

# **EduGrip**(A division of EduGrip Education Pvt.Ltd)

---

Class: XI (PCB)

Time allowed : 90 Minutes

Maximum Marks : 120

**PLEASE READ THE INSTRUCTIONS IN QUESTION BOOKLET BEFORE ANSWERING THE QUESTION PAPER.**

1. Before starting the paper, fill up the required details in the given space provided in the question paper cum answer sheet.
2. The question paper consists of '30' objective type questions. Each question carry 4 marks and all of them are compulsory.
3. Each question contains four alternatives out of which only ONE is correct.
4. There is **NEGATIVE** marking - **1** for incorrect responses against a question.
5. For rough work, use the space provided at the bottom of each page. No extra sheet will be provided for rough work and you are not supposed to bring the same.
6. Use of **blank papers, clip boards, log tables, calculator, slide rule, mobile** or any other electronic gadgets in any form is "**NOT PERMISSIBLE**".
7. You must not carry mobile phone even if you have the same, give it to your Invigilator before commencement of the test and take it back from him/her after the exam.
8. The answers of the questions must be marked by **ticking correct on the options** against the question by dark Black/Blue Ball point Pen only.

Name of the students: _____
Class: _____
Contact Number: _____
Exam Centre: _____

# BIOLOGY

---

## 1. What are the twin characteristics of growth?

- (a) increase in mass
- (b) increase in number
- (c) both a and b
- (d) none of the above

## 2. Growth by cell division occurs \_\_\_ in plants and \_\_\_ in animals

- (a) continuously, only up to a certain age
- (b) only up to a certain age, continuously
- (c) continuously, continuously
- (d) never, continuously

## 3. Which of the following aspects is an exclusive characteristic of living organisms?

- (a) isolated metabolic reactions occur in vitro
- (b) increase in mass is from inside only
- (c) increase in mass by accumulation of material both on surface as well as internally
- (d) perception of events happening around their environment and their memory

## 4. Pick the correct combination of statements (i-iv) regarding characteristics of some entities

- i. Methanogens are archaebacteria that produce methane in marshy areas
- ii. Nostoc is a filamentous blue green alga which fixes atmospheric nitrogen
- iii. Chemosynthetic autotrophic bacteria synthesize cellulose from glucose
- iv. Mycoplasma lack a cell wall and can survive without oxygen

### These are correct statements

- A. (ii) and (iii)
- B. (i), (ii) and (iii)
- C. (ii), (iii) and (iv)
- D. (i), (ii) and (iv)

## 5. Some hyperthermophilic organisms that grow in highly acidic (pH 2) habitats belong to two groups

- A. liverworts and yeasts

- B. eubacteria and archaea
- C. protists and mosses
- D. cyanobacteria and diatoms

**6. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are the ones categorized as (2012)**

- A. heterotrophic bacteria
- B. chemosynthetic autotrophs
- C. archaeobacteria
- D. cyanobacteria

**7. A plant shows a thallus level of organization. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. Identify the group to which it belongs to**

- (a) pteridophytes
- (b) gymnosperms
- (c) monocots
- (d) bryophytes

**8. Plants of this group are diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. The group in reference is**

- (a) monocots
- (b) dicots
- (c) pteridophytes
- (d) gymnosperms

**9. Which animal has a modified mantle cavity to expel water with force?**

- (a) snail
- (b) oyster
- (c) squid
- (d) chiton

**10. A characteristic feature of insects is**

- (a) antennae
- (b) 3 pairs of legs
- (c) 1 pair of compound eyes
- (d) 2 pairs of wings

*Space For Rough Work*

---

# PHYSICS

---

- 1. A piece of wood of mass 0.03 kg is dropped from the top of a 100 m height building. At the same time, a bullet of mass 0.02 Kg is fired vertically upward, with a velocity 100 m/s, from the ground. The bullet gets embedded in the wood. Then the maximum height to which the combined system reaches above the top of the building before falling below is ( $g = 10 \text{ m/s}^2$ )**

(a) 10 m  
(b) 30 m  
(c) 20 m  
(d) 40 m
- 2. A passenger train of length 60 m travels at a speed of 80 km/hr. Another freight train of length 120 m travels at a speed of 30 km/hr. The ratio of times taken by the passenger train to completely cross the freight train when: (i) they are moving in the same direction, and (ii) in the opposite direction, is**

(a) 25/11  
(b) 3/2  
(c) 5/2  
(d) 11/5
- 3. An automobile, travelling at 40 km/h, can be stopped at a distance of 40 m by applying brakes. If the same automobile is travelling at 80 km/h, the minimum stopping distance, in metres, is (assume no skidding)**

(a) 100 m  
(b) 75 m  
(c) 160 m  
(d) 150 m
- 4. A parachutist after bailing out falls 50 m without friction. When the parachute opens, it decelerates at  $2 \text{ m/s}^2$ . He reaches the ground with a speed of 3 m/s. At what height, did he bailout?**

(a) 293 m  
(b) 111 m  
(c) 91 m  
(d) 182 m
- 5. A car, starting from rest, accelerates at the rate  $f$  through a distance  $s$ , then continues at a constant speed for time  $t$  and then decelerates at the rate  $f/2$  to come to rest. If the total distance traversed in 15 s, then**

(a)  $s = \frac{1}{2}ft^2$   
(b)  $s = (\frac{1}{4})ft^2$   
(c)  $s = ft$   
(d)  $s = (1/72)ft^2$
- 6. From a building, two balls A and B are thrown such that A is thrown upwards and B downwards (both vertically). If  $v_A$  and  $v_B$  are their respective velocities on reaching the ground, then**

