परीक्षा पुस्तिका संकेत
Test Booklet Code

English + Hindi

A

NEET REAL TEST (2025-26)

इस परीक्षा पुस्तिका को तब तक न खोलें जब तक कहा न जाए।
Do not open this Test Booklet until you are asked to do so.
इस परीक्षा पुस्तिका के पिछले आवरण पर दिए निर्देशों को ध्यान से पढ़ें।
Read carefully the Instructions on the Back Cover of this Test Booklet.

Date: 03-08-2025

DURATION: 180 Minutes | **CLASS – Dropper** | **M. MARKS: 300**

Important Instructions:

1. (a) Total duration of NEET UG Paper is **180** min.
   (b) NEET UG Paper Contains **180** question.
   (c) Maximum Marks **720**
2. The question paper consists of 3 Subjects (Physics, Chemistry, Biology).
3. Each correct answer will give 4 marks while 1 Mark will be deducted for a wrong response.

महत्वपूर्ण निर्देश:

1. (a) सभी प्रश्नों को हल करने की कुल अवधि NEET UG Paper के लिए **180** मिनट है।
   (b) NEET UG Paper में **180** प्रश्न है।
   (c) अधिकतम अंक **720**
2. इस प्रश्न पत्र में 3 विषय (भौतिक विज्ञान, रसायन विज्ञान, जीव विज्ञान) हैं।
3. प्रत्येक सही उत्तर पर 4 अंक दिए जाएंगे जबकि प्रश्नों के लिए गलत उत्तर के लिए 1 अंक काटा जाएगा।

SYLLABUS

Physics:	**Motion in a Plane**
Chemistry:	**Thermodynamics, Equilibrium**
Botany:	**The Living World (Complete Chapter), Biological Classification (Complete Chapter)**
Zoology:	**Body fluids and circulation**

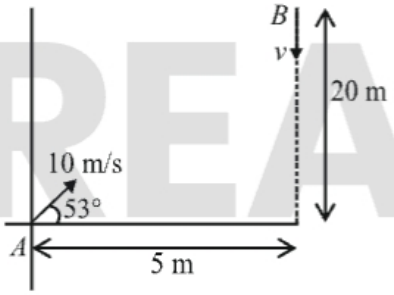
1. A centrifuge in a medical lab spins a test tube of blood at a high, constant angular velocity. A heavy RBC in blood is forced to the outside of the tube, far from the center of rotation. A lighter Plasma Protein in blood which remains closer to the center of rotation. Both particles are spinning together, then which of the following statements is **true**? (ω = angular speed, v = linear speed, a = magnitude of centripetal acceleration)

(1) $\omega_{RBC} > \omega_{plasma}, v_{RBC} > v_{plasma}, a_{RBC} > a_{plasma}$
(2) $\omega_{RBC} = \omega_{plasma}, v_{RBC} < v_{plasma}, a_{RBC} < a_{plasma}$
(3) $\omega_{RBC} = \omega_{plasma}, v_{RBC} > v_{plasma}, a_{RBC} > a_{plasma}$
(4) $\omega_{RBC} < \omega_{plasma}, v_{RBC} = v_{plasma}, a_{RBC} > a_{plasma}$

2. Wind is blowing with velocity 'v' towards north-east. A man starts running towards north with acceleration b. The time after which man will feel the wind blowing towards east is:

(1) $\frac{v}{\sqrt{2}b}$ (2) $\frac{v}{b}$
(3) $\frac{\sqrt{2}v}{b}$ (4) $\frac{2v}{b}$

3. Consider the situation shown in the figure given below. A particle A is projected with speed 10 m/s at an angle 53° with the horizontal. Another particle B which is located at a horizontal distance of 5 m from A and 20 m above the ground is simultaneously projected vertically downward with speed 'v'. Find v such that both the particles collide. (g = 10 m/s^2)



(1) 16 m/s (2) 12 m/s
(3) 8 m/s (4) 10 m/s

4. The position co-ordinates of a particle (in meters) moving in a coordinate system are given as a function of time t (in seconds): $x = 5\cos(2t)$, $y = 3\sin(2t)$. The trajectory of the particle is:

(1) straight line (2) parabolic
(3) circular (4) elliptical

5. A projectile is launched from a large height at an angle 'α' above the horizontal with a velocity 20 ms^{-1}. After 10 s, it inclination with horizontal is 'β'. The value of tan β will be: (g = 10 ms^{-2}).

(1) $\tan\alpha + 5\sec\alpha$ (2) $\tan\alpha - 5\sec\alpha$
(3) $2\tan\alpha - 5\sec\alpha$ (4) $2\tan\alpha + 5\sec\alpha$

6. Analyze the following scenarios describing the motion of different objects:

Scenario I: A billiard ball rolling across a flat, horizontal snooker table.

Scenario II: A housefly buzzing around inside a closed room.

Scenario III: The tip of a minute hand on a wall clock.

Which scenario/s **correctly** classifies the motion in a plane?

(1) scenario I only
(2) scenario II and III only
(3) scenario I, II and III
(4) scenario I and III only

7. A particle undergoes uniform circular motion of radius r. It moves from point A to point B on a circle, subtending an angle θ (in radians) at the center of the circle. What is the ratio of the magnitude of the average velocity to the average speed for this motion?

(1) $\frac{\sin\theta}{\theta}$ (2) $\frac{2\sin\left(\frac{\theta}{2}\right)}{\theta}$
(3) $\frac{\cos\theta}{\theta}$ (4) 1

8. Rain is falling vertically downwards with respect to ground at a speed of 4 km h^{-1}. A girl starts moving on a straight road with a velocity of 3 km h^{-1}. The apparent velocity of rain with respect to the girl is;

(1) 3 km h^{-1} (2) 8 km h^{-1}
(3) 5 km h^{-1} (4) 7 km h^{-1}

9. **Statement I:** A coin is allowed to fall in a train moving with constant velocity. Its trajectory is a straight line as seen by an observer attached to the train.

Statement II: An observer on ground will also see the path of falling coins in a train moving with constant velocity as a straight line.

(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

10. A person is riding in a motorboat on a river that flows due east at 3 m/s. The motorboat moves due north with speed of 4 m/s in still water. Simultaneously, rain is falling straight down with a vertical speed of 5 m/s. To stay dry, at what angle θ to the vertical must the person hold their umbrella?

(1) $\theta = \tan^{-1}(3/5)$ (2) $\theta = \tan^{-1}(4/5)$

(3) $\theta = \tan^{-1}(1)$ (4) $\theta = \tan^{-1}(2/5)$

11. A particle undergoes uniform circular motion in a horizontal plane. Which of the following lists contains only physical quantities that must change throughout the motion?

(1) angular velocity, Linear Momentum, Acceleration.

(2) linear Velocity, Linear Momentum, Acceleration

(3) Linear Momentum, angular speed, angular velocity

(4) linear Speed, Kinetic Energy, Magnitude of Acceleration

12. A projectile is fired horizontally with initial velocity u from the top of a tower. The time after which the instantaneous velocity will be perpendicular to the initial velocity (g is acceleration due to gravity, neglect air resistance);

(1) $t = \frac{u}{g}$

(2) $t = \frac{2u}{g}$

(3) $t = \frac{u}{2g}$

(4) It will never be perpendicular at any instant

13. A biologist is tracking a bird with a GPS tag. The bird takes off from a branch located at position A = (2, 5, 10) meters. It flies in a random manner and reaches to its nest located at position B = (5, 9, 22) meters. What is the unit vector that represents the direction of the bird's displacement from the branch to the nest?

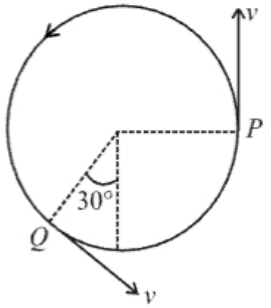
(1) $3\hat{i} + 4\hat{j} + 12\hat{k}$

(2) $\frac{1}{19}\left(3\hat{i} + 4\hat{j} + 12\hat{k}\right)$

(3) $\frac{1}{13}\left(-3\hat{i} - 4\hat{j} - 12\hat{k}\right)$

(4) $\frac{1}{13}\left(3\hat{i} + 4\hat{j} + 12\hat{k}\right)$

14. A particle of mass 2 kg is moving in circular path with constant speed 10 m/s. The change in magnitude of velocity, when particle travels from P to Q as shown, will be [assume radius of circle is $\frac{10}{\pi^2}$ m]



(1) $10\sqrt{3}$ m/s (2) $20\sqrt{3}$ m/s

(3) 10 m/s (4) 0

15. A person starts at the origin and moves in a series of 1-meter steps, with each step taking 1 second. First he moves 5 steps East then 4 steps North then 2 steps West and finally 2 steps South. What is the magnitude of average velocity of person for the entire journey?

