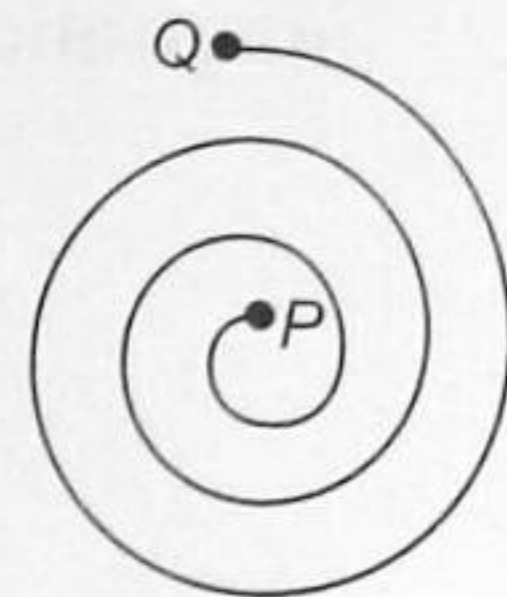


6. A solenoid of 0.4 m length with 500 turns carries a current of 3 A. A coil of 10 turns and of radius 0.01 m carries a current of 0.4 A. The torque required to hold the coil with its axis at right angle to that of solenoid in the middle part of it, is
 (A) $6\pi^2 \times 10^{-7}$ N m (B) $3\pi^2 \times 10^{-7}$ N m (C) $9\pi^2 \times 10^{-7}$ N m (D) $12\pi^2 \times 10^{-7}$ N m

7. Uniform magnetic field B is directed vertically upwards and 3 wires of equal length L , carrying equal current I are lying in a horizontal plane such that the first one is along north, second one along north-east and the third one at 60° north of east. Force exerted by magnetic field B on them is

- (A) zero on the first (B) $\frac{BIL}{\sqrt{2}}$ on the second
 (C) $\sqrt{3}\frac{BIL}{\sqrt{2}}$ on the third (D) BIL on all of them

8. A charged particle enters into a region which offers a resistance against its motion and uniform magnetic field exists in the region. The particle traces a spiral path as shown in the figure. Which of the following statements is correct?



- (A) Component of the magnetic field in the plane of spiral is zero.
 (B) Particle enters in the region at Q.
 (C) If the magnetic field is outward then the particle is positively charged.
 (D) All of the above.
9. Two identical charged spheres suspended from a common point by two massless strings of length l are initially a distance d ($d \ll l$) apart because of their mutual repulsion. The charge begins to leak from both the spheres at a constant rate. As a result the charges approach each other with a velocity v . Then as a function of distance x between them

- (A) $v \propto x^{-1/2}$ (B) $v \propto x^{-1}$ (C) $v \propto x^{1/2}$ (D) $v \propto x$

10. A particle of mass 40 mg and carrying a charge 5×10^{-9} C is moving towards a fixed charge of magnitude 10^{-8} C. When it is at a distance of 10 cm from the fixed charge, it has a velocity of 50 cm/s. At what distance from the fixed charge will the particle come momentarily to rest?

- (A) 1.3×10^{-3} m (B) 1.9×10^{-3} m
 (C) 3.9×10^{-2} m (D) 4.7×10^{-2} m

11. A galvanometer has a resistance of 30Ω and a current of 2.0 mA gives full scale deflection. How will you convert this galvanometer into a voltmeter of 0.2 volt range?

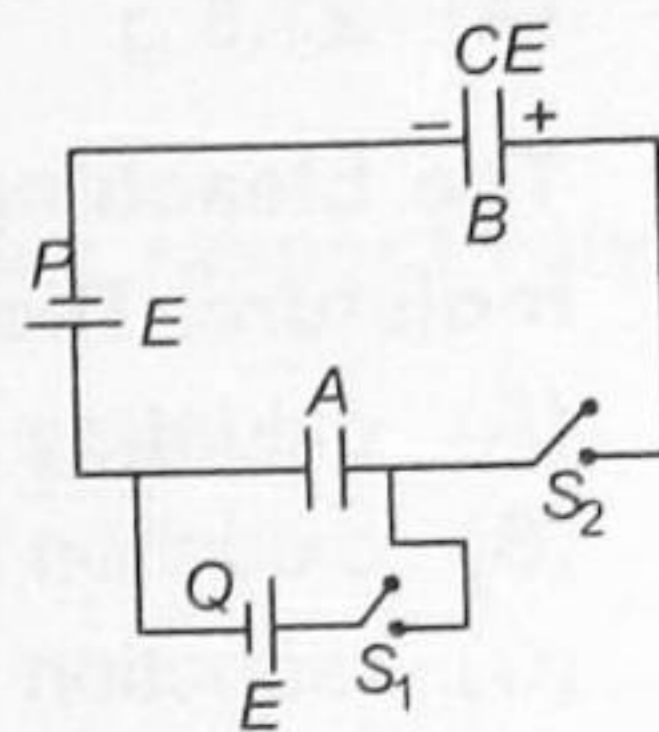
- (A) 700Ω resistance should be connected parallel to the galvanometer.
 (B) 70Ω resistance should be connected parallel to the galvanometer.
 (C) 700Ω resistance should be connected in series with the galvanometer.
 (D) 70Ω resistance should be used in series with the galvanometer.

12. A resistor R and $2 \mu\text{F}$ capacitor in series is connected through a switch to 200 V direct supply. Across the capacitor is a neon bulb that lights up at 120 V . Calculate the value of R to make the bulb light up 5 s after the switch has been closed. ($\log_{10} 2.5 = 0.4$)
- (A) $1.3 \times 10^4 \Omega$ (B) $1.7 \times 10^5 \Omega$ (C) $2.7 \times 10^6 \Omega$ (D) $3.3 \times 10^7 \Omega$

Paragraph for Question Nos. 13 to 15

Two identical capacitors A and B , both having same capacitance C , are connected with battery of emf as shown in the figure. Initially both switches S_1 and S_2 are open and initially, capacitor B has a charge of CE coulomb as shown in the figure and capacitor A is uncharged.

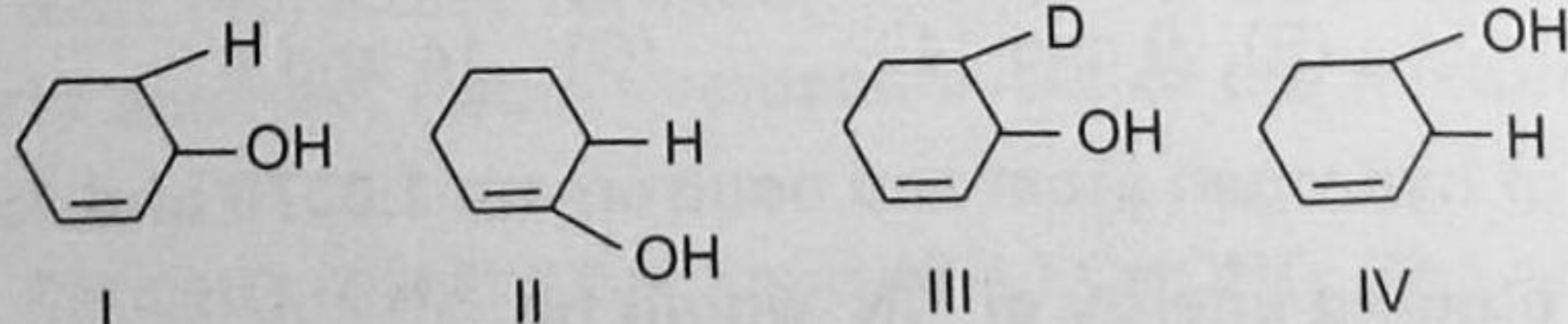
Now switch S_1 is closed and S_2 remain open till the capacitor A becomes fully charged. Then S_1 is open and S_2 is closed till the flow of charge through battery stops. This process constitutes one cycle. The cycle is repeated a number of times



