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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012**

**COURSE NAME : CONSTRUCTION PLANT
MANAGEMENT**

COURSE CODE : BFP 4023

PROGRAMME : 4 BFF

EXAMINATION DATE : JUNE 2012

DURATION : 3 HOURS

**INSTRUCTION : ANSWER FOUR (4) QUESTIONS
ONLY**

THIS QUESTION PAPER CONSISTS OF SEVEN (7) PAGES

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- Q1** (a) There are a few important factors involved to achieve an optimum excavator and haul unit combination. Describe briefly the important factors. (4 marks)
- (b) Table **Q1(a)** and Table **Q1(b)** shows relevant information for earthwork cost and production. Determine:
- (i) How many trucks would be required to service the excavator for each type of truck? (8 marks)
- (ii) How many trucks should be used to provide the lowest loading and hauling cost? (11 marks)
- (iii) From answer question (b)(i) and (ii), what is probability that there will be a truck available for loading at any particular instant? (2 marks)
- Q2** (a) Explain the site clearing in preliminary stage of construction. (10 marks)
- (b) Describe briefly the trafficability and loadability in earthmoving process. (10 marks)
- (c) A soil sample weighting 73.5kg in the natural state. After drying the sample weight reduce to 53.7kg . Calculate the moisture content of the sample. (5 marks)
- Q3** (a) Differentiate between replacement pile and displacement pile in deep foundation construction. (6 marks)
- (b) Discuss on loading and spreading techniques of scraper in order to increase their production and reduce operational cost. (10 marks)

- (c) Find the base width and height of a triangular spoil bank that is created when excavating for the construction of a drain measuring 6 feet deep and 4 feet wide. The soil is wet clay having a swell of 25% and an angle of repose of 35° . Given;

$$B = \left(\frac{4V}{Lx \tan R} \right)^{1/2}$$

Where;

B = base width
 H = bank or pile height
 L = bank length
 R = angle of repose
 V = bank or pile volume

(9 marks)

- Q4** (a) Ready-mixed concrete is supplied to sites in specially designed truck mixers, which are basically a mobile mixing drum mounted on a lorry chassis. Discuss **THREE (3)** ways that truck mixers can be employed.

(6 marks)

- (b) To obtain maximum advantage from the facilities offered by ready-mixed concrete suppliers, building contractors must place a clear order of the exact requirements. List all supply instruction that should contain in this order.

(8 marks)

- (c) A concrete pump is a tool used for moving large volumes of concrete by using a pump and pipeline. Explain clearly about this tool.

(11 marks)

- Q5** (a) Describe the bulldozer job management in earthwork.

(6 marks)

- (b) Explain **THREE (3)** techniques that may be used to increase the dozer production.

(9 marks)

- (c) With an appropriate sketch(s), discuss **THREE (3)** dozer blades adjustment in making the bulldozer operational more effective.

(10 marks)

TERJEMAHAN BAHASA MALAYSIA

- S1** (a) Terdapat beberapa faktor penting yang terlibat bagi mencapai penggunaan optimum gabungan antara jengkaut dan unit angkut. Jelaskan secara ringkas faktor-faktor tersebut. (4 markah)
- (b) Jadual **Q1(a)** and Jadual **Q1(b)** menunjukkan maklumat berkaitan untuk pengeluaran dan kos kerja tanah. Tentukan:
- (i) Berapa bilangan lori yang diperlukan untuk berkhidmat kepada jengkaut bagi setiap jenis lori? (8 markah)
- (ii) Berapa bilangan lori yang perlu digunakan untuk memberikan kos terendah bagi pengisian dan pengangkutan? (11 markah)
- (iii) Daripada jawapan soalan (b) (i) dan (ii), apakah kebarangkalian bahawa perlu disediakan lori tambahan untuk pengisian pada suatu kadar segera? (2 markah)
- S2** (a) Jelaskan tentang kerja pembersihan tapak semasa peringkat awalan pembinaan. (10 markah)
- (b) Terangkan secara ringkas berkenaan *trafficability* dan *loadability* dalam proses pergerakan tanah. (10 markah)
- (c) Satu sampel tanah seberat 73.5kg dalam keadaan semulajadi. Selepas proses pengeringan, berat sampel berkurangan kepada 53.7kg. Kirakan kandungan kelembapan dalam sampel tanah tersebut. (5 markah)
- S3** (a) Bezakan antara cerucuk penggantian (tak terjara) dan cerucuk terjara dalam pembinaan asas dalam. (6 markah)
- (b) Bincangkan teknik memuat dan merata jentera *scraper* yang perlu dipertimbangkan bagi meningkatkan pengeluaran dan mengurangkan kos operasinya. (10 markah)