(1) $\sqrt{13}$ m/s (2) $\frac{1}{\sqrt{13}}$ m/s

(3) $\sqrt{11}$ m/s (4) $\frac{1}{\sqrt{11}}$ m/s

16. In uniform circular motion, which of the following is directed along the axis of rotation?

(1) Linear velocity

(2) Centripetal acceleration

(3) Angular velocity

(4) Both (2) and (3)

17. A drone is being used to fight a wildfire spread on a horizontal ground. The drone flies at a constant altitude H with a constant horizontal speed v. To hit a target fire on the ground, the drone must release its fire resistant a horizontal distance d before it is directly over the target. On its first run, the drone successfully hits the target. For the second run, the drone fly at the altitude $\frac{H}{2}$, but at horizontal speed of $2v$. To hit the same fire target, what should the drone's new horizontal distance from target at which fire resistant released? (Assume air resistance is negligible).

(1) d (2) $2d$

(3) $\sqrt{2}d$ (4) $4d$

18. A particle is moving in a circular motion in the *xy*-plane. Its position vector is given by: $\vec{r}(t) = 4\cos(3t)\hat{i} + 4\sin(3t)\hat{j}$, where t is in seconds and r is in meters. What is the magnitude of the particle's centripetal acceleration?

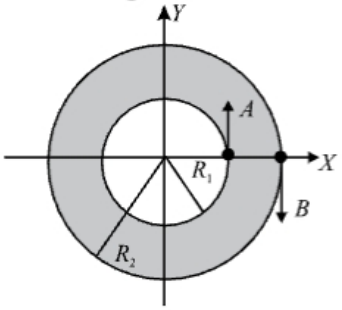
(1) 0 m/s^2 (2) 12 m/s^2
(3) 36 m/s^2 (4) 48 m/s^2

19. Match the physical situations described in List-I with the correct statement about the relationship between the velocity vector ($\vec{v}$) and the acceleration vector ($\vec{a}$) in List-II. Assume standard projectile motion (no air resistance) and ideal circular motion.

List-I (Physical Situation)		List-II (Condition for v and a)	
A.	For a particle undergoing uniform circular motion	I.	The angle between v and a is obtuse (between 90° and 180°)
B.	In oblique projectile motion, before attaining the maximum height	II.	The angle between v and a is acute (between 0° and 90°)
C.	In oblique projectile motion, after attaining the maximum height	III.	The velocity vector v is perpendicular to the acceleration vector a at all times.

(1) A-III, B-II, C-I
(2) A-III, B-I, C-II
(3) A-II, B-I, C-III
(4) A-II, B-III, C-I

20. Two particle A, B are moving on two concentric circles of radii R_1 and R_2 with equal angular speed ω. At $t = 0$, their positions and direction of motion are shown in the figure:



The relative velocity $\vec{v}_A - \vec{v}_B$ at $t = \frac{\pi}{2\omega}$ is given by:

(1) $\omega(R_1 + R_2)\hat{i}$ (2) $-\omega(R_1 + R_2)\hat{i}$
(3) $\omega(R_2 - R_1)\hat{i}$ (4) $\omega(R_1 - R_2)\hat{i}$

21. The velocities of three cars, A, B and C are $\vec{v}_A = (\hat{i} + 2\hat{j} - 3\hat{k})$ m/s, $\vec{v}_B = (-3\hat{i} - 6\hat{j} + 7\hat{k})$ m/s and $\vec{v}_C = (2\hat{i} + 4\hat{j} - 6\hat{k})$ m/s respectively. Which statement accurately describes the motion of the cars?

(1) Car B and Car C are moving in the same direction.
(2) All three cars are moving in different directions
(3) Car A and Car B are moving in the same direction.
(4) Car A and Car C are moving in the same direction.

22. A bird fly with a velocity of $15\sqrt{2}$ m/s in the North-West direction relative to the still air. A steady wind starts blowing at 7 m/s from North to South. What is the magnitude of the bird's resultant displacement with respect to ground after 10 seconds of flight?

(1) 220 m (2) 80 m
(3) 170 m (4) $150\sqrt{2}$ m

23. A particle starts from the origin at t = 0 with an initial velocity of $(5.0\hat{i} + 2.0\hat{j})$ m/s. It moves in the x-y plane with a constant acceleration of $(4.0\hat{i} + 2.0\hat{j})$m/s^2. What is the x-coordinate of the particle (in meters) at the instant when its y-coordinate is 24 m?

(1) 32 (2) 20
(3) 52 (4) 48

24. The path of a projectile in air as seen by an observer on another projectile in air is a/an; (neglect air resistance)

(1) Straight line (2) Parabola
(3) Ellipse (4) Circle

25. A particle is moving along a circular path with uniform speed in clockwise direction. Through what angle does direction of angular velocity change when it completes half of the circular path?

(1) 0° (2) 45°
(3) 180° (4) 90°

26. A boat is moving in direction of vector $-4\hat{i} - 3\hat{j}$ with a speed of 10 m/s. Velocity vector of boat can be:

(1) $-8\hat{i} - 6\hat{j}$ (2) $-\frac{4}{5}\hat{i} - \frac{3}{5}\hat{j}$
(3) $-6\hat{i} - 8\hat{j}$ (4) $-40\hat{i} - 30\hat{j}$

27. **Assertion (A):** To cross the river in minimum time, a swimmer should swim in a direction perpendicular to the river current.
Reason (R): When swimmer swim perpendicular to river current, then river flow helps to cross the river.
(1) A is true but R is false
(2) A is false but R is true
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true but R is NOT the correct explanation of A.

28. An object is in uniform circular motion. At a point P, on circle its velocity is $\vec{v} = (8.0\hat{i})$m/s and acceleration is $\vec{a} = (-16.0\hat{j})$m/s^2. What is the average acceleration vector as the object moves in a circle from point P to point Q, which makes a quarter of a revolution?
(1) $\frac{16}{\pi}(-\hat{i} - \hat{j})$m/s^2
(2) $\frac{32}{\pi}(-\hat{i} - \hat{j})$m/s^2
(3) $\frac{32}{\pi}(-\hat{i} + \hat{j})$m/s^2
(4) $\frac{64}{\pi}(-\hat{i} - \hat{j})$m/s^2

29. A particle is kept at rest at origin and given a variable acceleration as $\vec{a} = (3t^2\hat{i} + 2\sin t\hat{j})$m/s^2. Velocity of the particle as a function of time (t) is given by:
(1) $t^3\hat{i} + 2(\cos t - 1)\hat{j}$ m/s
(2) $t^3\hat{i} + 2(-\cos t + 1)\hat{j}$ m/s
(3) $t^3\hat{i} + 2(\sin t - 1)\hat{j}$ m/s
(4) $t^3\hat{i} + 2(-\sin t + 1)\hat{j}$ m/s

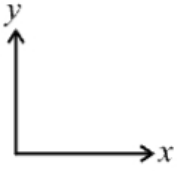
30. A swimmer can swim with a speed of 2.0 m/s in still water. He want to cross a river that is 100 meters wide and flows with a constant speed of 1.5 m/s. Which of the following times is it impossible for the swimmer to achieve for a complete crossing of the river from one bank to opposite bank?
(1) 45 s (2) 50 s
(3) 60 s (4) 80 s

31. Two stones A and B are thrown horizontally with velocities 10 m/s and 70 m/s respectively from a height of 100 m. Choose the **correct** option based on above information.
(1) A will hit the ground first
(2) B will hit the ground first
(3) Both will hit the ground simultaneously with different speed
(4) Both will hit the ground simultaneously with same speed

32. It is raining vertically downward at 20 m/s in still air. Now wind starts blowing with speed 10 m/s in north direction. If a cyclist starts moving at 10 m/s in south direction, then the apparent velocity of rain with respect to cyclist is;
(1) 20 m/s (2) $20\sqrt{2}$ m/s
(3) $10\sqrt{5}$ m/s (4) 30 m/s

33. A stone tied to the end of a 80 cm long string is whirled in a horizontal circle with a constant speed. If the stone makes 14 revolution in 22 s, the magnitude of its acceleration is; $\left(\pi = \frac{22}{7}\right)$
(Neglect gravity)
(1) 20 m/s^2 (2) 12.8 m/s^2
(3) 9.9 m/s^2 (4) 8.4 m/s^2

34. An object is projected at some angle with horizontal. The x coordinate of projection at t = 0 is x = 10 m. Two second after projection, object is observed to be at coordinates (x = 70 m, y = 60 m) and its vertical component of velocity is measured to be $v_y = (+20\hat{j})$m/s. What is the speed of object just before it lands back on ground? (Projectile motion is in x-y plane) (g = 10 m/s^2)



(1) $30\sqrt{2}$ m/s (2) $40\sqrt{2}$ m/s
(3) 50 m/s (4) 60 m/s

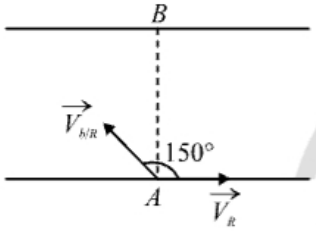
35. The position vector of a moving particle at any time t is given by $\vec{r} = (3t\hat{i} - 4t^2\hat{j} + 2t^3\hat{k})$ m. Its acceleration at t = 1 s is;
(1) $\sqrt{108}$ m/s^2 (2) $\sqrt{308}$ m/s^2
(3) $\sqrt{408}$ m/s^2 (4) $\sqrt{208}$ m/s^2

