

MHT CET 2026 Biology Memory Based Question Paper PDF

Biology

1. The species-area relationship is represented on a log scale as:
 - (a) a hyperbola
 - (b) a straight line
 - (c) a parabola
 - (d) a circle
2. Industrial melanism is one of the best examples for:
 - (a) Natural selection
 - (b) Artificial selection
 - (c) Genetic drift
 - (d) Gene flow
3. Which of the following statements about DNA packaging in eukaryotes are correct?
 - i. The negatively charged DNA helix wraps around a positively charged histone octamer to form a nucleosome.
 - ii. The histone octamer consists of eight molecules, two of each of the four types: H2A, H2B, H3, and H4.
 - iii. One nucleosome contains approximately 200 base pairs (bp) of DNA helix.
 - iv. The chromatin fiber is further organized into a solenoid structure of 30 nm diameter, needing additional NHC (Non-Histone Chromosomal) proteins for higher-level packaging.
 - (a) i, ii, and iii only
 - (b) ii, iii, and iv only
 - (c) i, iii, and iv only
 - (d) All i, ii, iii, and iv
4. Which of the following statements about Pollination by Water (Hydrophily) are correct?
 - i. It is found only in some 30 genera of aquatic monocots.
 - ii. In Hypohydrophily, the pollen grains are lighter than water and float on the water surface to reach the stigma.
 - iii. In *Vallisneria* (Epihydrophily), the female flowers reach the water surface temporarily to ensure pollination, and the male flowers float on the surface.
 - iv. Pollen grains of hydrophilous flowers are long and unwettable due to the presence of mucilage, and they lack exine in some species like *Zostera* (sea grass).
 - (a) i, ii, and iii only

- (b) i, iii, and iv only
 (c) ii, iii, and iv only
 (d) All i, ii, iii, and iv
5. What is the term for genetically identical progeny produced from a single organism through asexual reproduction?
- (a) Somaclones
 (b) Hybrids
 (c) Clones
 (d) Gametophytes
6. Which structure in the anther wall is the innermost, immediately enclosing the sporogenous tissue, and primarily functions in providing nutrition?
- (a) Epidermis
 (b) Endothecium
 (c) Middle layer
 (d) Tapetum
7. The process where a diploid sporophyte cell produces a diploid gametophyte without undergoing meiosis is called:
- (a) Apogamy
 (b) Parthenogenesis
 (c) Apospory
 (d) Diplospory
8. Match the type of linkage with the percentage of recombination observed in *Drosophila*.
- | Column I (Linkage Type) | Column II (Recombination % / Example) |
|--|---------------------------------------|
| P. Strong Linkage | 1. 37.2% Recombination |
| Q. Weak Linkage | 2. 1.3% Recombination |
| R. Genes for yellow body and white eye | 3. Incompletely linked genes |
| S. Genes for white body and miniature wing | 4. Completely linked genes |
- (a) P-2, Q-1, R-2, S-1
 (b) P-1, Q-2, R-1, S-2
 (c) P-2, Q-3, R-4, S-1
 (d) P-4, Q-3, R-2, S-1
9. In the development of the female gametophyte, the lower megaspore toward the centre of the nucellus remains functional. This functional megaspore undergoes successive mitotic divisions. This entire method of embryo sac development is called:
- (a) Tetrasporic
 (b) Monosporic
 (c) Bisporic
 (d) Diplosporic
10. A cross of the F_1 progeny with the homozygous recessive parent (e.g., F_1 tall $\times$ pure dwarf, $Tt \times tt$) is specifically called a:

- (a) Back cross
- (b) Dihybrid cross
- (c) Monohybrid cross
- (d) Test cross

11. Match the plant growth hormone with its primary chemical nature.

Column I		Column II	
P	Auxin	1	Simple gaseous hydrocarbon
Q	Gibberellin	2	Tryptophan is the primary precursor
R	Ethylene	3	15-carbon sesquiterpenoid
S	Absciscic Acid	4	Cyclic diterpene/Mevalonic acid precursor

- (a) P-2, Q-4, R-1, S-3
 - (b) P-4, Q-2, R-1, S-3
 - (c) P-2, Q-1, R-4, S-3
 - (d) P-3, Q-4, R-1, S-2
12. Fine soil particles imbibe or absorb water and hold it. This is called as:

- (a) Percolation
- (b) Adhesion
- (c) Imbibition
- (d) Cohesion

13. The pH of 0.001 M HCl solution is:

- (a) 1
- (b) 2
- (c) 3
- (d) 4

14. Which among the following is an ambidentate ligand?

- (a) CN^-
- (b) NH_3
- (c) H_2O
- (d) NO_2^-

15. An electric dipole is placed at an angle of 30° in an electric field of intensity $2 \times 10^5 \text{ N/C}$. It experiences a torque of 0.03 Nm. If the dipole length is 2 cm, find the charge on the dipole.

