Program: BE Biotechnology Engineering

Curriculum Scheme: Revised 2016

Examination: Final Year Semester VII

Course Code: BTC702 and Course Name: Bioprocess Modelling and Simulation

Time: 1 hour Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	At which point the iterations in the Newton Raphson method are stopped?
Option A:	When the consecutive iterative values of x are not equal
Option B:	When the consecutive iterative values of x differ by 2 decimal places
Option C:	When the consecutive iterative values of x differ by 3 decimal places
Option D:	When the consecutive iterative values of x are equal
Q2.	A key feature of a model is _____
Option A:	Manipulability
Option B:	Complexity
Option C:	Rigidness
Option D:	Large Size
Q3.	Identify the correct sequence during the industrial production of substances
Option A:	Inoculation, screening, fermentation, downstream processing, removal of waste
Option B:	Screening, Inoculation, fermentation, downstream processing, removal of waste
Option C:	Fermentation, screening, inoculation, removal of waste, downstream processing
Option D:	Fermentation, inoculation, inoculation, removal of waste, downstream processing
Q4.	_____ models possess some inherent randomness. The same set of parameter values and initial conditions will lead to an ensemble of different outputs.
Option A:	Deterministic
Option B:	Non-Deterministic
Option C:	Stochastic
Option D:	Non-Stochastic
Q5.	The unit of diffusion coefficient is
Option A:	m2/s
Option B:	m/s
Option C:	m2.s
Option D:	m2 /s2
Q6.	The final electron acceptor in lactic acid fermentation is
Option A:	Oxygen
Option B:	Lactic acid
Option C:	Pyruvate

Option D:	NAD
Q7.	Newton-Raphson method is used to find the root of the equation $x^2 – x-10 = 0$. In what range does the root lie
Option A:	f(4) to f(5)
Option B:	f(1) to f(2)
Option C:	f(2) to f(3)
Option D:	f(3) to f(4)
Q8.	_____is an optimum time when we can stop the operation and get the maximum amount of desired product from the Batch Reactor.
Option A:	Batch Time
Option B:	Done time
Option C:	Unripe Time
Option D:	Completion Time
Q9.	In an ideal tubular-flow reactor, which of the following is NOT applicable?
Option A:	There is no mixing in longitudinal direction
Option B:	Mixing takes place in radial direction
Option C:	There is a uniform velocity across the radius
Option D:	There is a non-uniform velocity across the radius
Q10.	Numerical techniques more commonly involve _____
Option A:	Iterative method
Option B:	Direct method
Option C:	Elimination method
Option D:	Reduction method
Q11.	The performance of a control system (its ability to control the process tightly) usually _____ as we increase the controller gain.
Option A:	Becomes unstable
Option B:	Increases
Option C:	Decreases
Option D:	Remains unchanged
Q12.	Modelling is the act of _____ a model
Option A:	Destroying
Option B:	Running
Option C:	Building
Option D:	Ruining
Q13.	Direct solution of the differential equations to give function of time is a
Option A:	Time domain technique.
Option B:	Laplace domain technique.
Option C:	Frequency response methods
Option D:	Matrix method technique
Q14.	A model is similar to but _____ than the system it represents.

Option A:	Simpler
Option B:	More difficult
Option C:	Highly complex
Option D:	Useless
Q15.	In which of the following mathematical operations are iterations involved _____ .
Option A:	Simpsons One eighth rule
Option B:	Simpsons One third rule
Option C:	Trapezoidal rule
Option D:	Gauss Seidel
Q16.	The purpose of a _____ is to study the characteristics of a real-life or fictional system by manipulating variables that cannot be controlled in a real system.
Option A:	Modelling
Option B:	Simulation
Option C:	Building
Option D:	Error Minimizing
Q17.	Which of the following is not true for aerobic digestion?
Option A:	It generates most sludge
Option B:	It generally incurs higher running cost
Option C:	It may generate a usable fuel
Option D:	Requires a shorter residence time
Q18.	Which of the following equation is the equation for Conservation Principle?
Option A:	[Accumulation] = [input] – [output] + [internal production]
Option B:	[Accumulation] = [input] + [output] + [internal production]
Option C:	[Accumulation] = [input] + [output] - [internal production]
Option D:	[Accumulation] = [input] - [output] - [internal production]
Q19.	_____ model is required for general understanding of sterilization of growing medium.
Option A:	Deterministic
Option B:	Non-Deterministic
Option C:	Stochastic
Option D:	Non-Stochastic
Q20.	According to the 'law of mass action', the rate of reaction is directly proportional to the
Option A:	Equilibrium constant
Option B:	Volume of the reaction vessel
Option C:	Nature of the reactants
Option D:	Molar concentration of the reactants
Q21.	The incubation temperature required for the production of Penicillin process is
Option A:	35-38^{o}C
Option B:	40-43^{o}C

Option C:	26-28^{o}C
Option D:	32-34^{o}C
Q22.	Which of the following Models are computationally complex?
Option A:	Structured Model
Option B:	Unstructured Model
Option C:	Finite Model
Option D:	Infinite Model
Q23.	Which of the following fermentation is carried out by yeast?
Option A:	Lactic acid fermentation
Option B:	Alcohol fermentation
Option C:	Pyruvic fermentation
Option D:	Acrylic fermentation
Q24.	Which of the following is the formula for Trapezoidal Rule?
Option A:	I=h/2[X+2R]
Option B:	I=3h/8[X+2T+3R]
Option C:	I=h/3[X+2E+4O]
Option D:	I= 4h/3[X+2T+2E+O]
Q25.	A batch reactor is suitable for
Option A:	Achieving cent percent conversion of reactants into products
Option B:	Large scale gaseous phase reactions
Option C:	Liquid phase reactions
Option D:	Obtaining uniform polymerisation products in highly exothermic reactions

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Question	**Correct Option (Enter either 'A' or 'B' or 'C' or 'D')**
Q1.	D
Q2.	A
Q3.	B
Q4	C
Q5	A
Q6	C
Q7	B
Q8.	A
Q9.	D
Q10.	A
Q11.	B
Q12.	C
Q13.	A
Q14.	A
Q15.	D
Q16.	B
Q17.	D
Q18.	A

Q19.	C
Q20.	D
Q21.	C
Q22.	A
Q23.	A
Q24.	A
Q25.	C