M/P ENT – 105

Total No. of Pages : 12

Seat No.	

M.Phil./Ph.D. Entrance Examination, August - 2018
Part - I BIOTECHNOLOGY ENGINEERING [BT]

Day and Date : Wednesday, 08 - 08 - 2018 **Total Marks : 100**
Time : 01.00 p.m. to 03.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Each question carries 2 marks.**
3) **Answer 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) Which of the following microorganisms leach metals out of rock ores and can accumulate silver?

A) Pseudomonas aeruginosa B) Thiobacillus

C) Pseudomonas putida D) Zoogloea ramigera

2) Milbemycin is known to exhibit a broad spectrum of activity against

A) agricultural pests B) agricultural herbs

C) agricultural insects D) all of these

3) The yield of the antibiotic depends upon

A) pH of the medium B) age of the inoculum

C) composition of the medium D) all of these

P.T.O.

4) At normal pH, penicillin remains in

A) agricultural pests
B) agricultural herbs
C) agricultural insects
D) all of these

5) Vinegar is typically produced in fed batch reactors because a fed batch reactor can be used to maintain low acetic acid

A) concentrations
B) a fed batch reactor can be used to maintain low ethanol concentrations
C) acetic acid bacteria tend to ferment at high ethanol concentrations
D) all of the above

6) Which of the following nitrogen sources is added in the fermentation medium of citric acid production?

A) Ammonium salt
B) Urea
C) Both (A) and (B)
D) Peptone

7) Which combination of the following statements is **CORRECT** for cyano bacteria?

P. They can perform oxygenic photosynthesis
Q. Usually filamentous forms are involved in nitrogen fixation
R. Nitrogen fixation occurs in heterocysts
S. They cannot grow in a mineral medium exposed to light and air

A) P, Q and R
B) P, S and R
C) Q, R and S
D) P, Q and S

8) Penicillin is produced by

A) aerobic fermentation
B) anaerobic fermentation
C) aerobic fermentation followed by anaerobic fermentation
D) anaerobic fermentation followed by aerobic fermentation

9) Select the **CORRECT** combination of genetic components that are essential for the transfer of T-DNA segment from *Agrobacterium tumefaciens* to plant cells.

A) Border repeat sequences and on co genes

B) Border repeat sequences and *vir* genes

C) Opine biosynthetic genes and *vir* genes

D) Opine biosynthetic genes and on co genes

10) The equilibrium potential of a biological membrane for $Na^+$is 55mV at 37°C. Concentration of Na^+in side the cell is 20mM. Assuming the membrane is permeable to Na^+only, the Na^+ concentration out side the membrane will be _____ mM.

(Faraday constant:23062cal. V^{-1}. mol^{-1}, Gasconstant:1.98cal. mol^{-1}. K^{-1})

11) 1 mole of glucose is burnt, how much carbon dioxide will it produce?

A) 44 grams

B) 176 grams

C) 264 grams

D) 352 grams

12) C2H4 + xO2->2CO2 + yH2O, what is the value of x + y?

A) 2

B) 3

C) 5

D) 8

13) C2H4 + xO2->2CO2 + yH2O, what is the value of x + y?

A) 2

B) 3

C) 5

D) 8

14) Choose the most appropriate word from the options given below to complete the following sentence.
A person suffering from Alzheimer's disease __ short-term memory loss.

A) experienced
B) un experienced
C) is experiencing
D) experiences

15) Choose the most appropriate word from the options given below to complete the following sentence.
_____ Is the key to their happiness; they are satisfied with what they have.

A) Contentment
B) Ambition
C) Perseverance
D) Hunger

16) In a batch culture of Penicillium chrysogenum, the maximum penicillin synthesis occurs during the

A) Lag phase
B) exponenetial phase
C) stationary phase
D) death phase

17) The most plausible explanation for a sudden increase of the respiratory quotient (RQ) of a microbial culture is that

A) cells are dying
B) yield of biomass is increasing
C) the fermentation rate is increasing relative to respiration rate
D) the maintenance rate is decreasing

18) The product(s) resulting from the hydrolysis of maltose is/are

A) a mixture of D-Glucose and D-Glucose
B) a mixture of D-Glucose and L-Glucose
C) D-Glucose only
D) none of these

19) Reactions between antibodies and antigens that are detected by precipitate formation in an agar gel are referred as

A) Immune precipitation assay
B) Immunodiffusion assay
C) Immune aggregation assay
D) immune fixation assay

20) As the fermentation for the ethanol production is over, the cells are separated to get the biomass of yeast cells that is used

A) for next fermentation
B) as single cell protein for animal feed
C) as manure
D) all of the above

21) Yeast is used in the production of

A) ethyl alcohol
B) acetic acid
C) cheese
D) curd

22) *S-cerevisiae* start producing ethanol with in

A) 10 h
B) 12h
C) 15 h
D) 24 h

23) Determine the correctness or otherwise of the following **Assertion** (a) and **Reason** (r).

Assertion: Immobilization of plant cells can enhance secondary metabolite production during bioreactor cultivation.

Reason: Immobilization protects the plant cells from shear forces in the bioreactor.

