UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2011/2012

COURSE NAME	:	CONSTRUCTION EQUIPMENT MANAGEMENT
COURSE CODE	:	BFP 4023
PROGRAMME	:	4BFF
EXAMINATION DATE	:	JANUARY 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS ONLY

THIS PAPER CONSISTS OF FIVE (5) PAGES

Q1 (a) Describe the principles of compaction

(3 marks)

(b) Explain **four (4)** principle forces involved in compaction.

(8 marks)

(c) The terms dragline and clamshell refer to the particular type of bucket used and to the digging motion of the bucket. With the aid of sketch compare the different between dragline and clamshell works.

(14 marks)

Q2 (a) Truck normally used for earthwork as transportation to transport excavated material, aggregates and construction materials. In your opinion why the truck is often used?

(5 marks)

(b) In order to determine the number of haul units required to service an excavator, it is necessary to compute the time required for a haul unit to make one complete cycle. Explain the components of the haul cycle.

(5 marks)

(c) A shovel has a loading rate of 233 BCM/h, a job efficiency of 80%, and costs RM 150.00/h. By refer to **Table 1** determine:

(i) How many trucks would be required to service the shovel for each type of truck?

(5 marks)

(ii) How many trucks should be used to provide the lowest loading and hauling cost?

(10 marks)

Table 1: Hauling Truck Information

Size Truck **(BCM)**	***Cost*** **RM/h**	***Transit Time*** **h**
8.97	35.00	0.45
11.30	43.00	0.49

Q3 (a) Explain about the setting up of a concrete batching plant.

(5 marks)

(b) Sketch and describe how a tilting drum concrete mixer works.

(5 marks)

(c) Select the most effective solution tool for moving large volumes of concrete on construction works and explain clearly the mechanism of this tool.

(15 marks)

Q4 (a) State **four (4)** rock characteristics affecting the difficulty of soil rock excavation.

(4 marks)

(b) Describe briefly **three (3)** basics classification of rock.

(3 marks)

(c) Sketch and discuss the seismic refraction test technology in rock investigation.

(9 marks)

(d) With appropriate diagram, explain briefly **three (3)** types of tractor mounted ripper in breaking up the hard soils.

(9 marks)

Q5 (a) Estimate the annual depreciation and book value at the end of each year for Hydraulic Excavator by using the Sum-Of-The-Years'-Digits Method. The Sum-Of-The-Years'-Digits Information are given in below.

Initial Cost	:	RM 373,499.00
Salvage Value	:	RM 19,999.00
Expected Life	:	7 years

(10 marks)

(b) It has been found that one of most serious construction accidents involve by construction equipment operations. As an engineer on construction site you required to develop safety precautions regarding equipment operation for safety guideline in your construction site.

(15 marks)

Terjemahan Bahasa Malaysia

S1 (a) Jelaskan prinsip-prinsip pemadatan

(3 markah)

(b) Terangkan **empat (4)** prinsip kuasa yang terlibat dalam pemadatan.

(8 markah)

(c) Terma *Dragline* dan *clamshell* adalah merujuk kepada jenis penggunaan timba tertentu dan kaedah pengalian dengan menggunakannya. Dengan bantuan lakaran bandingkan perbezaan kerja diantara *dragline* dan *clamshell*.

(14 markah)

S2 (a) Kebiasaanya *truck* digunakan sebagai pengangkutan untuk kerja tanah bagi mengangkut bahan-bahan yang digali, agregat dan bahan-bahan pembinaan. Pada pendapat anda mengapa *truck* sering digunakan?

(5 marks)

(b) Dalam usaha untuk menentukan bilangan unit pengangkut yang diperlukan untuk penggalian, adalah perlu mengira masa yang diperlukan bagi unit pengangkut untuk membuat satu kitaran lengkap. Jelaskan komponen bagi kitaran pengangkut tersebut.

(5 marks)

(c) Sebuah *shovel* mempunyai kadar muatan sebanyak 233 BCM/j, kecekapan kerja sebanyak 80%, dan kos RM 150.00/j. Dengan merujuk **Jadual 1** tentukan:

i. Berapa bilangan *truck* yang diperlukan untuk berkhidmat kepada *shovel* bagi setiap jenis *truck*?

(5 markah)

ii. Berapa bilangan *truck* yang perlu digunakan untuk memberikan kos terendah bagi pengisian dan pengangkutan?

(10 markah)

Jadual 1: Maklumat *Truck* Pengangkut

Saiz Truk **(BCM)**	***Kos*** **RM/j**	***Masa Transit*** **j**
8.97	35.00	0.45
11.30	43.00	0.49