


Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, July 2020

Programme Name: B.Tech Mechanical

Semester : VI

Course Name : Industrial Engineering

Time : 03 hrs

Course Code : MEPD 3004

Max. Marks: 100

Nos. of page(s) : 8

Instructions:

SECTION A

S. No.		M ar ks	CO
Q 1	<p>_____ is the process of forecasting an organizations future demand for, and supply of, the right type of people in the right number.</p> <p>a. Human Resource Planning</p> <p>b. Recruitments</p> <p>c. Human Resource Management</p> <p>d. Human Capital Management</p> <p>Which of the following factors state the importance of the Human Resource Planning?</p> <p>a. Creating highly talented personnel</p> <p>b. International strategies</p> <p>c. Resistance to change and move</p> <p>d. All of the above</p> <p>A process that is used for identifying and developing internal people with the potential to fill key business leadership positions in the company is called _____.</p> <p>a. Highly talented personnel creation</p> <p>b. Investing in human resources</p> <p>c. Succession planning</p> <p>d. None of the above</p> <p>State true or false</p> <p>i. Human Resource Planning facilitates international expansion strategies.</p> <p>a. True</p> <p>b. False</p> <p>Which of the following option is not the factor that hinders with the human resource planning process?</p>	9	CO3

- a. Type and quality of forecasting information
- b. Time horizons
- c. Environmental uncertainties
- d. Unite the perspectives of line and staff managers**

What is the major issue faced while doing personal planning?

- a. Type of information which should be used in making forecasts**
- b. Types of people to be hired
- c. Multiple positions to be filled
- d. All of the above

Rearrange the following steps involved in the Human resource planning process in proper order.

- A. HR Programming
- B. HR Demand Forecast
- C. Environmental Scanning
- D. Control and evaluation of programme
- E. Surplus - restricted hiring
- F. HRP implementation
- G. HR supply forecast
- H. Organisational objectives and Policies
- I. Shortage - Recruitments and Selection

- a. ABCDEFGHI
- b. CHBGAFDEI**
- c. IHDEBCAFG
- d. IHGFEDCBA

Which of these factors is not included in environmental scanning?

- a. Political and legislative issues
- b. Economic factors
- c. Technological changes
- d. None of the above**

_____ is the process of estimating the quantity and quality of people required to meet future needs of the organisation.

- a. Demand forecasting**
- b. Supply forecasting
- c. Environmental forecasting
- d. None of the above

	<p>Which of the below given options are the forecasting techniques used?</p> <p>A. Ration Trend Analysis B. Delphi Technique C. Staffing projections</p> <p>a. A & C b. B & C c. A, B & C d. A & B</p>		
<p>Q2</p>	<p>Which of the following industries should be located near the vicinity of raw materials?</p> <p>a. Cycles b. Televisions c. Sewing machines d. Steel mills</p> <p>“Space available in vertical and horizontal directions is most effectively utilized” is known as principle of</p> <p>a. Cubic space utilization b. Flexibility c. Flow d. Minimum distance</p> <p>If all the processing equipment and machines are arranged according to the sequence of operations of a product the layout is known as Product layout Process layout Fixed position layout Combination layout</p> <p>The following type of layout is preferred to manufacture a standard product in large quantity</p> <p>a. Product layout b. Process layout c. Fixed position layout d. Combination layout</p> <p>In ship manufacturing, the type of layout preferred is</p> <p>a. Product layout b. Process layout c. Fixed position layout d. Combination layout</p> <p>This chart is a graphic representation of all the production activities occurring on the shop floor</p> <p>a. Operation process chart b. Flow process chart c. Templates</p>	<p>16</p>	<p>CO1</p>

d. All of the above

Which of the following is not a part of Five M's?

- a. Material
- b. Machine
- c. **Motion**
- d. Method

The correct sequence of operations in production planning and control is

- a. **Routing-Scheduling-Dispatching-Follow up**
- b. Scheduling-Routing- Dispatching-Follow up
- c. Dispatching-Routing-Scheduling- Follow up
- d. Routing-Scheduling-Follow up-Dispatching

Which of the following is true for 'Routing'?

