

# NEST Biology Sample Paper – 6

Duration: 45 Minutes

Maximum Marks: 60

## Instructions

- This paper contains **20 Multiple Choice Questions (single correct answer)**, modelled on the Biology section of **NEST 2026**.
- Each correct answer carries **+3 marks**. There is a deduction of **–1 mark** for each incorrect answer; **no marks** are deducted for an unattempted question.
- Every question has exactly **four options**, of which only **one** is correct. Choose carefully.
- Personal calculators, log tables, mobile phones, and other electronic gadgets are strictly prohibited in the examination hall.
- A simple on-screen (virtual) calculator is provided in the computer-based test interface and may be used; blank sheets for rough work are supplied at the exam centre.

**Q1.** Carl Woese (1977) divided all cellular life into three domains on the basis of differences in ribosomal RNA. An organism that is a prokaryote able to live in extreme, hostile habitats such as hot springs and highly saline waters, and whose cell wall lacks peptidoglycan, is best placed in the domain

- (A) Bacteria
- (B) Eukarya
- (C) Archaea
- (D) Protista

**Q2.** A marine alga is large and brown, stores food chiefly as the carbohydrate laminarin and the alcohol mannitol, and owes its colour to the pigment fucoxanthin masking its chlorophyll. To which class of algae does it belong?

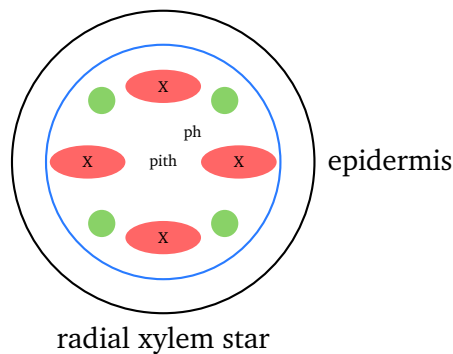


- (A) Chlorophyceae (green algae)
- (B) Phaeophyceae (brown algae)
- (C) Rhodophyceae (red algae)
- (D) Cyanophyceae (blue-green algae)

**Q3.** In certain mangrove plants growing in salty, oxygen-poor marshy soil, some roots grow vertically *upward* out of the ground and bear tiny pores through which the plant obtains oxygen. These specially modified roots are called

- (A) fibrous roots, for anchorage
- (B) prop roots, for mechanical support
- (C) storage tap roots, for food reserve
- (D) pneumatophores, for respiration

**Q4.** The transverse section of a young root shown below has the xylem and phloem on separate radii (a radial arrangement) with only *two to four* xylem groups forming a central star. This is characteristic of

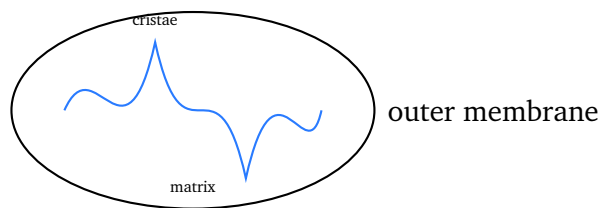


- (A) a dicot root (tetrarch)
- (B) a dicot stem
- (C) a monocot stem
- (D) a monocot leaf

**Q5.** The double-membrane organelle drawn below has its inner membrane thrown into folds (cristae) that project into a fluid-filled matrix bearing

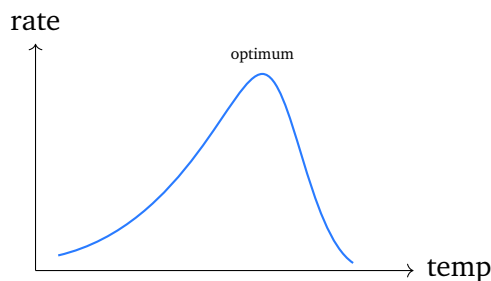


small  $F_1$  particles (oxysomes). Because it contains its own DNA and ribosomes, this organelle is described as



