**Q 2015 15 (c)**

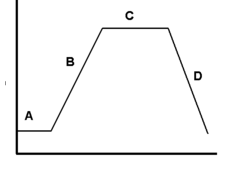
(i) Name the **three** general shapes of bacterial cells.

1. What is meant by the term *pathogen*?
2. What is the difference between ‘asepsis’ and ‘sterility’?
3. Give **one** way in which bacteria cope with unfavourable environments.
4. When growing bacteria in the laboratory, samples are taken regularly from the growth

medium and the number of cells per millilitre is counted. A graph of the results is drawn and is similar to the one shown below.

Answer the following questions in relation to this graph.

* 1. Name the stages B, C and D.
  2. Explain what is happening during stage C.
  3. Distinguish between batch processing and continuous flow in food processing. Refer to the stages labelled in the graph in your answer.



Time

Bacterial population size

**MS 2015 15 (c)**

(i) Rod (or bacilli) / spherical (or cocci) / spiral (or spirilla)

(ii) Disease-causing (agent or organism)

(iii) Asepsis: Free of pathogens

Sterility: Free of (micro)organisms

(iv) (Endo)spore formation

(v) 1. B = \*log (phase)

C = \*stationary (phase)

D = \*decline (or \*death) (phase)

2. Limited space (or food or O2) **or** waste (or toxin) accumulating **or** death rate = birth rate

3. Batch processing: Fixed amount of nutrients added at beginning **or** (bioreactor) emptied at end of production

Continuous flow: Nutrients continuously fed into (bioreactor) or product removed continuously

Stage Reference:

Batch: All stages occur

OR

Continuous flow: Stage B (or C) (or log or stationary phase) maintained

**Q 2013 12(b&c)**

* 1. (i) Name the kingdom to which bacteria belong.

1. Draw a large diagram of a bacterial cell to show:
   1. The relative positions of the cell wall, cell membrane and capsule.
   2. A plasmid.

Label **each** of the above structures.

1. 1. Under what circumstances does a bacterial cell form an endospore?

2. Describe briefly how an endospore forms.

1. Name **two** types of heterotrophic nutrition used by bacteria.
   1. (i) Distinguish clearly between *antibodies* and *antibiotics* by writing a note about each.
2. In relation to antibodies, distinguish between active and passive immunity.
3. Using your knowledge of antibiotics and bacteria, suggest why a person is more likely to pick up an infection in hospital than at home.

**MS 2013 12(b&c)**

(b) (i) \*Monera

(ii) 1 + 2 Diagram: wall + membrane + capsule + plasmid shown Labels:

(iii) 1. Harsh conditions or example

2. DNA replicates / thick wall (or described) / encloses / shrinkage (or water loss) / of cytoplasm

(iv) \*Saprophytic \*Parasitic

(c) (i) Antibodies – proteins / produced by body / in response to antigen (or to infection)

Antibiotics –produced by micro-organisms / kill (or destroy or stop growth of) other micro-organisms / do not affect viruses

(ii) Active - antibodies produced in body. Passive – antibodies given

(iii) Antibiotic resistance strains / more pathogens / more people (or poor hygiene) / patients weaker

**Q 2008 15 (C)**

The diagram shows a bacterial growth curve.

## A

**y**

**x**

**B**

(i) **A** and **B** represent the labels on the axes. What does each of them stand for?

(ii) What term is applied to the part of the curve labelled **x**? What is happening during **x**?

(iii) What term is applied to the part of the curve labelled **y**? What is happening during **y**?

(iv) Copy the diagram into your answer book and continue the curve to show the next phase. Explain why you have continued the curve in this way.

(v) Distinguish between batch and continuous flow food processing using micro-organisms in the food industry.

**MS 2008 15 (C)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (c) | (i) | A = population (size) of **or** number (of bacteria) | **3** |
|  |  | B = time | **3** |
|  |  | (ii) | X = lag (phase) | **3** |
|  | adapting to environment **or** low reproductive rate | **3** |
|  |  | (iii) | log **or** exponential (phase) | **3** |
|  | reproducing rapidly | **3** |
|  |  | (iv) | curve showing flattening **or** falling | **3** |
|  | reproduction slows **or** some limiting factor mentioned **or** toxin builds |  |