36. A ball is thrown at an angle of θ to the horizontal such that it covers maximum horizontal range. The value of sec θ is;

(1) $\frac{1}{\sqrt{2}}$ (2) $\sqrt{2}$

(3) 2 (4) $\frac{1}{2}$

37. A man can row a boat with speed $V_{b/R}$ = 5 km/hr in still water. To reach the directly opposite end B on the other side of river, he heads the boat from position A at an angle of 150° with direction of flow of river as shown in figure. The speed of river flow V_R is:



(1) $\frac{5}{2}$ km/hr (2) $\frac{5\sqrt{3}}{2}$ km/hr

(3) $\frac{5}{\sqrt{3}}$ km/hr (4) $\frac{5\sqrt{2}}{3}$ km/hr

38. An object is launched from the ground at t = 0 and follows a parabolic path. At time t_1 = 2.0 s, its height is observed to be 70 m. Later, at time t_2 = 4 s, its height is 100 m. Assuming gravity g = 10 m/s^2, what is the maximum height (H_{max}) reached by the object?

(1) 100.0 m (2) 105.5 m

(3) 110.0 m (4) 101.25 m

39. An air traffic controller tracks two airplanes. Relative to the control tower (at origin), airplane A is flying due north at constant speed 200 km/hr and airplane B is flying to south east at speed $200\sqrt{2}$ km/hr. What is the relative velocity of airplane B wrt to A? (+x axis point east and +y point north)

(1) $(200\hat{i})$km/hr

(2) $(-200\hat{i} + 400\hat{j})$km/hr

(3) $(200\hat{i} - 400\hat{j})$km/hr

(4) $(200\hat{i} - 200\hat{j})$km/hr

40. A particle is initially at rest at origin. Two perpendicular accelerations a_x = 3 m/s^2 and a_y = 4 m/s^2 start acting on it, then the trajectory of motion of the particle will be:

(1) Circle (2) Ellipse

(3) Parabola (4) Straight Line

41. A gun fires two bullets at 60° and 30° with the horizontal from same position. The bullets strikes at same horizontal distance. The ratio of maximum heights for the two bullets is;

(1) 1 : 4 (2) 3 : 4

(3) 3 : 1 (4) 2 : 1

42. A stone is thrown horizontally with some initial speed from a balloon rising upward with constant acceleration a. The acceleration of the stone relative to the ground is: (g is acceleration due to gravity)

(1) g, downwards

(2) $(g + a)$, downwards

(3) $(g - a)$, upwards

(4) $g + a$, upwards

43. The trajectory of a projectile launched from the ground is described by the equation:

$y = \sqrt{3}x - \frac{1}{20}x^2$ where x and y are the horizontal and vertical coordinates in meters, respectively. Assuming the acceleration due to gravity g = 10 m/s^2, what is the speed of the projectile at the highest point of its trajectory?

(1) 0 m/s (2) 20 m/s

(3) 17.32 m/s (4) 10 m/s

44. A person P can complete one round of a circular track in 30 s. Another person R can complete one round of the same circular track in 40 s. Both P and R start from a common point and start moving simultaneously in opposite sense on the circular track. After how much time both of them will collide?

(1) $\frac{120}{7}$ s (2) $\frac{60}{7}$ s

(3) $\frac{240}{7}$ s (4) $\frac{150}{7}$ s

45. A man walks 10 km due East, $10\sqrt{3}$ km due North and 30 km 60° South of West. Find resultant displacement of man.

(1) 20 km, 60° South of East

(2) 5 km, 30° South of West

(3) 10 km, 60° South of West

(4) 10 km, 60° West of South

46. Given below are two statements:
Statement I: In an aqueous solution hydronium ion is hydrated to give species like $H_5O_2^+, H_7O_3^+$ etc.
Statement II: BF_3 can act as a Lewis acid.
In the light of the above statements, choose the *most appropriate* answer from the options given below:
(1) Both Statement I and Statement II are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Both Statement I and Statement II are incorrect.

47. Consider the following processes:
A. $PCl_3(g) + Cl_2(g) \rightarrow PCl_5(g)$
B. $NH_4HS(s) \rightarrow NH_3(g) + H_2S(g)$
C. $H_2O(\ell) \rightarrow H_2O(g)$
D. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$
Identify the process in which ΔS is positive
(1) B and C
(2) A and C
(3) C and D
(4) A, B and D

48. The favourable conditions for the dissociation of $NaNO_3(s)$ into $NaNO_2(s)$ and $O_2(g)$ are;
(1) high temperature and low pressure
(2) high temperature and high pressure
(3) low temperature and high pressure
(4) low temperature and low pressure

49. The difference between heat of reactions at constant pressure and constant volume for the combustion of one mole of propane (g) at 27°C is;
(1) –2.52 kJ
(2) –7.48 kJ
(3) –4.67 kJ
(4) –5.38 kJ

50. The equilibrium constant (K_c) for the reaction $A + B \rightleftharpoons C$ is 2×10^{-4}. The equilibrium constant for the reaction $2C \rightleftharpoons 2A + 2B$ will be;
(1) 2.5×10^8
(2) 5×10^4
(3) 5×10^6
(4) 2.5×10^7

51. How many properties among the following are intensive properties?
Enthalpy, Molar heat capacity, Entropy, Gibb's energy, Temperature, Internal energy
(1) 2
(2) 3
(3) 4
(4) 5

52. Which among the following salts does **not** undergo hydrolysis?
(1) KCN
(2) NH_4NO_3
(3) HCOONa
(4) $CaCl_2$

53. Given below are two statements:
Statement I: $T\Delta S_{sys}$ is the energy which is not available to do useful work.
Statement II: For CO(g), $\Delta_f H°$ is positive.
In the light of the above statements, choose the *most appropriate* answer from the options given below:
(1) Both Statement I and Statement II are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Both Statement I and Statement II are incorrect.

54. The solubility of AgCl will be maximum in;
(1) 0.1 M $AgNO_3$
(2) pure water
(3) 0.1 M $CaCl_2$
(4) 0.1 M NH_3

55. The standard enthalpy of formation of $C_2H_6(g)$, $CO_2(g)$ and $H_2O(\ell)$ are x, y and z kJ mol^{-1} respectively. The standard enthalpy of combustion of ethane (in kJ mol^{-1}) will be;
(1) $3y + 2z - x$
(2) $2y + x - 3z$
(3) $2z + 3x - y$
(4) $2y + 3z - x$

56. The pH of 0.01 M $Ca(OH)_2$ solution will be:
(1) 12
(2) 13.7
(3) 11.7
(4) 12.3

57. $\Delta_f H°$ at 298K of $C_2H_5OH(\ell)$ is given by which reaction?

(1) $2CH_4(g) + O_2(g) \rightarrow C_2H_5OH(\ell) + H_2O(\ell)$

(2) $2C(\text{graphite}) + \frac{1}{2}O_2(g) + 3H_2(g) \rightarrow C_2H_5OH(\ell)$

(3) $4C(\text{diamond}) + O_2(g) + 6H_2(g) \rightarrow 2C_2H_5OH(\ell)$

(4) $C_2H_6(g) + \frac{1}{2}O_2(g) \rightarrow C_2H_5OH(\ell)$

58. Which of the following can act as Bronsted acid as well as Bronsted base?

(1) H_3PO_4

(2) $H_2PO_3^-$

(3) HPO_3^{2-}

(4) $H_2PO_2^-$

59. Given below are two statements:

Statement I: The energy of an isolated system is zero.

Statement II: In a closed system, there is no exchange of matter, but exchange of energy is possible between system and surrounding.

In the light of the above statements, choose the *most appropriate* answer from the options given below:

(1) Both Statement I and Statement II are correct.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are incorrect.