- (A) a non-living inclusion
- (B) a semi-autonomous organelle
- (C) a single-membrane organelle
- (D) the cell's protein-export channel

**Q6.** The graph below plots the rate of an enzyme-catalysed reaction against temperature. The rate rises to a peak at an optimum temperature and then falls steeply as the temperature is raised further. The steep fall just beyond the optimum is mainly because the enzyme



- (A) is denatured, losing its active-site shape
- (B) is synthesised faster than it is used
- (C) changes the substrate into a permanent product
- (D) begins to act as its own substrate

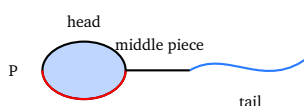
**Q7.** During the division of the cytoplasm (cytokinesis), a plant cell and an animal cell differ in the way the parent cell is partitioned. In a typical plant cell, cytokinesis is accomplished by

- (A) an inward-pinching cleavage furrow of the plasma membrane

- (B) budding off small vesicles from each pole
- (C) formation of a cell plate that grows outward to the wall
- (D) simple breakage of the cell along the metaphase plate
- Q8.** In the chloroplast the light reactions and the carbon-fixing dark reactions occur at different sites. The light reactions (including chemiosmotic ATP synthesis by ATP synthase) take place in the, and the dark (Calvin) reactions take place in the
- (A) stroma; thylakoid membranes
- (B) outer membrane; inner membrane
- (C) cytoplasm; thylakoid lumen
- (D) thylakoid membranes; stroma
- Q9.** In the absence of oxygen, yeast and the muscle cells of an over-exercised athlete both regenerate  $\text{NAD}^+$  from  $\text{NADH}$  so that glycolysis can continue. The respective end products of fermentation in yeast and in human muscle are
- (A) lactic acid (yeast) and ethanol (muscle)
- (B) ethanol +  $\text{CO}_2$  (yeast) and lactic acid (muscle)
- (C)  $\text{CO}_2$  + water in both
- (D) acetic acid (yeast) and pyruvate (muscle)
- Q10.** The largest fraction of the carbon dioxide carried from the tissues to the lungs in the blood is transported in the form of
- (A) gas physically dissolved in the plasma
- (B) carbamino-haemoglobin bound to the globin of haemoglobin
- (C) bicarbonate ( $\text{HCO}_3^-$ ) ions, formed with the help of carbonic anhydrase
- (D) carbon monoxide complexes in the red cells



- Q11.** The kidney can produce urine that is far more concentrated than blood plasma. This is achieved by a counter-current mechanism operating between the limbs of the loop of Henle and the vasa recta, which sets up an increasing osmotic gradient toward the inner medulla. The reabsorption of water from the collecting duct that finally concentrates the urine is controlled mainly by
- (A) insulin from the pancreas
  - (B) adrenaline from the adrenal medulla
  - (C) thyroxine from the thyroid
  - (D) ADH (vasopressin) from the posterior pituitary
- Q12.** The wall of a mature anther has, from outside inward, the epidermis, endothecium, middle layers and an innermost layer. This innermost layer nourishes the developing pollen grains and provides material for the pollen wall. This nutritive layer is the
- (A) endothecium
  - (B) tapetum
  - (C) middle layer
  - (D) epidermis
- Q13.** In the human sperm drawn below, the cap-like structure **P** at the very front of the head contains enzymes that help the sperm penetrate the layers around the egg at fertilisation. Structure **P** is the



