

Your: Student Number: & Surname.....



SUPPLEMENTARY EXAMINATION
8 January 2020

COURSE: *ENGINEERING* **TIME:** 3 HOURS

PAPER: *PROJECT MANAGEMENT 3B* **MARKS:** 120

EXAMINOR: Mnr D Kruger PrEng (UJ)
MODERATOR: Mr P vanTonder (UJ)

(THIS PAPER & MEMORANDUM CONSISTS OUT OF 9 PAGES)

Important Instructions:

1. *Closed book exam – no mobile phones are allowed anywhere near a candidate.*
2. ***NB!!!*** *For Questions 1 and 6, only the accompanying answer tables on page 9 of this paper will be marked. Use UJ exam paper **for all** other questions showing all your own calculations*
3. *On completion, your answer sheet, this exam paper and all UJ exam papers must be handed in together.*
4. *Ensure to write your student number on each page for identification.*

Question 1 (40) MULTIPLE CHOICE: *Indicate the correct answer (a, b, c or d) clearly with a large X in the appropriate block on the answer table on page 9 of this paper. (2 marks each)*

1. The _____ usually states the time by which a project scope must be completed in terms of the specific date agreed upon by the sponsor.
 - a. project schedule
 - b. project objective
 - c. task timetable
 - d. project scope
2. The project budget is based on
 - a. how well the project manager can use accounting software.
 - b. the estimated costs associated with the quantities of resources to be used.
 - c. the actual costs of the resources used for the project.
 - d. the costs to do the resources before any indirect costs.

Your: Student Number: & Surname.....

3. Which of the following is not an example of a project?
 - a. Starting up a restaurant
 - b. Creating a website for a company
 - c. Raising money for a disaster relief trip
 - d. Emptying the recycling bin every day
4. Costs for resources on a project could include all the following except
 - a. fees for subcontractors to perform project tasks.
 - b. salaries of people who will work on the project.
 - c. rental of facilities.
 - d. costs for equipment that extends beyond the project time.
5. A_____plan must be developed that identifies and assesses potential risks, determines the likelihood of occurrence and potential impacts of risks, and delineates responses for dealing with risks.
 - a. risk development
 - b. risk management
 - c. risk mitigation
 - d. risk avoidance
6. Resources are identified and selected in the
 - a. initiating phase.
 - b. planning phase.
 - c. performing phase.
 - d. closing phase.
7. The implementation of the new procedure is expected to reduce costs of production by 10% over the next year. This is an example of the_____ in a project charter.
 - a. acceptance criteria
 - b. project objective
 - c. project description
 - d. success criteria and expected benefits
8. The new employees are expected to receive R13 million of Fast Start training that will be provided by a provincial workforce development grant. This is an example of the_____ in a project charter.
 - a. acceptance criteria
 - b. key assumptions
 - c. project description
 - d. success criteria and expected benefits

Your: Student Number: & Surname.....

9. A bidders' meeting may be held to
 - a. clarify the RFP and answer any questions from potential bidders.
 - b. provide additional information only to those that attend the meeting.
 - c. provide an unfair advantage to those at the meeting.
 - d. solicit feedback on the clarity of the RFP to change the project requirements.

10. The most effective way to build a relationship is to
 - a. talk on the phone regularly.
 - b. send e-mails.
 - c. meet face-to-face.
 - d. maintain a blog so that readers know all about you.

11. You are reading an article about the value of antique stamps and remember that Sipho from Xolani Developers (Pty) Ltd is an aspirant **philatelist**. You decide to
 - a. send John a copy of the article with a note saying you thought this might be of interest.
 - b. not bother John, thinking he probably already read the article.
 - c. send John a copy of the article with a note expressing how displeased you are with the latest high costs of postage stamps.
 - d. print out a copy of the article and put it in your files in case John comes to the office for a meeting.

12. A way to foster trust is to
 - a. be reliable and responsive.
 - b. only contact the customer when planned.
 - c. ask about upcoming RFPs a company is planning.
 - d. get insider information about a company, then share it with a competitor.