13. Charge on the capacitor B after 2nd cycle is
- (A) $\frac{7CE}{8}$ (B) $\frac{7CE}{4}$ (C) $\frac{CE}{2}$ (D) $\frac{CE}{4}$
14. Total work done by the battery Q in 5 cycles is
- (A) $\frac{127}{64} CE^2$ (B) $\frac{31}{16} CE^2$ (C) $\frac{63}{32} CE^2$ (D) $\frac{31}{32} CE^2$
15. Potential difference across capacitor B if cycle is repeated infinite times is
- (A) E (B) $\frac{3E}{2}$ (C) $2E$ (D) $\frac{5E}{2}$

CHEMISTRY

16. Bleeding due to a cut can be stopped by applying ferric chloride solution in the laboratory. This is due to
- (A) coagulation of negatively charged blood particles by Fe^{3+} ions
 (B) coagulation of positively charged blood particles by Cl^- ions
 (C) reaction taking place between ferric ions and the haemoglobin forming a complex
 (D) common element, iron, in both FeCl_3 and haemoglobin.
17. The ease of dehydration in the following compounds is



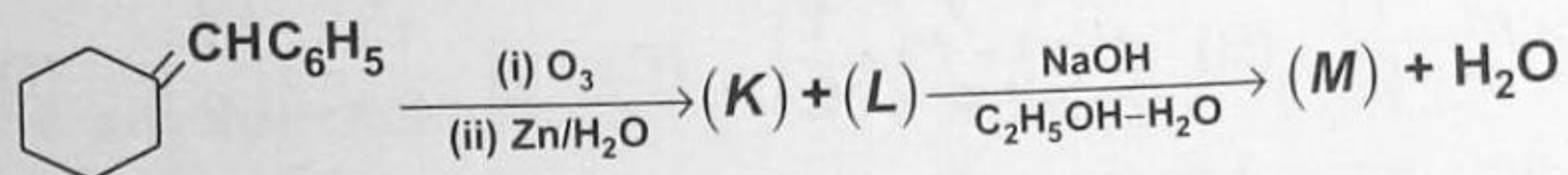
- (A) $\text{I} > \text{III} > \text{IV} > \text{II}$ (B) $\text{II} > \text{I} > \text{III} > \text{IV}$
 (C) $\text{IV} > \text{I} > \text{III} > \text{II}$ (D) $\text{III} > \text{I} > \text{II} > \text{IV}$

18. In the aqueous solution, Cu(+1) salts are unstable because
 (A) Cu(+1) has a $3d^{10}$ configuration
 (B) the change in free energy of the overall reaction is zero
 (C) they disproportionate easily to Cu(0) and Cu(+2) states
 (D) they disproportionate easily to Cu(+2) and Cu(+3) states.
19. How many grams of sucrose must be added to 320 g of water to lower the vapour pressure by 1.5 mm Hg at 25°C ?
 [Given : The vapour pressure of water at 25°C is 23.8 mm Hg and the molar mass of sucrose is 342.3 g/mol]
 (A) 21.5 g (B) 410 g (C) 324.3 g (D) 160.12 g
20. The bleaching action of both chlorine and sulphur dioxide occurs in presence of moisture. The nature of chemical reaction in both is
 (A) oxidation for both
 (B) oxidation for chlorine and reduction for sulphur dioxide
 (C) reduction for both
 (D) reduction for chlorine and oxidation for sulphur dioxide.
21. Ammonia forms the complex ion $[\text{Cu}(\text{NH}_3)_4]^{2+}$ with copper ions in alkaline solution but not in acidic solution. The probable reason for this is
 (A) in acidic solution, hydration protects Cu^{2+} ion
 (B) in acidic solution, proton coordinates with ammonia molecules to form NH_4^+ ions and NH_3 molecules are not available
 (C) in alkaline solution, insoluble $\text{Cu}(\text{OH})_2$ is precipitated which is soluble in excess of any alkali.
 (D) copper hydroxide is an amphoteric substance.
22. For the reaction:
 $4P \longrightarrow 3Q + R,$
 if $\frac{-d[P]}{dt} = k_1[P]^4$, $\frac{d[Q]}{dt} = k_2[P]^4$ and $\frac{d[R]}{dt} = k_3[P]^4$
 Which of the following is the most appropriate relation between k_1, k_2, k_3 ?
 (A) $4k_1 = 3k_2 = k_3$ (B) $3k_1 = 4k_2 = 12k_3$ (C) $k_1 = k_2 = k_3$ (D) $k_1 = 4k_2 = 3k_3$
23. Na and Mg crystallize in bcc and fcc type crystals respectively, then the number of atoms of Na and Mg present in the unit cell of their respective crystals is
 (A) 4 and 2 (B) 9 and 14 (C) 14 and 9 (D) 2 and 4
24. If the masses of hydrogen atom and neutron are 1.0078 and 1.0087 amu respectively, then the total binding energy of ${}^{14}_7\text{N}$ would be
 (Given, ${}^{14}_7\text{N} = 14.0031$ amu and $1 \text{ amu} = 931 \text{ MeV}$)
 (A) 95.4 MeV (B) 100.5 MeV (C) 104.6 MeV (D) 119.4 MeV.

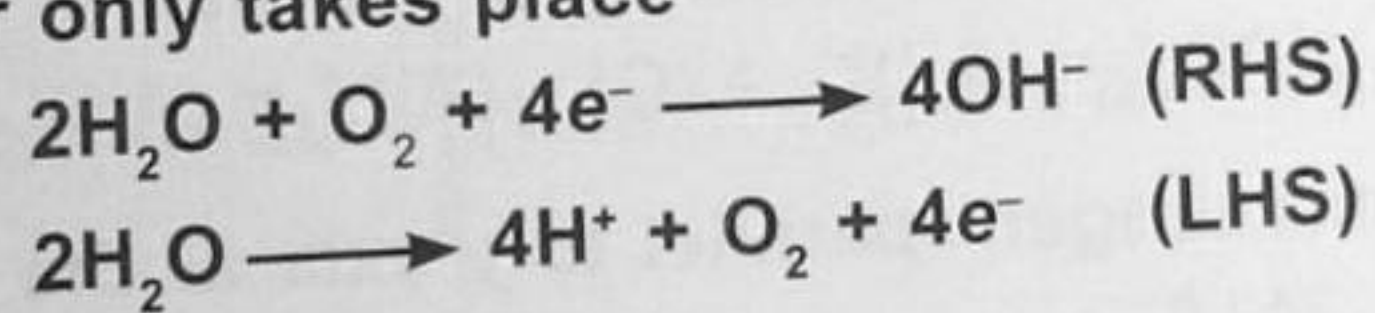
25. In solid ammonia, each NH_3 molecule has six other NH_3 molecules as nearest neighbours. ΔH of sublimation of NH_3 at the melting point is 30.8 kJ mol^{-1} , and the estimated ΔH of sublimation in the absence of hydrogen bonding is 14.4 kJ mol^{-1} . Strength of H-bond in solid NH_3 is approximately
- (A) 5.5 kJ mol^{-1} (B) 16.4 kJ mol^{-1} (C) 2.7 kJ mol^{-1} (D) -2.7 kJ mol^{-1}

26. 0.001 mol of $\text{Co}(\text{NH}_3)_5(\text{NO}_3)(\text{SO}_4)$ was passed through a cation exchanger and the acid coming out of it required 20 mL of 0.1 M NaOH for neutralisation. Hence, the complex is
- (A) $[\text{Co}(\text{NH}_3)_5(\text{SO}_4)]\text{NO}_3$ (B) $[\text{Co}(\text{NH}_3)_5(\text{NO}_3)]\text{SO}_4$
 (C) $[\text{Co}(\text{NH}_3)_5]\text{NO}_3 \cdot \text{SO}_4$ (D) None of these.

27. The compounds *K*, *L* and *M* in the following sequence of reactions respectively are



- (A) cyclohexanone, benzoic acid, benzyl alcohol
 (B) cyclohexanone, benzaldehyde, 2-benzylidene cyclohexanone
 (C) cyclohexane carboxaldehyde, benzaldehyde, benzyl alcohol
 (D) cyclohexanone, benzaldehyde, benzyl alcohol
28. 100 mL of a buffer of $1 \text{ M NH}_3(\text{aq})$ and $1 \text{ M NH}_4^+(\text{aq})$ are placed in two voltaic cells separately. A current of 1.5 A is passed through both the cells for 20 minutes . If electrolysis of water only takes place



then pH of the

- (A) LHS half-cell will increase (B) RHS half-cell will increase
 (C) both half-cells will increase (D) both half-cells will decrease.
29. What is the disadvantage of using $(\text{NH}_4)_2\text{SO}_4$ as a fertilizer?