- (A) acrosome
- (B) middle piece
- (C) flagellar tail
- (D) centriole



- Q14.** Human ABO blood groups are governed by three alleles  $I^A$ ,  $I^B$  and  $i$ , where  $I^A$  and  $I^B$  are codominant and both dominant over  $i$ . A man of blood group AB marries a woman who is homozygous group O. The possible blood groups among their children are
- (A) only AB
  - (B) only O
  - (C) A and B only
  - (D) A, B, AB and O
- Q15.** Hershey and Chase grew bacteriophages in media containing radioactive  $^{32}\text{P}$  (which labels DNA) or radioactive  $^{35}\text{S}$  (which labels protein), then allowed the phages to infect bacteria. They found that the substance which entered the bacterial cell and directed the formation of new phages was
- (A) the protein coat, carrying  $^{35}\text{S}$
  - (B) a polysaccharide capsule
  - (C) lipid from the phage envelope
  - (D) the DNA, carrying  $^{32}\text{P}$
- Q16.** The long neck of the giraffe is explained differently by different theories. The idea that the neck became long because each generation *stretched* its neck to reach higher leaves and then passed this acquired lengthening to its offspring is the central claim of
- (A) Lamarck's theory (inheritance of acquired characters)
  - (B) Darwin's theory of natural selection
  - (C) de Vries' mutation theory
  - (D) Mendel's law of inheritance
- Q17.** A patient presents with a sustained high fever, weakness and intestinal symptoms. The diagnosis is confirmed by a *Widal test*, and the disease is caused by a rod-shaped bacterium. The disease and its causative agent are

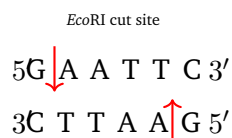


- (A) common cold, caused by rhinoviruses
- (B) pneumonia, caused by *Streptococcus pneumoniae*
- (C) malaria, caused by *Plasmodium*
- (D) typhoid, caused by *Salmonella typhi*

**Q18.** The large holes ("eyes") seen in a block of Swiss cheese are produced by a bacterium that releases carbon dioxide gas during ripening of the cheese. This bacterium is

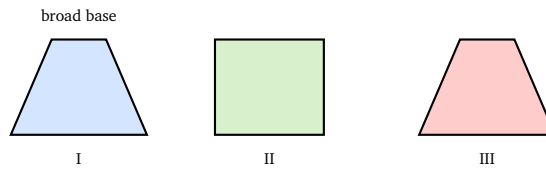
- (A) *Lactobacillus*, which curdles milk
- (B) *Propionibacterium sharmanii* (*P. freudenreichii*)
- (C) *Saccharomyces cerevisiae*, which leavens bread
- (D) *Penicillium roqueforti*, which ripens Roquefort

**Q19.** The DNA segment below shows the recognition site of the restriction enzyme *EcoRI*. The enzyme cuts each strand between G and A (arrows), producing fragments with short single-stranded overhangs. A recognition sequence of this kind, which reads the same 5' → 3' on both strands, is described as



- (A) a non-coding intron
  - (B) a promoter sequence
  - (C) a palindromic sequence giving sticky ends
  - (D) an origin of replication
- Q20.** The three age-pyramids below plot the proportion of pre-reproductive, reproductive and post-reproductive individuals in three populations. The pyramid with the *broad base* (labelled I) represents a population that is





- (A) rapidly expanding (growing)
- (B) stable, with a constant size
- (C) declining toward extinction
- (D) composed only of post-reproductive individuals



## Detailed Solutions

Q1.

## Solution

**Concept — Three domains of life:** Carl Woese, comparing ribosomal RNA, split life into three domains: Bacteria, Archaea and Eukarya. Archaea are prokaryotes that often live in extreme habitats and have cell walls lacking peptidoglycan.

**Step 1 — Match the clues:** Prokaryote + extreme habitats (hot springs, high salt) + no peptidoglycan in the wall = Archaea (archaebacteria).

**Why other options are wrong:**

- (A) Bacteria are prokaryotes but their wall contains peptidoglycan and most are not extremophiles.
- (B) Eukarya have true membrane-bound nuclei; the organism here is a prokaryote.
- (D) Protista is a kingdom in the older five-kingdom scheme, not a domain of Woese.

**Final Answer:** The organism belongs to Archaea ⇒

**Answer:** (C) [Go Back to Q1](#)

Q2.

## Solution

**Concept — Classes of algae:** Algae are grouped by their pigments and stored food. Brown algae (Phaeophyceae) contain chlorophyll a and c plus fucoxanthin (giving the brown colour) and store food as laminarin and mannitol.