13. In the____stage of team development, conflict emerges and tension increases.
 - a. forming
 - b. norming
 - c. storming
 - d. performing

14. The____stage of team development is the time for the project manager to provide an understanding and supportive environment.
 - a. forming
 - b. norming
 - c. storming
 - d. performing

Your: Student Number: & Surname.....

15. The project manager should schedule a_____, also referred to as a project orientation meeting, with the project team.
 - a. project kick-off meeting
 - b. project progress meeting
 - c. project status meeting
 - d. project design meeting
16. The_____agenda contains the welcome and introductions to provide opportunity for team members to get to know each other and the potential value and contributions to the project.
 - a. project kick-off meeting
 - b. project progress meeting
 - c. project status meeting
 - d. project design meeting
17. Team building is the responsibility of
 - a. both the project manager and the project team.
 - b. the project manager.
 - c. the project team.
 - d. the organisation's management.
18. _____is about acknowledging, understanding, and valuing differences and creating a work environment that recognises, respects, and harnesses differences among team members for the benefits of achieving a shared goal.
 - a. Diversity
 - b. Team building
 - c. Organising
 - d. Socialisation
19. ____is categorising individuals into a group and then conferring on them the characteristics that we believe apply universally to all members of that group.
 - a. Generalisation
 - b. Hypothesising
 - c. Stereotyping
 - d. Simplifying
20. A project organisation can take several steps to create and sustain a supportive and positive climate for diversity. These include all the following except:
 - a. develop a written policy regarding diversity.
 - b. provide training about diversity in the workplace.
 - c. include diversity as a primary meeting agenda item.
 - d. have team meetings for members to get to know each other and value each other's differences.

Your: Student Number: & Surname.....

Question 2 (10)

You manage a project which has a critical path duration estimated at 26 weeks. The total number of activities on the critical path is 13 and the standard deviation of the duration estimates on the critical path is 2 weeks. You have calculated the TBC for this project to be R172 000 but the client request that the project duration must now be reduced to 22 weeks. You estimate that this reduction in time will require extra resources which will add R32 000 to your original project budget. By how many weeks, at most, can this project's duration be reduced if you only have R20 000 available in a reserve fund to fund this action?

Question 3 (20)

Use the data for the DENEL aerospace launch project below and:

- 3.1 Construct a neatly drawn AON network diagram (5)
- 3.2 Calculate the estimated project duration (5)
- 3.3 Determine which activities are on the critical path. (5)
- 3.4 If the move to the launch pad is delayed with 3 days due to bad weather, what impact will this have on the launch date? (5)

No	Activity	Te (Weeks)	Preceding Activities
A	Check Controls	3	None
B	Check propellants	5	Check Controls
C	Check personnel	3	Check Controls
D	Assemble items	1	Check personnel
E	Move to launch pad	3	Check propellants
F	Run systems test	4	Check propellants; Assemble items
G	Check Astronauts	2	Check personnel
H	Get Ground station Go Ahead	3	Run systems test; Check Astronauts
I	Countdown and Launch	1	Move to launch pad; Get Ground station Go Ahead

Question 4 (20)

The project financial data for a 9-week project is determined as per the table below.

Week	1	2	3	4	5	6	7	8	9
Budget (R)	3000	3500	3800	2400	3000	2500	3000	2000	1000
Cost (R)	3400	3000	3500	3000	2400	2000	2000	3600	3200

- 4.1 Plot the cumulative budget and cumulative actual cost curves for this project. (4)

Your: Student Number: & Surname.....

4.2 If the client pays you a fixed weekly amount of R2800 for the first 8 weeks with a final payment of R10000 at the end of week 9, show this as cumulative income on your curve. (4)

4.3 Show the cumulative cash flow curve on your graph (4)

4.4 Highlight any potential cash flow problems if you only have R1500 of your own funds available to assist with cash flow during this project. (4)

4.5 What is the final profit or loss on this project? (4)

Question 5 (20)

The following activity duration estimates (in days) have been done for a project that you are managing. Assume these time estimates follow a Beta probability distribution.

