3rd year

Fayoum Univ. Faculty of Eng
Dept. of Industrial Eng.
Final Exam.

Plant Engineering and Management
Time Allowed: 3hours
Date: 16/1/2016

Tables and Charts are allowed & Assume any missing data
Please attempt all questions. No. of Questions: 4 No. of pages: 3

Q1: (22 Marks)

Case study: XXX Company is a manufacturer of plastic primary packaging (product Bottle & Cover) and one of the most respected names in the pharmaceutical field in Egypt.

Day	Available time (hour)	Down time (hour)	Planned Quantity (Unit)	Actual quantity (Unit)	Defects (Unit)
1	22	0	25000	23565	718
2	22	0	25000	23570	820
3	22	0	25000	22945	720
4	22	0	25000	24600	516
5	22	3	25000	19000	1300
6	22	0	25000	23200	140
7	22	0	25000	22000	65
8	22	0	25000	24233	500
9	22	2	25000	20230	854
10	22	0	25000	23398	480
11	22	0	25000	24005	179
12	22	6	25000	16340	1200
13	22	0	25000	24560	630
14	22	0	25000	20563	516
15	22	0	25000	23154	543

Required:

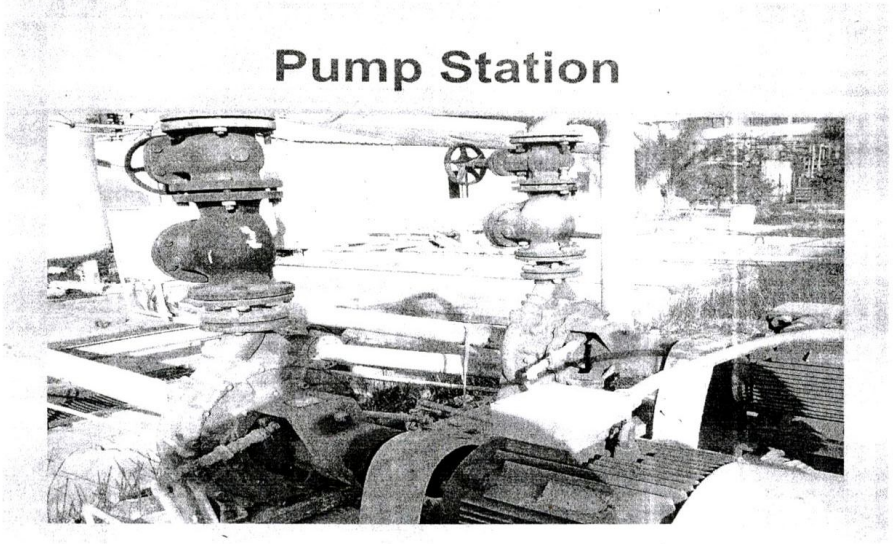
a) Availability. (4 Marks)
b) Performance efficiency. (4 Marks)
c) Rate of quality (4 Marks)
d) Overall equipment effectiveness (OEE). (5 Marks)
e) Discuss the comparison between word class standard and company (5 Marks)

Q2: (28Marks)

a) What are the main supportive systems in a plant? (4 Marks)
b) What is the different between productive and supportive systems? (4 Marks)
c) What is the plant management? (4 Marks)
d) What are standards? (4 Marks)
e) Explain systematic layout planning. (4 Marks)
f) Mention seven steps safety considerations. (4 Marks)
g) Mention four steps maintenance considerations. (4 Marks)

Q3: (25 Marks)

Design a water system for chemical process plant which looking for a water supply system (See Figure) to transportation the water from the main source (Demi plant) to process tank. The available information is as follows:



Sound annual production rate (ton)	162,000
Average water consumption rate (m^3/ton)	0.5
Working condition (day/year)	300
Total time rate (hr/day)	24
Average used time (hr/day)	20
Average actual production rate (ton/hr)	30
Piping length (m)	400
Static head (m)	25

Required:-

a) Calculate quality rate (4 Marks)
b) Utilization ratio (4 Marks)
c) Design of pipe lines system. (4 Marks)
d) Select and design for the pump station. (4 Marks)
e) Select valves. (4 Marks)
f) Process tank design (5 Marks)