**Step 1 — Match the features:** Large brown marine alga + fucoxanthin + laminarin/mannitol storage = Phaeophyceae.

**Why other options are wrong:**

- (A) Chlorophyceae (green algae) are grass-green with chlorophyll a and b and store starch.
- (C) Rhodophyceae (red algae) contain r-phycoerythrin and store floridean starch.
- (D) Cyanophyceae are prokaryotic blue-green algae, not the brown seaweeds described.

**Final Answer:** The alga belongs to Phaeophyceae ⇒



Answer: (B) [Go Back to Q2](#)

Q3.

### Solution

**Concept — Root modifications:** Roots are modified for various functions. In mangroves growing in marshy, oxygen-poor soil, some roots grow vertically upward and bear pores (pneumatodes) for gaseous exchange; these are pneumatophores.

**Step 1 — Match the feature:** Upward-growing roots with pores for breathing in waterlogged soil = pneumatophores (respiratory roots), as in *Rhizophora*.

**Why other options are wrong:**

- (A) Fibrous roots anchor the plant but do not grow upward for air.
- (B) Prop roots descend from branches for support, not for respiration.
- (C) Storage tap roots (e.g. carrot) swell to store food, not to obtain oxygen.

**Final Answer:** They are pneumatophores for respiration ⇒

Answer: (D) [Go Back to Q3](#)

Q4.

### Solution

**Concept — Dicot root anatomy:** In a root the vascular tissue is *radial*: xylem and phloem lie on separate radii. A dicot root has a limited number of xylem groups (usually two to four, i.e. di- to tetrarch) arranged as a central star, with phloem between the xylem arms.

**Step 1 — Read the figure:** A radial arrangement with only two to four xylem groups forming a central star is the hallmark of a dicot root.

**Why other options are wrong:**

- (B) A dicot stem has conjoint bundles in a ring with phloem outside xylem, not a radial star.
- (C) A monocot stem has scattered closed bundles.
- (D) A monocot leaf shows parallel venation, not a radial vascular star.

**Final Answer:** The section is a dicot root ⇒

Answer: (A) [Go Back to Q4](#)



Q5.

**Solution**

**Concept — Mitochondrion:** The mitochondrion is a double-membrane organelle whose inner membrane folds into cristae bearing  $F_1$  particles (oxysomes, the ATP synthase). It carries its own circular DNA and 70S ribosomes, so it is called semi-autonomous.

**Step 1 — Match the description:** Double membrane + cristae + matrix + oxysomes + own DNA/ribosomes = a semi-autonomous organelle.

**Why other options are wrong:**

- (A) A non-living inclusion (e.g. a starch grain) has no membranes, DNA or ribosomes.
- (C) The mitochondrion has *two* membranes, not one.
- (D) Protein export is carried out by the endoplasmic reticulum and Golgi, not the mitochondrion.

**Final Answer:** It is a semi-autonomous organelle  $\Rightarrow$

**Answer: (B)** [Go Back to Q5](#)

Q6.

**Solution**

**Concept — Enzymes and temperature:** Enzyme activity rises with temperature up to an optimum. Beyond this, heat disrupts the weak bonds holding the protein's three-dimensional shape, so the active site is distorted (denaturation) and the rate falls sharply.

**Step 1 — Interpret the curve:** The steep fall after the peak corresponds to denaturation, which destroys the active-site geometry needed for catalysis.

**Why other options are wrong:**

- (B) Faster synthesis would raise, not lower, activity, and heat does not synthesise enzymes.
- (C) An enzyme converts substrate to product but is not itself consumed; this does not explain the fall.
- (D) An enzyme does not act on itself as a substrate.

**Final Answer:** The enzyme is denatured beyond the optimum  $\Rightarrow$

**Answer: (A)** [Go Back to Q6](#)



Q7.