Activity	Predecessor	Optimistic Time	Most Likely Time	Pessimistic Time
A	None	6	7	14
B	None	8	10	12
C	A	2	3	4
D	A	6	7	8
E	B, C	5	5.5	9
F	B, C	5	7	9
G	D, E	4	6	8
H	F	2.5	3	3.5

5.1 Determine which activities are on the critical path and what the expected duration of this path will be (10)

5.2 What is the probability that the project will be completed within 21 days? (10)

Question 6 (10) MULTIPLE CHOICE : Indicate the correct answer (a, b, c or d) by making a clear big X in the appropriate space on the answer table for this question on page 9 (2 marks each)

1. A BAFO requested by a customer is
 - a. a base accounting and finance office clarification from the contractor.
 - b. a best and first offer from the contractor.

Your: Student Number: & Surname.....

- c. a clarification request for broad, ambiguous, frivolous, and obscure aspects of the proposal.
 - d. a best and final offer from the contractor.
2. Proposals are often organised
- a. as one long document with no breaks or sections.
 - b. with technical, management, and cost sections that may not be labelled.
 - c. as separate volumes to display the different phases of the project life cycle.
 - d. with a lot of detail to identify the customer's problem.
3. Clients want to work with people who can__problems, not with those who merely_____them.
- a. identify, evaluate
 - b. assess, talk about
 - c. solve, identify
 - d. create, solve
4. Sleeping on a contradictory issue and providing a thoughtful answer the next day
- a. reinforces that you cannot make quick decisions.
 - b. reinforces your thoughtfulness and builds a positive perception of you by the customer.
 - c. lets you get more information to prove the client was wrong.
 - d. gives you time to find a comic strip to include that expresses your political point of view.
5. In____, the customer usually requires that, throughout the project, the contractor regularly compares actual expenditures with the proposed budget and reforecasts cost at completion, comparing it with the original proposed price.
- a. fixed-price contracts
 - b. fixed agreements
 - c. cost-reimbursement contracts
 - d. work agreements

Formulae:

$$\text{Variance} = \sigma^2 = ((t_p - t_o)/6)^2$$

$$T_e = (T_o + 4(T_m) + T_p)/6$$

$$\text{Total Slack} = LF - EF$$

$$LS = LF - \text{Duration Estimate}$$

$$Z = (LF - EF)/\sigma_t$$

$$\text{Std Dev} = \sigma$$

$$CPI = CEV/CAC$$

$$CV = CEV - CAC$$

$$FCAC = TBC/CPI$$

$$FCAC = CAC + (TBC - CEV)$$

$$\text{Total slack} = LS - ES$$

Table 6.1 Table of Areas of the Normal Curve Between the Maximum Ordinate and Values of Z

