



**UNIVERSITY OF COLOMBO, SRI LANKA**

**UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING**

**BACHELOR OF SCIENCE IN INFORMATION SYSTEMS  
BACHELOR OF SCIENCE HONOURS IN INFORMATION SYSTEMS**

**Second Year Examination – Semester II – 2019**

***IS2108 – IT Project Management***

**TWO (2) HOURS**

***To be completed by the candidate***

Examination Index No: .....

**Important Instructions to candidates:**

1. The medium of instruction and questions is **English**.
2. All questions must be answered in **English**.
3. If a page or a part of this question paper is not printed, please inform the supervisor immediately.
4. Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
5. Write your index number on each and every page of the answer paper.
6. This paper has **04** questions on **14** pages.
7. Answer **ALL** questions. All questions carry equal marks (**25** marks).
8. Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are **not allowed**.
9. **Non-Programmable** calculators are **allowed**.

**For Examiner's use only**

For Examiner's use only	
Question No	Marks
1	
2	
3	
4	
Total	

Index No: .....

**Question 01**

a) List down two (02) characteristics of a project.

**[2 Marks]**

1.
2.

b) Use two (02) examples and briefly describe how software projects differ from other projects.

**[4 Marks]**

1.
2.

c) Give one (01) example each and briefly describe the following IT project life cycle types.

**[6 Marks]**

<b>Predictive:</b>
<b>Iterative:</b>
<b>Adaptive:</b>

**Index No:** .....

d) Following table shows the predicted revenues of two projects (Project X and Y) that ABC Pvt Ltd has shortlisted to invest. Initial investment for each project is Rs. 50,000.00.

Year	Project X (Rs.)	Project Y (Rs.)
1	10,000.00	10,000.00
2	40,000.00	50,000.00
3	10,000.00	30,000.00
4	50,000.00	20,000.00

Discount rates of project X and Y are 15% and 20% respectively.

i. Briefly describe the importance of the Net Present Value (NPV) when deciding to invest on a future project.

**[2 Marks]**

A		B	
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
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49	49	49	49
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51	51	51	51
52	52	52	52
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54	54	54	54
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56	56	56	56
57	57	57	57
58	58	58	58
59	59	59	59
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62	62	62	62
63	63	63	63
64	64	64	64
65	65	65	65
66	66	66	66
67	67	67	67
68	68	68	68
69	69	69	69
70	70	70	70
71	71	71	71
72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
78	78	78	78
79	79	79	79
80	80	80	80
81	81	81	81
82	82	82	82
83	83	83	83
84	84	84	84
85	85	85	85
86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

ii. Calculate the total NPV value of project X and Y at the end of four years. You should clearly state the NPV value for each year as well.

**[4 Marks]**

Figure 10: A plot of the function  $f(x)$  for  $x \in [0, 1]$ . The function is defined by the equation  $f(x) = \frac{1}{2}x^2 + \frac{1}{2}x$ . The plot shows a smooth, increasing curve starting at (0,0) and ending at (1,1). The x-axis is labeled from 0 to 1, and the y-axis is labeled from 0 to 1. The curve is concave up, with its slope increasing as  $x$  increases.

[illegible]

9

[illegible]

Index No: .....

b) As a project manager you have identified following possible risks in your project:

Risk I: power failures affecting the main server performance

Risk II: currently used technologies not meeting the expected performance criteria

Risk III: high employee turnover

Briefly explain *risk planning and controlling* activities to overcome those risks.

[6 Marks]

<b>Risk I:</b>
<b>Risk II:</b>
<b>Risk III:</b>

c) Following table shows the activities of a project with their time durations and precedents.