**Solution**

**Concept — Cytokinesis in plants:** Because a plant cell has a rigid wall, it cannot pinch inward. Instead, Golgi-derived vesicles fuse at the centre to lay down a cell plate, which grows centrifugally (outward) toward the existing wall, dividing the cell.

**Step 1 — Match the mechanism:** Cell-plate formation growing outward to the wall is the plant route to cytokinesis; animal cells use an inward cleavage furrow.

**Why other options are wrong:**

- (A) A cleavage furrow is the *animal* mechanism, not the plant one.
- (B) Cytokinesis is not done by budding vesicles from the poles.
- (D) Cells do not simply break apart along the metaphase plate.

**Final Answer:** A cell plate grows outward to the wall ⇒

**Answer: (C)** [Go Back to Q7](#)

Q8.

**Solution**

**Concept — Sites of photosynthesis:** The light reactions occur on the thylakoid membranes, where ATP synthase uses the proton gradient (chemiosmosis) to make ATP and NADPH. The dark (Calvin) reactions, which fix CO<sub>2</sub>, occur in the stroma.

**Step 1 — Assign the sites:** Light reactions = thylakoid membranes; dark reactions = stroma.

**Why other options are wrong:**

- (A) This reverses the two sites.
- (B) The outer and inner chloroplast membranes are not the reaction sites named.
- (C) Photosynthesis occurs in the chloroplast, not the cytoplasm.

**Final Answer:** Light = thylakoid membranes; dark = stroma ⇒

**Answer: (D)** [Go Back to Q8](#)



Q9.

**Solution**

**Concept — Fermentation:** When oxygen is lacking, pyruvate is reduced so that  $\text{NAD}^+$  is regenerated for glycolysis. In yeast (alcoholic fermentation) pyruvate  $\rightarrow$  ethanol +  $\text{CO}_2$ ; in human muscle (lactic-acid fermentation) pyruvate  $\rightarrow$  lactic acid.

**Step 1 — Assign products:** Yeast  $\rightarrow$  ethanol +  $\text{CO}_2$ ; muscle  $\rightarrow$  lactic acid.

**Why other options are wrong:**

- (A) This swaps the two end products.
- (C)  $\text{CO}_2$  + water are products of *aerobic* respiration, not fermentation.
- (D) Yeast does not yield acetic acid here, and muscle converts pyruvate to lactic acid, not leaving pyruvate.

**Final Answer:** Ethanol +  $\text{CO}_2$  (yeast); lactic acid (muscle)  $\Rightarrow$

**Answer: (B)** [Go Back to Q9](#)

Q10.

**Solution**

**Concept — Transport of  $\text{CO}_2$ :**  $\text{CO}_2$  is carried three ways: about 7% dissolved in plasma, about 20–25% as carbamino-haemoglobin, and about 70% as bicarbonate ions. Carbonic anhydrase in red cells speeds the formation of  $\text{HCO}_3^-$  (with the chloride shift maintaining balance).

**Step 1 — Pick the largest fraction:** Roughly 70% of  $\text{CO}_2$  travels as bicarbonate, the dominant form.

**Why other options are wrong:**

- (A) Only about 7% is physically dissolved.
- (B) Carbamino-haemoglobin carries only about 20–25%.
- (D)  $\text{CO}_2$  is not transported as carbon monoxide complexes.

**Final Answer:** Most  $\text{CO}_2$  is carried as bicarbonate  $\Rightarrow$

**Answer: (C)** [Go Back to Q10](#)



Q11.

**Solution**

**Concept — Urine concentration:** The loop of Henle and vasa recta act as a counter-current system that builds an osmotic gradient deep in the medulla. The final reabsorption of water from the collecting duct, which concentrates urine, is governed by ADH (vasopressin), which makes the duct more permeable to water.

**Step 1 — Identify the hormone:** More ADH → more water reabsorbed → concentrated urine; the controlling hormone is ADH from the posterior pituitary.

