**Design & Technology**

**Project Management Strategies**

**Materials required for questions**

* Pencil
* Rubber
* Calculator

**Instructions**

* Use black ink or ball-point pen
* Try answer all questions
* Use the space provided to answer questions
* Calculators can be used if necessary
* For the multiple choice questions, circle your answer

**Advice**

* Marks for each question are in brackets
* Read each question fully
* Try to answer every question
* Don’t spend too much time on one question

**Good luck!**

**Q1.** Outline the process of critical path analysis **(4 marks)**

**Q2.** Explain two ways Six Sigma can improve manufacturing processes **(6 marks)**

1.

2.

**Q3.** Give **three** features of critical path analysis **(3 marks)**

**Answers**

**Q1.**

* Compile a list of all activities/work breakdown structure (1)
* Work out the length of time/duration required for each activity (1)
* Determine the relationships/links between the activities (1)
* Determine specific points of time in the process/milestones/deliverable items (1).

**Q2.**

* Six Sigma improves quality of products by focusing on quality control (1) aimed at reducing the number of defects (1) from the 1st Sigma at 30% defects to the 6th Sigma at less than 0.001% defects (1)
* Six Sigma reduces the process cycle time (1) by removing errors / unnecessary stages in production (1) for example reducing the number of products that need to be reworked or replaced / inefficient layout of production lines / paperwork being completed that is not needed (1)
* Six Sigma reduces pollution resulting from the process (1) by reducing transportation and travel (1) and reducing production of waste due to product faults / utilising more energy efficient processes (1)
* Six Sigma reduces costs (1) by simplifying processes and steps needed / by using common manufacturing processes for different products (1) therefore reducing setting up time / reducing the amount of capital investment needed (1)
* Six Sigma makes processes as consistent as possible (1) by streamlining processes (1) which reduces the possibilities for defects (1)
* Six sigma improves efficiency / productivity (1) by using DMAIC (Define, Measure, Analyse, Improve, Control) (1) resulting in improved / streamlined use of resources (1)
* Six Sigma is a management tool / methodology (1) where employees become involved in the implementation of quality improvement (1) helps with defect reduction as employees understand the processes involved in the manufacturing of the product (1)

**Q3.**

* Projects broken down into small ‘step by step’ stages (1)
* Stage timings/duration shown (1)
* Route of stage completion to subsequent stage starts (1)
* Shows dependencies between activities (1)
* Indication of routes to completion (from shortest to longest) /optimum route to completion (1)
* Concurrent less critical activities (1)
* Identification of activities with most impact on overall completion (1)
* Identification of ‘float’ (1)
* Key dates or timings (1)
* Links to JIT (1)
* Reduces downtime (1)