UNIVERSITI
TEKNOLOGI
PETRONAS

FINAL EXAMINATION
MAY 2024 SEMESTER

COURSE	:	**DCM5053 – PROJECT MANAGEMENT & ECONOMICS**
DATE	:	**7 AUGUST 2024 (WEDNESDAY)**
TIME	:	**9:00 AM – 12:00 PM (3 HOURS)**

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in the Answer Booklet.
2. Begin **EACH** answer on a new page in the Answer Booklet.
3. Indicate clearly answers that are cancelled, if any.
4. Where applicable, show clearly steps taken in arriving at the solutions and indicate **ALL** assumptions, if any.
5. **DO NOT** open this Question Booklet until instructed.

Note :

i. There are **SEVEN (7)** printed pages in this **double-sided** Question Booklet including the cover page .

1. Projects require project management, while operations require business process management or operations management. Projects and operations will interact with each other at key points in the project and product lifecycle to improve overall performance.

   a. Propose **FIVE (5)** effective solutions to enhance the performance and to avoid failure of the oil and gas projects, and support your answer with examples.

   [5 marks]

   b. Compare project management and operation management in oil and gas projects and discuss project life cycle stages considering each stage and its percentage of contribution, and support your answer by examples.

   [5 marks]

   c. Conclude the risk management approach and its effect on the cost estimation of oil and gas projects, and support your answer with an example.

   [5 marks]

   d. Project manager for an Oil and Gas company manages a drilling project that should be completed within nine months. So far the project has the data shown in **TABLE Q1**. Develop the S-curves and evaluate the project performance using Earned Value Analysis (EVA).

TABLE Q1: The drilling project cost data

	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**
BCWS (PV)	3500	3300	4900	4800	6700	7700	8800	8700	8900
BCWP (EV)	3700	2800	5900	6800	7000	7900	8800		
ACWP (AC)	4000	5000	4000	4500	5200	7000	8500		

[10 marks]

2. a. A Quality Management Plan (QMP) guides the project manager and project personnel into executing quality management activities throughout the project lifecycle. Evaluate quality planning, quality assurance, and quality control approaches for oil and gas, and support your answer by examples.

[5 marks]

b. You are the procurement leader for XYZ drilling company based out of Malaysia. You are conducting a portfolio analysis for a project that you will be heading by the end of this year. Alongside your analysis, you have a Pareto chart illustrating the spending contribution of each product category for a similar project that was completed last year. **FIGURE Q2** reveals the distribution of the project items. The cost breakdown of the categories and the number of suppliers are shown in **TABLE Q2**.