60. If solubility of Ag_2SO_4 in water is S mol L^{-1} then its solubility of 0.1 M H_2SO_4 will be;

(1) 10 S M (2) $(10)^{1/3}$ S M

(3) $(10\ S^3)^{1/2}$ M (4) S M

61. Match **List-I** with **List-II**.

List-I (Spontaneity of reactions)		**List-II (Conditions)**	
(A)	Non-spontaneous at all temperatures	(I)	$\Delta_r H < 0$ and $\Delta_r S < 0$
(B)	Spontaneous at all temperatures	(II)	$\Delta_r H > 0$ and $\Delta_r S > 0$
(C)	Spontaneous only at high temperatures	(III)	$\Delta_r H > 0$ and $\Delta_r S < 0$
(D)	Spontaneous only at low temperatures	(IV)	$\Delta_r H < 0$ and $\Delta_r S > 0$

Choose the **correct** answer from the options given below:

(1) A-III; B-II; C-IV; D-I

(2) A-I; B-III; C-IV; D-II

(3) A-III; B-IV; C-II; D-I

(4) A-II; B-I; C-IV; D-III

62. Unit of K_c for the equilibrium $2NH_3(g) + \frac{5}{2}O_2(g) \rightleftharpoons 2NO(g) + 3H_2O(g)$, is:

(1) $\text{mol}^{\frac{1}{2}}\ L^{-\frac{1}{2}}$

(2) $\text{mol}\ L^{-1}$

(3) $\text{mol}^{-\frac{3}{2}}\ L^{\frac{3}{2}}$

(4) $\text{mol}^{-2}\ L^2$

63. Born Haber cycle is used to measure:

(1) enthalpy of combustion of hydrocarbons

(2) enthalpy of solution

(3) lattice enthalpy of ionic compounds

(4) bond energy of polyatomic molecules

64. The **correct** order of acidic strength is:

(1) $H_2O > HF > CH_4 > NH_3$

(2) $HF > H_2O > NH_3 > CH_4$

(3) $H_2O > NH_3 > HF > CH_4$

(4) $HF > NH_3 > H_2O > CH_4$

65. Two moles of an ideal gas at 27°C expands spontaneously into vacuum. The work done by the gas is,

(1) zero

(2) $2 \times 300 \times R$ J

(3) 2×300 J

(4) $2 \times R$ J

66. 1 L each of 0.15 M CH_3COOH and 0.05 M NaOH are mixed, the pH of resulting solution will be: [Given: $pK_a(CH_3COOH) = 4.7$]

(1) 4.4

(2) 4.7

(3) 5.2

(4) 3.8

67. 2 moles of an ideal gas expands isothermally and reversibly at 25°C from 10 L to 20 L. The entropy change (in $JK^{-1}\ mol^{-1}$) in the process is:

(1) 11.21 R (2) 14.91 R

(3) 12.45 R (4) 1.386 R

68. Given below are two statements: one is labelled as Assertion A and other is labelled as Reason R:
Assertion A: At equilibrium, there is no net change in composition of chemical reactions.
Reason R: At equilibrium, rate of forward and reverse reactions are equal.
In the light of above statements, choose the **correct** answer from the options given below:
(1) A is true but R is false.
(2) A is false but R is true.
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true and R is NOT the correct explanation of A.

69. ΔH and ΔS for a reaction are 1500 J mol^{-1} and 7.5 JK^{-1} mol^{-1}. The reaction will be spontaneous:
(1) below 100 K
(2) above 200 K
(3) at 100 K
(4) at 200 K

70. For the equilibrium A + B ⇌ 2C, the equilibrium constant (K_c) is 16. If initially 2 mol of A and 2 mol of B are added in 1L flask, then the equilibrium concentration of C is:
(1) 2.66 M
(2) 0.53 M
(3) 0.86 M
(4) 1.33 M

71. A system does 150 J of work and at the same time absorb 40 J of Heat. The change in internal energy of the system is:
(1) 190 J (2) –110 J
(3) –190 J (4) 110 J

72. The hydrolysis constant for NaX salt at 25°C will be:
[Given: $K_a(HX) = 1 \times 10^{-8}$]
(1) 10^{-22}
(2) 5×10^{-5}
(3) 10^{-6}
(4) 4×10^{-8}

73. If K_c for the reaction A ⇌ B + C, is 10^{-20}, then ΔG° of the reaction at 300 K is;
(1) 57.44 kJ mol^{-1}
(2) 94.26 kJ mol^{-1}
(3) 114.88 kJ mol^{-1}
(4) 72.22 kJ mol^{-1}

74. Consider the equilibrium,
$NH_2COONH_4(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$
if at equilibrium total pressure is 6 atm, then K_p for the reaction will be,
(1) 8 atm^3
(2) 32 atm^3
(3) 16 atm^3
(4) 24 atm^3

75. The average bond enthalpy of N–H bond at 25°C (in kJ mol^{-1}) is:
[Given: $BE_{H_2} = x$ kJ mol^{-1}, $BE_{N-N} = w$ kJ mol^{-1}, $BE_{N_2} = y$ kJ mol^{-1}, $(\Delta_f H^\circ)_{N_2H_4} = z$ kJ mol^{-1}]
(1) $\frac{1}{2}[y + x - z - w]$
(2) $\frac{1}{4}[2y + z + w - x]$
(3) $\frac{1}{4}[y + 2x - z - w]$
(4) $2[z + x - 2y - w]$

76. The degree of ionization of 0.1 M acid (HX) is:
(Given: $K_a(HX) = 1 \times 10^{-9}$)
(1) 0.1 (2) 0.001
(3) 0.01 (4) 0.0001

77. Most stable compound among the following is:
(1) AB ($\Delta_f H^\circ = -212$ kJ mol^{-1})
(2) P_2Q ($\Delta_f H^\circ = +68$ kJ mol^{-1})
(3) X_3Y_2 ($\Delta_f H^\circ = -105$ kJ mol^{-1})
(4) YZ_2 ($\Delta_f H^\circ = +312$ kJ mol^{-1})

78. Match **List-I** with **List-II**.

List-I (Aq. solution of salt at 25°C)		**List-II (pH)**	
(A)	NaCN	(I)	pH = 7
(B)	NH_4NO_3	(II)	$pH = 7 + \frac{1}{2}[pK_a - pK_b]$
(C)	NaCl	(III)	$pH = 7 - \frac{1}{2}[pK_b + \log C]$
(D)	CH_3COONH_4	(IV)	$pH = 7 + \frac{1}{2}[pK_a + \log C]$

Choose the **correct** answer from the options given below:
(1) A-IV; B-III; C-I; D-II
(2) A-I; B-III; C-IV; D-II
(3) A-III; B-IV; C-II; D-I
(4) A-II; B-I; C-IV; D-III

79. A gas at 27°C expands from 3 L to 4 L against a constant external pressure of 3 atm under isothermal conditions. The work done by the gas is: (1 L-atm = 101.3 J)

(1) –720 J (2) –303.9 J
(3) –206.6 J (4) –102.6 J

80. Given below are two statements:

Statement-I: If K_c is in the range of 10^{-3} to 10^3, the products predominate over reactants.

Statement-II: if $Q_c > K_c$, net reaction goes in forward direction.

In the light of the above statements, choose the *most appropriate* answer from the options given below:

(1) Both Statement I and Statement II are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Both Statement I and Statement II are incorrect.

81. Which of the following is **not** a state function?

(1) H (2) U
(3) W (4) H-TS

82. For which of the following equilibrium, $K_p \neq K_c$?

(1) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$
(2) $NO(g) + SO_3(g) \rightleftharpoons NO_2(g) + SO_2(g)$
(3) $2C(s) + O_2(g) \rightleftharpoons 2CO(g)$
(4) $2HCl(g) \rightleftharpoons H_2(g) + Cl_2(g)$

83. For reversible isothermal expansion of an ideal gas, the **incorrect** option is,

(1) $\Delta S > 0$
(2) $q > 0$
(3) $\Delta H < 0$
(4) $\Delta U = 0$

84. If α ($<<< 1$) is degree of dissociation of $N_2O_4(g)$ and total pressure at equilibrium is P then the degree of dissociation for $N_2O_4(g)$ is;

$$N_2O_4 \overset{K_p}{\rightleftharpoons} 2NO_2$$

(1) $2\left(\frac{K_p}{P}\right)^{1/3}$ (2) $\frac{1}{4}\left(\frac{P}{K_p}\right)$

(3) $\frac{1}{2}\left(\frac{K_p}{P}\right)^{1/2}$ (4) $\frac{2K_p}{P}$

85. The amount of heat required to raise the temperature of 5g of iron from 25°C to 95°C is; (Given: specific heat of iron is 0.45 $Jg^{-1} K^{-1}$)

(1) 157.5 J
(2) 131.8 J
(3) 142.3 J
(4) 149.7 J

86. The equilibrium constant K_p for the reaction, $SO_2Cl_2(g) \rightleftharpoons SO_2(g) + Cl_2(g)$ changes with:

(1) increase in pressure
(2) addition of catalyst
(3) increasing the concentration of SO_2Cl_2
(4) increase in temperature

87. Given below are two statements: one is labelled as Assertion A and other is labelled as Reason R:

Assertion A: For chemical reactions, heat absorbed at constant volume, is measured in a bomb calorimeter.

Reason R: During chemical reaction, temperature of bomb calorimeter does not change.

In the light of above statements, choose the **correct** answer from the options given below:

(1) A is true but R is false.
(2) A is false but R is true.
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true and R is NOT the correct explanation of A.