- (a) $1.5 \times 10^{-5} \text{ C}$
- (b) $2.0 \times 10^{-5} \text{ C}$
- (c) $2.5 \times 10^{-5} \text{ C}$
- (d) $3.0 \times 10^{-5} \text{ C}$

16. A solution of 8 g of a certain organic compound in 2 dm^3 water develops osmotic pressure 0.6 atm at 300 K. Calculate the molar mass of compound. [$R = 0.082 \text{ atm dm}^3 \text{ K}^{-1} \text{ mol}^{-1}$]

- (a) 148 g mol^{-1}
- (b) 164 g mol^{-1}

- (c) 172 g mol^{-1}
(d) 180 g mol^{-1}
17. What is the value of $\Delta H - \Delta U$ for the following reaction?
- $$2\text{C(s)} + 3\text{H}_2\text{(g)} \rightarrow \text{C}_2\text{H}_6\text{(g)}$$
- (a) $4RT$
(b) $-5RT$
(c) RT
(d) $-2RT$
18. Volume of a gas at NTP is $1.12 \times 10^{-7} \text{ cm}^3$. The number of molecules in it is:
- (a) 3.01×10^{12}
(b) 3.01×10^2
(c) 3.01×10^{23}
(d) 3.01×10^2
19. The wavelength of the radiation emitted, when an electron falls from infinity to stationary state 1, would be (Rydberg constant = $1.097 \times 10^7 \text{ m}^{-1}$):
- (a) 406 nm
(b) 192 nm
(c) 91 nm
(d) $9.1 \times 10 \text{ nm}$
20. In NO_3^- ion, the number of bond pairs and lone pairs of electrons on nitrogen atom are:
- (a) 2, 2
(b) 3, 1
(c) 1, 3
(d) 4, 0
21. In which of the compounds does 'manganese' exhibit highest oxidation number?
- (a) MnO
(b) MnO_2
(c) KMnO_4
(d) MnSO_4
22. Alkali metals are powerful reducing agents because:
- (a) they are metals
(b) they are monovalent
(c) their ionic radii are large
(d) their ionisation energies are low
23. A balloon filled with an air sample occupies 3 L volume at 35°C . On lowering the temperature to T , the volume decreases to 2.5 L. The temperature T is? [Assume p -constant]
- (a) 16°C
(b) -16°C

- (c) 24°C
(d) -20°C
24. Eight identical spherical liquid drops, each falling with a terminal velocity v , coalesce to form a single large drop. The terminal velocity of the new large drop is:
- (a) $2v$
(b) $4v$
(c) $8v$
(d) $16v$
25. A uniform solid sphere of mass M and radius R is placed on a smooth horizontal surface. It is struck by a horizontal cue at a height h above the center. For the sphere to roll without slipping immediately after the impact, the value of h must be:
- (a) $R/2$
(b) $2R/5$
(c) $2R/3$
(d) $3R/5$
26. A disc of mass M and radius R has a concentric hole of radius $R/2$. Its moment of inertia about an axis passing through its center and perpendicular to its plane is:
- (a) $15/32 MR^2$
(b) $13/32 MR^2$
(c) $5/16 MR^2$
(d) $3/8 MR^2$
27. The work done in increasing the radius of a soap bubble from R to $2R$ is W . The work done in further increasing its radius from $2R$ to $3R$ will be:
- (a) $5/3 W$
(b) $4/3 W$
(c) $7/3 W$
(d) W
28. Water flows through a horizontal pipe. At one point, the velocity is 2 m/s and the pressure is 2 m of water column. What is the pressure at another point where the velocity is 3 m/s ? (Density of water $= 10^3\text{ kg/m}^3$)
- (a) 1.75 m of water
(b) 1.2 m of water
(c) 1 m of water
(d) 1.5 m of water
29. The rms velocity of hydrogen molecules at 27°C is v . At what temperature will the rms velocity of oxygen molecules equal v ?
- (a) 4800 K
(b) 4527°C
(c) 1200 K
(d) 27°C

30. An ideal gas undergoes a cyclic process ABCA wherein AB is an isothermal expansion, BC is an isochoric pressure drop, and CA is an adiabatic compression. The work done by the gas in the complete cycle is:
- (a) Zero
 - (b) Positive
 - (c) Negative
 - (d) Cannot be determined
31. A Carnot engine operates between temperatures T_1 and T_2 ($T_1 > T_2$). If T_1 is increased by ΔT and T_2 is decreased by ΔT , its efficiency will:
- (a) Increase
 - (b) Decrease
 - (c) Remain constant
 - (d) Depend on the working substance
32. A particle executes simple harmonic motion of amplitude A and time period T . The time taken by the particle to travel from the mean position to a distance of $A/2$ is:
- (a) $T/4$
 - (b) $T/8$
 - (c) $T/12$
 - (d) $T/6$
33. A pendulum clock gives correct time at 20°C . If the coefficient of linear expansion of the pendulum's material is $\alpha = 1.2 \times 10^{-5}/^\circ\text{C}$, the clock will lose time per day at 40°C by approximately:
- (a) 10.4 s
 - (b) 5.2 s
 - (c) 20.8 s
 - (d) 2.6 s
34. An open pipe resonates with a tuning fork of frequency 500 Hz. It is observed that two successive nodes are separated by 34 cm. The velocity of sound in air is:
- (a) 330 m/s
 - (b) 340 m/s
 - (c) 350 m/s
 - (d) 360 m/s
35. A train moving at 20 m/s approaches a stationary observer. The frequency of the whistle emitted by the train is 640 Hz. If the velocity of sound is 340 m/s, the apparent frequency heard by the observer is:
- (a) 680 Hz
 - (b) 600 Hz
 - (c) 720 Hz
 - (d) 640 Hz