KOYA UNIVERSITY
Faculty of Engineering

Final Examination
Spring Semester (2024-2025)

Department: DCHE
Stage: 3rd
Total Mark: 100

Course Title: Engineering Statistics and Economics
Course Code: KOU20454
Time Allowed: 120 minutes
Attached Sheet: NA

Dear Students: Please answer all questions

Attention: The exam questions printed on both sides of the exam sheet (duplex).

1. An Engineering team has decided to establish tetrachloroethylene chemical solvents factory that may consider a very economical and beneficial project in the chemical industry. Consider the daily productivity is 1500 litters, number of operation days per year 300, the life of equipment 10 years and building 20 years for estimation depreciation, suppose that the project Fixed Cost 1200 TUS$.

Items	TUS$
Land and land preparation cost	300
Equipment and machines	300
All Building	500
Annual consumption of raw material	200
Labors annual salaries	100
Annual cost of Maintenance, Spare parts,Services	5% of equipment and machines cost
Annual cost of Management and marketing	10
Selling Price for one liter of the solvent	0.001

Estimate the followings:

a. Annual production capacity. b. Depreciation. c. Total annual Production Cost. d. Total Revenue. e. Total Profit. f. Net Profit (Taxes: Assume 1.5% total profit). g. Payback Period years. h. Is the project feasible or not? And why?

(32 Marks)

2. In the following table shows the data record in a specific experiment. Construct a frequency distribution table (Classes, Class Boundaries, Class Mark, Frequency, Percentage Frequency, Relative Frequency, Cumulative Frequency " Less than and More"). Assume the a grouped frequency distribution for the data using seven classes and five class width.

19	16	22	9	22	12	39	19
14	23	6	24	16	18	7	17
20	25	28	18	10	24	20	21
10	7	18	28	24	20	14	23
25	34	22	5	33	23	26	29
13	36	11	26	11	37	30	13
8	15	22	21	32	21	31	17
16	23	12	9	15	27	17	21

(15 Marks)

3. Find the standard deviation and coefficient of variation of the following data using step deviation method, given that Assumed Mean= (92.5).

Class	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115
Frequency	3	4	7	7	15	9	6	6	3

(33 Marks)

Best Wishes...

Examiner's Name: Mr. Ribwar Kermanj Abdulrahman

KOYA UNIVERSITY
Faculty of Engineering

Final Examination
Spring Semester (2024-2025)

Department: DCHE
Stage: 3rd
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Course Title: Engineering Statistics and Economics
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Time Allowed: 120 minutes
Attached Sheet: NA

4. Answer the following in details:

a. **Cost estimates is one of the most important project feasibility study structures and it is normally estimated annually and by a stable currency. Write all potential costs types that need to be estimated in any project feasibility study.**

b. **What is alternate cost (AC)? and how it can be calculated?**

(20 Marks/ 10 each)

$\Sigma fdi = 30$

$\Sigma fdi^2 = 1730$

Best Wishes...

Examiner's Name: Mr. Ribwar Kermanj Abdulrahman

KOI UNIVERSITY

Midterm Examination
Spring Semester (2024-2025)

Faculty of Engineering
Department: DCHE
Stage: 3rd
Total Mark: 100

Course Title: Engineering Statistics and Economics
Course Code: KOU20454
Time Allowed: 90 minutes
Attached Sheet: NA

Dear Students: Please answer all questions.

1. **Define the following:**

a. **Engineering Economic Analysis.** b. **Equilibrium quantity.**

(10 Marks/ 5 each)

2. **Answer the following in detail:**

a. **What are the potential mechanisms to distribute engineering project profits?**
b. **List the potential reasons to achieve (to do) Feasibility Study?**
c. **When can it be said that the market is an Imperfect Competition Market?**

(45 Marks /15 each)

3. **In the following table shows the data record in a specific experiment. Construct a frequency distribution table (Classes, Class Boundaries, Class Mark, Frequency, Percentage Frequency, Relative Frequency, Cumulative Frequency " Less than and More"). Assume the a grouped frequency distribution for the data using Six classes and 150 class width.**

100	101	102	101	110	403	200	300	500	600
604	545	900	999	990	123	124	345	567	666
777	888	999	999	545	987	522	444	511	212
567	890	987	323	231	123	123	234	432	655
655	771	400	401	430	507	600	911	844	400

50

(25 marks)

4. **Calculate the value of the mode of the following given data:**

grouped

mode = $L + \frac{D_1}{D_1 + D_2}$

Class	Frequency
0 - 100	19
100 - 200	13
200 - 300	40
300 - 400	11
400 - 500	12
500 - 600	9
600 - 700	39
700 - 800	2
800 - 900	1
900 - 1000	3

(20 marks)

Best Wishes...

Examiner's Name: Mr. Ribwar Kermanj Abdulrahman