UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2012/2013

COURSE NAME	:	CONSTRUCTION PLANNING AND SCHEDULING
COURSE CODE	:	BFP 40103
PROGRAMME	:	4 BFF
EXAMINATION DATE	:	JUNE 2013
DURATION	:	3 HOURS
INSTRUCTIONS	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1 A list of activities that are required to complete a project is shown on **Table Q1.** Based on the table:

(a) Develop an arrow diagram network for the project and perform the Critical Path Method (CPM) calculation on the diagram.

(12 marks)

(b) Evaluate total float for activity E and H.

(4 marks)

Table Q1

Item	Activity	Duration (day)	Predecessor
1	A	2	-
2	B	4	A
3	C	3	A
4	D	5	A
5	E	2	A
6	F	4	B
7	G	5	C
8	H	4	D
9	I	2	E
10	J	2	E, H
11	K	3	B, D, G
12	L	2	F, K
13	M	1	I, J, K
14	N	3	I
15	O	5	L, M, N

Q2 Activities that are required to complete a project in Kuala Lumpur is shown on **Table Q2**. Analyze the schedule in a tabular form showing an early start, early finish, late start and late finish for each activity.

Table Q2

Item	Activity	Duration (day)	Successor
1	A	2	Start
2	B	3	A
3	C	2	B (SS), H
4	D	4	C
5	E	2	B, D
6	F	4	H
7	G	2	F (FS) + 5
8	H	4	Start
9	I	3	H (SS) +2, K
10	J	2	I, L (FF)
11	K	4	Start
12	L	5	K
13	M	5	E, G, J

(7 marks)

Q3 Based on network diagram in **Figure Q3**, analyze your resource manually with a maximum **eight (8)** laborers per day.

(25 marks)

Q4 Develop crashing program for project given in **Table Q4**. Analyze the normal, least-cost and crash durations for the project and calculate the cost associated with each duration. Indirect (overhead) costs are RM 100.00 per day.

Table Q4: Cost and Durations for Crashing Program

Activity	IPA	Duration (days)		Cost (RM)	
		Normal	Crash	Normal	Crash
A	-	7	6	7,000	8,000
B	A	3	2	5,000	7,000
C	A	4	3	9,000	10,200
D	B,C	5	4	3,000	4,500
E	D	2	1	2,000	3,000
F	D	4	2	4,000	7,000
G	E,F	5	4	5,000	8,000

(14 marks)

Q5 **Figure Q5** shows the critical activities of a PERT diagram. The optimistic time (a), most likely time (m), and the pessimistic time (b) are shown at the bottom of each activity. Based on the data, compute the following:

(a) Most likely time (t_e) for each activity.

(2 marks)

(b) Expected time for completion a project.

(2 marks)

(c) Standard deviation (σe) for the project.

(2 marks)

(d) The probability that the project can be completed in 37 days.

(2 marks)

(e) The probability that the project can be completed before day 32.

(2 marks)

(f) The completion date at a 99% confidence level.

(2 marks)

(g) The probability that the project will finish at least 6 days early.

(2 marks)

(h) The probability that the project will finish no more than 4 days late.

(2 marks)

Q6 (a) Give the difference between most likely and expected duration.

(4 marks)

(b) Identify **three (3)** main reasons of accelerating project.

(6 marks)

(c) Explain **three (3)** problems related to manpower resources.

(6 marks)

(d) The total cost for project shown in **Table Q6** is RM 132,000. Predict the percent complete value by using Weighted Unit method for entire project.

Table Q6: Weighted Unit Method

Activity	Total cost	Cost to date
	RM	RM
Initial configurations	10,040	10,040
Initial design calculations	20,600	20,600
Preliminary layouts	30,100	28,000
Final calculations	10,060	8,200
CADD Drawing	50,720	10,050
Design approval	10,480	0
Total	132,000	

(6 marks)