Activity	Duration (Weeks)	Precedent Activity
A	2	-
B	3	-
C	4	A
D	4	A, B
E	2	C, D
F	1	D
G	2	E, F
H	2	F

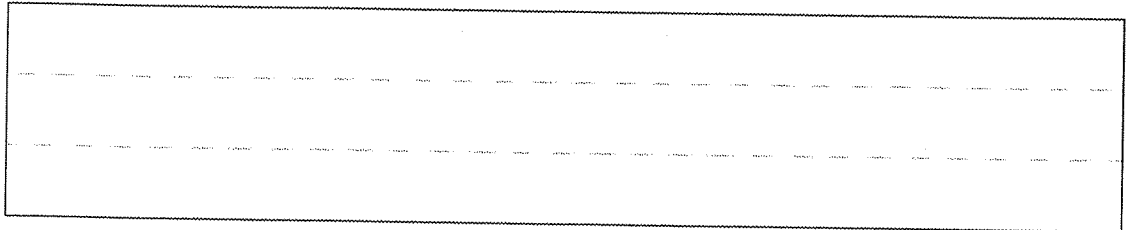
i. What is a *precedent activity*?

[2 Marks]


Index No: .....

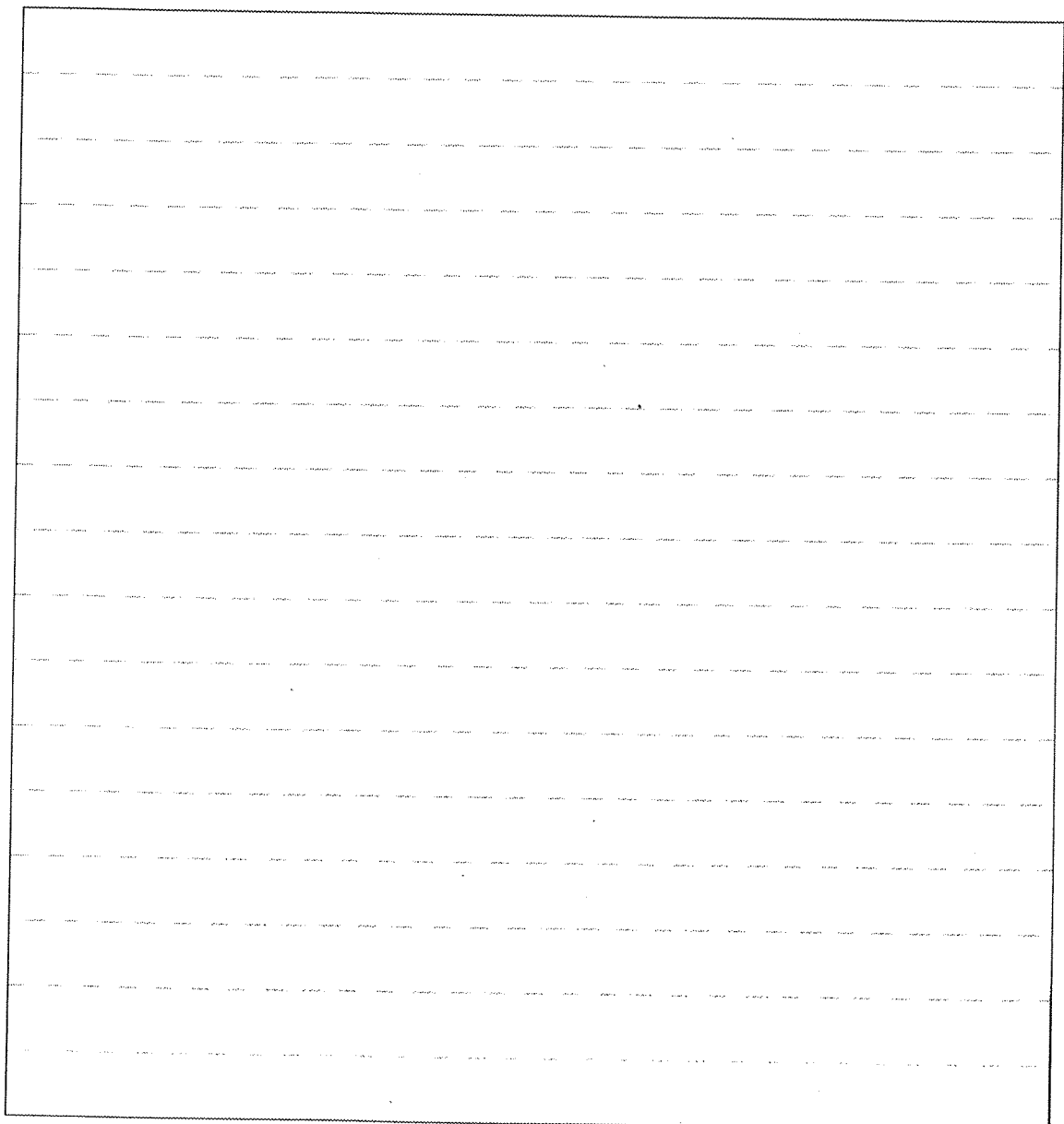
ii. What are the activities that can be carried out parallelly?