**Why other options are wrong:**

- (A) Insulin regulates blood glucose, not water reabsorption in the duct.
- (B) Adrenaline acts in the fight-or-flight response.
- (C) Thyroxine governs metabolic rate, not collecting-duct water permeability.

**Final Answer:** Water reabsorption is controlled by ADH ⇒ **D**

**Answer: (D)** [Go Back to Q11](#)

Q12.

**Solution**

**Concept — Anther wall and tapetum:** The anther wall has four layers: epidermis, endothecium, middle layers and the innermost tapetum. The tapetum nourishes the developing microspores and supplies sporopollenin and other materials for the pollen-grain wall.

**Step 1 — Match the function:** Innermost nutritive layer that feeds pollen and builds its wall = tapetum.

**Why other options are wrong:**

- (A) The endothecium lies just below the epidermis and helps in anther dehiscence.
- (C) The middle layers are short-lived and not the chief nutritive layer.
- (D) The epidermis is the outermost protective layer, not the nutritive one.

**Final Answer:** The nutritive layer is the tapetum ⇒ **B**

**Answer: (B)** [Go Back to Q12](#)



Q13.

**Solution**

**Concept — Human sperm structure:** A sperm has a head, a middle piece and a tail. The front of the head is capped by the acrosome, a vesicle filled with hydrolytic enzymes that help the sperm penetrate the layers (zona pellucida) around the egg.

**Step 1 — Identify P:** The enzyme-filled cap at the front of the head is the acrosome (structure P).

**Why other options are wrong:**

- (B) The middle piece houses mitochondria that power movement, not the penetrating enzymes.
- (C) The tail (flagellum) propels the sperm.
- (D) The centriole lies near the base of the head and forms the tail axoneme; it is not the enzyme cap.

**Final Answer:** Structure P is the acrosome  $\Rightarrow$

**Answer: (A)** [Go Back to Q13](#)

Q14.

**Solution**

**Concept — ABO multiple alleles:** A group-AB father is  $I^A I^B$ ; a homozygous group-O mother is  $ii$ . Each child gets one allele from each parent.

**Step 1 — Make the cross:**  $I^A I^B \times ii$  gives  $I^A i$  (group A) and  $I^B i$  (group B) in a 1 : 1 ratio. So children are group A or group B only.

**Why other options are wrong:**

- (A) Only AB would need both parents to supply  $I^A/I^B$ ; the mother supplies only  $i$ .
- (B) Only O would require the father to supply  $i$ , but he carries  $I^A$  and  $I^B$ .
- (D) AB and O cannot appear, because a child must receive an  $i$  from the mother and either  $I^A$  or  $I^B$  from the father.

**Final Answer:** Children are group A and group B only  $\Rightarrow$

**Answer: (C)** [Go Back to Q14](#)



Q15.

**Solution**

**Concept — Hershey–Chase experiment:** Using phages labelled with  $^{32}\text{P}$  (DNA) or  $^{35}\text{S}$  (protein), Hershey and Chase showed that only the  $^{32}\text{P}$ -labelled DNA entered the bacterium and directed the production of new phages, proving DNA is the genetic material.

**Step 1 — Trace the label:** Radioactivity inside the infected cells was  $^{32}\text{P}$ , i.e. DNA, not the  $^{35}\text{S}$  protein coat left outside.

**Why other options are wrong:**

- (A) The  $^{35}\text{S}$  protein coat stayed outside the bacterium.
- (B) Polysaccharide capsules were the focus of Griffith's earlier work, not the genetic material here.
- (C) Lipids are not the hereditary material entering the cell.

**Final Answer:** The genetic material is DNA ( $^{32}\text{P}$ )  $\Rightarrow$

**Answer: (D)** [Go Back to Q15](#)

Q16.

**Solution**

**Concept — Lamarckism:** Lamarck proposed that organs used more become better developed and that such acquired characters are inherited (use and disuse). The giraffe's neck lengthening through repeated stretching, passed to offspring, is the classic Lamarckian example.