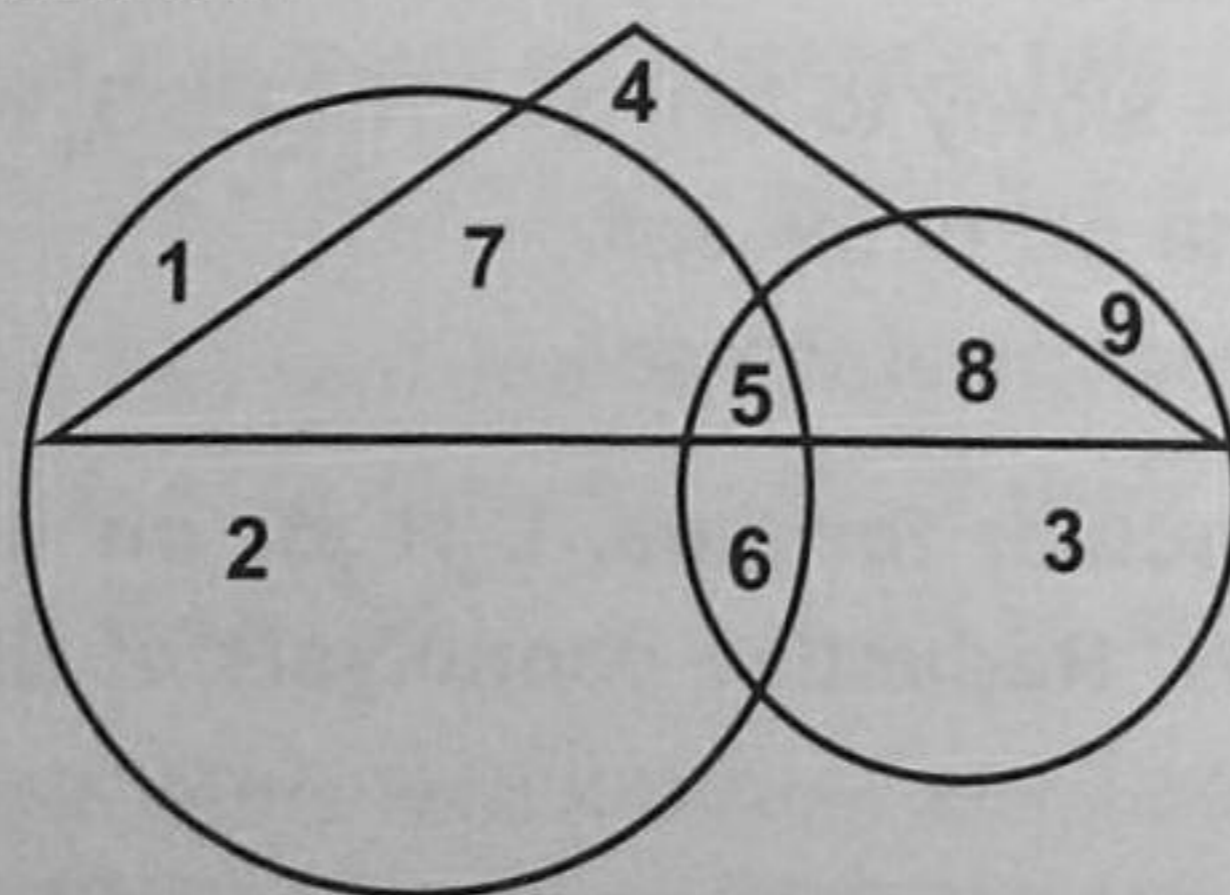
- (A) $(\text{NH}_4)_2\text{SO}_4$ is water soluble.
 (B) $(\text{NH}_4)_2\text{SO}_4$ decomposes slowly to NH_3 and NH_4HSO_4 in the soil.
 (C) $(\text{NH}_4)_2\text{SO}_4$ increases the pH of the soil.
 (D) $(\text{NH}_4)_2\text{SO}_4$ decreases the pH of the soil.

30. An alkyl halide with molecular formula, $\text{C}_6\text{H}_{13}\text{Br}$ on treatment with alcoholic KOH gave two isomeric alkenes. Reductive ozonolysis of the mixture gave the following compounds:

- CH_3COCH_3 , CH_3CHO , $\text{CH}_3\text{CH}_2\text{CHO}$ and $(\text{CH}_3)_2\text{CHCHO}$. The alkyl halide is
- (A) 2-bromohexane (B) 3-bromo-2-methylpentane
 (C) 2, 2-dimethyl-1-bromobutane (D) 2-bromo-2, 3-dimethylbutane

SECTION-2
MATHEMATICS

31. R is a relation from $\{11, 12, 13\}$ to $\{8, 10, 12\}$ defined by $y = x - 3$. The relation R^{-1} is
 (A) $\{(11, 8), (13, 10)\}$ (B) $\{(8, 11), (10, 13)\}$
 (C) $\{(8, 11), (9, 12), (10, 13)\}$ (D) None of these
32. The value of $f(0)$, so that function $f(x) = \frac{\sqrt{1+x} - (1+x)^{1/3}}{x}$ becomes continuous, is equal to
 (A) $1/6$ (B) $1/4$ (C) 2 (D) $1/3$
33. If $f(x) = 4x^8$, then
 (A) $f'\left(\frac{1}{2}\right) = f'\left(-\frac{1}{2}\right)$ (B) $f'(x) = f'\left(-\frac{1}{2}\right)$ (C) $f\left(-\frac{1}{2}\right) = f\left(\frac{1}{2}\right)$ (D) $f\left(\frac{1}{2}\right) = f'\left(-\frac{1}{2}\right)$
34. The number of real solutions of $\tan^{-1}\sqrt{x(x-1)} + \sin^{-1}\sqrt{x^2+x+1} = \frac{\pi}{2}$ is
 (A) Zero (B) One (C) Two (D) Infinite
35. For a function F , $F(0) = 2$, $F(1) = 3$, $F(x+2) = 2F(x) - F(x+1)$ for $x \geq 0$, then $F(5)$ is equal to
 (A) -7 (B) -3 (C) 17 (D) 13
36. If A is invertible, then which of the following is not true ?
 (A) $A^{-1} = |A|^{-1}$ (B) $(A^2)^{-1} = (A^{-1})^2$ (C) $(A')^{-1} = (A^{-1})'$ (D) None of these
37. The curve $x + y = e^{xy}$ has a tangent parallel to y -axis at the point
 (A) $(0, 1)$ (B) $(1, 0)$ (C) $(1, 1)$ (D) None of these
38. In the given diagram, the triangle represents female graduates, small circle represents self-employed females and the big circle represents self-employed females with bank loan facility. On the basis of numbers shown in the different sections of the diagram, answer the following question.



Which of the following numbers represents the only self-employed female graduates with bank loan facility?

- (A) 5 (B) 7 (C) 12 (D) None of these

39. If the first and the second digits of each of the numbers shown below are interchanged and hence the third digit of each number is placed between these two numbers, then which number will be the third number from the top, if the new numbers are arranged in the descending order of their values?

