 40) The predominant effector function of IgM is
- A) Opsonization
  - B) Complement fixation
  - C) Anaphylaxis
  - D) Transcytosis
- 41) 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
- 42) Ethidium bromide used in DNA staining has to be used carefully as it can cause following mutation
- A) Inversion
  - B) Thymine dimmers
  - C) Frame shift
  - D) point mutation
- 43) The half life for radioactive carbon is
- A) 60 days
  - B) 5600 years
  - C) 140 years
  - D) 1 - 8 days

- 44) DNA fingerprinting is useful in crime detection is based upon
- A) Northern blotting
  - B) Restriction fragment length polymorphism
  - C) DNA hybridization
  - D) Use of c DNA library
- 45) Following is a coenzyme needed for transamination reaction
- A) Pyridoxal phosphate
  - B) Coenzyme Q
  - C) Thiamine pyrophosphate
  - D) Biotin
- 46) Methylated purines and pyrimidines are found in
- A) mRNA
  - B) hnRNA
  - C) rRNA
  - D) tRNA
- 47) The mushroom poison Amanitin is an inhibitor of
- A) Protein biosynthesis
  - B) DNA polymerase III
  - C) RNA polymerase II
  - D) Both A and C
- 48) Deoxyribonucleotides are added to RNA primer by
- A) DNA polymerase I
  - B) DNA polymerase II
  - C) DNA polymerase III holoenzyme
  - D) RNA polymerase

- 49) Which is not an advantage of the fermented food?
- A) Makes the food more digestible
  - B) Increase storage life
  - C) Synthesize vitamins
  - D) Decrease intestinal microflora
- 50) The continuous cultures are not preferred in industry because
- A) They are not suited for secondary metabolite production
  - B) Contamination or mutation can have disastrous effects
  - C) Govt. will not permit use of pharmaceuticals from these fermentation
  - D) All of the above



**Rough Work**