

High Speed Rail Infrastructure Advanced Technician - Civil Engineering EPA Mock Knowledge Test Mark Scheme (M-EPA-HSRICE4001)

Answers for the multiple-choice questions (Q1-Q20) on the High Speed Rail Infrastructure Advanced Technician - Civil Engineering mock test (M-EPA-HSRICE4001) are:

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

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

Answers for the multiple-choice questions (Q21-Q25) on the High Speed Rail Infrastructure Advanced Technician - Civil Engineering mock test (M-EPA-HSRICE4001) are:

- 21) Civil engineering software is an important tool to be used in the design of high-speed railways. Describe BIM technology. (4 marks)
- 22) Identify software that may be used in the building of a civil engineering project using BIM. (3 marks)
- 23) Explain why BIM technology is used instead of traditional building methods. (3 marks)

Q	Answers include:	Max Marks	Criterion
21	1 mark for each relevant point describing BIM (max 4)	4	KCE4
	BIM is building information management and is a common data environment where any changes in design or materials are reflected across the whole project. For example, a change of structure will automatically make a change to all affected areas included the bill of quantities. https://www.autodesk.com/solutions/bim	4	
22	1 mark for each relevant piece of software identified (max 3)	3	KCE4
	Typical software that might be used for the drawing and design phase of the project may be AutoCAD, Revit, Civil 3D, Bentley and Autodesk 360	3	
23	1 mark for each relevant point as to why BIM technology is used instead of traditional building methods (max 3)	3	KCE4
	This technology enables all changes to alter every part of the job simultaneously so there is no duplication of equipment or structures in the same area for example and therefore no wasted time arguing about what goes where as would happen in traditional design and build projects https://connect.bim360.autodesk.com/benefits-of-bim-in-construction	3	

- 24) Drainage is an important factor to consider when designing and constructing a high-speed railway. Explain why it is important to calculate estimated rainwater flow for the construction of drainage for high-speed railway embankments. (3 marks)
- 25) Explain how drainage storage volumes are connected to the water flow. (3 marks)
- 26) Explain how vegetation is important to drainage design. (4 marks)

Q	Answers include:	Max Marks	Criterion
24	1 mark for each relevant point (max 3)	3	KCE6
	Calculations must be made of estimated stormwater flow and velocity so that correct size pipes and culverts can be constructed to allow effective runoff of surface water to prevent issues around the flooding of the trackbed https://atomconsultants.co.uk/services/civil-engineers/drainage/ https://www.newcivilengineer.com/the-future-of/202810-18-11-2019/	3	
25	1 mark for each relevant point (max 3)	3	KCE6
	Once stormwater runs off it needs to have sufficient storage capacity to hold those volumes until water flows away to the main drainage systems and soakaways back to wetlands	3	
26	1 mark for each relevant point (max 4)	4	KCE6
	Vegetation can be useful to help maintain embankments as a means of stabilising embankments with their root systems and help to draw water from the land. Conversely, excessive vegetation needs to be cut back to prevent line of sight issues for railway operatives as well as the potential to destabilise embankments if kept unchecked.	4	