EDX.MED9 The Role of Individuals in Driving Medical Change, c1250-Present

Total Marks

EDEXCEL 1HI0 · Calculators not allowed · about 70 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Write in full sentences for Questions 14, 15 and 16. You are advised to spend about 70 minutes on this pack.

1 Give the year Andreas Vesalius published De humani corporis fabrica.

(Total for Question 1 is 1 mark)

2 Name the ancient physician whose theory of the four humours dominated European medicine for many centuries.

(Total for Question 2 is 1 mark)

3 State one contribution William Harvey made to medical knowledge.

(Total for Question 3 is 2 marks)

4 Give the disease Edward Jenner's vaccination method was developed to prevent.

(Total for Question 4 is 1 mark)

5 Give the year Alexander Fleming discovered the mould which led to penicillin.

(Total for Question 5 is 1 mark)

6 State one way the Royal Society and similar institutions helped medical change.

(Total for Question 6 is 2 marks)

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7 Name two scientists most closely associated with the development of germ theory.

(Total for Question 7 is 2 marks)

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8 Give the medical technology discovered by Wilhelm Roentgen that allowed doctors to see inside the body and the year it was discovered.

(Total for Question 8 is 1 mark)

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9 State one reason why Galenic medicine remained authoritative into the early modern period.

(Total for Question 9 is 2 marks)

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10 Name the two scientists whose work on antibiotics took penicillin from Fleming's discovery to a usable treatment in the 1940s.

(Total for Question 10 is 2 marks)

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11 State two ways in which an individual doctor's reputation could slow acceptance of their discoveries.

(Total for Question 11 is 2 marks)

12 Give one way luck or chance has affected medical discoveries, with a brief example.

(Total for Question 12 is 1 mark)

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13 Explain one way in which the influence of individuals and the influence of institutions were different in bringing about medical change over the period c1250 to the present.

(Total for Question 13 is 4 marks)

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14 Explain why medical breakthroughs by individuals sometimes took a long time to be accepted by the medical establishment.

You may use the following in your answer:
- the authority of established medical teaching such as Galenism
- professional and institutional resistance to changes that threatened existing status or income

You must also use information of your own.

(Total for Question 14 is 12 marks)

15 "Individuals, not institutions, were the decisive force behind medical progress.' How far do you agree? Explain your answer.

You may use the following in your answer:
- individual discoveries such as those by Vesalius, Jenner, Pasteur and Fleming
- the role of institutions such as universities, medical colleges and scientific societies in testing and spreading ideas

You must also use information of your own. There are 4 marks available for spelling, punctuation, grammar and the accurate use of specialist terminology.

(Total for Question 15 is 20 marks)

Mark scheme · EDX.MED9 The Role of Individuals in Driving Medical Change, c1250-Present

Question 1

- **B1** 1543
- **Answer: 1543**

Question 2

- **B1** Galen
- **Answer: Galen**

Question 3

- **B1** identifies a contribution, e.g. showing how blood circulates
- **B1** supporting detail, e.g. demonstrated the role of the heart in pumping blood and described venous return
- **Answer: He explained blood circulation, showing the heart pumps blood around the body and demonstrating venous return.**

Question 4

- **B1** smallpox
- **Answer: Smallpox**

Question 5

- **B1** 1928
- **Answer: 1928**

Question 6

- **B1** identifies a role, e.g. they provided a forum for sharing and testing new ideas
- **B1** supporting detail, e.g. by publishing experiments and encouraging peer discussion, which helped spread discoveries beyond an individual
- **Answer: They provided a forum for sharing and testing new ideas, for example publishing experiments and encouraging peer discussion that spread discoveries.**

Question 7

- **B1** Louis Pasteur
- **B1** Robert Koch
- **Answer: Louis Pasteur and Robert Koch**

Question 8

- **B1** X-rays, 1895
- **Answer: X-rays, 1895**

Question 9

- **B1** identifies a reason, e.g. Galen's writings were integrated into university teaching and medical training
- **B1** supporting detail, e.g. universities and medical faculties relied on Galen as an authoritative textbook, so new ideas faced institutional resistance
- **Answer: Because Galen's writings were embedded in university teaching and medical training, so universities and faculties treated them as authoritative and resisted new ideas.**

Question 10

- **B1** Howard Florey
- **B1** Ernst Chain
- **Answer: Howard Florey and Ernst Chain**