[2 Marks]



iii. Draw the activity on node diagram using the standard 9-partition node convention.  
Note: You should complete both forward and backward passes of the diagram.

[6 Marks]



**Index No:** .....

iv. What is the project duration?

**[2 Marks]**

v. State the critical path and explain the reason for choosing it.

**[5 Marks]**

[illegible]

### Question 03

Assume that you are managing an **organic** type software project which is into seven days of its execution. You are now reviewing the project status with the details given below.

The actual cost of Activity A is Rs. 300,000.00 and that of Activity B is Rs. 200,000.00. The planned values of these activities are Rs. 280,000.00 and Rs. 160,000.00 respectively. The Activity A is 100% complete. However, Activity B is only 75% complete.

(You can make your own assumption on the total activities in this project.)

a) What would be the assumptions you can make to calculate cumulative data on total project activities.

**[2 Marks]**

DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	INTEREST	TOTAL	BALANCE
1/1/19	BANK OF AMERICA	100.00	1001	BOA	0.00	100.00	100.00
1/15/19	CHASE	50.00	1002	CHASE	0.00	50.00	50.00
2/1/19	WELLS FARGO	75.00	1003	WELLS	0.00	75.00	75.00
2/15/19	CITIBANK	120.00	1004	CITI	0.00	120.00	120.00
3/1/19	PNC	90.00	1005	PNC	0.00	90.00	90.00
3/15/19	TD BANK	60.00	1006	TD	0.00	60.00	60.00
4/1/19	USAA	110.00	1007	USAA	0.00	110.00	110.00
4/15/19	AMERITRUST	80.00	1008	AMERITRUST	0.00	80.00	80.00
5/1/19	KEYBANK	130.00	1009	KEY	0.00	130.00	130.00
5/15/19	FRYDOLPH	100.00	1010	FRYDOLPH	0.00	100.00	100.00
6/1/19	USAA	110.00	1011	USAA	0.00	110.00	110.00
6/15/19	AMERITRUST	80.00	1012	AMERITRUST	0.00	80.00	80.00
7/1/19	KEYBANK	130.00	1013	KEY	0.00	130.00	130.00
7/15/19	FRYDOLPH	100.00	1014	FRYDOLPH	0.00	100.00	100.00
8/1/19	USAA	110.00	1015	USAA	0.00	110.00	110.00
8/15/19	AMERITRUST	80.00	1016	AMERITRUST	0.00	80.00	80.00
9/1/19	KEYBANK	130.00	1017	KEY	0.00	130.00	130.00
9/15/19	FRYDOLPH	100.00	1018	FRYDOLPH	0.00	100.00	100.00
10/1/19	USAA	110.00	1019	USAA	0.00	110.00	110.00
10/15/19	AMERITRUST	80.00	1020	AMERITRUST	0.00	80.00	80.00
11/1/19	KEYBANK	130.00	1021	KEY	0.00	130.00	130.00
11/15/19	FRYDOLPH	100.00	1022	FRYDOLPH	0.00	100.00	100.00
12/1/19	USAA	110.00	1023	USAA	0.00	110.00	110.00
12/15/19	AMERITRUST	80.00	1024	AMERITRUST	0.00	80.00	80.00
1/1/20	KEYBANK	130.00	1025	KEY	0.00	130.00	130.00
1/15/20	FRYDOLPH	100.00	1026	FRYDOLPH	0.00	100.00	100.00
2/1/20	USAA	110.00	1027	USAA	0.00	110.00	110.00
2/15/20	AMERITRUST	80.00	1028	AMERITRUST	0.00	80.00	80.00
3/1/20	KEYBANK	130.00	1029	KEY	0.00	130.00	130.00
3/15/20	FRYDOLPH	100.00	1030	FRYDOLPH	0.00	100.00	100.00
4/1/20	USAA	110.00	1031	USAA	0.00	110.00	110.00
4/15/20	AMERITRUST	80.00	1032	AMERITRUST	0.00	80.00	80.00
5/1/20	KEYBANK	130.00	1033	KEY	0.00	130.00	130.00
5/15/20	FRYDOLPH	100.00	1034	FRYDOLPH	0.00	100.00	100.00
6/1/20	USAA	110.00	1035	USAA	0.00	110.00	110.00
6/15/20	AMERITRUST	80.00	1036	AMERITRUST	0.00	80.00	80.00
7/1/20	KEYBANK	130.00	1037	KEY	0.00	130.00	130.00
7/15/20	FRYDOLPH	100.00	1038	FRYDOLPH	0.00	100.00	100.00
8/1/20	USAA	110.00	1039	USAA	0.00	110.00	110.00
8/15/20	AMERITRUST	80.00	1040	AMERITRUST	0.00	80.00	80.00
9/1/20	KEYBANK	130.00	1041	KEY	0.00	130.00	130.00
9/15/20	FRYDOLPH	100.00	1042	FRYDOLPH	0.00	100.00	100.00
10/1/20	USAA	110.00	1043	USAA	0.00	110.00	110.00

