

NATIONAL UNIVERSITY OF SCIENCE AND TECNOLOGY

FACULTY OF BUILT ENVIRONMENT

DEPARTMENT OF QUANTITY SURVEYING

PART IV FIRST SEMESTER EXAMINATIONS – FEBRUARY 2010

CONSTRUCTION EQUIPMENT METHODS – AQS4108

Time: 3 hours

Total Marks: 100

INSTRUCTIONS:

Answer all questions, all questions carry equal marks.

QUESTION ONE

- a) Describe what is involved in planning a construction project. (5 Marks)
b) Draw a Gantt chart and a network diagram for the infrastructure development work of a small factory, given the following information:

Approach road	15 days
Culvert	30 days
Boundary wall	45 days
Drainage	60 days
Internal roads	90 days
Deep tube well	21 days
Electricity	15 days

Consider that the construction of the approach road can only be done after doing the culvert, and that the drainage and the internal roads will be done after the boundary wall is finished. What is the estimated duration of the project? (20 marks)

QUESTION TWO

- a) Calculate the cost per hour to the builder of using a concrete mixer on site, for the following data:

Cost of concrete mixer	\$100 000.00
Scrap value	\$15 000.00
Annual Depreciation	20%
Repairs and Renewals	1/3 of cost
Operators wages	\$100.00 per 8 hour day
Cost of fuel	\$20.00 per 8 hour day
Cost of oil	\$5.00 per 8 hour day
Cost of grease	\$3.00 per 8 hour day

Assume the following:

Total holiday period of 15 weeks in a year

Overheads 10%

Profit 10%

Tax and insurance \$5000.00 per year

(15 marks)

- b) Describe the organizational structure ideal for the construction industry, highlighting the functions of each position in the structure. (10 marks)

QUESTION THREE

- a) Define the following terms with regard to a construction site
- Labour productivity
 - Site productivity (6 marks)
- b) A dump truck with a capacity of 5m^3 is used to dispose of excavated material to a site 3km away. A power shovel with a dipper of 1m^3 is used to load the material and has standard operating cycle time of 60 sec. The speed of the dump truck is 50km/h and dumping time is 60 sec.
- Find the daily standard production rate of the truck. (12 marks)
 - If a fleet of dump trucks of this capacity is used to dispose of 600m^3 excavated material for 9 hours per day calculate the number of trucks needed daily. (7 marks)

QUESTION FOUR

You are working for a contractor and you have been put in charge of some work in your particular profession. Assume that the project will take you about six months and will need the services of machinery and thirty workers.

- Describe the possible activities (at least ten) involved in your work
- Draw up a method statement to show how this work will be carried out.
- Write a construction programme clearly highlighting the expected project completion date. (25 marks)

END OF EXAMINATION