

Question Paper Preview

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Paper II Biology
Subject Name :	Paper II Biology
Creation Date :	2025-03-26 06:56:45
Total Marks :	300
Display Marks:	Yes
Change Font Color :	No
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Help Button :	No
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Paper II Biology

Group Number :	1
Group Id :	63068028489
Group Maximum Duration :	0
Group Minimum Duration :	150
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300

Paper II Biology

Section Id :	63068058634
Section Number :	1
Section type :	Online
Section Marks :	300
Section Negative Marks :	0.66
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	63068076023
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 6306801327988 Question Type : MCQ
Correct Marks : 2 Wrong Marks : 0.66

Bacterial cell walls contain which of the following types of structural polysaccharides?

Options :

1. ✘ Chitin
2. ✘ Hyaluronic acid
3. ✔ Peptidoglycan
4. ✘ Cellulose

Question Number : 2 Question Id : 6306801328533 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Select the option that is correct regarding the following two statements labelled Assertion (A) and Reason (R).

Assertion (A): Some bacteria demonstrate chemolithotrophy, which allows them to oxidise inorganic substances for energy production.

Reason (R): Bacteria lack mitochondria; hence they completely rely on glycolysis for ATP synthesis.

Options :

1. ✘ Both A and R are true, and R is the correct explanation of A.
2. ✘ Both A and R are true, but R is not the correct explanation of A .
3. ✔ A is true, but R is false.
4. ✘ A is false, but R is true.

Question Number : 3 Question Id : 6306801349022 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the following names of bacteria in Column A with their uses/harmful effects in column B.

Column A (Bacteria)

1. Mycobacterium sp.
2. Lactobacillus sp.
3. Staphylococcus sp.
4. Streptomyces sp.

Column B (Use/Harmful Effect)

- a. Food poisoning
- b. Antibiotics production
- c. Yoghurt preparation
- d. Causes tuberculosis

Options :

1. ✔ 1-d; 2-c; 3-a; 4-b
2. ✘ 1-a; 2-c; 3-b; 4-d
3. ✘ 1-b; 2-a; 3-d; 4-c
4. ✘ 1-c; 2-a; 3-d; 4-b

Question Number : 4 Question Id : 6306801355667 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following Eubacteria is an example of a species that can survive in extreme environments through the formation of endospores?

Options :

1. ✔ Bacillus subtilis
2. ✘ Escherichia coli

3. ✘ Staphylococcus aureus
4. ✘ Pseudomonas aeruginosa

Question Number : 5 Question Id : 6306801355680 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term for the classification of Archaea based on their membrane property?

Options :

1. ✔ Glycerol ether lipid classification
2. ✘ Sugar classification
3. ✘ Glycolipid classification
4. ✘ Phospholipid classification

Question Number : 6 Question Id : 6306801309306 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the following archaea groups with their respective characteristics.

Archaea Group	Characteristics
1. Methanogenic archaea	a. Thermoacidophilic and chemoorganotrophic
2. Cell wall less archaea	b. Extremely thermophilic
3. Archaeal sulphate reducer	c. Can use light energy to produce ATP
4. Extremely halophilic archaea	d. Methane is the major metabolic end product

Options :

1. ✔ 1-d, 2-a, 3-b, 4-c
2. ✘ 1-a, 2-b, 3-c, 4-d
3. ✘ 1-d, 2-a, 3-c, 4-b
4. ✘ 1-c, 2-b, 3-a, 4-d

Question Number : 7 Question Id : 6306801327020 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the terms in Column A with their correct description in Column B.

Column A	Column B
1. Acetobacter aceti	a. Methane formation
2. Methanobacterium	b. Butyric acid formation
3. Clostridium butylicum	c. Acetic acid formation
4. Azotobacter	d. Biofertiliser formation

Options :

1. ✘ 1-a, 2-b, 3-d, 4-c
2. ✔ 1-c, 2-a, 3-b, 4-d
3. ✘ 1-b, 2-d, 3-a, 4-c
4. ✘ 1-a, 2-d, 3-b, 4-c

Question Number : 8 Question Id : 6306801328243 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following types of inclusions is typically found in Eubacterial cells and serves as a storage site for carbon and energy?

Options :

1. ✓ Glycogen granules
2. ✗ Lipid inclusions
3. ✗ Polyphosphate granules
4. ✗ Carboxysomes

Question Number : 9 Question Id : 6306801328248 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the following statement and select the correct conclusion about the mode of nutrition of the bacterium without making assumptions.

Statement: A bacterium is only able to grow in a medium containing CO₂, H₂O and inorganic salts.

Options :

1. ✗ It is a heterotroph.
2. ✓ It is an autotroph.
3. ✗ It is a mixotroph.
4. ✗ It is a saprotroph.

Question Number : 10 Question Id : 6306801328519 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a distinct group within the domain Archaea?

Options :

1. ✓ Methanogens
2. ✗ Cyanobacteria
3. ✗ Chloroxybacteria
4. ✗ Green sulphur bacteria

Question Number : 11 Question Id : 6306801328540 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is NOT a eubacteria?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Clostridia
2. Lactobacillus
3. Desulfovibrio
4. Cyanobacteria

Question Number : 12 Question Id : 6306801319704 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What type of asexual reproduction uses a protein tube known as a 'pilus'?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Binary fission
2. Conjugation
3. Transformation
4. Transduction

Question Number : 13 Question Id : 6306801325112 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which type of reproduction makes use of a protein tube called a pilus?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Binary fission
2. Conjugation
3. Transformation
4. Transduction

Question Number : 14 Question Id : 6306801328263 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term for the process by which bacteria become temporarily dormant to resist the effect of antibiotics?

Options :

1. ✘ Sporulation
2. ✘ Stationary phase
3. ✔ Persister cell formation
4. ✘ Quorum sensing

Question Number : 15 Question Id : 6306801328266 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a nitrogen-fixing heterotrophic soil bacteria?

Options :

1. ✓ Clostridium butyricum
2. ✗ Pseudomonas aeruginosa
3. ✗ Nitrosococcus nitrosus
4. ✗ Nostoc commune

Question Number : 16 Question Id : 6306801355651 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following pairs of bacteria are used in the production of yogurt?

Options :

1. ✓ Streptococcus thermophilus and Lactobacillus delbrueckii subsp. bulgaricus
2. ✓ Lactobacillus acidophilus and Streptococcus thermophilus
3. ✗ Bifidobacterium bifidum and Streptococcus thermophilus
4. ✗ Escherichia coli and Streptococcus thermophilus

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 17 Question Id : 6306801355660 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the statement carefully and determine which conclusion logically follows without making assumptions.

Statement: Eubacteria such as Bacillus and Pseudomonas are used in the production of various industrial products such as detergents and textiles

Which of the following conclusion is correct?

