



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF LAW, BUSINESS INTELLIGENCE AND ECONOMICS

DEPARTMENT OF ECONOMICS, MARKETING AND ENTREPRENEURSHIP

EXAMINATION PAPER

COURSE CODE : CBM 404
COURSE TITLE : PROJECT MANAGEMENT
DURATION : 3 Hours
LEVEL : 4.2
DATE : 13 FEB 2024

INSTRUCTIONS TO CANDIDATES:

1. No cell phones are allowed in the examination venue.
2. Use of silent, non-programmable calculators is allowed
3. Answer question number one (1) in Section A (Compulsory) and any other three (3) questions in Section B.
4. Begin each question on a new page.
5. The number of marks for each question or part question is shown in brackets []
6. Show all workings, where applicable.

SECTION A (COMPULSORY)

Question 1

Bridgecon is a medium-size construction company that specializes in the detail design and construction of bridges that combine steel and concrete elements. An opportunity has recently been identified by Marketing Team: A well-known bridge architect has just completed the concept design of a cable-stayed bridge, intended to cross over electrified railway lines. The senior managers are excited about this opportunity, and this marks the end of the first phase. Bridgecon now enters the second phase—the Estimating phase. This phase includes site visits by the estimating team, review of resources and skills available, a more detailed risk review than the one done during the first phase, as well as a preliminary plan for detail design, procurement, logistics, and construction. The deliverable of this phase is an initial presentation to the customer. The third phase (Pre-contract phase) should lead to a contract signed by both Bridgecon and the customer. In Table 1 below, Activities A and B are required for preparing a bid for building the bridge and form part of the second phase.

The project manager who leads the estimating team sets up a number of meetings with stakeholders. First meetings were held with the bridge architect and structural engineers who produced the concept design in order to acquaint the estimating team with the design. The estimating team then meets with subcontractors who might be selected for piling and for fabrication of steel components. The columns “initial duration estimate” and “initial cost estimate” of Table 1 are completed subsequent to these meetings.

The RFP (request for proposal) for building the bridge indicates acceptance of the plan by the rail authority as one of the criteria for the selection of a contractor. At this stage it is evident that, from the start of Activity D until the completion of Activity S, the operation of one of the railway lines will be impaired, and preliminary, informal discussion with someone from the rail authority indicates that this might be acceptable. On a subsequent meeting with the rail authorities, concern is expressed about the planned 17 weeks of impaired operation and Bridgecon is requested to

reconsider the duration of this period. The estimating team now suggests the following possibilities:

- The duration of Activity N could be reduced from 1 week to half a week by hiring additional trucks. The additional cost would be \$33,000.
- An alternative subcontractor for piling has been approached. This subcontractor indicates that it would be able to halve the time of Activity H and provides a first round cost indication of \$960,000 for such an expedited piling operation.
- Two steps to shorten the duration of Activity D are possible: First, additional temporary workers could be employed. This would reduce the duration to 3 weeks and increase the cost to \$147,000. Second, a team of workers highly skilled in this type of procedure (with their equipment) could be temporarily reallocated from another site to this project, and the estimating team believes that adding this team to the original team and temporary workers would lead to completion of the work within 1 week. The project manager of the other project indicates that such a reallocation would cause him to forfeit an incentive fee of \$150,000 for finishing his project early. The two project managers agree that, should the reallocation be made, the value of incentive fee would be booked as a cost against the cable-stayed bridge project and transferred to the other project.

Table 1: Cable-stayed Bridge Construction

ACTIVITY	ACTIVITY DESCRIPTION	INITIAL DURATION ESTIMATE	PREDECESSORS	INITIAL COST ESTIMATE(\$1,000)
A	Detail site investigation and survey	2	—	17
B	Detail planning	6	A	16
C	Detail design	6	B	557
D	Preparation of site	4	C	47
E	Relocate services	3	C	28
F	Re-align overhead track electrification	4	C, E	650
G	Access road and ramp construction	1	D	63
H	Piling	2	G	820
J	Construct foundations and abutments	3	H	975
K	Construct temporary supports to support bridge deck during construction	2	F, G	720
L	Fabrication planning of structural steel components	2	C	13
M	Manufacture structural steel components (off-site)	2	L	1320
N	Transport structural steel components and erect on-site	1	M	433
P	Erect pylons and fill with concrete	2	J	840
Q	Construct main span deck on pre-cast concrete beams	3	H, K, N, P	2,800
R	Cable-stay installation and lift the bridge deck off temporary supports	3	Q	875
S	Removal of temporary supports	1	R	54
T	Electrical system installation	1	S	147
U	Roadway surfacing (paving)	2	S	142
V	Finishing and ancillaries	2	T, U	76
W	Commissioning—cut-over	1	V	14
X	Formal hand-over and ceremony	1	W	9
Y	Project sign-off	1	X	1
Z	Administrative closure	1	W	4
AA	Project end (milestone)	0	Y, Z	10,621

- a) Compile a list showing the reduced periods for impairment of the rail operation and the associated additional costs. [12 marks]
- b) Comment on the impact that crashing might have on the risk of not meeting the committed due date. [13 marks]

SECTION B (ANSWER ANY THREE (3) QUESTIONS)

Question 2

Using the construction of Mbudzi Interexchange (Harare) construction plan as a case study, discuss the assertion that resources planning is key to the success of projects. [25 marks]

Question 3

Consider the five ways to handle risk: transfer risk, avoid risk, reduce risk, do contingency planning, and accept risk. Recommend the most appropriate in case of insurgency. [25 marks]

Question 4

Assess the feasibility of reducing risk in a project that involves spaceflight. [25 marks]

Question 5

Recommend the most appropriate way of measuring work progress in the construction of a learning centre. [25 marks]

---The End---

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INSTRUCTIONS TO CANDIDATES

1. Do not pass any part of this paper to the candidates' marks.
2. Use of white, yellow, red, blue, or black ink is allowed.
3. Answer all questions in part (a) in Section A if it is possible and any other three (3) questions in Section B.
4. Designate each question on a new page.
5. The number of marks for each question or part question is shown in brackets ().
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