271 361 912 714 459 187

- (A) 187 (B) 271 (C) 459 (D) 361

40. Equation of the plane parallel to the plane $3x - 2y + 4z = 11$ is

- (A) $2x + 3y - 4z = 3$ (B) $6x - 4y + 8z = 7$
 (C) $4x + 4y - 3z = 1$ (D) $3x + 2y + 4z = 9$

41. The point (3, 2) is reflected in the y -axis and then moved a distance of 5 units towards the negative side of y -axis. The coordinates of the point thus obtained are

- (A) (-3, -3) (B) (3, 3) (C) (-3, 3) (D) (3, -3)

42. Let $f : R \rightarrow R$ be any function. Define $g : R \rightarrow R$ by $g(x) = |f(x)| \forall x$. Then g is

- (A) Onto if f is onto (B) One-one if f is one-one
 (C) Continuous if f is continuous (D) Differentiable if f is differentiable

43. Let $f(x) = \cos x \sin 2x$, then

- (A) $\min f(x) = -\frac{1}{3\sqrt{3}}$ for $x \in [-\pi, \pi)$ (B) $\min f(x) > -\frac{9}{7}$ or $-\frac{7}{9}$ for $x \in [-\pi, \pi]$
 (C) $\min f(x) > -\frac{1}{9}$ for $x \in [-\pi, \pi]$ (D) $\min f(x) > -\frac{2}{9}$ for $x \in [-\pi, \pi]$

44. If $\int_0^1 (1 + \sin^4 x)(ax^2 + bx + c) dx = \int_0^2 (1 + \sin^4 x)(ax^2 + bx + c) dx$, then the quadratic equation $ax^2 + bx + c = 0$ has

- (A) At least one root in (1, 2) (B) No root in (1, 2)
 (C) Two equal roots in (1, 2) (D) Both roots imaginary

45. The area bounded by $y = xe^{|x|}$ and the lines $|x| = 1, y = 0$ is

- (A) 4 sq. units (B) 6 sq. units (C) 1 sq. units (D) 2 sq. units

46. General solution of $\frac{d^2y}{dx^2} = e^{-2x}$ is

- (A) $y = \frac{1}{4}e^{-2x} + c$ (B) $y = e^{-2x} + cx + d$
 (C) $y = \frac{1}{4}e^{-2x} + cx + d$ (D) $y = e^{-2x} + cx^2 + d$

47. There is a three-volume dictionary among 43 books arranged on a shelf in random order. Three books are drawn at random from the shelf. The probability that all the three volumes of the dictionary will be drawn, is

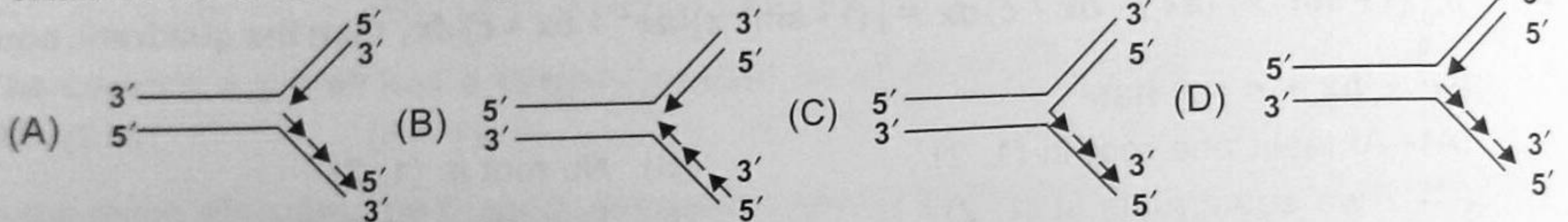
- (A) $3/12341$ (B) $2/12341$ (C) $1/12341$ (D) None of these

48. If $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$, $\vec{b} = \hat{i} + 2\hat{j} - \hat{k}$ and $\vec{c} = \hat{i} + \hat{j} - 2\hat{k}$, then a vector in the plane \vec{b} and \vec{c} whose projection on \vec{a} is of magnitude $\sqrt{\frac{2}{3}}$ is
- (A) $2\hat{i} + 3\hat{j} - 3\hat{k}$ (B) $2\hat{i} + 3\hat{j} + 3\hat{k}$ (C) $-2\hat{i} - \hat{j} + 5\hat{k}$ (D) $2\hat{i} + \hat{j} + 5\hat{k}$
49. If the letters of the word ECOSURVEY which are at even numbered positions in the English alphabet are picked up and arranged in alphabetical order from left and if they are now substituted by L, M, N, O and so on, which letter will get substituted by N?
- (A) S (B) R (C) V (D) No such letter
50. Each surveyor in a factory has his own call, which has been converted into a password and kept in a code language. The call of Ashutosh is 'hard work is the best solution', and its coded form is 'is best hard the work solution'. If the call of Amit is 'honest work is always appropriately rewarded', then what will be its password code?
- (A) work appropriately honest rewarded always is
 (B) is appropriately honest always work rewarded
 (C) honest appropriately always work rewarded is
 (D) reward appropriately always honest is work

OR

BIOLOGY

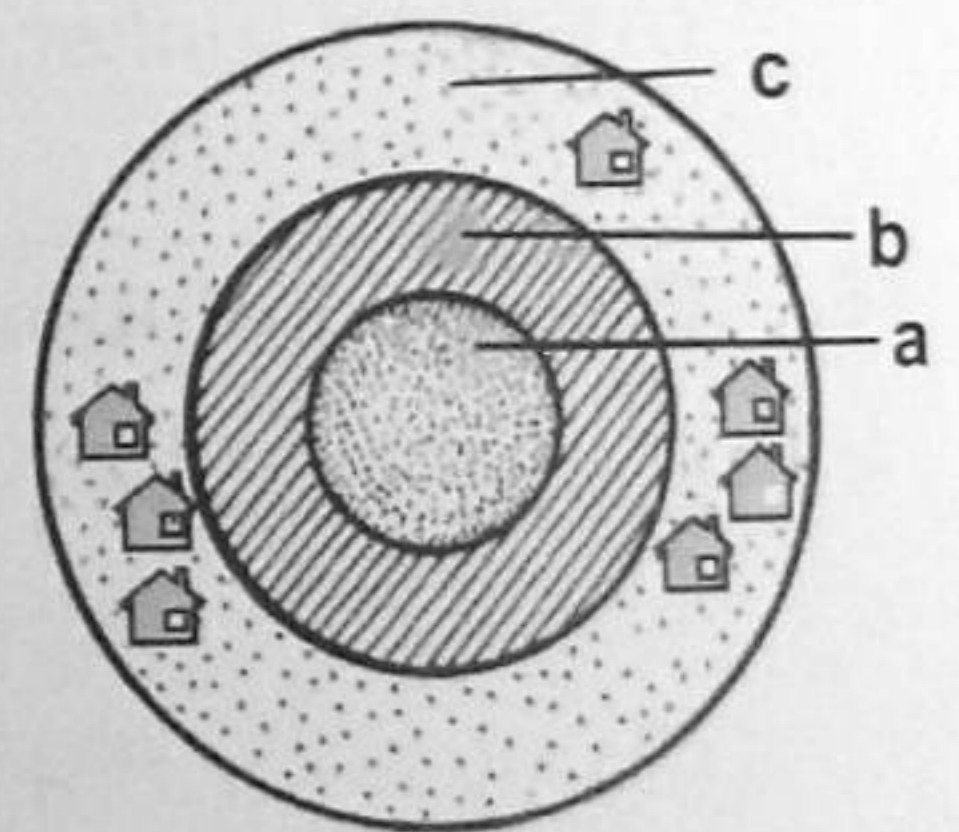
31. Which one of the following correctly represents the manner of replication of DNA?



32. Refer the given figure representing different zones of a biosphere reserve.

Select the correct answer as per the statements given below.

- (i) Limited human activity is allowed such as for research and education.
 (ii) An active co-operation occurs between reserve management and local people for activities like cropping, settlements etc.
 (iii) No human activity is allowed.



- | | | |
|-------|------|-------|
| (i) | (ii) | (iii) |
| (A) a | b | c |
| (B) b | c | a |
| (C) c | a | b |
| (D) c | b | a |

33. When a cross is made between a tall plant with yellow seeds (Tt Yy) and a tall plant with green seeds (Tt yy), what is true regarding the proportions of phenotypes of the offsprings in F₁ generation?

