

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT
BACHELOR OF QUANTITY SURVEYING (HONOURS) DEGREE
PART IV FIRST SEMESTER EXAMINATIONS DECEMBER 2011
CONSTRUCTION EQUIPMENT AND METHODS – AQS4108

Time: 3 hours

Total Marks: 100

Instruction to candidates

Answer any **four** questions

Question 1

- a) Proper selection of construction equipment for a project is of vital importance in terms of speedy and economic execution of the project. Give at least 10 main points to be considered when selecting equipment to be used for a project. (15 marks)
- b) Construction equipment can be classified under different categories. Give at least 3 types of equipment that fall under each of the following categories and explain what each one of them is used for:-
- i) Heavy earth moving equipment
 - ii) Compaction equipment (10 marks)

Question 2

- a) Differentiate between breakdown maintenance and preventive maintenance outlining
- i) The elements of preventive maintenance
 - ii) The advantages of preventive maintenance (15 marks)
- b) i) What do you understand by the term “matching units” in reference to construction equipment.
- ii) Illustrate your answer by giving 3 examples of equipment that can be operated as matching units. (10 marks)

Question 3

- a) The output of construction equipment varies with the conditions where it is being used. Give at least 8 such conditions which may affect the output of the equipment.

(15 marks)

- b) Differentiate between depreciation and obsolescence in terms of construction equipment.

(10 marks)

Question 4

- a) A project has been defined to contain the following list of activities along with their required duration for completion.

| Activity | Duration (days) | Immediate predecessors |
|-----------------|------------------------|-------------------------------|
| A | 1 | - |
| B | 4 | A |
| C | 3 | A |
| D | 7 | A |
| E | 6 | B |
| F | 2 | C,D |
| G | 7 | E, F |
| H | 9 | D |
| I | 4 | G,H |

- i) Draw the network diagram. (5 marks)

- ii) Show the early start and early finish times (5 marks)

- iii) Show the critical path. (3 marks)

- iv) What would happen to the diagram if activity "F" was revised to take 4 days instead of 2? (3 marks)

- b) List any 3 types of aggregate production equipment and explain the principle or method used by each type of equipment to crush the rock. (9 marks)

Question 5

- a) A contractor has purchased an excavating plant costing \$25 000. The estimated economic life of the plant is 5 years. The salvage value after 5 years' use is \$5 000 and the current interest rate is 8%. Using the straight line depreciation method, determine:-
- i) The depreciation charges during years 1 and 2 (5 marks)
 - ii) The depreciation reserve accumulated by the end of year 3. (5 marks)
 - iii) The book value at the end of year 3. (5 marks)
- b) State the advantages of using PERT or CPM method of network analysis. (10 marks)