**Step 1 — Match the claim:** "Stretching during life  $\rightarrow$  acquired lengthening inherited" is the inheritance of acquired characters, i.e. Lamarck's theory.

**Why other options are wrong:**

- (B) Darwin explained long necks by selection of pre-existing heritable variation, not by stretching.
- (C) de Vries attributed evolution to sudden large mutations (saltation), not gradual stretching.
- (D) Mendel's laws describe how traits are inherited, not how the long neck evolved.

**Final Answer:** This is Lamarck's theory  $\Rightarrow$

**Answer: (A)** [Go Back to Q16](#)



Q17.

**Solution**

**Concept — Typhoid:** Typhoid fever is caused by the rod-shaped bacterium *Salmonella typhi*. It produces sustained high fever and intestinal symptoms and is confirmed by the Widal test, which detects antibodies against the bacterium.

**Step 1 — Use the diagnostic clue:** Sustained fever + Widal test + rod-shaped bacterium = typhoid caused by *Salmonella typhi*.

**Why other options are wrong:**

- (A) The common cold is viral (rhinoviruses) and is not diagnosed by the Widal test.
- (B) Pneumonia is confirmed by other means, and *Streptococcus pneumoniae* affects the lungs.
- (C) Malaria is caused by the protozoan *Plasmodium*, diagnosed by blood smears, not a Widal test.

**Final Answer:** The disease is typhoid (*Salmonella typhi*) ⇒ **D**

**Answer: (D)** [Go Back to Q17](#)

Q18.

**Solution**

**Concept — Microbes in dairy products:** Different microbes give different fermented foods. The large holes in Swiss cheese are made by *Propionibacterium* (*P. sharmanii* / *freudenreichii*), which releases large amounts of CO<sub>2</sub> during ripening.

**Step 1 — Match microbe to feature:** Gas-producing holes in Swiss cheese = *Propionibacterium*.

**Why other options are wrong:**

- (A) *Lactobacillus* curdles milk into curd; it does not make the Swiss-cheese holes.
- (C) *Saccharomyces cerevisiae* leavens bread dough, a different product.
- (D) *Penicillium roqueforti* ripens Roquefort/blue cheese; it does not produce the holes.

**Final Answer:** The holes are made by *Propionibacterium* ⇒ **B**

**Answer: (B)** [Go Back to Q18](#)



Q19.

**Solution**

**Concept — Palindromic recognition site:** Restriction enzymes recognise short palindromic sequences, which read the same in the 5' → 3' direction on both strands. *EcoRI* recognises GAATTC and cuts between G and A on each strand, leaving single-stranded AATT overhangs (sticky ends).

**Step 1 — Read the figure:** The staggered cut between G and A on each strand gives complementary sticky ends, and GAATTC is palindromic.

**Why other options are wrong:**

- (A) An intron is a non-coding segment of a gene, not a restriction recognition site.
- (B) A promoter is where transcription begins; it is not the enzyme's cut site here.
- (D) An origin of replication is where DNA copying starts, not a palindromic cut site.

**Final Answer:** It is a palindromic sequence giving sticky ends ⇒

[Go Back to Q19](#)

Q20.

**Solution**

**Concept — Age pyramids:** The shape of an age pyramid shows a population's growth status. A broad base means many pre-reproductive young individuals, so the population is rapidly expanding (growing).

**Step 1 — Read pyramid I:** A broad base → large young (pre-reproductive) fraction → a rapidly growing population.

**Why other options are wrong:**

- (B) A stable population has a roughly straight (bell-like) pyramid, not a broad base.
- (C) A declining population has a narrow base (few young).
- (D) A population of only post-reproductive individuals cannot persist and is not shown by a broad-based pyramid.

**Final Answer:** Pyramid I is a rapidly expanding population ⇒

[Go Back to Q20](#)



## Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	B	3	D	4	A	5	B
6	A	7	C	8	D	9	B	10	C
11	D	12	B	13	A	14	C	15	D
16	A	17	D	18	B	19	C	20	A