	Proportion of Tall and Green	Proportion of Dwarf and Green
(A)	$\frac{3}{8}$	$\frac{1}{8}$
(B)	$\frac{2}{8}$	$\frac{1}{8}$
(C)	$\frac{1}{8}$	$\frac{3}{8}$
(D)	$\frac{2}{8}$	$\frac{2}{8}$

34. Select the correct matching of the type of behavioural adaptation, its example and processes and activities.

Type	Example	Processes and activities
(A) Hibernation	Northern ground squirrels	Avoid cold by going into sleep during winter
(B) Aestivation	Praying mantis	Avoid heat by spending summers into burrows
(C) Batesian mimicry	Monarch and queen butterfly	Both look similar and are distasteful
(D) Mullerian mimicry	Viceroy and Monarch butterfly	Both produce high frequency sounds and detect presence of echoes

35. Assume that you are trying to insert a gene from human DNA into a plasmid and someone gives you a preparation of human DNA cut with restriction endonuclease A. The human gene you are after has sites on both ends for restriction endonuclease B. You have a plasmid with a single site for B, but not for A. Your best strategy would be to:

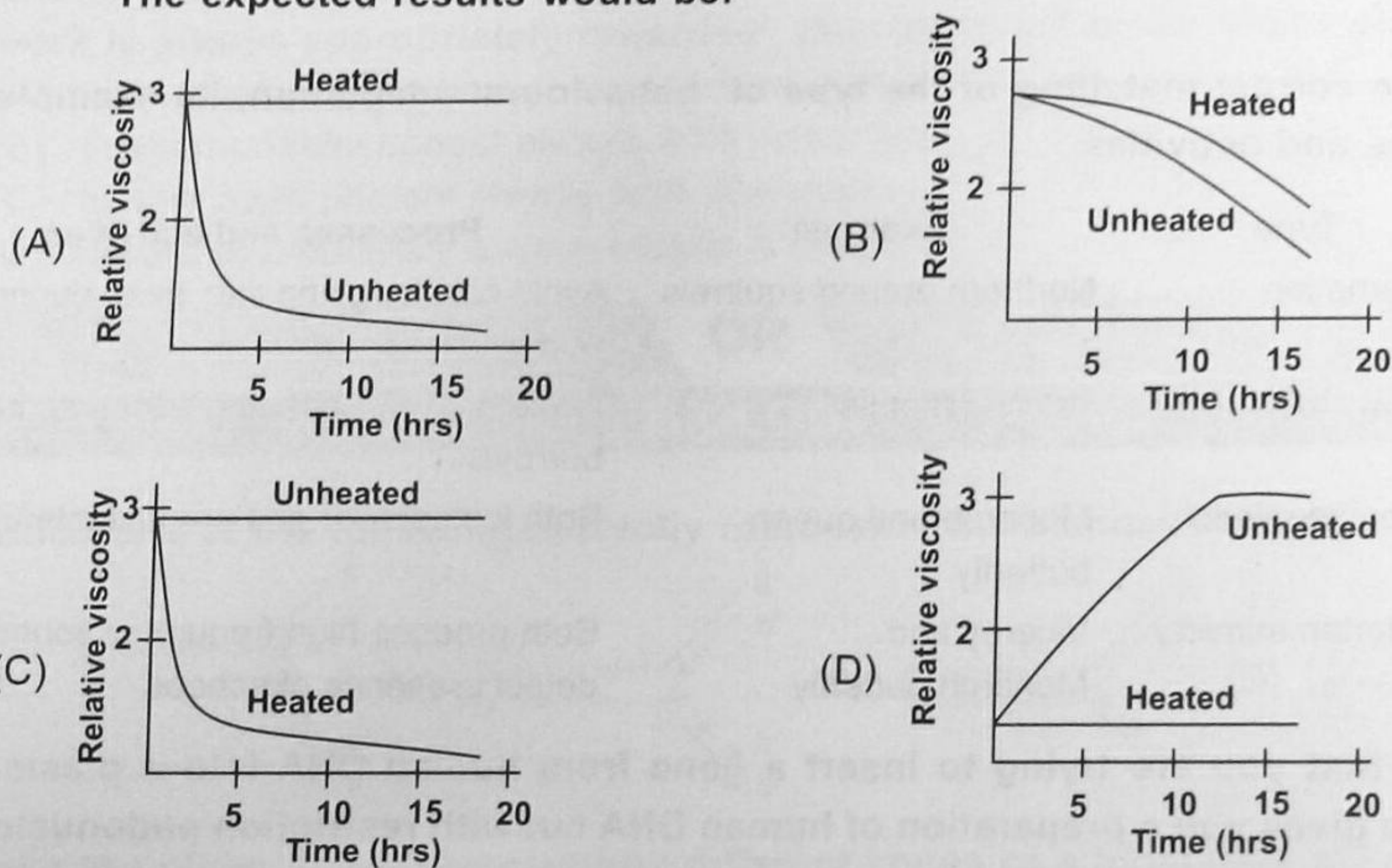
- (A) Cut the plasmid with restriction endonuclease A and insert the human DNA cut with restriction endonuclease B into the plasmid.
- (B) Cut the plasmid twice with restriction endonuclease B and ligate the two fragments onto the ends of the human DNA fragments cut with restriction endonuclease A.
- (C) Cut the human DNA again with the restriction endonuclease B and insert these fragments into the plasmid cut with the same enzyme.
- (D) Cut the plasmid with restriction endonuclease A and insert the human DNA cut with restriction endonuclease A into the plasmid.

36. The development of the current idea that DNA is the genetic material was first demonstrated by Griffith in his famous experiment using smooth and rough strains of *Pneumococci*. DNA was then called as "transforming principle". Consider the following experiment in this connection:

Steps:

- Pneumococci* of smooth strains were first grown on culture media.
- Cells were separated and lysed to collect cell free extract.
- "Transforming principle" was isolated from the extract and distributed into two test tubes.
- To each test tube, crude enzyme preparation containing "depolymerase or deoxyribonuclease," was added.
- Only one test tube was heated to 65°C after adding the enzyme.
- Relative viscosities of both the preparations were measured.

The expected results would be:



37. A local population of farmers (747 in total) was tested for their MN blood grouping. Following are the results.

Genotype :	MM	MN	NN
Number of individuals :	233	385	129

What are the frequencies of alleles M and N in this population?

- (A) M - 0.57 N - 0.63 (B) M - 0.63 N - 0.57
 (C) M - 0.57 N - 0.43 (D) M - 0.47 N - 0.53

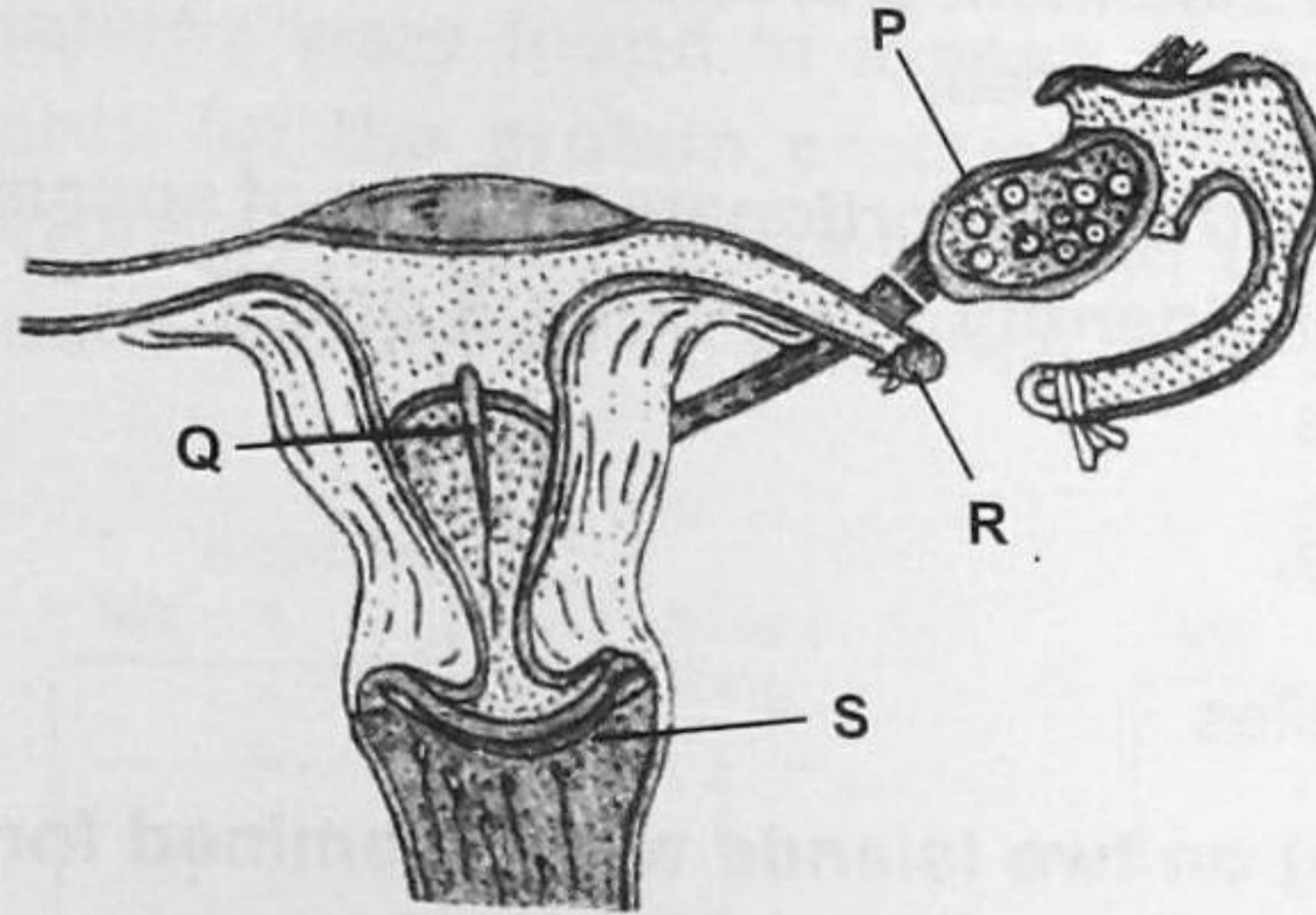
38. Which of the following is an incorrect match ?

