

J: Biotechnology

Q. 1 – Q. 6 carry one mark each.

- Q.1 The specific growth rate (μ) of a microorganism in death phase is
- (A) 0 (zero) (B) μ_{\max}
(C) less than zero (D) greater than zero
- Q.2 Which of the following reagents is used for harvesting anchorage-dependent animal cells from culture vessels?
- (A) Trypsin/Collagenase (B) Trypsin/Collagen
(C) Collagen/Fibronectin (D) DMSO
- Q.3 Protein binding regions of DNA are identified by one of the following techniques
- (A) finger printing (B) foot printing
(C) southern blotting (D) western blotting
- Q.4 Plant secondary metabolites
- (A) help to increase the growth rate of plant
(B) help in plant reproduction processes
(C) provide defense mechanisms against microbial attack
(D) make the plant susceptible to unfavorable conditions
- Q.5 Si RNA(s) interfere at
- (A) transcriptional level (B) post-transcriptional level
(C) DNA replication level (D) translational level
- Q.6 Presence of $CX_2.4CX\phi X_8HX_3H$ sequence in a protein suggest that it is
- (A) a protein kinase (B) GTP binding protein
(C) zinc finger protein (D) lipase

Q. 7 – Q. 24 carry two marks each.

- Q.7 A protein binds to phosphocellulose column at pH 7.0 and elutes at pH 8.0. If the protein has to be further purified on a DEAE Sephacel column, the binding buffer should have a pH of
- (A) 5 (B) 6 (C) 7 (D) 8

Q.8 Oils rich in PUFA are NOT desirable for bio-diesel production because

- (A) they form epoxides in presence of oxygen
- (B) they do not form epoxides in presence of oxygen
- (C) they have high ignition temperature
- (D) they solidify at low temperature

Q.9 Gynogenesis is a process of development of haploid plants

- (A) from a fertilized cell of female gametophyte
- (B) from an unfertilized cell of female gametophyte
- (C) from isolated pollen grains
- (D) by selective elimination of chromosomes following distant hybridization

Q.10 Match items in group 1 with correct examples from those in group 2

Group 1

- P. Catabolic product
- Q. Bioconversion
- R. Biosynthetic product
- S. Cell mass

Group 2

- 1. Griseofulvin
- 2. Bakers yeast
- 3. 6- Aminopenicillanic acid
- 4. Ethanol

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

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

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

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

Q.11 A bioremedial solution to reduce oxides of nitrogen and carbon in flue gases is to integrate flue gas emission to

- (A) micro-algal culture
- (C) mushroom culture

- (B) fish culture
- (D) seri culture

Q.12 The respiratory coefficient for the reaction

$a \text{CH}_m\text{O}_n + b \text{O}_2 + c \text{NH}_3 \rightarrow d \text{CH}_\alpha\text{O}_\beta\text{N}_\gamma + e \text{H}_2\text{O} + f \text{CO}_2$ is defined as

(A) f/a

(B) e/b

(C) b/f

(D) f/b

Q.13 Match the methods available on world wide web in group 1 for performing the jobs listed in group 2

Group 1

- P. Boxshade
- Q. BCM launcher
- R. Prosite
- S. PSI-BLAST

Group 2

- 1. Searching family data base
- 2. Finding alignments
- 3. Displaying alignments
- 4. Searching for multiple alignments

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

(B) P-2, Q-3, R-2, S-4

(C) P-3, Q-4, R-1, S-4

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

Q.14 Match the recombinant products in group 1 with their therapeutic applications in group 2

Group 1

- P. Human growth hormone
- Q. Platelet growth factor
- R. Factor VIII
- S. Erythropoietin

Group 2

- 1. Pituitary dwarfism
- 2. Chemotherapy induced thrombocytopenia
- 3. Haemophilia
- 4. Anaemia associated with chronic renal failure

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

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

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

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

Q.15 Mobile genetic elements present in human genome are

- (P) long interspersed elements (LINEs)
- (Q) short interspersed elements (SINES)
- (R) P elements
- (S) IS elements

(A) Q, R

(B) P, Q

(C) P, R

(D) Q, S

Q.16 Match the following marker genes in group 1 with suitable selecting agent in group 2

Group 1

- P. npt II
- Q. aro A
- R. hpt
- S. bar

Group 2

- 1. Glyphosate
- 2. Phosphinothricin
- 3. Kanamycin
- 4. Hygromycin B

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

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

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

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

Q.17 Determine the correctness or otherwise of the following **Assertion [a]** and **Reason [r]**
Assertion: Enzymatic method of tissue dispersion is milder than chemical and mechanical methods.

Reason: Enzymes work at optimal temperature and pH

- (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

Q.18 Match each parameter in group 1 with the appropriate measuring device in group 2

Group 1

- P. Pressure
- Q. Foam
- R. Turbidity
- S. Flow rate

Group 2

- 1. Photometer
- 2. Rotameter
- 3. Diaphragm gauge
- 4. Rubber sheathed electrode

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

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

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

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

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