-END OF QUESTIONS-

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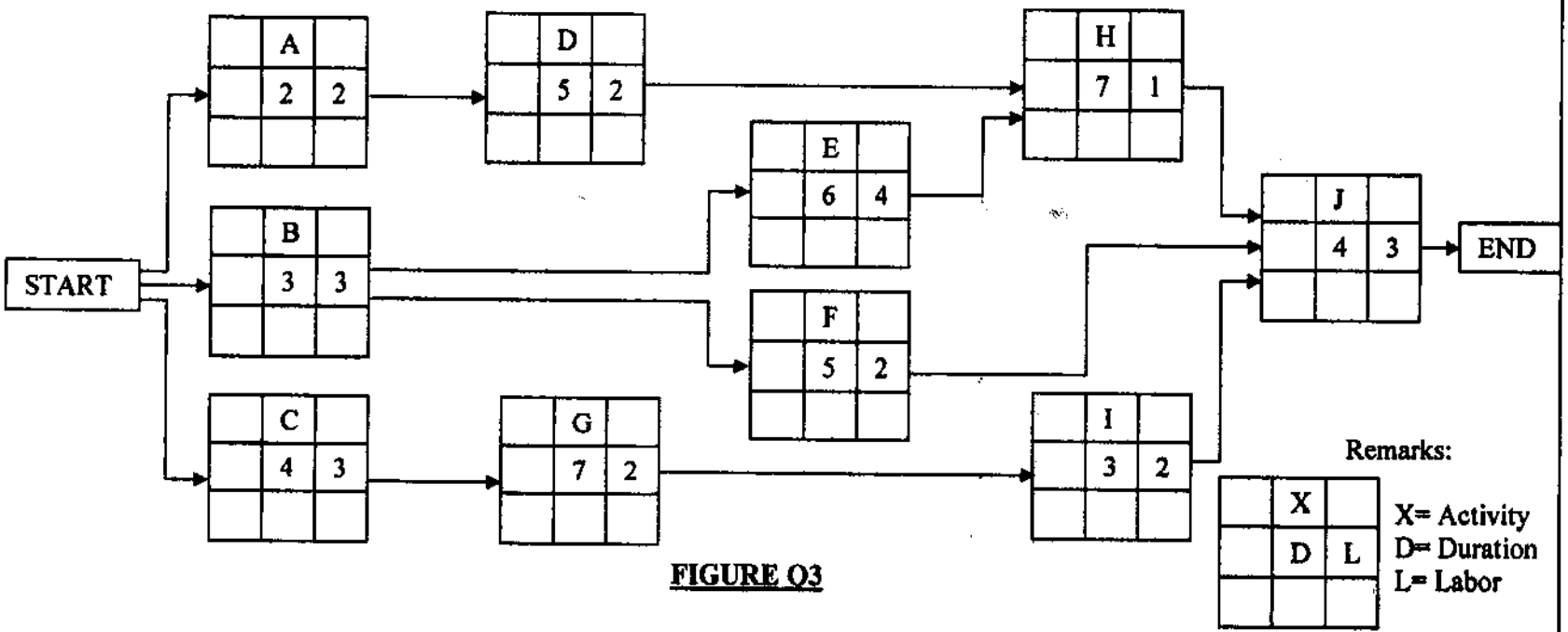

FIGURE Q3

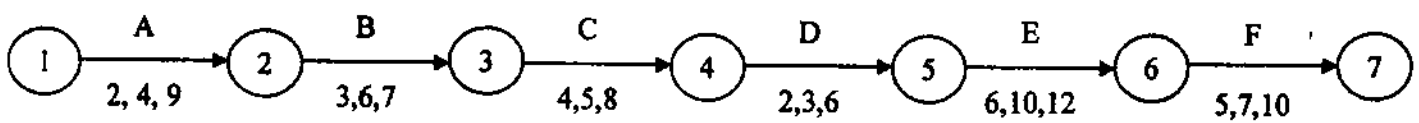

FIGURE Q5

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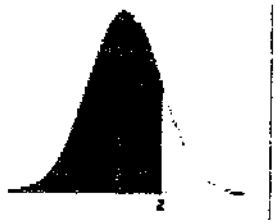
APPENDIX I

Cumulative Probability of the Standard Normal Distribution

Standard Normal Cumulative Probability Table



Cumulative probabilities for POSITIVE z-values are shown in the following table:

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998