88. The dissociation of PCl_5 into PCl_3 and Cl_2 at constant temperature is favoured by;

(1) decreasing the volume of container
(2) adding Cl_2 gas at constant volume
(3) Adding inert gas at constant volume
(4) Adding inert gas at constant pressure

89. If the enthalpy of combustion of carbon is –x kJ mol^{-1}, then the heat released during combustion of 0.12 g Carbon is:

(1) 0.1 x kJ
(2) 0.01 x kJ
(3) 10 x kJ
(4) 100 x kJ

90. At T K, pure water has $[H_3O^+] = 10^{-8}$ mol L^{-1}. The value of K_w at T K is:

(1) 10^{-14}
(2) 10^{-8}
(3) 10^{-16}
(4) 10^{-12}

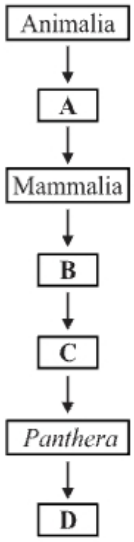
91. Which of the following is considered a defining property of living organisms?
(1) Increase in body mass
(2) The ability to reproduce
(3) The sum total of all chemical reactions occurring in the body
(4) Awareness about self

92. Aristotle's classification of animals was based on:
(1) scientific criteria involving cell structure.
(2) the presence or absence of a cell wall.
(3) whether they possessed red blood or not.
(4) their mode of nutrition and habitat.

93. The biological name of mustard is *Brassica campestris* Linn. Choose the incorrect statement about it.
(1) More than one species of mustard can be included in the given genus.
(2) *campestris* represents the specific epithet.
(3) Linnaeus was the first one to describe this species.
(4) The name *Brassica campestris* is derived from Greek language.

94. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Archaebacteria can survive in extremely harsh habitats.
Reason R: Archaebacteria possess a cell wall but other bacteria lack it.
In the light of the above statements, choose the **correct** answer from the options given below.
(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.

95. Shown below is the arrangement of taxonomical hierarchy of an organism. Identify the **correct** statement about it.



(1) Maximum number of common characteristics will be observed at the level of 'A'.
(2) 'D' stands for species like *domestica*.
(3) In 'B', several classes of the organism are included.
(4) 'C' represents the taxon family which is same for *Panthera* and cats.

96. Consider the following statements regarding Kingdom Protista:
A. The boundaries of this kingdom are very well defined.
B. Members are primarily aquatic.
C. It forms a link with the kingdoms Plantae, Animalia and Fungi.
D. Being prokaryotic, the members lack a well-defined nucleus.
E. The members reproduce only asexually.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) A, B, and C are correct but D and E are incorrect
(2) B and C are correct but A, D and E are incorrect
(3) A, C, and E are correct but D and B are incorrect
(4) C, D, and E are correct but A and B are incorrect

97. Match **List-I** with **List-II**.

List-I		List-II	
(A)	Family	(I)	Diptera
(B)	Order	(II)	Arthropoda
(C)	Class	(III)	Muscidae
(D)	Phylum	(IV)	Insecta

Choose the *most appropriate* answer from the options given below.
(1) A-I, B-II, C-IV, D-III
(2) A-III, B-IV, C-II, D-I
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

98. The cell walls of diatoms;
(1) are embedded with chitin.
(2) are indestructible.
(3) form diatomaceous earth within a week of depositions.
(4) are of no use to mankind.

99. Given below are two statements:
Statement I: Human beings had never been interested in knowing about the various kinds of organisms.
Statement II: Mules are living organisms but do not reproduce.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement I is incorrect but Statement II is correct.

100. Identify the **true** statement.
(1) A type of true bacteria produce biogas from cow dung.
(2) Mycoplasma are unicellular prokaryotic organisms.
(3) Thermoacidophiles can survive easily in marshy areas.
(4) Methanogens are found in the gut of ruminants like dog and cat.

101. The structure called pellicle;
A. is present in coenocytic fungi.
B. makes the body of organism flexible.
C. is rich in phospholipids.
D. is proteinaceous.
E. is present in organisms that may behave as either autotrophic or heterotrophic depending upon conditions.
Choose the **correct** option.
(1) A, B and C
(2) B, C and D
(3) B, D and E
(4) A, C and E

102. Match **List-I** with **List-II**.

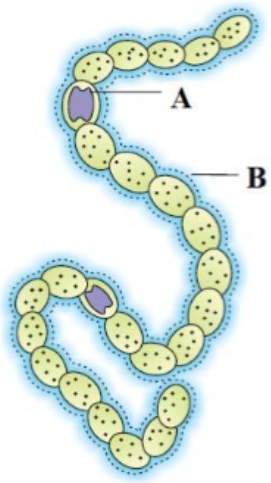
List-I		List-II	
(A)	Amoeboid protozoans	(I)	Have an infectious spore-like stage
(B)	Flagellated protozoans	(II)	Move and capture prey using pseudopodia
(C)	Ciliated protozoans	(III)	One of these causes sleeping sickness
(D)	Sporozoans	(IV)	Active movement due to thousands of locomotory structures on surface

Choose the *most appropriate* answer from the options given below.
(1) A-II, B-III, C-IV, D-I
(2) A-III, B-IV, C-II, D-I
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

103. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Systematics takes into account evolutionary relationships between organisms.
Reason R: The scope of systematics was later reduced to include identification, nomenclature and classification.
In the light of the above statements, choose the correct answer from the options given below.
(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.

104. A newly discovered non-cellular organism could not find any place in Whittaker's 5-kingdom classification system. What can be true about it?
(1) It is a new species of lichen.
(2) It lacks any infectious particle hence cannot be classified in any of the five kingdoms proposed by Whittaker.
(3) It shows both living as well as non-living characteristics.
(4) It is an obligate autotroph.

105. Go through the diagram given below:



Choose the **incorrect** statement about it.
(1) This organism can fix atmospheric nitrogen in specialized cells labeled as 'A'.
(2) These belong to kingdom Monera.
(3) Being exclusively terrestrial, they are surrounded by a gelatinous sheath labeled as 'B'.
(4) These are able to perform photosynthesis.

106. Identify the **incorrect** statements regarding Fungi.
A. With the exception of yeasts, fungi are unicellular.
B. The cell walls of fungi are composed of only polysaccharides.
C. Some fungi are symbiotic in association with algae as in mycorrhiza.
D. The network of hyphae in them is known as mycelium.
E. All fungi can reproduce sexually as well as asexually.
Choose the **correct** option.
(1) A, B, C and D (2) A, C, D and E
(3) B, C and D only (4) A, B, C and E

107. Choose the **correctly** matched pair.
(1) *Systema Naturae* : R. H. Whittaker
(2) Binomial Nomenclature : Aristotle
(3) Two-kingdom classification system : Carolus Linnaeus
(4) Three-domain classification system : Ernst Mayr

108. Given below are two statements:
Statement I: In ascomycetes and basidiomycetes, fusion of two haploid cells is immediately followed by karyogamy.
Statement II: In phycomycetes and deuteromycetes, a dikaryotic stage (n+n) is formed after plasmogamy.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) Statement I is correct but Statement II is incorrect.
(2) Statement I is incorrect but Statement II is correct.
(3) Both Statement I and Statement II are correct.
(4) Both Statement I and Statement II are incorrect.

109. Match **List-I** with **List-II**.

List-I		List-II	
(A)	*Petunia*	(I)	Class Monocotyledonae
(B)	*Mangifera*	(II)	Order Polymoniales
(C)	*Triticum*	(III)	Family Anacardiaceae
(D)	*Musca*	(IV)	Kingdom Animalia

Choose the *most appropriate* answer from the options given below.
(1) A-II, B-III, C-I, D-IV
(2) A-III, B-IV, C-II, D-I
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

110. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: The ascospores in *Penicillium* are produced in club-like asci.
Reason R: The ascospores are spores produced endogenously in asci, and meant for sexual reproduction in *Penicillium*.
In the light of the above statements, choose the correct answer from the options given below.
(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.

111. Select the **incorrect** statement from the following.
(1) Unicellular organisms grow by cell division.
(2) For unicellular organisms, reproduction is synonymous with growth.
(3) Multicellular organisms grow by cell division.
(4) A dead organism grows by accumulation of material on the surface.

112. *Albugo*;
A. is a parasitic fungus.
B. belongs to phycomycetes.
C. is commonly called bread mould.
D. reproduces asexually by motile aplanospores.
E. has a septate and branched mycelium.
Choose the **correct** option.
(1) A and B (2) B and C
(3) C and D (4) D and E

113. Identify the **incorrect** statement w.r.t *Homo sapiens*.
(1) They belong to the same order as monkey.
(2) They belong to the same class as dogs.
(3) They show the presence of notochord and dorsal hollow neural system.
(4) They belong to the same phylum as *Musca*.