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.00000	.00399	.00798	.01197	.01595	.01994	.02392	.02790	.03188	.03586
0.1	.03983	.04380	.04776	.05172	.05567	.05962	.06356	.06749	.07142	.07535
0.2	.07926	.08317	.08706	.09095	.09483	.09871	.10257	.10642	.11026	.11409
0.3	.11791	.12172	.12552	.12930	.13307	.13683	.14058	.14431	.14803	.15173
0.4	.15542	.15910	.16276	.16640	.17003	.17364	.17724	.18082	.18439	.18793
0.5	.19146	.19497	.19847	.20194	.20540	.20884	.21226	.21566	.21904	.22240
0.6	.22575	.22907	.23237	.23565	.23891	.24215	.24537	.24857	.25175	.25490
0.7	.25804	.26115	.26424	.26730	.27035	.27337	.27637	.27935	.28230	.28524
0.8	.28814	.29103	.29389	.29673	.29955	.30234	.30511	.30785	.31057	.31327
0.9	.31594	.31859	.32121	.32381	.32639	.32894	.33147	.33398	.33646	.33891
1.0	.34134	.34375	.34614	.34850	.35083	.35314	.35543	.35769	.35993	.36214
1.1	.36433	.36650	.36864	.37076	.37286	.37493	.37698	.37900	.38100	.38298
1.2	.38493	.38686	.38877	.39065	.39251	.39435	.39617	.39796	.39973	.40147
1.3	.40320	.40490	.40658	.40824	.40988	.41149	.41309	.41466	.41621	.41774
1.4	.41924	.42073	.42220	.42364	.42507	.42647	.42786	.42922	.43056	.43189
1.5	.44319	.43448	.43574	.43699	.43822	.43943	.44062	.44179	.44295	.44408
1.6	.44520	.44630	.44738	.44845	.44950	.45053	.45154	.45254	.45352	.45449
1.7	.45543	.45637	.45728	.45818	.45907	.45994	.46080	.46164	.46246	.46327
1.8	.46407	.46485	.46562	.46638	.46712	.46784	.46856	.46926	.46995	.47062
1.9	.47128	.47193	.47257	.47320	.47381	.47441	.47500	.47558	.47615	.47670
2.0	.47725	.47778	.47831	.47882	.47932	.47982	.48030	.48077	.48124	.48169
2.1	.48214	.48257	.48300	.48341	.48382	.48422	.48461	.48500	.48537	.48574
2.2	.48610	.48645	.48679	.48713	.48745	.48778	.48809	.48840	.48870	.48899
2.3	.48928	.48956	.48983	.49010	.49036	.49061	.49086	.49111	.49134	.49158
2.4	.49180	.49202	.49224	.49245	.49266	.49286	.49305	.49324	.49343	.49361
2.5	.49377	.49396	.49413	.49430	.49446	.49461	.49477	.49492	.49506	.49520
2.6	.49534	.49547	.49560	.49573	.49585	.49598	.49609	.49621	.49632	.49643
2.7	.49653	.49664	.49674	.49683	.49693	.49702	.49711	.49720	.49728	.49736
2.8	.49744	.49752	.49760	.49767	.49774	.49781	.49788	.49795	.49801	.49807
2.9	.49813	.49819	.49825	.49831	.49836	.49841	.49846	.49851	.49856	.49861
3.0	.49865	.49869	.49874	.49878	.49882	.49886	.49889	.49893	.49897	.49900
3.1	.49903	.49906	.49910	.49913	.49916	.49918	.49921	.49924	.49926	.49929
3.2	.49931	.49934	.49936	.49938	.49940	.49942	.49944	.49946	.49948	.49950
3.3	.49952	.49953	.49955	.49957	.49958	.49960	.49961	.49962	.49964	.49965
3.4	.49966	.49968	.49969	.49970	.49971	.49972	.49973	.49974	.49975	.49976
3.5	.49977	.49978	.49978	.49979	.49980	.49981	.49981	.49982	.49983	.49983
3.6	.49984	.49985	.49985	.49986	.49986	.49987	.49987	.49988	.49988	.49989
3.7	.49989	.49990	.49990	.49990	.49991	.49991	.49992	.49992	.49992	.49992
3.8	.49993	.49993	.49993	.49994	.49994	.49994	.49994	.49995	.49995	.49995
3.9	.49995	.49995	.49996	.49996	.49996	.49996	.49996	.49996	.49997	.49997
4.0	.49997	.49997	.49997	.49997	.49997	.49997	.49998	.49998	.49998	.49998

Your: Student Number: & Surname.....

Answer sheet for question 1

Answer sheet for question 1 MULTIPLE CHOICE: Indicate the correct answer (a, b, c or d) on the answer sheet below clearly with a large X. (2 marks each, 40 marks total)									
No	(a)	(b)	(c)	(d)	No	(a)	(b)	(c)	(d)
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Answer sheet for question 6

Answer sheet for question 6 Indicate Correct answer with a large X. (2 marks each)				
No	(a)	(b)	(c)	(d)
1				
2				
3				
4				
5				