(Disease)	(Pathogen)
(A) Pneumonia	<i>Haemophilus influenzae</i>
(B) Whooping cough	<i>Bordetella pertussis</i>
(C) Syphilis	<i>Bacillus anthracis</i>
(D) Plague	<i>Yersinia pestis</i>

39. Which of the following is correctly matched ?

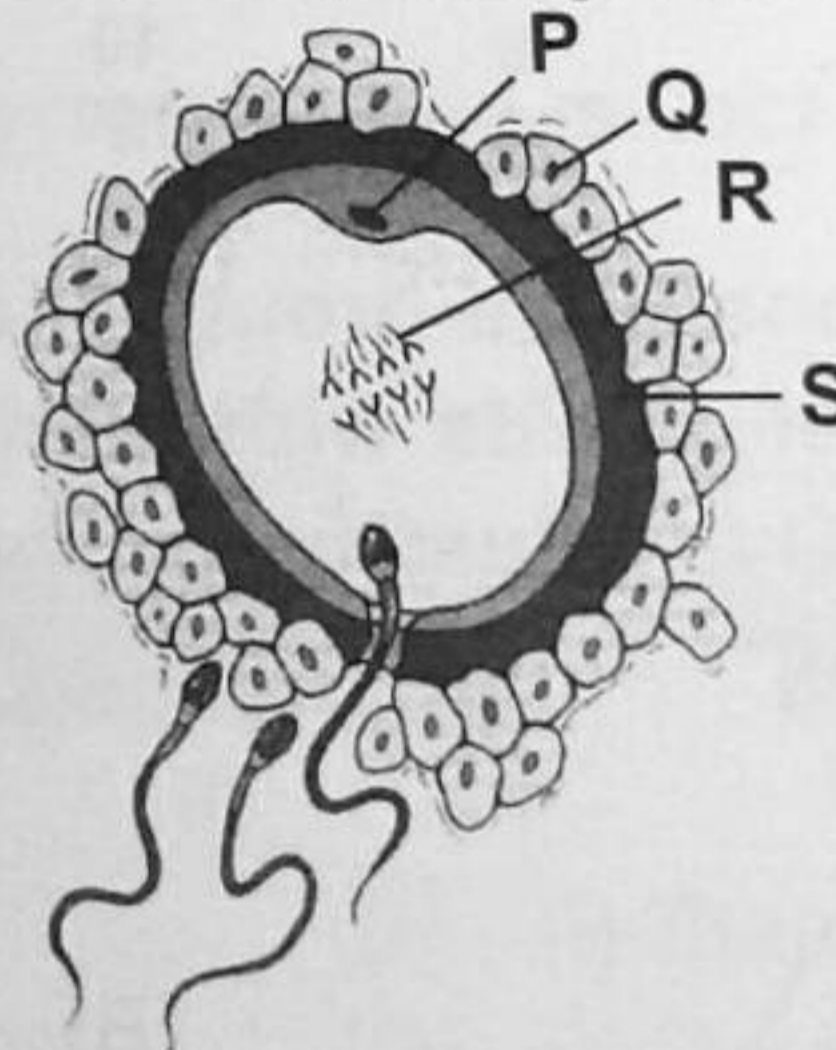
Name of organism	Chromosome number in meiocyte	Chromosome number in gamete
(A) Human	42	21
(B) Onion	32	16
(C) Housefly	8	4
(D) Rice	12	6

40. The given figure represents locations in human female reproductive system that are affected by different birth control measures. Identify the birth control measures and select the correct option.



P	Q	R	S
(A) Copper-T	Birth control pills	Tubectomy	Condom
(B) Birth control pills	Copper-T	Tubectomy	Diaphragm
(C) Birth control pills	Diaphragm	Ovariectomy	Copper-T
(D) Copper-T	Birth control pills	Ovariectomy	Diaphragm

41. Identify the parts labelled P, Q, R and S in the given figure.



P	Q	R	S
(A) Second polar body	Granulosa cell	First meiotic spindle	Zona pellucida
(B) Second polar body	Zona pellucida	First meiotic spindle	Granulosa cell
(C) First polar body	Granulosa cell	Second meiotic spindle	Zona pellucida
(D) First polar body	Zona pellucida	Second meiotic spindle	Granulosa cell

42. Read the given statements and select the correct option.

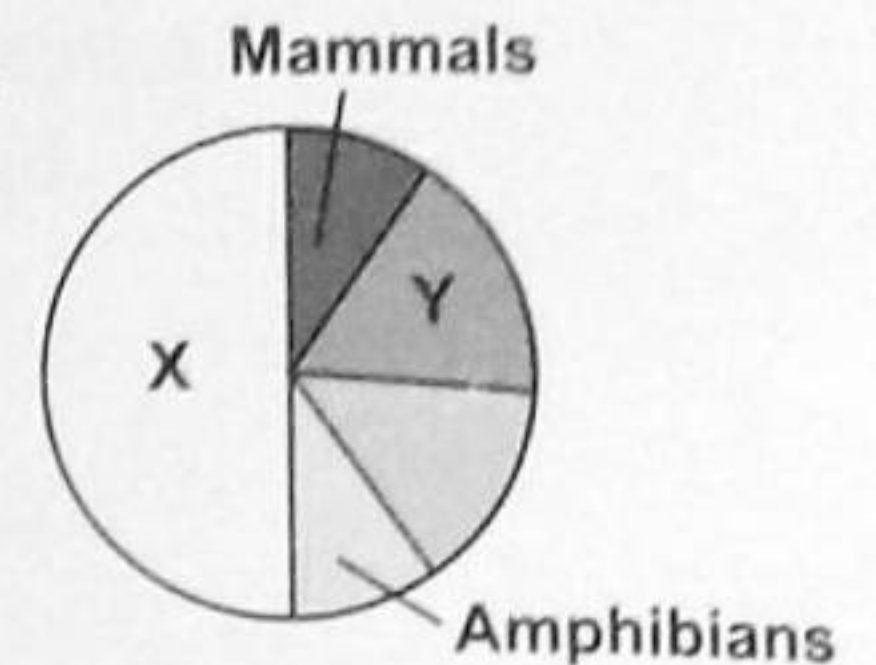
Statement 1 : Active immunity is developed when a person's own cells produce antibodies in response to infection or vaccine.

Statement 2 : Injection of snake antivenom against snake bite is an example of active immunization.