114. Match **List-I** with **List-II**.

List-I		List-II	
(A)	Parasitic plant	(I)	All animals
(B)	Holozoic nutrition	(II)	*Agaricus*
(C)	Autotrophic unicellular eukaryote	(III)	*Cuscuta*
(D)	Saprophytic multicellular eukaryote	(IV)	Desmid

Choose the *most appropriate* answer from the options given below.
(1) A-II, B-III, C-I, D-IV
(2) A-III, B-IV, C-II, D-I
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

115. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: The taxonomical category Division represents an aggregate of classes of plants with a few similar characters.
Reason R: The category Division lies between kingdom and phylum in the taxonomical hierarchy.
In the light of the above statements, choose the **correct** answer from the options given below.
(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.

116. Read the following statements.
A. Cyanobacteria have chlorophyll '*b*' similar to higher plants.
B. Chemosynthetic autotrophic bacteria play a great role in recycling nutrients.
C. Heterotrophic bacteria are the most abundant in nature.
D. Bacteria reproduce mainly by fission.
E. Some bacteria produce spores under favourable conditions.
How many of the above statements are **correct**?
(1) Five
(2) Four
(3) Zero
(4) Three

117. Choose the **incorrectly** matched pair.
(1) Lichens : Good pollution indicators
(2) Viroids : RNA is of low molecular weight
(3) Prions : Cause BSE in cow and CJD in humans
(4) Mycorrhiza : Possess two components phycobiont and mycobiont

118. Given below are two statements:
Statement I: M.W. Beijerinck recognised certain microbes as causal organism of the mosaic disease of tobacco.
Statement II: Dmitri Ivanowsky showed that viruses could be crystallised and crystals consist largely of proteins.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement I is incorrect but Statement II is correct.

119. All the following can multiply by fragmentation, **except**;
(1) protonema of mosses.
(2) fungi.
(3) *Amoeba*.
(4) filamentous algae.

120. The main criteria used by R.H. Whittaker for classification of organisms into various kingdoms included:
A. Body organization
B. Phylogenetic relationships between organisms
C. Presence or absence of a notochord
D. Mode of nutrition
E. Mode of reproduction
(1) A, B, D and E (2) A, B, C and D
(3) B, C, D and E (4) A, C, D and E

121. Which of the following statements about living organisms are **correct**?
A. Properties of tissues arise as a result of interactions among the constituent cells.
B. Living organisms are self-replicating, evolving and self-regulating interactive systems.
C. All present day living organisms are related to each other.
D. Early man deified some of the inanimate matter (animals and plants) and some among the wind, sea and fire.
E. All present day living organisms are related to all organisms that ever lived on this earth.
Select the **correct** option.
(1) A and B only (2) B, C and D only
(3) A and D only (4) A, B, C and E

122. The organisms that make the sea appear red show all the given characteristics, **except** that they;
(1) release toxins that can kill marine fishes.
(2) are mostly marine and photosynthetic.
(3) have stiff cellulose plates on the inner surface of cell membrane.
(4) are biflagellate.

123. Match **List-I** with **List-II**.

List-I		List-II	
(A)	Budding	(I)	Yeast and *Paramoecium*
(B)	Unicellular	(II)	*Claviceps* and *Alternaria*
(C)	Conidia	(III)	Yeast and hydra
(D)	Alternation of generations	(IV)	Bladderwort and Venus fly trap

Choose the *most appropriate* answer from the options given below.
(1) A-II, B-III, C-I, D-IV
(2) A-III, B-I, C-II, D-IV
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

124. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: The two-kingdom classification system was found to be inadequate.
Reason R: It did not distinguish between eukaryotes and prokaryotes, unicellular and multicellular organisms, and photosynthetic and non-photosynthetic organisms.
In the light of the above statements, choose the correct answer from the options given below.
(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.

125. Given below are two statements:
Statement I: Societies which indulged in anthropocentric view of biology could register limited progress in biological knowledge.
Statement II: The description of living organisms including human beings began much later in human history.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) Both Statement I and Statement II are correct.
(2) Both Statement I and Statement II are incorrect.
(3) Statement I is correct but Statement II is incorrect.
(4) Statement I is incorrect but Statement II is correct.

126. Coenocytic mycelium, characterized by a continuous tube filled with multinucleated cytoplasm, is found in:
(1) *Trichoderma* and *Neurospora.*
(2) *Rhizopus* and *Mucor.*
(3) puff balls and morels.
(4) truffles and mushroom.

127. Select the **correct** arrangement of taxonomical categories of tiger in ascending order.
(1) *tigris* → *Panthera* → Felidae → Carnivora → Mammalia → Chordata → Animalia
(2) *tigris* → *Panthera* → Carnivora → Mammalia → Felidae → Chordata → Animalia
(3) Animalia → Chordata → Mammalia → Carnivora → Felidae → *Panthera* → *tigris*
(4) Animalia → Carnivora → Felidae → Chordata → Mammalia → *Panthera* → *tigris*

128. Match **List-I** with **List-II**.

List-I		List-II	
(A)	Plant viruses	(I)	Usually dsDNA
(B)	Animal viruses	(II)	Generally ssRNA
(C)	Bacterial viruses	(III)	ssRNA, dsRNA or dsDNA
(D)	Prions	(IV)	Lack both DNA and RNA

Choose the *most appropriate* answer from the options given below.
(1) A-II, B-III, C-I, D-IV
(2) A-III, B-I, C-II, D-IV
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-I, C-IV, D-II

129. Choose the **incorrect** statement.
(1) The taxonomic groups/ categories are distinct biological entities and not merely morphological aggregates.
(2) Characterisation, identification, classification and nomenclature are the processes that are basic to taxonomy.
(3) Classification is a single step process.
(4) Each taxonomical category, referred to as a unit of classification, in fact, represents a rank and is commonly termed as taxon.

130. Which of the following statements about viruses are **correct**?
A. No virus contains both RNA and DNA.
B. The genetic material is infectious.
C. Tobacco mosaic is caused by a virus having ssDNA.
D. The capsid is made of capsomeres.
E. A virus is a nucleoprotein.
(1) A, B, C and D (2) B, C, D and E
(3) A, C and D only (4) A, B, D and E

131. Choose the **incorrect** statement.
(1) The most obvious and technically complicated feature of all living organisms is this ability to sense their surroundings or environment and respond to these environmental stimuli.
(2) The environmental stimuli could be physical, chemical or biological.
(3) Plants cannot respond to external factors like water, temperature, other organisms, pollutants, etc.
(4) Photoperiod affects reproduction in seasonal breeders, both plants and animals.

132. Given below are two statements:
Statement I: Kingdom Protista includes all single-celled eukaryotes.
Statement II: Kingdom Protista includes Chrysophytes, Dinoflagellates, Euglenoids, Slime-moulds and Protozoans.
In the light of the above statements, choose the **correct** answer from the options given below.
(1) Statement I is correct but Statement II is incorrect.
(2) Statement I is incorrect but Statement II is correct.
(3) Both Statement I and Statement II are correct.
(4) Both Statement I and Statement II are incorrect.

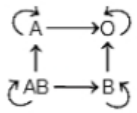
133. All of the following are true for the term 'Biology', **except** that;
(1) it is the story of life on earth.
(2) it is the story of evolution of living organisms on earth.
(3) it is the science of living processes.
(4) it is the science of non-life forms.

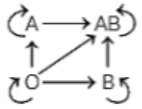
134. The sole members of kingdom Monera;
(1) lack cell wall.
(2) possess well-defined nucleus and membrane-bound organelles.
(3) can be divided into four categories based on their shape.
(4) are never found as parasites.

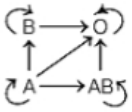
135. Which of the following is not at the same level of taxonomical hierarchy as others?
(1) Mammalia
(2) Insecta
(3) Dicotyledonae
(4) Sapindales

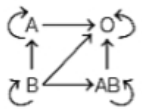
■■■

136. Which of the given options is **correct** about blood groups and donor compatibility?

(1) 

(2) 

(3) 

(4) 

137. Which of the following statements is **correct** regarding the cardiac cycle?

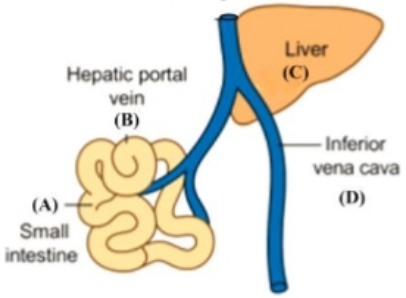
(1) Atrial systole is the longest phase of the cardiac cycle.
(2) Ventricular systole lasts three times longer than atrial systole.
(3) Joint diastole accounts for 25% of the cardiac cycle.
(4) The duration of ventricular systole is equal to that of joint diastole.

138. Read the following statements about the lymphatic system and identify how many of them are **correct**:

A. Lymph is similar to blood plasma but lacks red blood cells and has lower protein content.
B. Lymph capillaries are blind-ended and help in absorbing excess tissue fluid.
C. The lymphatic system forms a closed circulatory loop similar to blood vessels.
D. Lymph is eventually drained into the subclavian veins through thoracic or right lymphatic ducts.
E. The primary function of lymph is oxygen transport to tissues.

(1) Two (2) Three
(3) Four (4) All five

139. Observe the given diagram of the hepatic portal system and answer the question:



Which of the following statements based on the diagram is **correct**?