Options :

1. ✗ The microbes are used for fermentation to produce detergents.
2. ✓ The microbes are used for extraction of the enzymes to produce detergents.
3. ✗ The microbes are used for membrane properties to produce detergents.
4. ✗ The microbes are used for mucilage to produce detergents.

Question Number : 18 Question Id : 6306801319782 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What type of virus infects bacteria?

Options :

1. ✗ Virion
2. ✗ Prion
3. ✓ Bacteriophage
4. ✗ Viroid

Question Number : 19 Question Id : 6306801326786 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What kind of virus is responsible for infecting bacteria?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Virion
2. Prion
3. Bacteriophage
4. Viroid

Question Number : 20 Question Id : 6306801328267 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following types of viral replication involves the synthesis of a complementary RNA strand from a DNA template?

Options :

1. ✘ Positive-sense RNA replication
2. ✘ Negative-sense RNA replication
3. ✔ Reverse transcription
4. ✘ Transcriptional activation

Question Number : 21 Question Id : 6306801328275 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary characteristic that distinguishes viruses from other microorganisms?

Options :

1. ✔ Host-mediated replication
2. ✘ DNA as genetic material
3. ✘ RNA signalling
4. ✘ Diverse speciation

Question Number : 22 Question Id : 6306801349033 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the plant/animal viruses in Column A with their characters in Column B.

Column A (Virus)	Column B (Character)
1. Tobacco Mosaic Virus (TMV)	a. AIDS
2. Human Immunodeficiency Virus (HIV)	b. Haemorrhagic fever in humans
3. Tomato Spotted Wilt Virus (TSWV)	c. Transmitted by thrips
4. Ebola Virus	d. Chlorosis in leaves

Options :

1. ✔ 1-d; 2-a; 3-c; 4-b

2. ✘ 1-d; 2-c; 3-a; 4-b

3. ✘ 1-c; 2-a; 3-b; 4-d

4. ✘ 1-d; 2-a; 3-b; 4-c

Question Number : 23 Question Id : 6306801327012 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the terms in Column A with their correct description in Column B.

Column A	Column B
1. Tobacco mosaic virus	a. Associated with cervical cancer
2. Papilloma virus	b. Associated with common cold
3. HIV	c. Detected by ELISA method
4. Rhino virus	d. Genetic material is RNA

Options :

1. ✔ 1-d, 2-a, 3-c, 4-b

2. ✘ 1-d, 2-c, 3-a, 4-b

3. ✘ 1-a, 2-d, 3-c, 4-b

4. ✘ 1-b, 2-c, 3-d, 4-a

Question Number : 24 Question Id : 6306801327994 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term used to describe the viral genome that has been integrated into the host cell's genome?

Options :

1. ✔ Prophage

2. ✘ Lysogen

3. ✘ Retrovirus

4. ✘ Virusoid

Question Number : 25 Question Id : 6306801328271 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following terms indicates the state of specificity of a virus to a particular cell type, species or host?

Options :

1. ✘ Antigenecity

2. ✔ Viral tropism

3. ✘ Retro-transcription

4. ✘ Virulence

Question Number : 26 Question Id : 6306801328294 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the name of the viral enzyme produced by the Influenza A Virus that is responsible for the cleavage of the host cell's haemagglutinin protein?

Options :

1. ✔ Neuraminidase

2. ✖ Peptidase
3. ✖ Lipase
4. ✖ Serine dehydrogenase

Question Number : 27 Question Id : 6306801328300 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Select the option that is true regarding the following two statements labelled Assertion (A) and Reason (R).

A: The viral envelope of the Human Cytomegalovirus (HCMV) contains glycoproteins.

R: The viral envelope of HCMV contains glycoproteins necessary for the virus to attach to and enter host cells.

Options :

1. ✔ Both A and R are correct.
2. ✖ A is correct but R is incorrect.
3. ✖ Both A and R are incorrect.
4. ✖ A is incorrect but R is correct.

Question Number : 28 Question Id : 6306801328541 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

One distinguishing feature of eukaryotic viruses is that:

Options :

1. ✔ they can only replicate inside the host cell nucleus
2. ✖ they are infected by bacteriophage
3. ✖ they do not have capsid
4. ✖ they do not have DNA

Question Number : 29 Question Id : 6306801328542 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

During infection, eukaryotic viruses attach themselves to certain _____ found on the surface of host cells.

Options :

1. ✖ enzymes
2. ✔ receptors
3. ✖ DNA
4. ✖ ribosomes

Question Number : 30 Question Id : 6306801355610 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a primary characteristic that defines a virus?

Options :

1. ✔ Obligate parasitism
2. ✖ Symbionts
3. ✖ Endoparasitism
4. ✖ Endosymbionts

Question Number : 31 Question Id : 6306801328537 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What structural components are found in an icosahedral capsid?

Options :

1. ✘ Pentameres and tetrameres
2. ✘ Hexameres and octameres
3. ✔ Pentameres and hexameres
4. ✘ Tetrameres and octameres

Question Number : 32 Question Id : 6306801355459 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following chromatography techniques is commonly used for the purification of viruses?

Options :

1. ✔ Ion exchange chromatography
2. ✔ Size exclusion chromatography
3. ✘ Affinity chromatography
4. ✘ Hydrophobic interaction chromatography

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 33 Question Id : 6306801355480 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the mechanism of action of the viral reverse transcriptase?

Options :

1. ✔ The viral reverse transcriptase synthesizes double-stranded DNA from a single-stranded RNA template.
2. ✘ The viral reverse transcriptase synthesizes single-stranded RNA from a single-stranded DNA template.
3. ✘ The viral reverse transcriptase synthesizes double-stranded DNA from a single-stranded DNA template.
4. ✘ The viral reverse transcriptase synthesizes double-stranded RNA from a single-stranded RNA template.

Question Number : 34 Question Id : 6306801325551 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which part of the cell contains ecto-enzymes?

Options :

1. ✘ Cell wall
2. ✘ Mitochondria
3. ✘ Centrosome
4. ✔ Plasma membrane

Question Number : 35 Question Id : 6306801328331 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is majorly present as the primary component in the middle lamella?

Options :

1. ✓ Calcium pectate
2. ✗ Arabinogalactans
3. ✗ Cellulose micelles
4. ✗ Glucan units

Question Number : 36 Question Id : 6306801328554 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the name of the protein complex that mediates the transport of proteins from the endoplasmic reticulum to the Golgi apparatus?

Options :

1. ✓ COPII
2. ✗ COPI
3. ✗ SNARE
4. ✗ Clathrin

Question Number : 37 Question Id : 6306801353652 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the plasmalemma in plant cells, and how does it differ from the tonoplast?

