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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Thursday 16 June 2022 – Morning**

**Level 3 Cambridge Technical in Engineering**

**05873**

**Unit 24: Project management for engineers**

**Time allowed: 2 hours plus your additional time allowance**

**Resource Booklet**

**TEXT 1**

**Lux Tiles plc manufactures ceramic floor tiles. It has factories in England, Peru and Thailand.**

**Ceramic tiles are made from natural ingredients – clay, sand and water. Lux Tiles plc has strong environmental objectives, and Tina Peng, the company's Chief Executive Officer, believes that greater environmental awareness is driving sales. To support this trend, Lux Tiles plc aims to be at the forefront of sustainable manufacturing, reducing its carbon footprint and minimising waste wherever possible.**

**The fluorescent lighting at all of its factories was installed over twenty years ago and is below today's standards. In addition, moisture from the manufacturing process has corroded many of the light fittings over the years.**

**Tina has initiated a formal project to upgrade the company's lighting at all three factories. Whilst this is the primary purpose of the project, Tina also sees an opportunity to enhance the company's environmental profile and take control of spiralling energy costs. Consequently, the project's objectives also include reducing annual CO<sub>2</sub> emissions by at least 250,000 kg and reducing the overall energy cost for lighting by at least 45%. To achieve these objectives, new energy suppliers may be required. The project is expected to take at least four years to complete. The budget for the project is £6 million and will be funded by external finance.**

**Zand Hidalgo, a senior engineer at the factory in England, has been appointed as Project Manager.**

**Communication across the three sites will not be easy. Peru and Thailand are both located approximately 6,000 miles from the factory in England; the factories are also in different time zones, with Peru being five/six hours behind UK time and Thailand being six/seven hours ahead of UK time (depending on the time of year). Zand is fluent in English and Spanish (the language spoken in Peru) but does not know Thai.**

To help manage the project teams in each country, three project team leaders have been appointed to assist Zand:

Elise, based at the factory in England, speaks fluent English and Thai;

Piero, based at the factory in Peru, only speaks Spanish;

Tetsu, based at the factory in Thailand, speaks fluent Thai and basic English.

## TEXT 2

Zand is confident at planning and scheduling. He intends to use a range of project management tools, as appropriate, to monitor the progress of the project.

Zand begins by dividing the project into five phases as shown in Table 1, below.

Table 1

Phase:
1: Research and selection of lighting system
2: Implementation in the UK
3: Implementation in Peru
4: Implementation in Thailand
5: Project closure

Zand is less confident about his team building skills. His most significant weakness on previous projects has been his inability to establish rapport with project team members.

Eager to establish a good rapport with project team members on this project, Zand sends them a welcome message. He also attaches a document that he has found on a lighting manufacturer's website. The document is entitled: 'How our LED lighting could brighten up your home in 2017'.

**TEXT 3**

**All three of Lux Tiles plc's factories are to be refitted with energy-efficient, digitally controlled LED lighting systems. The technical specifications for each refit will vary depending on the particular needs of each factory.**

**Zand wants to find out what staff at each factory think about the current lighting and how it can be improved.**

**Because Lux Tiles plc operates in different countries, Zand thinks that it is important to make use of the knowledge and skills of each of the project team leaders by delegating tasks to them, where possible.**

**Zand is also thinking about the physical resource requirements of the new lighting system. He wants to make sure that nothing is missed, not even the supply of LED bulbs.**

**TEXT 4**

**Phase 2: Implementation in the UK and Phase 3: Implementation in Peru are completed on schedule. Both factories report improvements in the quality of the lighting, and CO<sub>2</sub> reductions.**

**Phase 4: Implementation in Thailand is now in its 14th month. Zand knew from his scheduling that this phase would take longer than the others due to the size of the factory in Thailand. He also anticipated that its 15-metre high ceiling would pose additional challenges in terms of lighting quality and compliance with health and safety regulations. However, Zand failed to anticipate the problems that would be caused by cultural differences and unfavourable exchange rates. Zand is concerned about whether the project's energy cost objective will be met.**

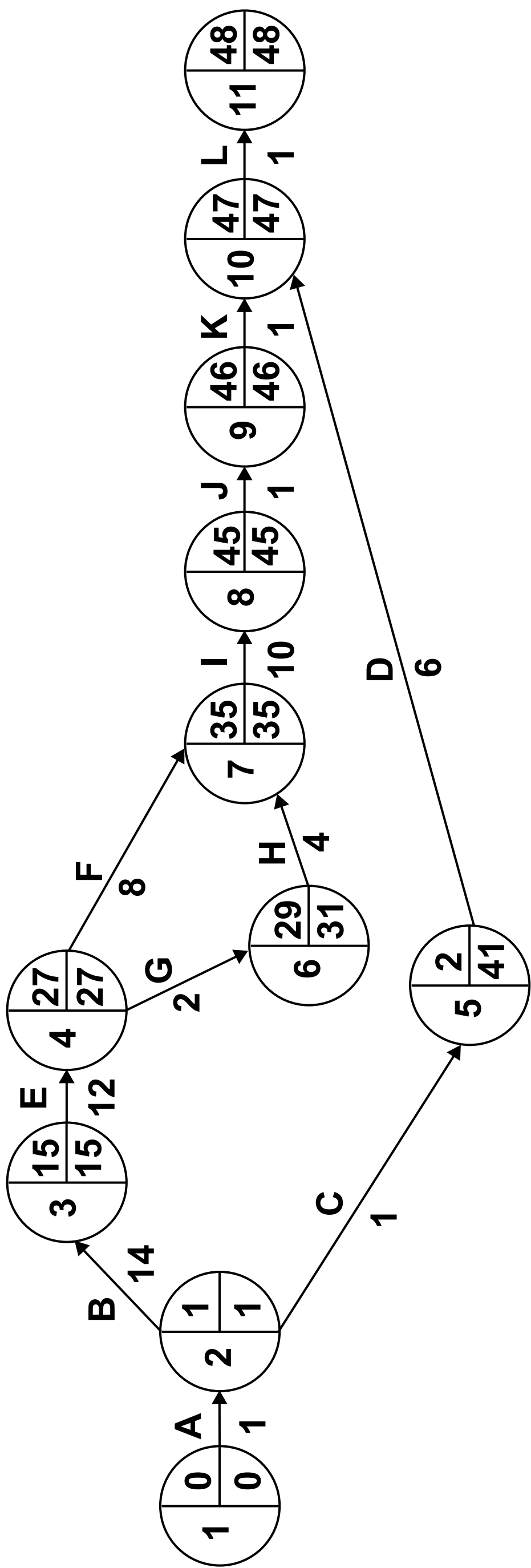
**However, before Zand has time to analyse any data, Tetsu, the project team leader in Thailand, sends three issue logs to him:**

**Issue A: Humidity levels in the factory are causing ceramic dust to stick to the new light fittings reducing the quality of the lighting – a reactive adjustment is required.**

**Issue B: The switchover to our new electricity supplier has been delayed by two weeks due to a communication error between our current and new supplier.**

**Issue C: Installation contractors are not following health and safety regulations for working at heights, the scaffolding is insecure and lacks toe boards and guard rails.**

Network diagram for PHASE 2: Implementation in the UK



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