**Index No:** .....

- b) Calculate Schedule Variance (SV) and Schedule Performance Index (SPI) and explain how likely that the project will/will not finish on time.

**[5 Marks]**

[illegible]

- c) Calculate Cost Variance (CV) and Cost Performance Index (CPI) and explain how the project manager can make a conclusion about the future performance of the project in terms of cost.

**[5 Marks]**

[illegible]



**Index No:** .....

- d) Assume that the size of this **organic** type project has been estimated to be 45,000 lines of source code. Assume that the average salary of a software engineer to be Rs. 25,000/- per month.
- i. Using the COCOMO model, determine the effort required to develop this software product.

Hint: COCOMO model equations:

Effort	Development time
2.4 x size <sup>1.05</sup>	2.5(Effort) <sup>0.38</sup>
3.0 x size <sup>1.12</sup>	2.5(Effort) <sup>0.35</sup>
3.6 x size <sup>1.20</sup>	2.5(Effort) <sup>0.32</sup>

**[3 Marks]**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	5
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- ii. Calculate the nominal development time in months.

**[3 Marks]**

[illegible]

3:

3:

3:

3:

3:

3:

3:

**Question 04**

Consider the table 1 and table 2 below that represent the activity schedule and the human resource requirements details of a project respectively.

Table: Activity schedule (duration in days)

Activity	Precedence	Duration (days)	Required HR types
A	-	2	managers and business analysts only
B	A	1	business analysts only
C	A	2	software architects only
D	B	2	programmers only
E	C and D	2	managers and technical writers only

Table 2: Human resource requirements per day

HR Type	Dates						
	1st	2nd	3rd	4th	5th	6th	7th
Managers	3	3	0	0	0	2	0
Business Analysts	1	1	3	0	0	0	0
Software Architects	0	0	5	3	0	0	0
Programmers	0	0	0	1	2	0	0
Technical Writers	0	0	0	0	0	2	1

Index No: .....

- a) Draw the Gantt chart and clearly write on it the human resource requirements per day on an activity by activity basis. E.g., Day 1: Activity A- 4 people

[10 Marks]

A large empty rectangular box with a black border, intended for drawing a Gantt chart. The box is approximately 700x650 units in size.

Index No: .....

b) Draw the resource histogram.

[8 Marks]

A large rectangular box with horizontal ruling lines, intended for drawing a resource histogram.

**Index No:** .....

- c) Assume that this company can accommodate only 7 workers on a day. Explain how the company can enforce this requirement by using the resource leveling technique.

**[4 Marks]**

[illegible]

- d) Explain the difference between resource leveling and resource smoothing.

**[3 Marks]**

[illegible]

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