(a)  $v_B > v_A$   
(b)  $v_A = v_B$   
(c)  $v_A > v_B$   
(d) their velocities depend on their masses

*Space For Rough Work*

---

7. If a body loses half of its velocity on penetrating 3 cm in a wooden block, then how much will it penetrate more before coming to rest?  
(a) 1 cm  
(b) 2 cm  
(c) 3 cm  
(d) 4 cm
8. In the formula  $X = 3YZ^2$ , X and Z have dimensions of capacitance and magnetic induction respectively. What are the dimensions of Y in MKS system ?  
a)  $[M^{-3}L^{-1}T^3Q^4]$       b)  $[M^{-3}L^{-2}T^4Q^4]$   
c)  $[M^{-2}L^{-2}T^4Q^4]$       d)  $[M^{-3}L^{-2}T^4Q^1]$
9. Which of the following sets have different dimensions ?  
(a) Pressure, Young's modulus, stress  
(b) Emf, potential difference, electric potential  
(c) Heat, work done, energy  
(d) Dipole moment, electric flux, electric field
10. The density of a solid ball is to be determined in an experiment. The diameter of the ball is measured with a screw gauge, whose pitch is 0.5 mm and there are 50 divisions on the circular scale. The reading on the main scale is 2.5 mm and that on the circular scale is 20 divisions. If the measured mass of the ball has a relative error of 2%, the relative percentage error in the density is  
(a) 0.9%      (b) 2.4%      (c) 3.1%      (d) 4.2%

*Space For Rough Work*

---

# CHEMISTRY

---

11. **If the kinetic energy of an electron is increased four times, the wavelength of the de-Broglie wave associated with it would become**  
(a) Two times  
(b) Half  
(c) One fourth  
(d) Four times
12. **The radius of the second Bohr orbit for the hydrogen atom is :**  
(Planck's constant,  $h = 6.262 \times 10^{-34}$  Js; Mass of electron =  $9.1091 \times 10^{-31}$  kg; Charge of electron  $e = 1.60210 \times 10^{-19}$  C; permittivity of vacuum  $\epsilon_0 = 8.854185 \times 10^{-12}$  kg<sup>-1</sup>m<sup>3</sup>A<sup>2</sup>)  
(a) 1.65 Å  
(b) 4.76 Å  
(c) 0.529 Å  
(d) 2.12 Å
13. **The frequency of light emitted for the transition  $n = 4$  to  $n = 2$  of He<sup>+</sup> is equal to the transition in H atom corresponding to which of the following**  
(a)  $n = 3$  to  $n = 1$   
(b)  $n = 2$  to  $n = 1$   
(c)  $n = 3$  to  $n = 2$   
(d)  $n = 4$  to  $n = 3$
14. **Based on the equation  $\Delta E = -2.0 \times 10^{-18} \text{ J } (1/n_2^2 - 1/n_1^2)$  the wavelength of the light that must be absorbed to excite hydrogen electron from level  $n = 1$  to level  $n = 2$  will be ( $h = 6.625 \times 10^{-34}$  Js,  $C = 3 \times 10^8 \text{ ms}^{-1}$ )**  
(a)  $2.650 \times 10^{-7}$  m  
(b)  $1.325 \times 10^{-7}$  m  
(c)  $1.325 \times 10^{-10}$  m  
(d)  $5.300 \times 10^{-10}$  m
15. **In the Bohr series of lines of hydrogen spectrum, the third line from the red end corresponds to which one of the following inter-orbit jumps of the electron for Bohr orbits in an atom of hydrogen**  
(a)  $5 \rightarrow 2$   
(b)  $4 \rightarrow 1$   
(c)  $2 \rightarrow 5$   
(d)  $3 \rightarrow 2$
16. **Which of the following sets of quantum numbers is correct for an electron present in 4f orbital?**  
(a)  $n = 4, l = 3, m = +4, s = +\frac{1}{2}$   
(b)  $n = 3, l = 2, m = -2, s = +\frac{1}{2}$   
(c)  $n = 4, l = 3, m = +1, s = +\frac{1}{2}$   
(d)  $n = 4, l = 4, m = -4, s = -\frac{1}{2}$
17. **Which of the following sets of quantum numbers represents the highest energy of an atom?**  
(a)  $n=3, l=2, m=1, s= +\frac{1}{2}$   
(b)  $n=3, l=2, m=1, s= +\frac{1}{2}$   
(c)  $n=4, l=0, m=0, s= +\frac{1}{2}$   
(d)  $n=3, l=0, m=0, s= +\frac{1}{2}$

*Space For Rough Work*

---

18. The ratio of mass percent of C and H of an organic compound ( $C_xH_yO_z$ ) is 6 : 1. If one molecule of the above compound ( $C_xH_yO_z$ ) contains half as much oxygen as required to burn one molecule of compound  $C_xH_y$  completely to  $CO_2$  and  $H_2O$ . The empirical formula of compound  $C_xH_yO_z$  is :
- (a)  $C_2H_4O$
  - (b)  $C_3H_4O_2$
  - (c)  $C_2H_4O_3$
  - (d)  $C_3H_6O_3$
19. The concentrated sulphuric acid that is peddled commercially is 95%  $H_2SO_4$  by weight. If the density of this commercial acid is  $1.834 \text{ g cm}^{-3}$ , the molarity of this solution is :-
- (a) 17.8 M
  - (b) 15.7 M
  - (c) 10.5 M
  - (d) 12.0 M
20. The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is 1 : 4. The ratio of number of their molecule is :
- (a) 1 : 8
  - (b) 3 : 16
  - (c) 1 : 4
  - (d) 7 : 32

*Space For Rough Work*

---