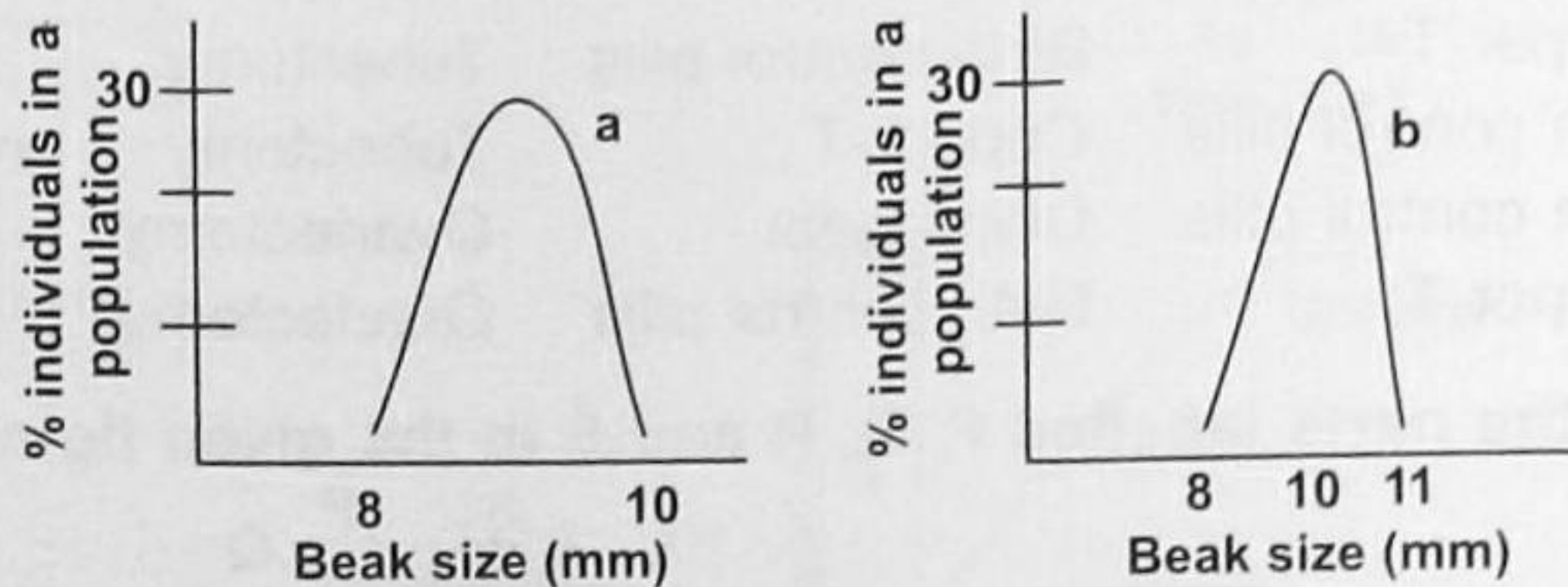
- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 (B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 (C) Statement 1 is true and statement 2 is false.
 (D) Both statements 1 and 2 are false.

43. Given pie diagram represents the proportionate number of species of major taxa of vertebrates. Identify the groups X and Y.

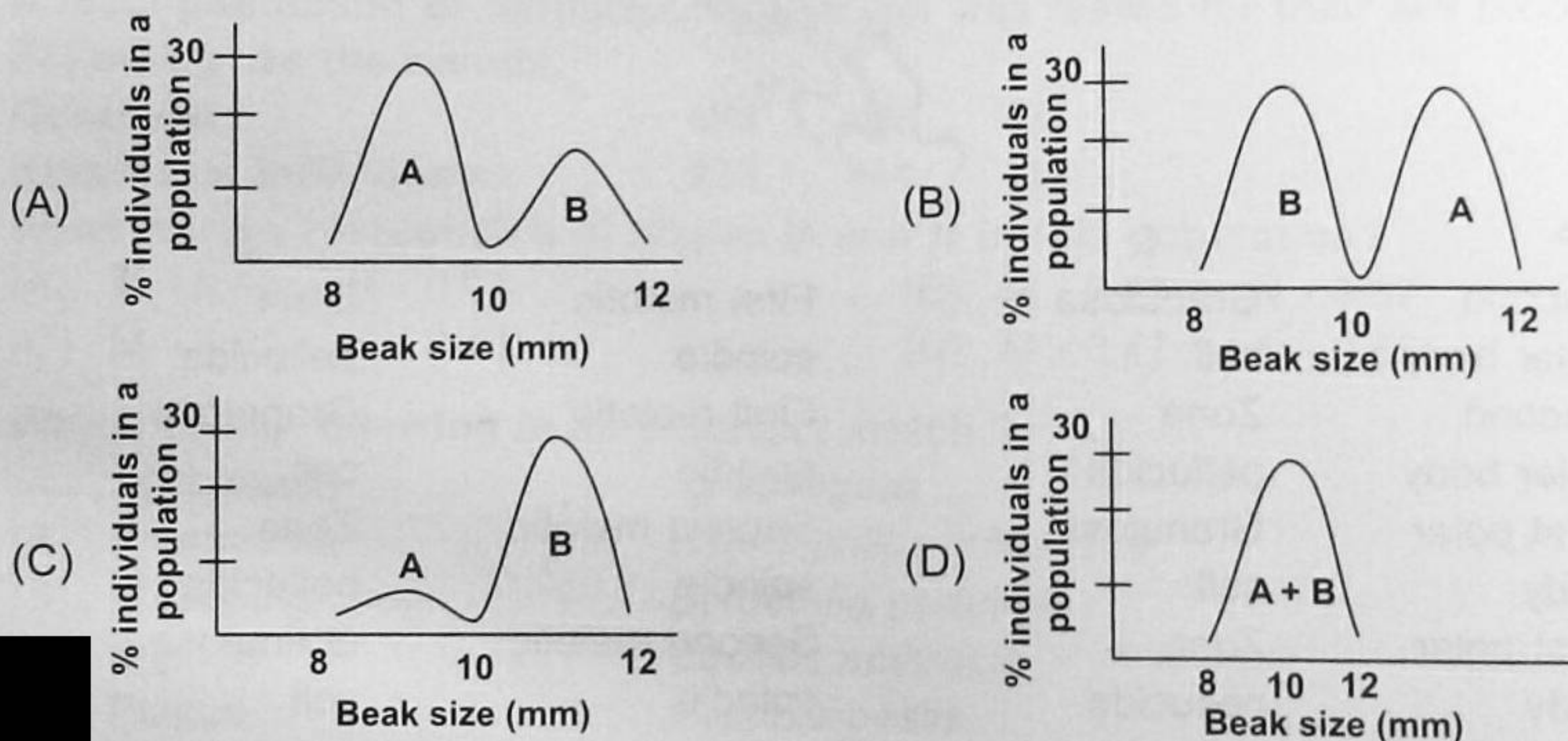
- (A) X – Reptiles, Y – Birds
 (B) X – Fish, Y – Birds
 (C) X – Birds, Y – Fish
 (D) X – Birds, Y – Reptiles



44. Two bird populations (a & b) on two islands were examined for their beak sizes. The results are shown in graphs 1 and 2 respectively.

