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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019**

COURSE NAME : CONSTRUCTION PLANNING AND SCHEDULING
COURSE CODE : BFP40103
PROGRAMME CODE : BFF
EXAMINATION DATE : JUNE / JULY 2019
DURATION : 3 HOURS
INSTRUCTION : ANSWER **ALL** QUESTIONS

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

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- Q1**
- (a) Explain **FIVE (5)** principles of construction project planning and scheduling. (10 marks)
 - (b) Compare different type of available methods in construction scheduling with **THREE (3)** factors that governed the method selection. (9 marks)
 - (c) With appropriate example or illustration, explain 100% Rule for Work Breakdown Structures (WBS). (6 marks)
- Q2**
- (a) Critical Path Method (CPM) is a technique used to determine the minimum duration to complete a project. Arrow Diagram Method (ADM) is one the CPMs that can be used in construction industry. Explain basic rules in developing ADM. (5 marks)
 - (b) Time management is important in construction project management. One of the techniques in time management is fast-tracking. Discuss your understanding of the fast-tracking concept in construction and detail-up the consideration for fast-tracking. (4 marks)
 - (c) A contractor is required to complete a project with the activities as shown in **Table Q2(c)**. The contractor is only able to allocate eight labours per day for this project. By using an Arrow Diagram Method (ADM), construct a network diagram and level the resources manually by satisfying the preceding activity to comply with the maximum number of resources provided by the contractor. (16 marks)

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- Q3** (a) In a Critical Path Method (CPM) network, the critical path has five activities. Their durations are tabulated in **Table Q3(a)**. Compute the following:
- (i) The probability that the project will finish by the end of day 64.
 - (ii) The probability that the project will finish by the end of day 65.
 - (iii) The probability that the project will finish before day 60.
 - (iv) The probability that the project will finish on the 62nd day.
 - (v) The probability that the project will finish at least 6 days early.
 - (vi) The probability that the project will finish no more than 4 days late.
 - (vii) The completion date with at least a 95% confidence level.
- (14 marks)
- (b) Construct a schedule for a 5-kilometre road-resurfacing project using Linear Scheduling Method (LSM) for activities given in **Table Q3(b)**.
- (11 marks)
-
- Q4** (a) Define project crashing according to your understanding
- (5 marks)
- (b) **Table Q4(b)** shows time-cost information for a kitchen renovation work in Melaka. The owner decided the project to be completed in 11 days. Develop a crashing program for the project and evaluate the effect in total project cost.
- (10 marks)
- (c) With aid of illustration, explain the differences between resource smoothing and resource leveling in a construction project.
- (10 marks)

– END OF QUESTIONS –

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TABLE Q2(c)

Activity	Duration (days)	Predecessor	Labours
A	6	-	2
B	2	-	3
C	8	A	3
D	5	A,B	5
E	3	B	4
F	6	D,E	3
G	5	C,D	2
H	2	F,G	3

TABLE Q3(a)

Activity	Duration (Days)		
	Optimistic (T_o)	Most Likely (T_m)	Pessimistic (T_p)
A	4	6	9
D	6	10	15
G	7	11	15
H	10	20	36
M	8	10	14
O	4	5	8

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TABLE Q3(b)

Activity	Daily Production (Linear Meter)
A. Miling	2,000
B. Structural Course	1,000
C. Friction Course	800
D. Striping and Signage	1,200

TABLE Q4(b)

Activity	Predecessor	Normal		Crash	
		Time (day)	Cost (RM)	Time (day)	Cost (RM)
A	-	12	12,000	10	15,000
B	-	2	1,800	1	2,000
C	B	4	16,000	3	21,000
D	C	3	1,400	2	2,000
E	D,F	5	3,600	4	4,800
F	B	6	13,500	4	18,000

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**APPENDIX 1
 (CUMULATIVE STANDARDIZE NORMAL DISTRIBUTION 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
3 5	0 9998	0 9998	0 9998	0 9998	0 9998	0 9998	0 9998	0 9998	0 9998	0 9998
3 6	0 9998	0 9998	0 9999							

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