A) Both (a) and (r) are true and (r) is the correct reason for (a).
B) Both (a) and (r) are true but (r) is not the correct reason for (a).
C) (a) is true but (r) is false.
D) (a) is false but (r) is true

24) Match the cell structures in **Group I** with the organisms in **Group II**.

Group I Group II

P. Endospores 1. *Methanobacterium*

Q. Bipolar flagella 2. *Treponema*

R. Pseudomurine in cell wall 3. *Spirillum*

S. Periplasmic flagella 4. *Clostridium*

A) P-4, Q-3, R-1, S-2 B) P-4, Q-3, R-2, S-1

C) P-3, Q-4, R-1, S-2 D) P-4, Q-l, R-3, S-2

25) Match the antibiotics in **Group I** with the targets in **Group II**.

Group I Group II

P. Sulfonamide 1. Peptidoglycan synthesis

Q. Quinolones 2. Peptide chain elongation

R. Erythromycin 3. Folic acid biosynthesis

S. Cephalosporin 4. Topoisomerase

A) P-3, Q-4, R-1, S-2 B) P-2, Q-4, R-3, S-1

C) P-4, Q-1, R-2, S-3 D) P-3, Q-4, R-2, S-1

Part-II Research Methodology [RM]

26) The first step in formulating a problem is

A) Statement of the problem B) Gathering of Data

C) Measurement D) Survey

27) To ensure adequate informed consent, a researcher should include all of the following components in an introduction except _____

A) Promise of anonymity and confidentiality

B) Sponsoring organization

C) Purpose of the research

D) Estimate of when the research study will be published

28) _____will help in finding out a problem for research

A) Professor
B) Tutor
C) HOD
D) Guide

29) What does a descriptive study seek to accomplish?

A) Attempts to capture a population's characteristics by making inferences from a sample's characteristics and testing resulting hypotheses
B) Emphasizes a full contextual analysis of a few events or conditions and their interrelations
C) Discovers answers to the questions who, what, when, where, or how much
D) Attempts to reveal why or how one variable produces changes in another

30) An interval scale contains _____.

A) Mutually exclusive and collectively exhaustive categories as well as the property of order, but not distance or unique origin
B) The properties of order, classification, and equal distance between points but no unique origin
C) Mutually exclusive and collectively exhaustive categories, but without the properties of order, distance, and origin
D) The properties of classification, order, equal distance, and unique origin

31) Second step in problem formulation is

A) Statement of the problem
B) Understanding the nature of the problem
C) Survey
D) Discussions

32) Last step in problem formulation is

A) Survey

B) Discussion

C) Literature survey

D) Re Phrasing the Research problem

33) Which of the following is true of resistant statistics?

A) Inappropriate for statistical analysis

B) Corrupted with measurement bias

C) Based on nominal scales

D) Able to resist influence of extreme values

34) Which quartile value(s) are likely to be most different between bell-shaped and highly skewed distributions?

A) The first or third quartile, depending on the skewing.

B) The second quartile or mean.

C) All quartiles.

D) The fourth quartile

35) Which ONE of these is the best description of secondary data?

A) Ordinary data.

B) Existing data.

C) Omnibus data

D) Ordinal data.

36) A _____ is an abstraction formed by generalization from particulars

A) Hypothesis

B) Variable

C) Concept

D) facts

37) A tentative proposition subject to test is

A) Variable
B) Hypothesis
C) Data
D) Concept

38) What level of measurement would be used if participants were asked to choose their favorite picture from a set of six?

A) Ordinal
B) Nominal
C) Ratio
D) Interval

39) Conclusions from qualitative research are

A) less certain than from quantitative research
B) Of little practical use.
C) Of descriptive value only.
D) Seldom defensible.

40) What is the appropriate test statistic to use to determine the significance of the coefficient of determination in a bivariate regression?

A) F statistic
B) Z score
C) X2
D) ANOVA

41) Concepts which cannot be given operational definitions are _____ concepts

A) Verbal
B) Oral
C) Hypothetical
D) Operational

42) A Hypothesis which develops while planning the research is

A) Null Hypothesis
B) Working Hypothesis
C) Relational Hypothesis
D) Descriptive Hypothesis

43) _____which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out

A) Statistical design
B) Observational design
C) Operational design
D) Sampling design

44) The _____ is not used as a measure of association for nominal, nonparametric variables.

A) Chi-square
B) Phi
C) Cramer's v
D) Z score

45) When a 'hypothesis is stated negatively it is called

A) Relational Hypothesis
B) Situational Hypothesis
C) Null Hypothesis
D) Casual Hypothesis

46) Hypothesis which explain relationship between two variables is

A) Causal
B) Relational
C) Descriptive
D) Tentative

47) A Hypothesis from which no generalization can be made is

A) Null Hypothesis
B) Barren Hypothesis
C) Descriptive Hypothesis
D) Analytical Hypothesis

48) _____which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out

A) Statistical design
B) Observational design
C) Operational design
D) Sampling design

49) Which of the following is a non-probability sample?

A) Quota sample
B) Simple random sample
C) Purposive sample
D) (A) and (C) both

50) A Hypothesis contributes to the development of _____

A) Theory
B) Generalization
C) Evolution
D) Concept

Rough Work