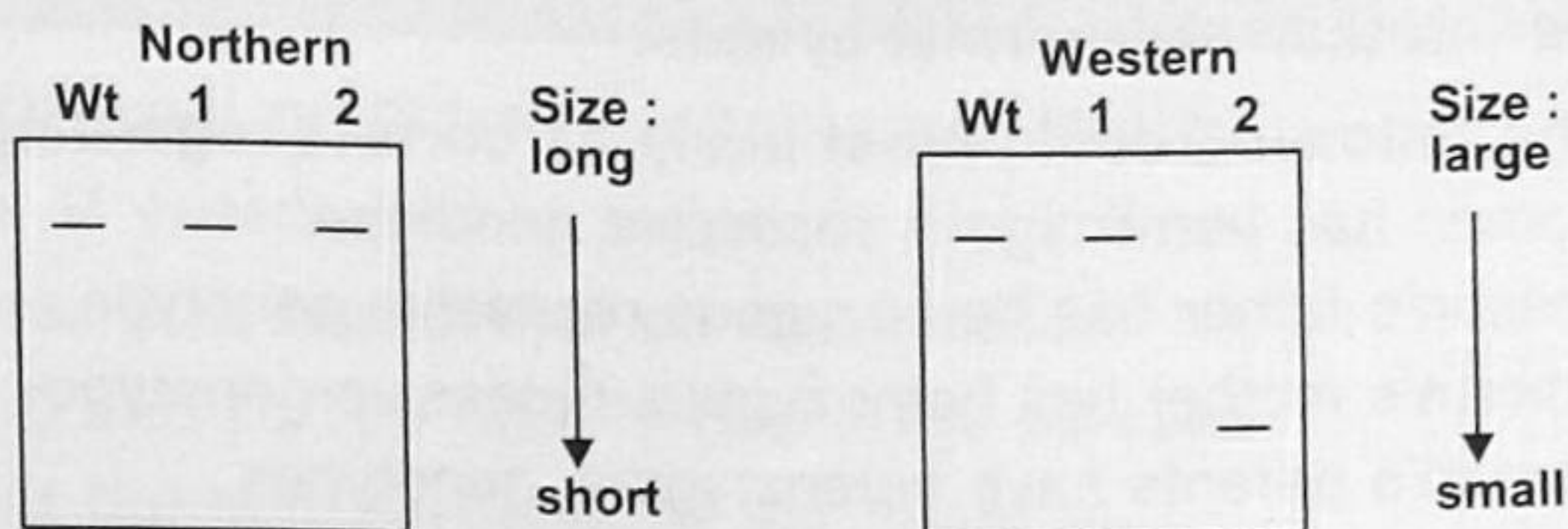


When these two populations were brought together on one island, competition for the ecological niche between birds with identical beaks greatly increased and they were reduced in number. This situation is correctly depicted in:

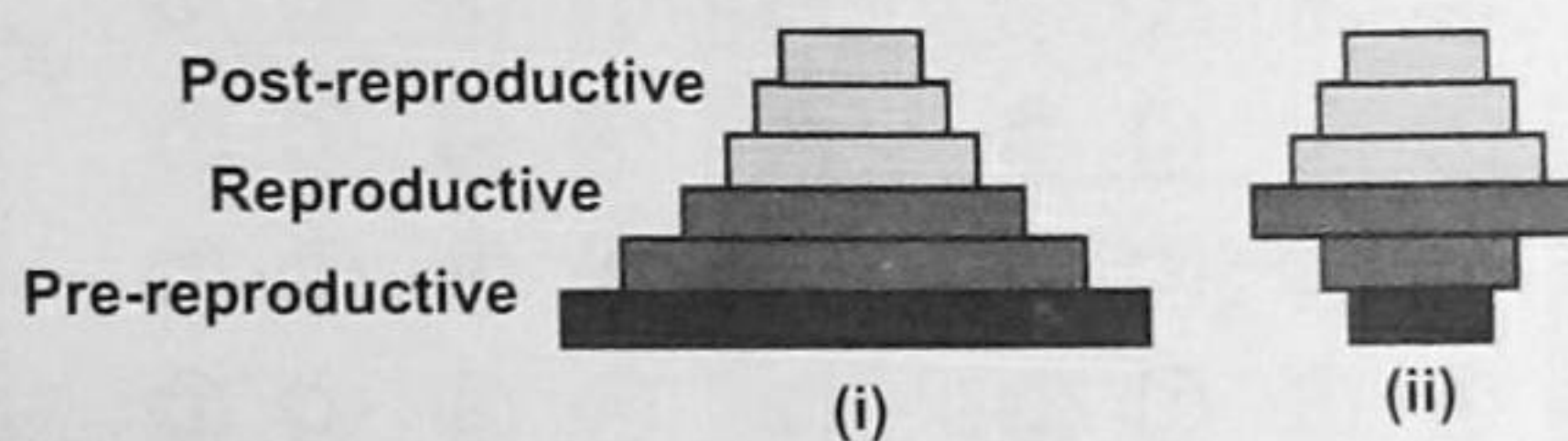


45. Which of the following statements regarding antibiotics is not correct?
- (i) Antibiotics are the attenuated microorganisms which in small concentration, can kill or retard the growth of other harmful microorganisms.
 - (ii) Penicillin was the first antibiotic to be discovered by Alexander Fleming (1928) while working on bacterium *Staphylococcus aureus*.
 - (iii) The full potential of penicillin as an effective antibiotic was established by Ernest Chain and Howard Florey.
 - (iv) Fleming, Chain and Florey were awarded the Nobel Prize in 1945.
- (A) (i) only (B) (iii) only (C) (ii) and (iv) (D) (i), (iii) and (iv)

46. Two different mutations were found in a gene. The gene has been cloned and an antibody is available for the protein product of this gene. Northern and Western analyses were performed on each mutant (1 and 2) and the wild-type gene (Wt, no mutation). The results are shown below. What type of mutation has occurred in the two mutants?

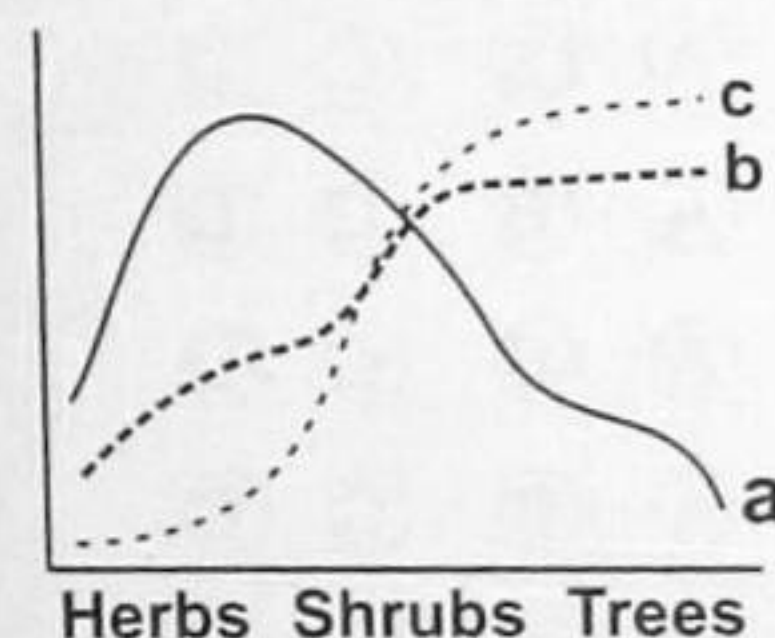


- (A) Mutants 1 and 2 both have missense mutations at different positions
 - (B) Mutant 1 has a missense mutation, while mutant 2 has a silent mutation
 - (C) Mutant 1 has a missense mutation, with mutant 2 has a nonsense mutation
 - (D) Mutant 1 has a nonsense mutation, while mutant 2 has a silent mutation
47. What do the shapes of the given pyramids (i-ii) reflect about the growth status of the population?



- (A) (i)-Expanding; (ii)-Stable
- (B) (i)-Stable; (ii)-Declining
- (C) (i)-Expanding; (ii)-Declining
- (D) (i)-Declining; (ii)-Stable

48. Succession in a forest ecosystem is characterized by changes in species diversity, biomass and net primary productivity as shown in the graph below. Identify curves a, b and c.



- (A) a: biomass b: net primary productivity c: species diversity
- (B) a: species diversity b: net primary productivity c: biomass
- (C) a: net primary productivity b: biomass c: species diversity
- (D) a: net primary productivity b: species diversity c: biomass

49. Select the incorrect statement out of the following with regard to megasporogenesis in angiosperms?

- (A) A primary archesporial cell develops in the hypodermal region of nucellus usually towards the chalazal end.
- (B) The primary archesporial cell divides periclinally to form outer parietal cell and inner sporogenous cell.
- (C) The sporogenous cell functions as MMC, which undergoes reduction division to form 4 haploid megaspores.
- (D) Only the single functional megaspore develops into female gametophyte, this type of embryo sac development is called as monosporic development.

50. Refer the given paragraph.

A woman has a rare abnormality of the eyelids called ptosis which unables her to completely open her eyes. The condition has been found to depend on a single dominant gene (P). The woman's father had ptosis but her mother had normal eyelids. Her father's mother had normal eyelids.

Which of the following could most likely be correct regarding the given paragraph?

- (A) The woman has homozygous recessive genotype.
- (B) The woman's father has homozygous recessive genotype.
- (C) The woman's mother has homozygous recessive genotype.
- (D) The woman's parents have heterozygous genotypes.