UNIVERSITY
— OF —
JOHANNESBURG

PROGRAM	:	BACHELOR OF TECHNOLOGY ENGINEERING: INDUSTRIAL
SUBJECT	:	**PROJECT ENGINEERING**
CODE	:	**IPE 411**
DATE	:	WINTER EXAMINATION 26 MAY 2018
DURATION	:	(SESSION 2) 12:30 PM-15:30 PM
WEIGHT	:	40 : 60
TOTAL MARKS	:	104

ASSESSOR	:	MR T.A BALOYI
MODERATOR	:	MR F. CHOSHI
NUMBER OF PAGES	:	6 PAGES

INSTRUCTIONS :

- DRAWING INSTRUMENTS.
- A CALCULATOR OF ANY MAKE OR MODEL IS PERMITTED.

REQUIREMENTS:

- 2 SHEETS GRAPH PAPER.

QUESTION 1

1.1 Why is the implementation of projects important to strategic planning and the project manager? (5)

1.2 Describe the major components of the strategic management process. (5)

QUESTION 2

2.2 Why should an organization not rely only on ROI to select projects? (4)

2.2 Under what conditions would it be advisable to use a strong matrix instead of a dedicated project team? (4)

QUESTION 3

You are the head of the project selection team at SIMSOX. Your team is considering three different projects. Based on past history, SIMSOX expects at least a rate of return of 20 percent. Your financial advisors predict inflation to remain at 3 percent into the foreseeable future. Given the following information for each project, which one should be SIMSOX first priority? Should SIMSOX fund any of the other projects? If so, what should be the order of priority based on return on investment? (17)

Project: **Dust Devils**

Year	Inflows	Outflows
0		R500,000
1	R50,000	
2	R250,000	
3	R350,000	

Project: **Ospry**

Year	Inflows	Outflows
0		R250,000
1	R75,000	
2	R75,000	
3	R75,000	
4	R50,000	

Project: **Voyagers**

Year	Inflows	Outflows
0		R75,000
1	R15,000	
2	R25,000	
3	R50,000	
4	R50,000	
5	R150,000	

QUESTION 4

4.1 What are the six elements of a typical scope statement? (6)

4.2 What does it mean if the priorities of a project include: Time–constrain, Scope-accept, and Cost–enhance? (6)

QUESTION 5

Mrs. Tolstoy and her husband, Serge, are planning their dream house. The lot for the house sits high on a hill with a beautiful view of the Appalachian Mountains. The plans for the house show the size of the house to be 2,900 square feet. The average price for a lot and house similar to this one has been R120 per square foot. Fortunately, Serge is a retired plumber and feels he can save money by installing the plumbing himself. Mrs. Tolstoy feels she can take care of the interior decorating.

The following average cost information is available from a local bank that makes loans to local contractors and disperses progress payments to contractors when specific tasks are verified as complete.
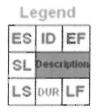
24%	Excavation and framing complete
8%	Roof and fireplace complete
3%	Wiring roughed in
6%	Plumbing roughed in
5%	Siding on
17%	Windows, insulation, walks, plaster, and garage complete
9%	Furnace installed
4%	Plumbing fixtures installed
10%	Exterior paint, light fixtures installed, finish hardware installed
6%	Carpet and trim installed
4%	Interior decorating
4%	Floors laid and finished

5.1 What is the estimated cost for the Tolstoy's house if they use contractors to complete all of the house? (2)

5.2 Estimate what the cost of the house would be if the Tolstoys use their talents to do some of the work themselves. (6)

QUESTION 6

K. Nelson project manager of Print Software, Inc., wants you to prepare a project network; compute the early, late, and slack activity times; determine the planned project duration; and identify the critical path. His assistant has collected the following information for the Color Printer Drivers Software Project:

ID	Description	Predecessor	Time
A	External specifications	None	5
B	Review design features	A	2
C	Document new features	A	3
D	Write software	A	60
E	Program and test	B	40
F	Edit and publish notes	C	2
G	Review manual	D	2
H	Alpha site	E, F	20
I	Print manual	G	10
J	Beta site	H, I	10
K	Manufacture	J	12
L	Release and ship	K	3

Legend

ES	ID	EF
SL	Description	
LS	DUR	LF

(10)

QUESTION 7

7.1 Project risks can/cannot be eliminated if the project is carefully planned. Explain. (5)

7.2 You are a father or mother of a family of four (kids ages 13 and 15) planning a weekend camping trip. Develop a responsibility matrix for the work that needs to be done prior to starting your trip. (10)

QUESTION 8

8.1 Present six reasons scheduling resources is an important task. (7)

8.2 What are the best practices used by firms to outsource project work? (7)

QUESTION 9

9.1 What does the exchange model of influence suggest you do to build cooperative relationships to complete a project? (5)

9.2 Why should a project manager emphasize group rewards over individual rewards? (5)

TABLES AND FORMULAS

TABLE 5.2
Simplified Basic Function Point Count Process for a Prospective Project or Deliverable

Element	Low	Average	High	Total
		Complexity Weighting		
Number of *inputs*	___ × 2 +	___ × 3 +	___ × 4	= ___
Number of *outputs*	___ × 3 +	___ × 6 +	___ × 9	= ___
Number of *inquiries*	___ × 2 +	___ × 4 +	___ × 6	= ___
Number of *files*	___ × 5 +	___ × 8 +	___ × 12	= ___
Number of *interfaces*	___ × 5 +	___ × 10 +	___ × 15	= ___

TABLE A7.2
Z Values and Probabilities

Z Value	Probability	Z Value	Probability
−3.0	.001	+0.0	.500
−2.8	.003	+0.2	.579
−2.6	.005	+0.4	.655
−2.4	.008	+0.6	.726
−2.2	.014	+0.8	.788
−2.0	.023	+1.0	.841
−1.8	.036	+1.2	.885
−1.6	.055	+1.4	.919
−1.4	.081	+1.6	.945
−1.2	.115	+1.8	.964
−1.0	.159	+2.0	.977
−0.8	.212	+2.2	.986
−0.6	.274	+2.4	.992
−0.4	.345	+2.6	.995
−0.2	.421	+2.8	.997

$$t_e = \frac{a + 4m + b}{6}$$

$$\sigma_{t_e} = \left(\frac{b - a}{6}\right)$$

$$\sigma_{T_e} = \sqrt{\Sigma \sigma_{t_e}^2}$$

$$Z = \frac{T_S - T_E}{\sqrt{\Sigma \sigma_{t_e}^2}}$$

where
T_E = critical path duration
T_S = scheduled project duration
Z = probability (of meeting scheduled duration) found in statistical Table A7.2

Legend

ES	ID	EF
SL	Description	
LS	DUR	LF

Project NPV $= I_0 + \sum_{t=1}^{n} \dfrac{F_t}{(1+k)^t}$ where

I_0 = Initial investment (since it is an outflow, the number will be negative)

F_t = net cash inflow for period t

k = required rate of return