Options :

1. ✓ The plasmalemma regulates ion transport and signaling, while the tonoplast regulates vacuolar pH and ion homeostasis.
2. ✗ The plasmalemma regulates vacuolar pH and ion homeostasis, while the tonoplast regulates ion transport and signaling.
3. ✗ The plasmalemma regulates cell wall synthesis and deposition, while the tonoplast regulates vacuolar protein degradation.
4. ✗ The plasmalemma regulates vacuolar protein degradation, while the tonoplast regulates cell wall synthesis and deposition.

Question Number : 38 Question Id : 6306801326428 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following elements is NOT present in a primary cell wall?

Options :

1. ✗ Pectin
2. ✗ Microfibril
3. ✗ Hemicellulose
4. ✓ Lignin

Question Number : 39 Question Id : 6306801326462 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which cell organelle is responsible for lysosome formation?

Options :

1. ✘ Endoplasmic reticulum
2. ✘ Plasma membrane
3. ✔ Golgi apparatus
4. ✘ Cytoplasmic vacuoles

Question Number : 40 Question Id : 6306801328552 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following routes of cellular transport in plant cells involve the function of plasmodesmata?

Options :

1. ✔ Symplastic route
2. ✘ Apoplastic route
3. ✘ Transmembrane route
4. ✘ Extracellular route

Question Number : 41 Question Id : 6306801328563 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the tonoplast in plant cells?

Options :

1. ✔ To regulate the transport of ions and metabolites across the vacuolar membrane
2. ✘ To regulate protein folding in the ER
3. ✘ To provide structural support and maintain cell shape
4. ✘ To induce cytosolic trafficking

Question Number : 42 Question Id : 6306801355454 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the function of the cristae in mitochondria?

Options :

1. ✔ The cristae are involved in the synthesis of ATP and provide increased surface area of inner membrane.
2. ✘ The cristae are involved in the synthesis of NADH, and they increase the surface area of the inner membrane.
3. ✘ The cristae are involved in the citric acid cycle, and they increase the surface area of the inner membrane.
4. ✘ The cristae are involved in the electron transport chain, and they increase the surface area of the outer membrane.

Question Number : 43 Question Id : 6306801355455 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following enzymes is NOT typically found in lysosomes?

Options :

1. ✘ Acid phosphatase
2. ✘ Cathepsin D
3. ✘ Lysosomal acid lipase
4. ✔ Alkaline phosphatase

Question Number : 44 Question Id : 6306801355456 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following enzymes is typically found in the Golgi body?

Options :

1. ✘ Protease
2. ✔ Glycosidase
3. ✘ Phospholipase
4. ✘ ATPase

Question Number : 45 Question Id : 6306801355457 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the statement carefully and determine which conclusion logically follows without making assumptions.

Statement: The plasma membrane is dynamic and can change its shape and structure in response to various stimuli.

Which of the conclusion is correct?

Options :

1. ✔ This involves the movement of molecules across the membrane in response to various stimuli.
2. ✘ The components of the membrane are rigid and do not reform in response to external signal.
3. ✘ The components of the membrane are broken down by degrading enzymes.
4. ✔ The component lipids and proteins of the membrane can change in response to external signal.

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 46 Question Id : 6306801326435 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Ribophorins I and II present in the rough endoplasmic reticulum (RER) are _____.

Options :

1. ✘ phospholipids
2. ✔ glycoproteins
3. ✘ polypeptides
4. ✘ steroids

Question Number : 47 Question Id : 6306801328005 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match Column A with Column B.

Column A	Column B
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1. Tonoplast	a. formed when the food particles are engulfed during phagocytosis
2. Contractile vacuole	b. present in photosynthetic bacteria
3. Food vacuoles	c. membrane surrounding the vacuole
4. Gas vacuoles	d. associated with osmoregulation and excretion

Options :

1. ✓ 1-c, 2-d, 3-a, 4-b
2. ✗ 1-c, 2-b, 3-d, 4-a
3. ✗ 1-d, 2-a, 3-c, 4-b
4. ✗ 1-a, 2-d, 3-b, 4-c

Question Number : 48 Question Id : 6306801328671 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the Arp2/3 complex in the regulation of actin filament dynamics?

Options :

1. ✗ To stabilise existing actin filaments
2. ✓ To nucleate branched actin filaments
3. ✗ To enhance Rho GTPase activity
4. ✗ To enhance actin-tubulin interaction

Question Number : 49 Question Id : 6306801326834 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the function of nucleosomes?

Options :

1. ✗ To unwind DNA
2. ✓ To condense DNA
3. ✗ To denature DNA
4. ✗ To replicate DNA

Question Number : 50 Question Id : 6306801328530 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

During what stage of the cell cycle, does the size of each daughter centriole reach maturity?

Options :

1. ✗ Metaphase
2. ✓ Late prophase
3. ✗ Anaphase
4. ✗ Telophase

Question Number : 51 Question Id : 6306801328686 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following types of chromatin is characterised by a high degree of compaction and a low gene expression?

Options :

1. ✗ Euchromatin

2. ✓ Heterochromatin
3. ✗ Chromatin fibres
4. ✗ Nucleosomes

Question Number : 52 Question Id : 6306801353633 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Based on the given statement, which of the following conclusions is correct?

Statement: Nucleosomes can be modified by the addition of histone modifications

Options :

1. ✓ Nucleosomes are important for regulating gene expression.
2. ✗ Nucleosomes are non-active regions of chromosome.
3. ✗ Nucleosomes are important for mitosis.
4. ✗ Nucleosomes do not undergo gene silencing.

Question Number : 53 Question Id : 6306801353638 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the nuclear lamina in the nuclear membrane?

Options :

1. ✗ To regulate gene expression
2. ✗ To facilitate DNA replication
3. ✓ To maintain the structure of the nucleus
4. ✗ To control the movement of molecules in and out of the nucleus

Question Number : 54 Question Id : 6306801319947 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Two distinct components of chromatin can be differentiated by staining with _____-specific dyes.

Options :

1. ✗ chromosome
2. ✗ genes
3. ✗ RNA
4. ✓ DNA

Question Number : 55 Question Id : 6306801319956 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

_____ refers to areas of chromatin that are extremely densely packed with fibres.

Options :

1. ✗ Euchromatin
2. ✓ Heterochromatin
3. ✗ Chromosome territories
4. ✗ Nucleosome

Question Number : 56 Question Id : 6306801323730 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the cells listed below is a polynuclear cell?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Bone marrow
2. RBC
3. Blue-green algae
4. Paramecium

Question Number : 57 Question Id : 6306801326869 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

_____ refers to areas of chromatin that are extremely densely packed with fibres.

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Euchromatin
2. Heterochromatin
3. Chromosome territory
4. Nucleosome

Question Number : 58 Question Id : 6306801328003 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following statements is INCORRECT about interphase nucleus?