- (c) Dapatkan lebar dasar serta ketinggian sesuatu *triangular spoil bank* yang terbentuk hasil dari kerja pengorekan tanah semasa pembinaan longkang berukuran 6 kaki dalam dan 4 kaki lebar. Tanah adalah jenis liat basah yang mempunyai pengembangan 25% serta sudut rehat sebanyak 35°.

$$B = \left(\frac{4V}{Lx \tan R} \right)^{1/2}$$

B = base width

H = bank or pile height

L = bank length

R = angle of repose

V = bank or pile volume

(9 markah)

- S4 (a) Konkrit siap-campuran kebiasaanya dihantar ke tapak bina dengan menggunakan lori *mixer* yang direka khas, yang mana pada dasarnya *mobile mixing drum* akan dipasang pada casis lori. Bincangkan **TIGA (3)** cara lori *mixer* boleh digunakan.

(6 markah)

- (b) Untuk mendapatkan kelebihan dari kemudahan yang ditawarkan oleh pembekal konkrit siap-campur, kontraktor hendaklah memastikan pesanan yang jelas bagi keperluan yang diperlukan. Senaraikan semua arahan bekalan yang perlu ada dalam pesanan tersebut.

(8 markah)

- (c) Pam konkrit adalah peralatan yang digunakan untuk menggerakkan sejumlah besar konkrit dengan menggunakan pam dan saluran paip. Terangkan dengan jelas berkenaan peralatan ini.

(11 markah)

- S5 (a) Terangkan pengurusan kerja jentera jentolak di dalam kerja tanah.

(6 markah)

- (b) Jelaskan **TIGA (3)** teknik yang boleh digunapakai untuk meningkatkan daya pengeluaran jentolak.

(9 markah)

- (c) Dengan bantuan lakaran, bincangkan **TIGA (3)** kaedah pelarasan bilah jentolak untuk menghasilkan operasi yang lebih berkesan.

(10 markah)

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TABLE Q1(a)

Item		
Dipper load/ capacity: 1.618 BCM		
Bucket fill factor: 0.85		
Load Factor: 0.79		
Job efficiency: 0.85		
Dipper cycle time: 25 sec		
Rate: RM75.00/hour		
Trucks:		
Size Truck (BCM)	Cost (RM/h)	Transit Time (h)
8.79	45.00	0.55
12.6	55.00	0.60

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TABLE Q1(b)

Number of Haul Units													
<i>r</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
.01	.030	.040	.049	.059	.069	.079	.089	.099	.109	.119	.129	.138	.148
.02	.059	.078	.098	.117	.137	.156	.176	.195	.215	.234	.253	.274	.292
.03	.087	.116	.145	.174	.203	.231	.260	.288	.317	.345	.373	.401	.429
.04	.115	.153	.191	.229	.266	.304	.341	.378	.414	.450	.486	.522	.556
.05	.142	.189	.236	.282	.328	.373	.418	.462	.506	.548	.590	.631	.670
.06	.169	.224	.279	.333	.386	.439	.490	.541	.590	.637	.682	.726	.766
.07	.194	.258	.320	.382	.442	.501	.558	.613	.665	.715	.762	.804	.843
.08	.220	.291	.361	.429	.495	.559	.620	.678	.732	.782	.827	.866	.900
.09	.244	.323	.399	.473	.545	.613	.676	.736	.789	.837	.876	.911	.938
.10	.268	.353	.436	.515	.591	.662	.727	.785	.837	.880	.916	.943	.964
.11	.291	.383	.471	.555	.634	.706	.771	.828	.875	.914	.943	.964	.979
.12	.314	.412	.505	.593	.673	.746	.810	.863	.906	.939	.962	.978	.988
.13	.335	.439	.537	.627	.709	.782	.843	.892	.930	.957	.975	.987	.993
.14	.357	.465	.567	.660	.742	.813	.871	.915	.948	.970	.984	.992	.996
.15	.377	.491	.596	.690	.772	.840	.894	.934	.962	.979	.989	.995	.998
.16	.397	.515	.622	.718	.799	.864	.914	.949	.972	.986	.993	.997	.999
.17	.416	.538	.648	.743	.823	.885	.930	.960	.979	.990	.996	.998	
.18	.435	.560	.672	.767	.844	.902	.943	.969	.985	.993	.997	.999	
.19	.453	.581	.694	.788	.863	.917	.954	.976	.989	.995	.998		
.20	.470	.602	.715	.808	.879	.930	.963	.982	.992	.997	.999		