

IIT JAM 2024 MSQ Model Questions

Subject- Biotechnology (BT)

Q.1 Which of the following statement(s) is/are correct about telophase?

- (A) Daughter chromosomes are yet to form
- (B) New nuclear envelop starts to reassemble
- (C) Division of cytoplasm begins
- (D) Nuclear membrane disappears

Q.2 The characteristic morphological change(s) in cells undergoing apoptosis is/are

- (A) formation of blebs on cell surface
- (B) swelling and bursting of cells
- (C) collapse of the cytoskeleton
- (D) condensation and fragmentation of nuclear chromatin

Q.3 A species of fish living in a lake are separated by drying up of the lake into two separate lakes. After several hundreds of years of separation, the two groups are unable to mate. These groups are now considered to be different_____.

- (A) communities
- (B) organisms
- (C) populations
- (D) species

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Q.4 Which of the following is/are essential feature(s) of high-fidelity DNA polymerases used in polymerase chain reaction?

- (A) 5'→3' exonuclease activity
- (B) Endonuclease activity
- (C) 3'→5' exonuclease activity
- (D) Optimum temperature for activity ≥ 72 °C

Q.5 Which of the following option(s) represent(s) the evolutionary relationship between the bird and bat wings as structures for flying?

- (A) analogous
- (B) convergence
- (C) divergence
- (D) homologous

Q.6 Infrared (IR) spectroscopy is used for determining certain aspects of the structure of organic compounds. Which of the following statement(s) is/are FALSE?

- (A) IR radiation induces electronic transitions
- (B) IR peak intensities are related to molecular mass

- (C) Most organic functional groups absorb in a characteristic region of the IR spectrum
- (D) Each element absorbs at a characteristic wavelength

Q.7 Cyclic AMP (cAMP) acts as a second messenger for which of the following primary signalling molecule(s)?

- (A) Retinoic acid
- (B) Prostaglandins
- (C) Cortisol
- (D) Epinephrine

Q.8 Which of the following is/are TRUE about the electron carrier, ubiquinone (coenzyme Q)?

- (A) Its ability to accept two electrons, one at a time, enables ubiquinone to function at the junction between a 2-electron donor and a 1-electron acceptor
- (B) Being small and hydrophobic, ubiquinone readily shuttles between protein-based electron transfer complexes within the membrane
- (C) Its hydrophilic nature and high affinity for protons enable ubiquinone to transport protons readily within the intermembrane space of mitochondria.
- (D) Its ability to interact with Heme C of cytochromes enables electron transport in the mitochondrial membrane

Q.9 Which of the following is/are common to both prokaryotic and eukaryotic gene expression?

- (A) Coupled transcription and translation
- (B) Post-translational modification
- (C) Genetic code
- (D) Presence of the sequence TATA in the promoter

Q.10 Which of the following molecular genetic technique(s) is/are used in forensic science? (A)

- Coimmunoprecipitation
- (B) DNA fingerprinting
- (C) Restriction fragment length polymorphism
- (D) Electrophoretic mobility shift assay

Q.11 Pick the correct statement(s) with respect to the inter-conversion of the topoisomers of a circularly closed double stranded DNA.

- (A) Only one strand needs to be cut
- (B) Both strands have to be cut
- (C) No strand needs to be cut
- (D) ATP is required for inter-conversion

Q.12 The advantage(s) of storing chemical energy in the form of starch and not as free glucose is/are that it_____.

- (A) minimises diffusion
- (B) enables compact storage
- (C) reduces osmotic pressure

(D) protects against chemical reactivity of aldehyde groups

Q.13 Which of the following cell types can develop from myeloid lineage?

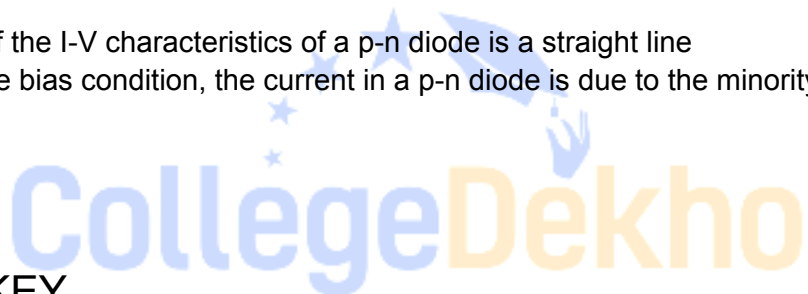
- (A) Macrophages
- (B) T lymphocytes
- (C) B lymphocytes
- (D) Erythrocytes

Q.14 Electromagnetic waves _____.

- (A) carry energy
- (B) carry momentum
- (C) are transverse in nature while travelling in vacuum
- (D) do not need a material medium to travel

Q.15 Which of the following statement(s) is/are true?

- (A) In intrinsic semiconductors, the number of electrons is equal to the number of holes at any temperature
- (B) An intrinsic semiconductor changes to an n-type semiconductor upon addition of a trivalent element
- (C) The shape of the I-V characteristics of a p-n diode is a straight line
- (D) In the reverse bias condition, the current in a p-n diode is due to the minority carriers



ANSWER KEY

Question No.	Question Type (QT)	Subject Name (SN)	Key/Range (KY)	Mark (MK)
1	MSQ	BT	B, C	2
2	MSQ	BT	A, C, D	2
3	MSQ	BT	D	2
4	MSQ	BT	C, D	2
5	MSQ	BT	A, B	2
6	MSQ	BT	A, B, D	2

7	MSQ	BT	B, D	2
8	MSQ	BT	A, B	2
9	MSQ	BT	C, D	2
10	MSQ	BT	B, C	2
11	MSQ	BT	A, B, D	2
12	MSQ	BT	A, B, C, D	2
13	MSQ	BT	A, D	2
14	MSQ	BT	A,B,C,D	2
15	MSQ	BT	A, D	2