Options :

1. ✘ It has one or more spherical nucleoli.
2. ✔ It has chromosomes, which are extremely long and complex nucleoprotein fibres.
3. ✘ The nuclear envelope consists of two parallel membranes separated by the perinuclear space.
4. ✘ The outer membrane of the nucleus contains ribosomes.

Question Number : 59 Question Id : 6306801328981 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Select the option that is correct regarding the following two statements labelled Assertion (A) and Reason (R).

Assertion (A): Heterochromatin is a dynamic structure that can undergo changes in response to environmental cues.

Reasoning (R): Heterochromatin is regulated by chromatin-modifying enzymes that can respond to environmental signals, such as DNA damage or nutrient availability.

Options :

1. ✘ A is true but R is false.
2. ✔ Both A and R are true and R is the correct reason for A.
3. ✘ A is false but R is true.
4. ✘ Both A and R are true but R is not the correct reason for A.

Question Number : 60 Question Id : 6306801353622 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the main function of euchromatin?

Options :

1. ✔ To regulate gene expression
2. ✘ To maintain chromosome stability
3. ✘ To facilitate DNA replication
4. ✘ To repair DNA damage

Question Number : 61 Question Id : 6306801328539 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the average number of base pairs present in a nucleosome?

Options :

1. ✘ 85 bp
2. ✘ 75 bp
3. ✘ 125 bp
4. ✔ 200 bp

Question Number : 62 Question Id : 6306801328961 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following conclusions is correct for the given statement?

Euchromatin is a type of chromatin that is highly sensitive to micrococcal nuclease digestion and gets regulated by chromatin remodelling.

Options :

1. ✘ Euchromatin is a type of chromatin that is highly compacted.
2. ✘ Euchromatin is a type of chromatin that is only found in prokaryotic cells.
3. ✔ Euchromatin is a type of chromatin that is highly accessible to transcription factors.
4. ✘ Euchromatin does not involve in gene expression.

Question Number : 63 Question Id : 6306801328988 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the telomere repeat-binding factor (TRF) in telomere organisation?

Options :

1. ✘ To recruit telomerase to the telomere
2. ✔ To regulate the length of the telomere repeat

3. ✓ To stabilise the telomere loop structure
4. ✗ To recruit chromatin-modifying enzymes to the telomere

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 64 Question Id : 6306801330209 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following plants has an XX/XY sex chromosome system?

Options :

1. ✓ *Melandrium album*
2. ✗ *Helianthus annuus*
3. ✗ *Catharanthus roseus*
4. ✓ *Cannabis sativa*

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 65 Question Id : 6306801353603 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the columns (A) and (B) for the characters of sex chromosome in plants.

Column A	Column B
1. Heterogamety	a. Chromosomes that do not determine sex
2. Homogamety	b. Chromosomes that determine sex
3. Sex chromosomes	c. Production of only one type of gamete
4. Autosomes	d. Production of two types of gametes

Options :

1. ✓ 1-d; 2-c; 3-b; 4-a
2. ✗ 1-c; 2-b; 3-d; 4-a
3. ✗ 1-d; 2-b; 3-c; 4-a
4. ✗ 1-a; 2-d; 3-c; 4-b

Question Number : 66 Question Id : 6306801320449 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Having an additional copy of chromosome number 21 causes the hereditary disorder known as _____.

Options :

1. ✓ Down's syndrome
2. ✗ thalassemia
3. ✗ phenylketonuria
4. ✗ Turner's syndrome

Question Number : 67 Question Id : 6306801326415 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What exactly does tetrad analysis mean in genetics?

Options :

1. ✗ To analyse three products produced by meiosis

2. ✓ To analyse four products produced by meiosis
3. ✗ To analyse three products produced by mitosis
4. ✗ To analyse four products produced by mitosis

Question Number : 68 Question Id : 6306801327317 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match Column A with Column B.

Column A	Column B
1. Conjugation	a. When a virus mediates the transfer of genes between bacteria
2. Plasmids	b. The unidirectional transport of DNA across cells via a cytoplasmic bridge
3. Transduction	c. Contains the genes essential for bacterial conjugation.
4. F plasmid	d. Extra chromosomal genetic material

Options :

1. ✓ 1-b, 2-d, 3-a, 4-c
2. ✗ 1-a, 2-d, 3-c, 4-b
3. ✗ 1-c, 2-b, 3-a, 4-d
4. ✗ 1-b, 2-a, 3-c, 4-d

Question Number : 69 Question Id : 6306801330249 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following conclusions is correct for the given statement?

A cross between two mice, one with black fur (B) and one with white fur (b), produces an F1 generation with grey fur.

Options :

1. ✗ The black fur trait is dominant.
2. ✗ The white fur trait is dominant.
3. ✓ The grey fur trait is the result of incomplete dominance.
4. ✗ The grey fur trait is the result of codominance.

Question Number : 70 Question Id : 6306801333678 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary purpose of using transformation to map genes?

Options :

1. ✗ To determine the dominance or recessiveness of a gene
2. ✓ To identify the chromosomal location of a gene
3. ✗ To study the expression of a gene in different tissues
4. ✗ To determine the function of a gene

Question Number : 71 Question Id : 6306801339825 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A geneticist performs a tetrad analysis on a cross between two strains of yeast, one with the genotype ABC and the other with the genotype abc. The results show that the genes A, B, and C are linked and are located on the same chromosome. What type of tetrad analysis is this?

Options :

1. ✘ Two-point cross
2. ✔ Three-point cross
3. ✘ Four-point cross
4. ✘ Five-point cross

Question Number : 72 Question Id : 6306801353563 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term for the bacterial plasmid that is responsible for initiating conjugation?

Options :

1. ✔ F plasmid
2. ✘ R plasmid
3. ✘ Col plasmid
4. ✘ Ti plasmid

Question Number : 73 Question Id : 6306801353570 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the phenomenon where the presence of one crossover event affects the frequency of another crossover event?

Options :

1. ✔ Interference
2. ✘ Linkage
3. ✘ Crossing over
4. ✘ Genetic drift

Question Number : 74 Question Id : 6306801353577 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the fundamental principle of Mendelian genetics that states that each pair of alleles separates from each other during gamete formation?

Options :

1. ✔ Law of segregation
2. ✘ Law of independent assortment
3. ✘ Law of dominance
4. ✘ Law of epistasis

Question Number : 75 Question Id : 6306801320447 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Identify the Mendelian Law from the following statement.

‘Two copies of genetic factors separate during gamete formation, allowing children to inherit a single factor from each parent.’

Options :

1. ✖ Law of dominance
2. ✖ Law of independent assortment
3. ✔ Law of segregation
4. ✖ Law of chromosomal inheritance

Question Number : 76 Question Id : 6306801326800 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match column A with column B.