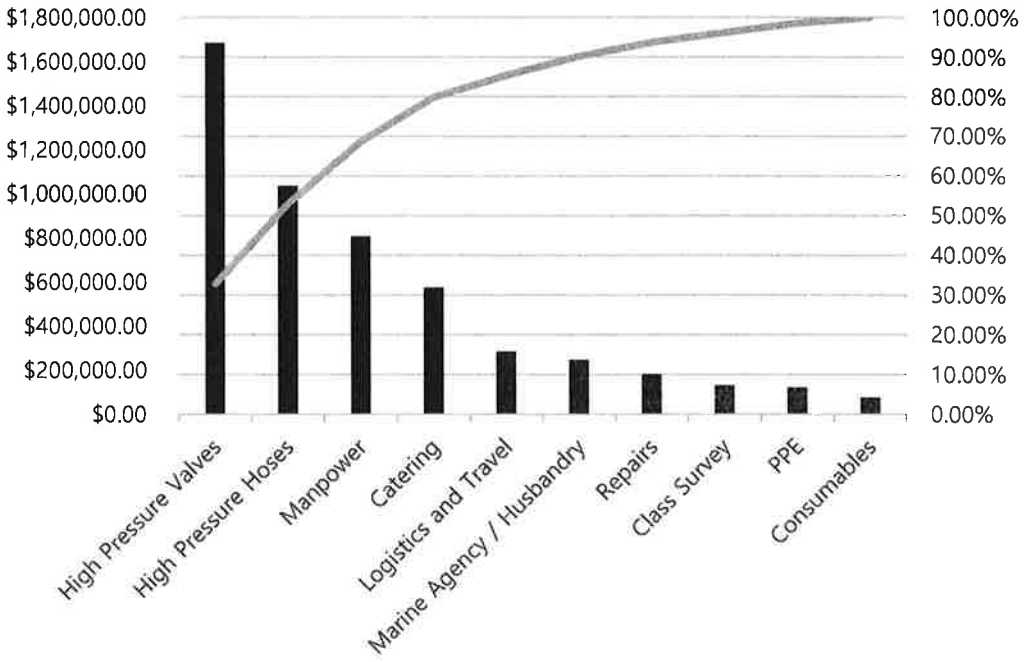

FIGURE Q2: Categories of the project items

TABLE Q2: Categories and the number of suppliers

Categories	Number of Suppliers	Annual Cost	Percent of Total Cost
High Pressure Valves	2	$1,685,000.00	32.81%
High Pressure Hoses	10	$1,035,500.00	20.17%
Manpower	10	$805,500.00	15.69%
Catering	5	$573,000.00	11.16%
Logistics & Travel	5	$285,000.00	5.55%
Marine Agency / Husbandry	2	$246,000.00	4.79%
Repairs / services	10	$180,000.00	3.51%
Class Survey	2	$130,000.00	2.53%
PPE	2	$120,000.00	2.34%
Consumables	20	$75,000.00	1.46%

i. Utilizing a portfolio analysis model such as the Supplier Portfolio Matrix or Kraljic Matrix, categorize each supplier category. Evaluate the rationale for the categorization of each category.

[10 marks]

ii. Considering the strategic objectives of the procurement function, propose specific procurement strategies for each supplier category to enhance the overall efficiency and effectiveness of procurement operations.

[10 marks]

3. a. There are provisions in a typical Production Sharing Contract (PSC) that address the interest of both contractor or government. Analyze the following:

i. Domestic Market Obligation

[3 marks]

ii. Ringfencing

[3 marks]

b. In a PSC arrangement, every equipment belongs to the government. Decide whether the contractor has breached cost recovery provision when it freely imports or exports such equipment from the country. Justify your answer.

[4 marks]

c. Information on a PSC is shown in **TABLE Q3**. The price is assumed at USD 40 per barrel. Determine the following:

TABLE Q3: PSC data

	Year 1	Year 2	Year 3
Oil Production (bbl/day)	0	7000	14000
Bonus (USD million)	3		
CAPEX (USD million)	20	20	
OPEX (USD million)		6	8
Cost Recovery (%)	45	45	45
Contractor's Share (%)			
Excess Cost Recovery	40	40	40
Profit Oil	40	40	40

i. Annual excess cost recovery for the project.

[8 marks]

ii. Net revenues for the contractor in year 1 and year 2.

[6 marks]

4. A company is considering drilling an exploration well on a structure with two possible oil bearing reservoirs: shallow and deep reservoirs. The former lies above the latter reservoir. The exploration well could be drilled to test only the shallow reservoir. However, the company also has the option to drill further to test the deep reservoir. **TABLE Q4** shows data for the well, Net Present Value (NPV) and probability of success (Ps).

TABLE Q4: Well data

Cost of well to drill the shallow reservoir only	USD 2MM
Extra cost to drill further to the deep reservoir	USD 1MM
NPV if only the shallow reservoir is a discovery (excluding well cost)	USD 10MM
NPV if only the deep reservoir is a discovery (excluding well cost)	USD 20MM
NPV if both reservoirs are discovery (excluding well cost)	USD 40MM
Ps for the shallow reservoir	30%
Ps for the deep reservoir if the shallow reservoir is a discovery	40%
Ps for the deep reservoir if the shallow reservoir is dry	10%

a. Draw a decision tree based on the given information indicating drill and don't drill options and their respective Expected Monetary Value (EMV).

[10 marks]

b. Determine if the well should be drilled to the possible shallow reservoir.

[3 marks]

c. If a discovery is made in the shallow reservoir, should the well be drilled to the possible deep reservoir? Justify your answer.

[3 marks]

d. i. If no discovery is made in the shallow reservoir, evaluate if the well should be drilled to the possible deep reservoir. Justify your answer.

[3 marks]

ii. Generate the EMV for drilling both reservoirs.

[7 marks]

- END OF PAPER–