- a. It is flow of work in the plant
- b. Route sheets include list of machine tools that are to be followed
- c. It depends upon material handling facilities
- d. **All of the above**

Micro motion study is

- (a) enlarged view of motion study
- (b) analysis of one stage of motion study
- (c) minute and detailed motion study
- (d) subdivision of an operation into therbligs and their analysis
- (e) motion study of small components up to micro-seconds.

In micro motion study, therbligs is described by

- (a) a symbol
- (b) an event
- (c) an activity
- (d) micro motions
- (e) standard symbol and color.

The allowed time for a job equals standard time plus

- (a) policy allowance
- (b) interference allowance
- (c) process allowance
- (d) learning allowance
- (e) unforeseen allowance.

The standard time for a job is

- (a) total work content
- (b) base time + relaxation time

	<p>(c) total work content + basic time (d) total work content + delay contingency allowance (e) total work content + relaxation time.</p> <p>Micro motion study is</p> <p>(a) analysis of a man-work method by using a motion picture camera with a timing device in the field of view (b) motion study observed on enhanced time intervals (c) motion study of a sequence of operations conducted systematically (d) study of man and machine conducted simultaneously (e) scientific, analytically procedure for determining optimum work method.</p> <p>Time study is</p> <p>(a) the appraisal, in terms of time, of the value of work involving human effort (b) machine setting time (c) time taken by workers to do a job (d) method of fixing time for workers (e) method of determining the personnel Requirement.</p> <p>If a worker working at 110 % rating complete his job in 10 min, then the basic allowed time is</p> <p>(a) 8 min (b) 10 min (c) 11 min (d) 12 min</p>		
--	---	--	--

SECTION B

<p>Q3</p>	<p>George Stein sat in his large office overlooking Chicago’s Michigan Avenue. As CEO of Gold Coast Advertising, he seemed to always be confronted with one problem or another. Today was no exception. George had just come out of a long meeting with Jim Gerard, head of the board for the small advertising agency. Jim was concerned about a growing problem with lowered sales expectations and a decreasing customer base. Jim warned George that something had to be done quickly or Jim would have to go to the board for action. George acknowledged that sales were down but attributed this to general economic conditions. He assured Jim that the problems would be addressed immediately. As George pondered his next course of action, he admitted to himself that the customer base of GCA was slowly decreasing. The agency did not quite understand the reason for this decrease. Many regular customers were not coming back, and the rate of new customers seemed to be slowly declining. GCA’s competitors seemed to be doing well. George did not understand the problem.</p> <p>What Do Customers Want?</p> <p>GCA was a Chicago-based advertising agency that developed campaigns and promotions for small and medium-sized firms. Its expertise was in the retail area, but it worked with a wide range of firms from the food service industry to the medical field. GCA competed on price and speed of product development.</p>	<p>15</p>	<p>CO3</p>
-----------	--	-----------	------------