Column A	Column B
1. Yeast	a. Ustilago hordei
2. Neurospora	b. Chlamydomonas reinhardi
3. Ordered tetrads	c. Four spores are present in tetrad
4. Unordered tetrads	d. Eight spores are present in tetrad

Options :

1. ✔ 1-c, 2-d, 3-a, 4-b
2. ✖ 1-c, 2-b, 3-a, 4-d
3. ✖ 1-a, 2-b, 3-c, 4-d
4. ✖ 1-a, 2-d, 3-c, 4-b

Question Number : 77 Question Id : 6306801326907 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Identify the Mendelian Law related to the following statement.

‘Two copies of genetic factors separate during gamete formation, allowing children to inherit a single factor from each parent.’

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. Law of dominance
2. Law of independent assortment
3. Law of segregation
4. Law of chromosomal inheritance

Question Number : 78 Question Id : 6306801326978 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following best describes 'cytoplasmic inheritance'?

Options :

1. ✔ Mitochondrial inheritance
2. ✖ X-linked recessive inheritance
3. ✖ Autosomal inheritance
4. ✖ X-linked dominant inheritance

Question Number : 79 Question Id : 6306801328522 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What does transformation-based gene mapping help to determine?

Options :

1. ✓ Relative positions of genes on a chromosome
2. ✓ Distance between two genes on a chromosome
3. ✗ Rate of replication
4. ✗ Type of mutation

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 80 Question Id : 6306801328524 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Two genomic units that exhibit cis-trans phenomena are regarded to be the same functional unit, known as a/an _____.

Options :

1. ✗ intron
2. ✓ cistron
3. ✗ cristae
4. ✗ muton

Question Number : 81 Question Id : 6306801332718 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Two genes, X and Y, are located on the same chromosome. The distance between the two genes is 10 map units. A geneticist performs a cross between two parents with the genotypes XxYY and xxYY. What is the expected frequency of non-recombinant offspring?

Options :

1. ✗ 80%
2. ✓ 90%
3. ✗ 10%
4. ✗ 99%

Question Number : 82 Question Id : 6306801326466 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A _____ epistasis occurs when one gene's dominant allele (B) inhibits the expression of another gene's dominant allele (A) at a ratio of 13 : 3.

Options :

1. ✓ dominant suppression
2. ✗ recessive suppression
3. ✗ dominant phenotype
4. ✗ dominant regression

Question Number : 83 Question Id : 6306801328523 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

According to gene mapping, what does a three-point test cross indicate?

Options :

1. ✘ The genotype of the parent
2. ✔ The sequencing of genes
3. ✔ The distance between genes
4. ✘ The speed of replication

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 84 Question Id : 6306801339816 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A researcher observes that a strain of bacteria has acquired antibiotic resistance through the transfer of a plasmid. What is the most likely mechanism by which this occurred?

Options :

1. ✔ Conjugation
2. ✘ Transduction
3. ✘ Transformation
4. ✘ Mutation

Question Number : 85 Question Id : 6306801339820 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A geneticist performs a tetrad analysis on a cross between two yeast strains, one with the genotype AB and the other with the genotype ab. The results show that 50% of the tetrads are parental ditype (AB and ab), 25% are non-parental ditype (Ab and aB), and 25% are tetratype (AB, Ab, aB, and ab). What can be concluded from these results?

Options :

1. ✘ The genes A and B are linked and are located on the same chromosome.
2. ✔ The genes A and B are unlinked and are located on different chromosomes.
3. ✘ The genes A and B are located on the same chromosome, but are not linked.
4. ✘ The genes A and B are located on different chromosomes, but are linked.

Question Number : 86 Question Id : 6306801339834 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A geneticist identifies a mutation in a gene that results in no change to the amino acid sequence of the protein. What type of mutation is this?

Options :

1. ✘ Missense mutation
2. ✘ Nonsense mutation
3. ✘ Frameshift mutation
4. ✔ Silent mutation

Question Number : 87 Question Id : 6306801339840 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary mechanism by which UV radiation causes DNA damage and mutations?

Options :

1. ✓ Formation of pyrimidine dimers
2. ✗ Formation of purine dimers
3. ✗ Breakage of DNA strands
4. ✗ Alkylation of DNA bases

Question Number : 88 Question Id : 6306801353290 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the effect of a frameshift mutation on protein synthesis?

Options :

1. ✗ It results in the synthesis of a normal protein.
2. ✓ It results in the synthesis of a protein with a different amino acid sequence.
3. ✗ It always results in absolute premature termination of protein synthesis.
4. ✓ It results in the synthesis of a protein with a different function.

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 89 Question Id : 6306801353550 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary mechanism by which ionizing radiation, such as X-rays and gamma rays, causes mutations?

Options :

1. ✗ Base pair substitution
2. ✗ Frameshift mutation
3. ✓ DNA strand breakage
4. ✗ Epigenetic modification

Question Number : 90 Question Id : 6306801353565 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the following statement and answer the question based on Assertion (A) and Reason (R).

Assertion: Mitochondrial DNA is responsible for the transmission of traits through cytoplasmic inheritance.

Reason: Mitochondrial DNA inheritance does not follow mendelian principle.

Options :

1. ✓ Both assertion and reason are correct and the reason is a correct explanation of the assertion.
2. ✗ Both assertion and reason are correct, but the reason is not a correct explanation of the assertion.
3. ✗ Assertion is correct but reason is incorrect.
4. ✗ Assertion is incorrect but reason is correct.

Question Number : 91 Question Id : 6306801326414 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

According to 'Panspermia' theory, the unit of life is termed as _____.

Options :

1. ✘ cells
2. ✔ spores
3. ✘ pores
4. ✘ RNA

Question Number : 92 Question Id : 6306801326935 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Who among the following is NOT a pioneer of the synthetic theory of evolution?

Options :

1. ✘ Huxley
2. ✘ Stebbins
3. ✔ Mendel
4. ✘ Mayr

Question Number : 93 Question Id : 6306801339843 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term for the hypothetical RNA molecule that is thought to have played a central role in the origin of life on Earth, serving as both genetic material and catalyst?

Options :

1. ✔ Ribozyme
2. ✘ Aptamer
3. ✘ Ribosome
4. ✘ Protocell

Question Number : 94 Question Id : 6306801353266 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the following types of speciation (column A) and their description (column B).

Column A (Speciation)	Column B (Description)
1. Allopatric speciation	a. Occurs when a single species colonizes a new geographic area and rapidly adapts to different environments, resulting in the formation of multiple new species
2. Sympatric speciation	b. Occurs when a new species emerges in a geographic area that is adjacent to, but not overlapping with, the ancestral species
3. Parapatric speciation	c. Occurs when a new species emerges in the same geographic area as the ancestral species
4. Adaptive radiation	d. Occurs when a new species emerges in a geographic area that is separate from the ancestral species

Options :

1. ✔ 1-D; 2-C; 3-B; 4-A
2. ✘ 1-C; 2-D; 3-B; 4-A

3. ✘ 1-B; 2-C; 3-D; 4-A

4. ✘ 1-A; 2-B; 3-C; 4-D

Question Number : 95 Question Id : 6306801353267 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the driving force behind Adaptive Radiation?

