

## High Speed Rail Infrastructure Advanced Technician – Rolling Stock EPA Mock Knowledge Test Mark Scheme (M-EPA-HSRIRS4001)

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Answers for the multiple-choice questions (Q1-Q20) on the High Speed Rail Infrastructure Advanced Technician – Rolling Stock mock test (M-EPA-HSRIRS4001) are:

| Question | Correct answer |
|----------|----------------|
| 1        | D              |
| 2        | B              |
| 3        | A              |
| 4        | C              |
| 5        | B              |
| 6        | C              |
| 7        | B              |
| 8        | D              |
| 9        | C              |
| 10       | A              |

| Question | Correct answer |
|----------|----------------|
| 11       | A              |
| 12       | D              |
| 13       | B              |
| 14       | A              |
| 15       | C              |
| 16       | D              |
| 17       | A              |
| 18       | D              |
| 19       | B              |
| 20       | C              |

Answers for the short-answer questions (Q21-Q25) on the High Speed Rail Infrastructure Advanced Technician – Rolling Stock mock test (M-EPA-HSRIRS4001) are:

You are in charge of a team of design engineers working on a project to build a new high-speed train. There are certain documents and standards that your designers have to follow in the UK when designing rolling stock.

21. Name the **main** document written by the Rail Delivery Group which you must follow and name the **3** standards it complies with in the delivery of high speed rail vehicles. **(4 marks)**

22. What **2** documents may also be relevant to your team if designing for HS2? For each document, give a description of **2** areas that they specifically cover. **(6 marks)**

| Q  | Answers include:   | Max Marks | Learning Outcome |
|----|--|-----------|------------------|
| 21 | <b>1 mark for identifying ‘Key Train Requirements’ (only accept this answer). 1 mark for each standard identified (max 3).</b>   | <b>4</b>  | KRS1             |
|    | <b>Document:</b><br>Key Train Requirements   | 1         |                  |
|    | <b>Standards:</b><br>Railway Industry Standards (RIS)  | 1         |                  |
|    | Rail Group Standards (RGS)<br>National Technical Rules (NTR)   | 1<br>1    |                  |
| 22 | <b>1 mark for each suitable document identified (max 2), 1 mark for each suitable description of what the documents specify (max 2 per document)</b>   | <b>6</b>  |                  |
|    | <b>Document:</b><br>Rolling Stock Scope and Requirements   | 1         |                  |
|    | <b>Description:</b> <ul style="list-style-type: none"> <li>• general requirements for HS2</li> <li>• delivery targets for type and number of trains</li> <li>• minimum maintenance periods considering the whole lifecycle approach</li> </ul> | 2         |                  |
|    | <b>Document:</b><br>HS2 Train Technical Specification  | 1         |                  |
|    | <b>Description:</b> <ul style="list-style-type: none"> <li>• standards for specific components in detail</li> <li>• energy collection</li> </ul>   | 2         |                  |

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|--|--|--|--|
|  | <ul style="list-style-type: none"> <li>• power supply</li> <li>• braking</li> <li>• EMC, ETCS, etc.</li> </ul> |  |  |
|--|--|--|--|

You are responsible for a team of engineers involved in the maintenance of a high speed train braking system.

23. Describe **4** components that are typically used in the braking system for high speed rolling stock. **(4 marks)**

24. For each component, identify **1** reason why they are used in the braking system. **(4 marks)**

25. Describe **2** interactions that occur between the components in a braking application. **(2 marks)**

| Q     | Answers include  | Max Marks           | Learning Outcome |
|-------|--|---------------------|------------------|
| 23-25 | <b>1 mark for each suitable component identified (max 4)</b><br><b>1 mark for each correct reason for use (max 4)</b><br><b>1 mark for each interaction the component makes (max 2)</b>  | 10                  | KRS2             |
|       | <b>Component:</b> Compressor<br><br><b>Reason for use:</b> required to supply air to train brake pipe before the train can move, usually on powering up the vehicle<br><br><b>Interaction:</b> supplies brake cylinders via the train brake pipe | 1<br><br>1<br><br>1 |                  |
|       | <b>Component:</b> Cab Power/Brake Controller<br><br><b>Reason for use:</b> driver controller for speed and braking<br><br><b>Interaction:</b> sends a signal to make an application to the Brake Control Unit (BCU)                              | 1<br><br>1<br><br>1 |                  |
|       | <b>Component:</b> Brake Control Unit (BCU)<br><br><b>Reason for use:</b> controls all necessary valves to release air from brake pipe to make a brake application  | 1<br><br>1<br><br>1 |                  |

|  |  |   |  |
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|  | <b>Interaction:</b> sends a signal to the compressor to build up pressure again after a brake application                    |   |  |
|  | <b>Component:</b> Brake discs or blocks  | 1 |  |
|  | <b>Reason for use:</b> applied to the wheel to mechanically friction brake the wheel   | 1 |  |
|  | <b>Interaction:</b> controlled by callipers attached to brake cylinders controlled by the release of air to apply the brakes | 1 |  |