(1) Vessel B carries oxygenated blood directly to the liver for metabolism.
(2) The liver receives blood from both the hepatic portal vein and hepatic artery.
(3) Blood from the liver drains directly into the aorta through vessel D.
(4) The hepatic portal system is absent in non-vertebrates like frogs and fishes.

140. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: In double circulation, the right and left halves of the heart pump blood to the lungs and body respectively, without any mixing.

Reason R: In double circulation, oxygenated and deoxygenated blood remain completely separated due to the presence of a common ventricle.

In the light of the above statements, choose the **correct** answer from the options given below:

(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.

141. In humans, blood passes from the postcaval (inferior vena cava) to the diastolic right atrium of the heart due to;

(1) Pressure difference between the postcaval and atrium
(2) Stimulation of sino-auricular node
(3) Pushing open of the venous valves
(4) Suction pull

142. Read the following statements regarding Rh antibodies and Rh incompatibility:

A. Rh antibodies are naturally present in the plasma of all Rh-negative individuals.
B. Rh-negative mothers can produce Rh antibodies if she is exposed to Rh-positive fetal blood.
C. Nearly 20% of humans are Rh negative.
D. Rh antibodies belong to the IgG class and can cross the placental barrier.
E. Administration of anti-Rh immunoglobulin to the mother after the first delivery can prevent Rh sensitization.

Which of the following combinations includes only the **correct** statements?

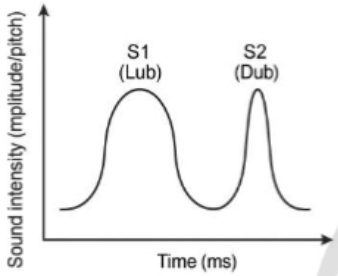
(1) A, B, D (2) B, C, D, E
(3) A, C, E (4) B, C, E only

143. Choose the **incorrect** statement.

(1) In an athlete, the cardiac output at rest is normal w.r.t other individuals, with lesser heart rate and greater stroke volume
(2) Greater the heart rate, greater is the cardiac output (up to a certain limit)
(3) The stroke volume of the heart increases in response to an increase in the volume of blood filling the heart
(4) Lesser the length of cardiac muscle fibre, greater is the force of contraction of heart

144. Injury to the chordae tendineae of the heart is likely to lead to which of the following consequences?
(1) Inability of semilunar valves to prevent backflow of blood into ventricles.
(2) Incompetence of atrioventricular valves, leading to backflow of blood into atria during ventricular systole.
(3) Reduced cardiac output due to failure of the sinoatrial node.
(4) Interruption of blood flow from atria to ventricles during diastole.

145.



(1) S1 is sharper and of shorter duration than S2.
(2) S2 is lower in pitch and longer than S1.
(3) S1 corresponds to AV valve closure and is low-pitched and longer.
(4) S2 is produced at the beginning of ventricular systole.

146. Atrial systole results in ___**A**___ filling of ventricles and occurs for about ___**B**___.
Choose the option to **correctly** fill in the blanks **A** and **B**.
(1) A- 30%; B-0.1 sec
(2) A- 30%; B-0.3 sec
(3) A-1/3rd; B- 1 sec
(4) A-50%; B- 0.3 sec

147. Which of the following conditions is most likely to decrease blood pressure in the human body?
(1) Increase in peripheral resistance (narrowing of blood vessels)
(2) Increase in blood volume
(3) Increase in cardiac output
(4) Prolonged diarrhoea

148. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Among all types of blood vessels, capillaries exhibit the slowest movement of blood.
Reason R: The sum of cross-sectional areas of the capillary network far exceeds that of any single class of vessels such as arteries, arterioles, veins, or venules.
In the light of the above statements, choose the **correct** answer from the options given below:
(1) A is true but R is false.
(2) A is false but R is true.
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true but R is NOT the correct explanation of A.

149. Which of the following valves always come in contact with deoxygenated blood only?
(1) Mitral valve and semilunar valve of aorta
(2) Bicuspid and tricuspid valve
(3) Tricuspid valve and pulmonary semilunar valve
(4) Eustachian valve and mitral valve

150. Read the following statements regarding heart murmurs.
A. They may be audible by Stethoscope
B. Are abnormal heart sounds
C. Are generated by backflow of blood, due to incompetence of valves
D. Are originated due to opening of AV valves during auricular diastole
E. These sounds are of no clinical significance.
Which of the above statement are **incorrect**?
(1) A, B and E only
(2) B, C and D only
(3) C and D only
(4) D and E only

151. Read the following statements regarding regulation of heart activity:
A. The sinoatrial (SA) node is influenced by both sympathetic and parasympathetic nerve fibres.
B. Sympathetic stimulation increases heart rate and force of contraction.
C. Vagus nerve, a component of the sympathetic system, slows down heart rate.
D. Adrenal medulla releases adrenaline and noradrenaline, which enhance cardiac output.
E. Medulla oblongata regulates cardiac function via autonomic control.
Which of the above statements are **correct**?
(1) A, B, D, and E only
(2) A, B, C, and D only
(3) A, C, D, and E only
(4) A, B, C, D, and E

152. Which of the following matches is **correct**?

	Structure	Percentage	Function
(1)		0.3-0.5	Phagocytic
(2)		0.5-1.0	Secrete histamine and serotonin
(3)		30-40	Defence against parasites
(4)		30-40	Allergic reactions

153. Match **List-I** and **List-II**.

List-I (ECG Component)		List-II (Physiological Event)	
(A)	P wave	(I)	Ventricular depolarization
(B)	QRS complex	(II)	Atrial depolarization
(C)	T wave	(III)	Ventricular repolarization
(D)	PR interval	(IV)	Time between atrial depolarization and ventricular depolarization

(1) A–II, B–I, C–III, D–IV
(2) A–I, B–II, C–IV, D–III
(3) A–II, B–I, C–IV, D–III
(4) A–II, B–III, C–IV, D–I

154. Given below are two statements:
Statement I: Evolution of the vertebrate heart shows a progressive increase in the number of chambers from fishes to mammals, improving separation of oxygenated and deoxygenated blood.
Statement II: In birds and mammals, the four-chambered heart ensures complete mixing of oxygen-rich and oxygen-poor blood for efficient double circulation.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Statement I is correct but Statement II is incorrect.
(2) Statement I is incorrect but Statement II is correct.
(3) Both Statement I and Statement II are correct.
(4) Both Statement I and Statement II are incorrect.

155. Which of the following statements best explains the functional significance of both the atrioventricular (AV) node and the atrioventricular (AV) bundle (Bundle of His) in maintaining coordinated cardiac activity?
(1) The AV node delays the impulse from the SA node, allowing the ventricles to complete contraction before atrial systole begins. The AV bundle transmits this delayed impulse simultaneously to both atria for rapid depolarization.
(2) The AV node ensures simultaneous contraction of atria and ventricles, while the AV bundle solely regulates blood flow through coronary arteries.
(3) The AV node acts as a secondary pacemaker and slows the impulse to ensure atrial emptying before ventricular systole, while the AV bundle transmits this impulse rapidly to ventricular muscle through Purkinje fibres.
(4) The AV node and AV bundle both function to contract the semilunar valves and prevent backflow of blood into the atria during diastole.

156. Which of the following is the most characteristic haematological abnormality observed in Dengue fever, explaining the bleeding tendency?
(1) A significant reduction in erythrocyte counts due to hemolysis
(2) A significant reduction in leukocyte counts due to immune suppression
(3) A significant decrease in thrombocyte counts due to immune-mediated destruction and bone marrow suppression
(4) A significant increase in platelet counts due to reactive thrombocytosis post-viral infection

157. Given below are two statements:
Statement I: Cardiac output is defined as the amount of blood pumped by each ventricle per minute, which is typically around 5 litres.
Statement II: Total 10 litres of blood is pumped out by heart per minute.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Statement I is correct but Statement II is incorrect.
(2) Statement I is incorrect but Statement II is correct.
(3) Both Statement I and Statement II are correct.
(4) Both Statement I and Statement II are incorrect.

158. Which of the following cells are capable of diapedesis, and what is its physiological significance?

(1) Only erythrocytes exhibit diapedesis to reach tissues and deliver oxygen.

(2) Neutrophils and monocytes perform diapedesis to migrate from blood vessels to the site of injury.

(3) Basophils and platelets actively perform diapedesis to trigger vasodilation.

(4) Lymphocytes and thrombocytes cross the endothelium via diapedesis to initiate coagulation.

159. Read the following statements and choose the **correct** option:

Statement I: Atria receives blood from all parts of the body which subsequently flows to ventricles.

Statement II: Action potential generated at the sino-atrial (SA) node passes from atria to ventricles.

(1) Statement I is correct but Statement II is incorrect.

(2) Statement I is incorrect but Statement II is correct.

(3) Both Statement I and Statement II are correct.