Options :

1. ✘ Genetic drift
2. ✔ Natural selection
3. ✘ Gene pool
4. ✘ Gene flow

Question Number : 96 Question Id : 6306801328073 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Speciation occurs when populations of a species become reproductively isolated due to _____.

Options :

1. ✘ lack of genetic variations
2. ✘ different climatic conditions
3. ✔ geographical and physiological barriers
4. ✘ similar environmental changes

Question Number : 97 Question Id : 6306801328087 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following best describes the centre of genetic diversity for a species?

Options :

1. ✔ Region of origin
2. ✘ Unusual habitat
3. ✘ Population density
4. ✘ Domestication area

Question Number : 98 Question Id : 6306801339953 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the given Assertion (A) and Reason (R) carefully and select the correct option.

(A): The peppered moth evolved from a light-coloured to a dark-coloured morph in response to the industrial revolution.

(R): This is an example of natural selection, where the dark-coloured morph had a selective advantage in a polluted environment.

Options :

1. ✔ Both A and R are correct and R is the correct reason of A
2. ✘ A is incorrect and R is correct
3. ✘ A and R are correct, but R is not the correct reason for A
4. ✘ A is correct, but R is incorrect

Question Number : 99 Question Id : 6306801339955 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A population of birds is found to have a variation in beak size. During a drought, the birds with larger beaks are better able to crack open tough seeds and survive. What is the outcome of this scenario?

Options :

- ✘ The population of birds will evolve to have smaller beaks.
- ✔ The population of birds will evolve to have larger beaks.
- ✘ The population of birds will not change.
- ✘ The population of birds will become extinct.

Question Number : 100 Question Id : 6306801339958 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is an example of sympatric speciation?

Options :

- ✘ The formation of the Grand Canyon, which separated two populations of squirrels and led to the formation of two distinct species.
- ✔ The evolution of two distinct species of apple maggots, one that infests apples and another that infests hawthorns, in the same geographic area.
- ✘ The formation of a new species of finch on the Galapagos Islands, which is reproductively isolated from other finch species.
- ✘ The evolution of antibiotic resistance in bacteria.

Question Number : 101 Question Id : 6306801349071 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the following terms in column A with their descriptions in column B.

Column A (Term)	Column B (Description)
1. Mutation	a. A change in the frequency of a gene due to random events
2. Genetic Drift	b. The movement of individuals with different genes into a population
3. Gene Flow	c. A change in the frequency of a gene due to errors during DNA replication
4. Natural Selection	d. The process by which the best-adapted individuals in a population are more likely to survive and reproduce

Options :

- ✔ 1-c; 2-a; 3-b; 4-d
- ✘ 1-c; 2-b; 3-d; 4-a
- ✘ 1-d; 2-c; 3-a; 4-b
- ✘ 1-a; 2-c; 3-b; 4-d

Question Number : 102 Question Id : 6306801353270 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Who among the following proposed the theory of punctuated equilibrium?

Options :

1. ✘ Charles Darwin
2. ✔ Niles Eldredge and Stephen Jay Gould
3. ✘ Jean-Baptiste Lamarck
4. ✘ Gregor Mendel

Question Number : 103 Question Id : 6306801328081 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following best describes an evolutionary prezygotic isolating mechanism?

Options :

1. ✘ Hybrid sterility
2. ✔ Behavioural isolation
3. ✔ Gametic isolation
4. ✘ Hybrid breakdown

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 104 Question Id : 6306801353259 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a primitive wild ancestor of wheat?

Options :

1. ✘ Triticum aestivum
2. ✘ Triticum durum
3. ✔ Triticum monococcum
4. ✔ Aegilops tauschii

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 105 Question Id : 6306801353269 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary mechanism of Natural Selection?

Options :

1. ✘ Genetic drift
2. ✘ Mutation
3. ✘ Gene flow
4. ✔ Differential reproduction

Question Number : 106 Question Id : 6306801343842 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following enzymes is responsible for sealing the gaps between nucleotides during DNA replication?

Options :

1. ✘ DNA polymerase
2. ✘ RNA polymerase

3. ✓ DNA ligase
4. ✗ Topoisomerase

Question Number : 107 Question Id : 6306801353197 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the following and answer the question on the basis of Assertion (A) and Reason (R).

Assertion (A): Helicase is responsible for unwinding the DNA double helix during replication.

Reason (R): Helicase has ATPase activity.

Options :

1. ✓ Both assertion and reason are correct and reason is the correct explanation for assertion.
2. ✗ Both assertion and reason are correct, but reason is not the correct explanation for assertion.
3. ✗ Assertion is correct, but reason is incorrect.
4. ✗ Assertion is incorrect, but reason is correct.

Question Number : 108 Question Id : 6306801353244 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the structure of the DNA double helix?

Options :

1. ✗ A left-handed helix with 10 base pairs per turn
2. ✓ A right-handed helix with 10 base pairs per turn
3. ✗ A left-handed helix with 20 base pairs per turn
4. ✗ A right-handed helix with 20 base pairs per turn

Question Number : 109 Question Id : 6306801320973 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the definition of a replication bubble?

Options :

1. ✗ It is when the unwinding of the double helix produces a loop.
2. ✓ It is the unwinding point at which the double-stranded DNA helix separates into two single nucleotide strands.
3. ✗ It is the point at which the two single strands of nucleotides condense.
4. ✓ It is when the replication forks move outward in both directions.

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 110 Question Id : 6306801327243 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which functional group is found at the 2'-position of every nucleotide residue in RNA?

Options :

1. ✓ -OH
2. ✗ -COOH
3. ✗ -CHO

4. ✘ -CH₃

Question Number : 111 Question Id : 6306801327277 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the word used to refer to the DNA replication process in which each newly created DNA molecule comprises one parental strand and one newly synthesised strand?

Options :

1. ✔ Semiconservative
2. ✘ Conservative
3. ✘ Continuous
4. ✘ Disruptive

Question Number : 112 Question Id : 6306801328521 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Identify the FALSE statement.

Options :

1. ✘ In prokaryotic cells, introns are not present in genes.
2. ✘ DNA is linked to basic proteins (histones) in eukaryotic cells.
3. ✔ A eukaryotic nucleoid contains 60% DNA and small quantities of RNA and protein.
4. ✘ Prokaryotic genome is circular in shape.

Question Number : 113 Question Id : 6306801339960 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following types of RNA is responsible for carrying genetic information from DNA to the ribosome during protein synthesis?

