Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2014/2015

COURSE NAME	:	PROJECT MANAGEMENT
COURSE CODE	:	BWA30102
PROGRAMME	:	3 BWA
EXAMINATION DATE	:	DECEMBER 2014/JANUARY 2015
DURATION	:	2 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

Q1 **Figure Q1** shows the network of a project.

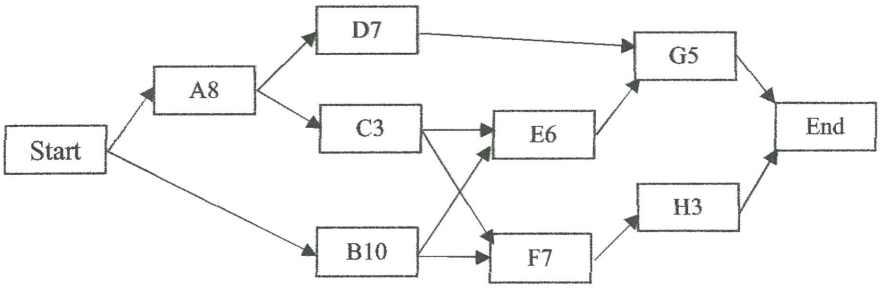

Figure Q1: Network of the project

(a) Determine the critical path for the network.

(13 marks)

(b) Calculate the distance of the critical path to complete this project.

(2 marks)

(c) Decide whether the activity *B* can be delayed without delaying the completion of the project.

(2 marks)

(d) The estimated activity times for the network of the project in **Figure Q1** are given in **Table Q1**.

Table Q1: Estimated activity times

Activity	Optimistic time estimate *a*	Most likely time estimate *m*	Pessimistic time estimate *b*
A	6.5	7.5	14.5
B	8.5	10.5	12.5
C	2.5	3.5	4.5
D	6.5	7.5	8.5
E	5.5	5.5	9.5
F	5.5	7.5	9.5
G	4.5	6.5	8.5
H	2.5	3.5	3.5

Calculate the critical path probability that the project will be completed within 21 days.

(8 marks)

Q2 Consider the network of a project in **Figure Q2**.

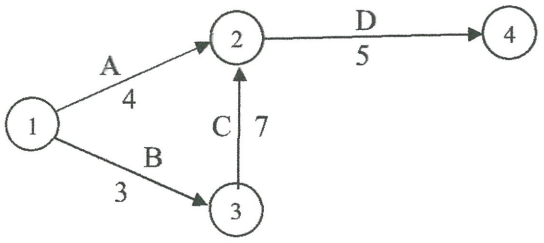

Figure Q2: Network of a project

(a) Determine the first activity to be crashed by the following priority rules:

(i) Shortest task first.
(ii) Minimum slack first.
(iii) Most critical followers.
(iv) Most successors.

(12 marks)

(b) Using the network in **Figure Q2** and the information from **Table Q2**,

(i) find the crash cost (RM) per day.

(ii) decide which activities should be crashed to meet a project deadline of 13 days at minimum cost. Assume partial crashing is allowed.

Table Q2: Normal and crashed times

Activity	Crash time (days)	Crashed cost (total)	Normal time (days)	Normal cost
A	3	500	4	300
B	1	325	3	250
C	4	550	7	400
D	3	250	5	150

(13 marks)

Q3 (a) Find the schedule and cost variances for a project that has an actual cost at month 22 of RM540 000, a scheduled cost of RM523 000, and an earned value of RM535 000.

(3 marks)

(b) A software development project at day 70 exhibits an actual cost of RM78 000 and a scheduled cost of RM84 000. The software manager estimates a value completed of RM81 000. Calculate cost variance, schedule variance and cost-schedule-index (CSI).

(10 marks)

(c) Given an activity in an advertising project whose planned cost was RM12 000 but actual cost to date is RM10 000 so far. The value completed is only 70 percent.

(i) Calculate the cost and schedule variances.

(ii) Give the response, either the client will be pleased or angry.

(12 marks)

Q4 (a) The cost (RM) information about a showroom renovation is given in **Table Q4**. Determine which activities are on time, which activities are early, and which activities are behind schedule.

Table Q4: Cost information

Activity	Budgeted cost	Actual cost	Critical ratio
A: Plan changes	60	40	1.0
B: Solicit bids	25	50	0.5
C: Select contractor	45	30	1.5
D: Schedule date	20	20	1.5
E: Start renovation	50	50	0.67

(10 marks)

(b) A company is constructing a 4-story commercial building for the customer. The project has a planned daily cost of 100 and a planned daily earned value of 100. The earned values and costs for the first six days are given below:

Earned value : 90, 88, 95, 101, 89, 105
Cost : 92, 88, 93, 98, 85, 100

Calculate the critical ratio for each day.

(15 marks)

- END OF QUESTION -

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Earliest finish time = earliest start time + duration

Latest start time = latest finish time – duration

Slack = latest start time – earliest start time

Expected time, $TE = \frac{(a+4m+b)}{6}$ Variance, $\sigma^2 = \left(\frac{b-a}{6}\right)^2$

Uncertain completion time, $Z = \frac{(D-\mu)}{\sqrt{\sigma_\mu^2}}$

Cost per day of crashing a project, $Slope = \frac{\text{crash cost} - \text{normal cost}}{\text{crash time} - \text{normal time}}$

Cost variance (CV) = earned value (EV) – actual cost (AC)

Schedule variance (SV) = earned value (EV) – planned value (PV)

Time variance (TV) = time scheduled (ST) – actual time (AT)

Cost performance index CPI = EV / AC

Schedule performance index SPI = EV / PV

Time performance index TPI = ST / AT

Cost-schedule index CSI = (CPI)(SPI)

Critical ratio = (actual progress / scheduled progress) × (budgeted cost / actual cost)

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TABLE 3 AREA IN TAIL OF THE NORMAL DISTRIBUTION

$$P(Z > z_\alpha) = \alpha$$

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	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
2.0	0.02275	0.02222	0.02169	0.02118	0.02068	0.02018	0.01970	0.01923	0.01876	0.01831
2.1	0.01786	0.01743	0.01700	0.01659	0.01618	0.01578	0.01539	0.01500	0.01463	0.01426
2.2	0.01390	0.01355	0.01321	0.01287	0.01255	0.01222	0.01191	0.01160	0.01130	0.01101
2.3	0.01072	0.01044	0.01017	0.00990	0.00964	0.00939	0.00914	0.00889	0.00866	0.00842
2.4	0.00820	0.00798	0.00776	0.00755	0.00734	0.00714	0.00695	0.00676	0.00657	0.00639
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357
2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139
3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100