	<p>Advertising in the retail area was competitive, and price had always been important. Also, since retail fashions change rapidly, speed in advertising development was thought to be critical. George reminded himself that price and speed had always been what customers wanted. Now he felt confused that he really didn't know his customers. This was just another crisis that would pass, he told himself. But he needed to deal with it immediately.</p> <p>Case Questions</p> <ol style="list-style-type: none"> 1. What is wrong with how Gold Coast Advertising measures its quality? Explain why Gold Coast should ask its customers about how they define quality. 2. Offer suggestions to George Stein on ways of identifying quality dimensions GCA's customers consider important. 3. Develop a short questionnaire to be filled out by GCA's customers that evaluates how customers define quality. 																																			
Q4	<p>A. Define Acceptance sampling. Discuss in detail various acceptance sampling plans.</p> <p>B. A retailer of household appliances has collected data on the relationship between the company's sales and disposable household income. For the presented data:</p> <ol style="list-style-type: none"> (i) Obtain a linear regression equation for the data. (ii) Compute a correlation coefficient and determine the strength of the linear relationship. (iii) Use the linear regression equation to develop a forecast of sales if disposable household income is \$37,800. <table border="1" data-bbox="446 1102 1193 1627"> <thead> <tr> <th>S. No.</th> <th>Sales (in 000s of \$)</th> <th>Disposable household income (in 000s of \$)</th> </tr> </thead> <tbody> <tr><td>1</td><td>29.8</td><td>16.8</td></tr> <tr><td>2</td><td>35.9</td><td>18.4</td></tr> <tr><td>3</td><td>38.8</td><td>20.4</td></tr> <tr><td>4</td><td>43.6</td><td>22.9</td></tr> <tr><td>5</td><td>46.8</td><td>25.7</td></tr> <tr><td>6</td><td>49.5</td><td>27.3</td></tr> <tr><td>7</td><td>52.3</td><td>32.1</td></tr> <tr><td>8</td><td>55.2</td><td>35.2</td></tr> <tr><td>9</td><td>57.2</td><td>36.3</td></tr> <tr><td>10</td><td>58.6</td><td>38.2</td></tr> </tbody> </table>	S. No.	Sales (in 000s of \$)	Disposable household income (in 000s of \$)	1	29.8	16.8	2	35.9	18.4	3	38.8	20.4	4	43.6	22.9	5	46.8	25.7	6	49.5	27.3	7	52.3	32.1	8	55.2	35.2	9	57.2	36.3	10	58.6	38.2	15	CO2
S. No.	Sales (in 000s of \$)	Disposable household income (in 000s of \$)																																		
1	29.8	16.8																																		
2	35.9	18.4																																		
3	38.8	20.4																																		
4	43.6	22.9																																		
5	46.8	25.7																																		
6	49.5	27.3																																		
7	52.3	32.1																																		
8	55.2	35.2																																		
9	57.2	36.3																																		
10	58.6	38.2																																		
Q5	<p>A. A soft drink bottling company is interested in controlling its filling operation. Random samples of size 4 are selected and the fill weight is recorded. Table shows the data for 24 samples. The specifications on fill weight are 350 ± 5 grams (g). Daily production rate is 20,000 bottles.</p> <ol style="list-style-type: none"> (a) Find the trial control limits for the \bar{X}-bar and R-bar charts. (b) Assuming special causes for out-of-control points, find the revised control limits. 	15	CO2																																	

(c) Draw the control charts.
 Data: For sample size of 4 the different constant values are $A_2 = 0.729$, $D_3 = 0$, $D_4 = 2.282$

B. A lumber yard is open 6 days per week (300 days per year) and sells 3,600 sheets of plywood per year. Order lead time is one week. Inventory holding cost is \$2. The cost of placing an order is \$30.

- (a) Find the economic order quantity.
- (b) Find the annual cost of placing orders and holding inventory for the economic order quantity.
- (c) If the economic order quantity is used, how many orders will be placed per year?
- (d) If the economic order quantity is used, what will the average inventory be?
- (e) Find the reorder point, if no safety stock is kept.

Sample	Observations (g)				Sample	Observations (g)			
1	352	348	350	351	13	352	350	351	348
2	351	352	351	350	14	356	351	349	352
3	351	346	342	350	15	353	348	351	350
4	349	353	352	352	16	353	354	350	352
5	351	350	351	351	17	351	348	347	348
6	353	351	346	346	18	353	352	346	352
7	348	344	350	347	19	346	348	347	349
8	350	349	351	346	20	351	348	347	346
9	344	345	346	349	21	348	352	351	352
10	349	350	352	352	22	356	351	350	350
11	353	352	354	356	23	352	348	347	349
12	348	353	346	351	24	348	353	351	352

Q9 Health care facilities must conform to certain standards in submitting bills to Medicare/Medicaid for processing. The number of bills with errors and the number sampled are shown in Table. Construct an appropriate control chart and comment on the performance of the billing department. Revise the control limits, if necessary, assuming special causes for out-of-control points. Comment on the capability of the department

15 CO2

Observation	Bills with Errors	Number Sampled	Observation	Bills with Errors	Number Sampled
1	8	400	14	3	300
2	6	400	15	5	300
3	4	400	16	8	300
4	9	400	17	11	500
5	7	400	18	13	500
6	5	400	19	8	500
7	5	300	20	7	500
8	7	300	21	8	500
9	4	300	22	4	500
10	15	300	23	3	500
11	6	300	24	7	500
12	7	300	25	6	500
13	4	300			