Options :

1. ✔ Messenger RNA (mRNA)
2. ✘ Transfer RNA (tRNA)
3. ✘ Ribosomal RNA (rRNA)
4. ✘ Small nuclear RNA (snRNA)

Question Number : 114 Question Id : 6306801343845 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a step in the initiation of replication at the origin of replication?

Options :

1. ✘ Synthesis of the leading strand
2. ✘ Synthesis of the lagging strand
3. ✔ Binding of the origin recognition complex (ORC)
4. ✘ Unwinding of the DNA double helix

Question Number : 115 Question Id : 6306801353183 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following type of repairs corrects errors after replication is complete?

Options :

1. ✘ Proofreading
2. ✔ Mismatch repair
3. ✘ Error-prone repair
4. ✘ Base pair mechanism

Question Number : 116 Question Id : 6306801353204 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary difference between DNA replication in prokaryotes and eukaryotes?

Options :

1. ✘ Prokaryotes have a single origin of replication and eukaryotes also have single origin of replication.
2. ✘ Prokaryotes have a linear chromosome, while eukaryotes have a circular chromosome.
3. ✘ Prokaryotes use RNA polymerase for replication, while eukaryotes use DNA polymerase.
4. ✔ Prokaryotes have a shorter replication time, while eukaryotes have a longer replication time.

Question Number : 117 Question Id : 6306801326911 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

A replication fork DOES NOT include which of the following enzymes?

Options :

1. ✘ DNA helicase
2. ✘ Primase
3. ✘ DNA polymerase
4. ✔ Endonuclease

Question Number : 118 Question Id : 6306801327254 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a characteristic of RNAs but NOT of DNAs?

Options :

1. ✘ They have the power to direct the duplications.
2. ✘ They are capable of mutating.
3. ✔ They have the ability to synthesise proteins.
4. ✘ They can operate as genetic material.

Question Number : 119 Question Id : 6306801343843 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a characteristic of the unit of replication in prokaryotic cells?

Options :

1. ✔ It is a single, circular chromosome with bidirectional replication.
2. ✘ It is a single, linear chromosome.
3. ✘ It is a group of genes that are replicated together.
4. ✘ It is a single gene that is replicated independently.

Question Number : 120 Question Id : 6306801343846 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following checkpoints is responsible for ensuring that DNA replication is complete and accurate before the cell enters mitosis?

Options :

- ✘ G1/S checkpoint
- ✔ G2/M checkpoint
- ✘ Mitotic spindle checkpoint
- ✘ DNA damage checkpoint

Question Number : 121 Question Id : 6306801353165 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the levels of chromatin organisation (Column A) and their characters (Column B).

Column A (Level of Chromatin Organisation)	Column B (Characteristic)
1. Nucleosome	A. 30-nanometer fibre
2. Chromatin fibre	B. Series of loops attached to a scaffold
3. Loop domain	C. Most compact form of chromatin
4. Chromonema fibre	D. Primary level of chromatin organisation

Options :

- ✔ 1-D; 2-A; 3-B; 4-C
- ✘ 1-C; 2-A; 3-B; 4-D
- ✘ 1-B; 2-C; 3-A; 4-D
- ✘ 1-D; 2-A; 3-C; 4-B

Question Number : 122 Question Id : 6306801343847 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the following statement and select the correct conclusion without making assumptions.

Statement: It is essential to add a methylated guanine nucleotide to the 5' end of a eukaryotic mRNA and is called capping.

Options :

- ✔ Capping helps to stabilise the mRNA molecule and prevent degradation.
- ✘ Capping is only found in prokaryotic mRNA.
- ✘ Capping is involved in the initiation of translation.
- ✘ Capping is a post-transcriptional modification that occurs in the cytoplasm.

Question Number : 123 Question Id : 6306801343849 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary function of the sigma factor in prokaryotic transcription?

Options :

- ✔ To bind to the promoter region and recruit RNA polymerase
- ✘ To unwind the DNA double helix and initiate transcription
- ✘ To synthesise the first few nucleotides of the RNA transcript

4. ✖ To terminate transcription and release the RNA transcript

Question Number : 124 Question Id : 6306801328061 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Identify the FALSE statement about transcription factors.

Options :

1. ✖ Multiple transcription factors constitute a transcription complex necessary for transcription initiation.
2. ✔ DNA polymerases are thought to have their own transcription factors.
3. ✖ All three RNA polymerases require TF II D or a part of it.
4. ✖ Transcription factors are generally protein in nature.

Question Number : 125 Question Id : 6306801328520 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What does a triplet genetic code define?

Note: For this question, discrepancy is found in question/answer. So, this question is ignored for all candidates.

Options :

1. It specifies one nucleotide amino acid.
2. It specifies 16 amino acids.
3. It specifies 64 amino acids.
4. It specifies 128 amino acids.

Question Number : 126 Question Id : 6306801328556 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Select the option that is correct regarding the following two statements labelled Assertion (A) and Reason (R).

Assertion (A): RNA polymerase synthesises RNA in the 5' to 3' direction.

Reason (R): RNA polymerase requires a primer to initiate transcription.

Options :

1. ✖ Both A and R are true, and R is the correct explanation of A.
2. ✖ Both A and R are true, but R is not the correct explanation of A.
3. ✔ A is true, but R is false.
4. ✖ A is false, but R is true.

Question Number : 127 Question Id : 6306801343851 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is an example of RNA editing in humans?

Options :

1. ✖ The correction of genetic errors in the CFTR gene.

2. ✓ The modification of the apolipoprotein B gene to change its function.
3. ✗ The insertion of nucleotides into the HIV genome.
4. ✗ The degradation of the p53 tumour suppressor gene.

Question Number : 128 Question Id : 6306801343852 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following features of the genetic code refers to the fact that more than one codon can specify the same amino acid?

Options :

1. ✗ Localised
2. ✓ Degeneracy
3. ✗ Commalessness
4. ✗ Non-overlapping

Question Number : 129 Question Id : 6306801349247 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the term for the feature of the genetic code that states that the sequence of nucleotides is read in a specific sequence of three nucleotides (codons) that specify one of the 20 amino acids?

Options :

1. ✓ Triplet code
2. ✗ Degeneracy
3. ✗ Commalessness
4. ✗ Non-overlapping

Question Number : 130 Question Id : 6306801349248 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is the correct reason for polyadenylation of mRNA?

Options :

1. ✓ Polyadenylation helps to stabilise the mRNA molecule and prevent degradation.
2. ✗ Polyadenylation is meant to protect prokaryotic mRNA.
3. ✗ Polyadenylation is involved in the initiation of translation.
4. ✗ Polyadenylation is a post-translational modification that occurs in the cytoplasm.