(4) Both Statement I and Statement II are incorrect.

160. Laboratory tests of a boy reveal a deficiency of a plasma protein essential for the conversion of prothrombin to thrombin. Based on this, which of the following is the most accurate interpretation of the physiological consequences?

(1) The boy is likely deficient in heparin, which delays clotting by stimulating platelet breakdown.

(2) Platelet plug formation compensates entirely for the lack of thrombin, so no long-term consequences arise.

(3) Defective activation of fibrinogen prevents fibrin mesh formation, leading to continuous blood loss even on a minor cut.

(4) Excessive vitamin K accelerates clot breakdown, resulting in delayed coagulation response.

161. Match the structures/components in **List I** with their primary functions or characteristics in **List II**.

List-I		List-II	
(A)	Purkinje fibres	(I)	Filters lymph and houses lymphocytes
(B)	Aorta	(II)	Prevents backflow of blood into the ventricles
(C)	Lymph Nodes	(III)	Last part in the sequence of conduction of impulse
(D)	Semilunar valves	(IV)	Largest artery carrying oxygenated blood from the heart

Choose the **correct** answer from the options given below:

(1) A-III, B-IV, C-I, D-II

(2) A-I, B-II, C-III, D-IV

(3) A-IV, B-III, C-II, D-I

(4) A-III, B-I, C-IV, D-II

162. Read the following statements carefully regarding a prolonged QRS complex in an electrocardiogram (ECG) and choose the **correct** option:

I. Prolonged QRS duration indicates delayed ventricular depolarisation.

II. It may occur due to bundle branch block or abnormal conduction pathways.

III. A prolonged QRS complex always indicates a healthy heart.

IV. Increased QRS duration may result in asynchronous ventricular contraction and reduced cardiac output.

(1) Only Statements I, II, and III are correct.

(2) Only Statements I, II, and IV are correct.

(3) All four statements are correct.

(4) Only Statements II and IV are correct.

163. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: ABO incompatibility reactions are usually immediate and occur during mismatched blood transfusions, whereas Rh incompatibility becomes critical during subsequent pregnancies.

Reason R: In ABO incompatibility, naturally occurring antibodies cause agglutination, while in Rh incompatibility, antibodies are formed only after prior sensitization.

In the light of the above statements, choose the **correct** answer from the options given below:

(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.

164. Given below are two statements:

Statement I: The renal portal system transports blood from the lower part of the body to kidney before it enters systemic circulation.

Statement II: A special coronary system of blood vessels is present in our body exclusively for the circulation of blood to and from the cardiac musculature.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct but Statement II is incorrect.
(2) Statement I is incorrect but Statement II is correct.
(3) Both Statement I and Statement II are correct.
(4) Both Statement I and Statement II are incorrect.

165. Select the **incorrect** difference between open and closed circulatory system.

	Open circulatory system	Close circulatory system
(1)	Found in arthropods and molluscs	Found in annelids and chordates
(2)	Exchange of materials is direct.	Exchange of materials occurs through tissue fluid
(3)	It is less efficient.	It is more efficient
(4)	Blood flows at high pressure	Blood flow at low pressure

166. Which of the following **correctly** compares the blood pressure in the pulmonary artery to other blood vessels?

(1) It is higher than the pressure in the pulmonary vein.
(2) It is lower than the pressure in the vena cava.
(3) It is equal to the pressure in the aorta.
(4) It is greater than the pressure in the carotid artery.

167. The Rh antigen is an autosomal dominant trait (e.g. myotonic dystrophy) i.e., for being Rh-negative both alleles should be recessive. Rh-negative mother and Rh-positive father always lead to a probability of *erythroblastosis foetalis* in second pregnancy.

(1) The statement is true for Rh antigen trait but false for probability of *erythroblastosis foetalis.*
(2) The statement is true for both the trait of Rh antigen and *erythroblastosis foetalis*.
(3) The statement is false for Rh antigen but true for *erythroblastosis foetalis*.
(4) The statement is false for both the Rh antigen and *erythroblastosis foetalis.*

168. Consider the following statements.

I. pH of blood in arteries is more and less in veins.
II. In old people heart pumps blood more forcefully due to decreased elasticity of arteries.
III. Vasodilation is one of the effective means to regulate high blood pressure.
IV. Arteries have thick wall with large lumen compared to vein.
V. Systolic blood pressure is higher than diastolic blood pressure because blood is forced into veins during contraction.

Which of the above statement is/are **correct**?

(1) I, II and V only
(2) I, II, III and V only
(3) I, II, III and IV only
(4) I, II and III only

169. Match **List-I** with **List-II**.

List-I		List-II	
(A)	Cardiac arrest	(I)	Heart not pumping blood effectively
(B)	Heart failure	(II)	Heart muscle is damaged suddenly
(C)	Heart attack	(III)	Acute chest pain
(D)	Angina	(IV)	Heart stops beating

Choose the **correct** answer from the options given below:

(1) A-I, B-II, C-III, D-IV
(2) A-IV, B-II, C-I, D-III
(3) A-IV, B-I, C-II, D-III
(4) A-II, B-III, C-I, D-IV

170. Systemic heart refers to;

(1) the heart that contracts under stimulation from nervous system
(2) Left auricle and left ventricle in higher vertebrates
(3) Entire heart in lower vertebrates
(4) The two ventricles together in humans

171. In humans, under normal physiological condition, the duration between first and second heart sounds is;

(1) 0.3 seconds
(2) 0.4 seconds
(3) 0.5 seconds
(4) 0.8 seconds

172. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Any deviation from normal shape of ECG indicates a possible abnormality of heart structure or function
Reason R: The end of T – wave marks the end of both atrial and ventricular systole.
In the light of the above statements, choose the **correct** answer from the options given below:
(1) A is true but R is false.
(2) A is false but R is true.
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true but R is NOT the correct explanation of A.

173. How many of the following statements are **correct**?
A. Angina is not limited to a gender but is more probable with increasing age.
B. Heart attack is same as cardiac arrest as in both the heart eventually stops beating.
C. Bradycardia is a condition where the heart rate exceeds 100 beats per minute at rest.
D. Hypertension increases the workload on the left ventricle and may lead to ventricle enlargement.
E. Pacemakers can be implanted in patients with defective SA nodes to restore normal rhythm.
(1) Three
(2) Five
(3) One
(4) Two

174. Which of the following is **correct**?
(1) 55-70% of plasma is water and proteins contribute 6-8% of it.
(2) A healthy individual has 12-16 gm of Hb in every 100dl of blood.
(3) Blood is most commonly used tissue fluid by most of the higher organisms including humans for the transport of nutrients, O_2 etc.
(4) Leucocytes are not known as lymphocytes commonly.

175. Which of the following is a **correct** match?
(1) SA node – present at the top right corner of right ventricle
(2) Purkinje fibres – can produce action potentials at rate higher than AVN
(3) Heart - oriented downward, forward, and to the left side of the thoracic cavity.
(4) AVN – Also known as pace breaker

176. Read the following statements.
A. Thromboplastin inhibits the formation of thrombokinase.
B. An injury stimulates blood platelets to release platelet factor which initiates coagulation of blood.
C. Calcium ions play a very important role in blood coagulation of blood.
D. Fibrinogen is the 1st clotting factor
E. In case of bleeding, we put ice at the site of injury as a first aid to stop bleeding.
Select the options with **correct** statements.
(1) B, C, D only (2) B, C, D, E
(3) A, B, C, D (4) A and B only

177. Given below are two statements:
Statement I: The heart is enclosed in a double-layered membranous sac called the pericardium, which contains pericardial fluid for cushioning.
Statement II: The ventricular walls are significantly thicker than the atrial walls to support forceful pumping of blood.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

178. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: The sequential event in the heart which is cyclically repeated is called the cardiac cycle.
Reason R: Cardiac cycle consists of systole and diastole of both the atria and ventricles.
In the light of the above statements, choose the **correct** answer from the options given below:
(1) Both A and R are true and R is a correct explanation of A.
(2) Both A and R are true but R is not a correct explanation of A.
(3) A is true and R is false.
(4) A is false and R is true.

179. In blood vessels, Tunica media is a layer of _____, while tunica externa is a layer of _____ tissue with _____ fibres.
(1) Smooth muscle and collagen fibres, fibrous tissue, elastic
(2) Smooth muscle and elastic fibres, fibrous tissue, collagen
(3) Fibrous tissue and collagen fibres, smooth muscular, elastic
(4) Fibrous tissue and elastic fibres, smooth muscular, collagen

180. The absence of a nucleus in mature human red blood cells is a crucial adaptation. Which statement(s) best describe(s) the primary benefit(s) or reason(s) for this feature?"

A. It aligns with the reason that they do not need to replicate.
B. It's a general characteristic of all somatic cells.
C. It indicates a complete lack of metabolic processes.
D. It allows for greater volume dedicated to oxygen-carrying haemoglobin.

(1) Only D (2) Only A
(3) A, C and D (4) B and C

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