Question 11

- **B1** identifies factor, e.g. if the individual lacked academic or social standing their claims were distrusted
- **B1** supporting detail, e.g. university-trained physicians or established surgeons were more likely to be listened to than a lone practitioner
- **Answer: If the individual lacked academic or social standing their claims were distrusted, because established university-trained physicians were more likely to be listened to.**

Question 12

- **B1** e.g. Fleming's accidental mould contamination in 1928 led to the discovery of penicillin
- **Answer: Fleming's accidental mould contamination in 1928 led to the discovery of penicillin.**

Question 13

- **B2** individuals could introduce radically new ideas quickly through discovery or experiment, for example Vesalius challenging anatomical errors by dissection, whereas institutions tended to change more slowly
- **B2** institutions provided the framework for wider acceptance and application of ideas, for example universities, medical colleges and learned societies testing, teaching and legitimising discoveries so that individuals alone rarely achieved widespread change without institutional support
- **Answer: Individuals could introduce radical new ideas quickly by innovative work, but institutions were needed to test, teach and legitimise those ideas before they became widely used.**

Question 14

- **Level 1** (1-3): Identifies one or two basic reasons why breakthroughs were resisted, with little or no supporting detail or explanation.
- **Level 2** (4-6): Identifies and begins to explain reasons, supported by some relevant detail and an example.
- **Level 3** (7-9): Explains several reasons clearly, supported by accurate and relevant detail and more than one example.
- **Level 4** (10-12): Explains a range of connected reasons in a well-developed, analytical way, supported throughout by precise and accurate detail and linked examples, showing how reasons reinforced each other.
- **Indicative content:**
  - The long authority of Galen and Galenic teaching meant medical education and textbooks taught a coherent system that universities and licensing bodies defended, so students and practitioners were taught to mistrust or ignore evidence that contradicted Galen.
  - Institutions and practitioners had vested interests in the status quo, including economic interests, professional reputation and accepted clinical routines, so an individual threatening those routines could be resisted or marginalised by colleagues.
  - Some discoveries challenged basic assumptions about the body or disease, requiring not just new facts but a change in conceptual framework, for example the shift from humoral ideas to germ theory required replacing an entire explanatory model.
  - Evidence standards and methods mattered: early experimental demonstrations might be seen as anecdotal until repeated and replicated, so institutional acceptance depended on reproducible evidence and peer endorsement.
  - The personality and reputation of the discoverer influenced acceptance: a respected, well-connected figure could persuade peers faster than a less-known clinician, and social, religious or political factors could also shape whether an idea spread.
  - Chance and practicalities affected the timescale: Fleming discovered penicillin in 1928 but it took Florey and Chain, wartime need and mass production to make it a usable treatment in the 1940s, showing how factors beyond the discovery itself determine acceptance and application.

Question 15

- **Level 1** (1-4): Shows limited relevant knowledge and offers only a general or unsupported opinion on the statement.
- **Level 2** (5-8): Shows some relevant knowledge and begins to weigh factors for and against the statement, but the argument lacks development and specific supporting detail.
- **Level 3** (9-12): Shows good relevant knowledge, explains a range of factors on both sides and reaches a supported judgement, with appropriate examples.
- **Level 4** (13-16): Shows precise, well-selected knowledge and explains a balanced range of factors in depth, reaching a sustained, well-supported judgement, with clear links between examples and consistent use of specialist terminology.
- **Indicative content:**
  - Arguments agreeing: individuals have often provided the initial breakthrough without which no institutional change could begin, for example Vesalius correcting anatomical errors by dissection, Jenner's steps towards vaccination, Pasteur and Koch developing germ theory, and Fleming's discovery of penicillin.
  - Individuals often acted as catalysts whose experiments or observations exposed the limits of existing knowledge and forced debate, showing the centrality of personal curiosity, skill and sometimes luck in discovery.
  - Arguments disagreeing: institutions were essential for turning discoveries into accepted knowledge and practical medicine, since universities, medical colleges, hospitals and scientific societies tested, taught, validated and disseminated ideas so that a lone discovery remained marginal without institutional backing.
  - Examples where institutions mattered include the Royal Society and medical journals spreading accurate experimental results, and the work of Florey and Chain together with wartime production and pharmaceutical firms that made penicillin a practical treatment.
  - The process of acceptance often required both: an individual provided the idea, but institutions, professional networks and economic and social conditions enabled scale, replication and integration into practice.
  - A balanced judgement recognises that individuals and institutions were interdependent, with individual creativity initiating change and institutions shaping its adoption and impact; the relative importance of each varied by period and by the nature of the discovery.