Question Number : 131 Question Id : 6306801353135 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following types of RNA is involved in the regulation of gene expression by binding to specific mRNA molecules?

Options :

1. ✗ Messenger RNA (mRNA)
2. ✓ Small interfering RNA (siRNA)
3. ✗ Transfer RNA (tRNA)
4. ✗ Ribosomal RNA (rRNA)

Question Number : 132 Question Id : 6306801343850 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following enzymes is/are responsible for adding the 5' cap to eukaryotic mRNA?

Options :

1. ✘ RNA polymerase
2. ✔ Guanylyl and methyl transferase
3. ✘ Phosphatase
4. ✘ Adenylase and ligase

Question Number : 133 Question Id : 6306801349249 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following mechanisms is involved in the regulation of microRNA (miRNA) biogenesis through the Drosha complex?

Options :

1. ✘ Phosphorylation of Drosha
2. ✘ Ubiquitination of DGCR8
3. ✔ Sumoylation of Drosha
4. ✘ Acetylation of the Drosha complex

Question Number : 134 Question Id : 6306801349253 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the function of the sigma factor in RNA polymerase?

Options :

1. ✘ To unwind DNA during transcription
2. ✘ To synthesise RNA from the DNA template
3. ✔ To recognise and bind to specific promoter sequences
4. ✘ To terminate transcription

Question Number : 135 Question Id : 6306801326467 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which enzyme is responsible for attaching amino acids to tRNA?

Options :

1. ✔ Amino acyl tRNA synthetase
2. ✘ Amino acyl tRNA kinase
3. ✘ Amino acyl tRNA dehydrogenase
4. ✘ Amino acyl tRNA ligase

Question Number : 136 Question Id : 6306801326469 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is an unusual base found in eukaryotic tRNA?

Options :

1. ✘ Cytosine
2. ✘ Adenine

- ✘ Uracil
- ✔ Inosine

Question Number : 137 Question Id : 6306801328558 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the primary purpose of tRNA aminoacylation?

Options :

- ✔ Activating an amino acid before binding to its tRNA
- ✘ Releases of amino acid from its tRNA
- ✘ ATP generation
- ✘ Amino acid assembly in ribosome

Question Number : 138 Question Id : 6306801328009 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is NOT a codon for termination?

Options :

- ✘ UAA
- ✔ AAU
- ✘ UAG
- ✘ UGA

Question Number : 139 Question Id : 6306801328034 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

The presence of hydrogen bonding in proteins typically stabilises which of the following secondary structures?

Options :

- ✔ Alpha helix and Beta pleated sheet
- ✘ Beta pleated sheet and Collagen helix
- ✘ Only Alpha helix
- ✘ Only Collagen helix

Question Number : 140 Question Id : 6306801328094 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following statements is TRUE about ribosomes?

Options :

- ✘ All eukaryotic and prokaryotic cells have membrane-bound ribosomes.
- ✔ Mitoribosomes is the name given to the 55S ribosomes.
- ✘ About equal amounts of proteins and DNA are found in ribosomes.
- ✘ They are made up of the 50S and 80S subunits.

Question Number : 141 Question Id : 6306801328560 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

How do initiation factors function throughout the process of protein synthesis?

Options :

1. ✓ They play a role in ribosome assembly on messenger RNA.
2. ✗ They help in folding of proteins.
3. ✗ They help in unwinding DNA.
4. ✗ They play a role in ribosome assembly on transfer RNA.

Question Number : 142 Question Id : 6306801343854 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the following statement and select the correct conclusion without making assumptions.

Statement: The aminoacylation reaction involves the attachment of an amino acid to the 3' end of a tRNA molecule.

Options :

1. ✓ The aminoacylation reaction is an energy-requiring process.
2. ✗ The aminoacylation reaction is a spontaneous process.
3. ✗ The aminoacylation reaction involves the attachment of an amino acid to the 5' end of a tRNA molecule.
4. ✗ The aminoacylation reaction is not essential for protein synthesis.

Question Number : 143 Question Id : 6306801348978 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is a component of the large subunit of the eukaryotic ribosome?

Options :

1. ✗ 15S rRNA
2. ✗ 16S rRNA
3. ✗ 23S rRNA
4. ✓ 28S rRNA

Question Number : 144 Question Id : 6306801349012 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

What is the energy source that drives translational proofreading during protein synthesis?

Options :

1. ✓ ATP hydrolysis
2. ✓ GTP hydrolysis
3. ✗ Peptide bond formation
4. ✗ Translation initiation

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 145 Question Id : 6306801326473 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following is an essential component of the transcription initiation complex in prokaryotes?

Options :

1. ✘ mRNA
2. ✔ Sigma factor
3. ✘ IF 2
4. ✘ IF 4

Question Number : 146 Question Id : 6306801328561 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which motif has between 30 to 50 amino acids?

Options :

1. ✔ Zinc finger motif
2. ✘ Helix-turn-helix motif
3. ✘ $\alpha\alpha$ motif
4. ✘ EF hand motif

Question Number : 147 Question Id : 6306801348977 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Read the given assertion (A) and reason (R) carefully and select the correct option.

(A): Aminoacyl-tRNA synthetases are important for the fidelity of translation.

(R): Aminoacyl-tRNA synthetases have evolved to recognise and correct errors in aminoacyl-tRNA pairing, ensuring the accuracy of protein synthesis.

Options :

1. ✘ A is correct, but R is incorrect
2. ✔ Both A and R are correct and R is the proper reason for A
3. ✘ A is incorrect, but R is correct
4. ✘ Both A and R are correct, but R is not the proper reason for A

Question Number : 148 Question Id : 6306801348983 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following elongation factors is responsible for translocating the ribosome along the mRNA during translation elongation?

Options :

1. ✘ EF-Tu
2. ✔ EF-G
3. ✘ EF-Ts
4. ✘ EF-4

Question Number : 149 Question Id : 6306801349015 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Which of the following post-translational modifications involves proteins with ubiquitin-like modifiers?

Options :

1. ✘ Glycosylation
2. ✘ Ubiquitination

3. ✓ SUMOylation

4. ✗ Palmitoylation

Question Number : 150 Question Id : 6306801349016 Question Type : MCQ

Correct Marks : 2 Wrong Marks : 0.66

Match the following functions of protein domains in column A with their examples in column B.

Column A (Domain Function)	Column B (Example)
1. Enzymatic activity	a. SH2 and SH3 domains
2. Protein-protein interactions	b. Transmembrane domains
3. Membrane anchoring	c. Zinc finger domains
4. DNA binding	d. Kinases and phosphatases

Options :

1. ✓ 1-d; 2-a; 3-b; 4-c

2. ✗ 1-d; 2-a; 3-c; 4-b

3. ✗ 1-d; 2-b; 3-a; 4-c

4. ✗ 1-d; 2-c; 3-b; 4-a