Q-1. For the vectors $V_1$ and $V_2$ shown in fig. (1).
   a - determine the magnitude $V$ of their vector sum $V = V_1 + V_2$.
   b - determine the angle $\theta$ between $V$ and the positive x-axis.
   c - write $V$ as a vector in terms of the unit vectors $i$ and $j$ and then write a unit vector $\lambda$ along the vector sum $V$.

Q-2. The rigid structure member shown in fig.(2) is subjected to a couple consisting of the two 100 N forces. Replace this couple by an equivalent couple consisting of the two forces $P$ and $-P$, each of which has a magnitude of 400 N. Determine the proper angle $\theta$.

Q-3. Determine the resultant of the four forces and one couple which act on the plate shown in fig.(3).

Q-4. The turnbuckle shown in fig. (4) is tightened until the tension in cable AB is 2.4 kN. Determine the moment about point O of the cable force acting on point A and the magnitude of this moment.
Q1- Solve the following differential equation using Variable separable
solution: \[
\frac{2}{\sqrt{1 + x^2 + y^2 + x^2 y^2}} + xy \frac{dy}{dx} = 0
\]

Q2- Solve the following non homogeneous linear differential equation:
\[
\frac{dy}{dx} = \frac{2x+3y-4}{4x+y-3} \quad \text{if} : y(1) = 1
\]

Q3- Solve the differential equation:
\[
(y^3 - 3xy^2) \, dx + (2x^2y - xy^2) \, dy = 0
\]

Q4- Find the complementary, the particular and the general solution of the following differential equation:
\[
\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = \sin 2x
\]

GOOD LUCK
**Answer Seven Questions Only**

**Q1:** How does mechanization differ from automation? Explain the effects of automation type on the labor skill level and equipments.

**Q2:** Explain graphically the manufacturing cycle. Which manufacturing function is responsible for ensuring that the quality of the product meets the standards specified by the designer?

**Q3:** Define production and discuss the differences between manufacturing industries and process industries.

**Q4:** What does classification and coding mean in GT? Explain why GT reduces production time.

**Q5:** State the features of equipment in fixed automation. What are the advantages of using Geneva and Walking Beam?

**Q6:** What is adaptive control and its purpose? What is the difference between FMS and FMC?

**Q7:** What are the considerations that can be applied in product design to facilitate automated assembly?

**Q8:** What are the factors considered for selecting facility layout and material handling system?

*Good luck*
Notice: Answer only 4 questions

Q1. Outline at least five determinate uses for time study and explain about time allowances as a considered part of standard time?

Q2. Discuss about mere tools pertaining to the job upon conducting methods improvement?

Q3. Explain in-detail the basic guidelines that should be proceed in work study for raising productive efficiency?

Q4. State four aspects to facilitate the select technique applied in work study?

Q5. List three rules that should be followed in dividing an operation into elements to organize the record technique of the method?

GOOD LUCK
Examination Questions to 1st term 2011 - 2012

Answer (any Two branches) of each question:

Q1.
   a. Classify the comparators according to the principles used for obtaining magnification, and list the basic uses of comparators.
   b. Draw schematic diagram of any type of pneumatic comparator system.
   c. List the advantages of any class of comparators.
   d. Show diagrammatically the method of testing: 1- squareness of bore, 2- depth, 3- plate straightness, 4- outside diameter, using any suitable type of comparators.

Q2.
   a. Draw a diagram of the optical arrangement of interferometer for testing flatness.
   b. Draw carefully four types of fringes formed both on the gauge surface and the base plate as can be shown by the instrument above.
   c. Explain a method of testing parallelism of a gauge block of (30) mm height using the instrument above.
   d. Explain with drawing a method of testing flatness of a gauge block using the instrument above.

Q3.
   a. Define the surface texture, and list the major causes of the two groups of surface irregularities.
   b. Draw schematic diagram of Talyurf surface roughness tester.
   c. Explain the Peak to Valley height method used in surface finish measurement.
   d. Explain the surface finish measuring method using Interference Microscope.

Q4.
   a. List the major applications of sine bars.
   b. Show diagrammatically the inspection of conical objects using sine centre.
   c. What are the constructional features of sine bars?
   d. Explain briefly the sine bar principles.

Q5.
   b. Classify the limit gauges.
   c. Show diagrammatically the disposition of tolerances on general plug gauge.
   d. Show diagrammatically the disposition of tolerances on ring and gap gauge.

Good luck
Subject: Information Systems and Technology
Date: Jan. 2012
3rd yr.-1E Division

Time: 2 hrs.
Assist. Prof. Dr. Lamyaa M. Dawood

Note: Choose 3 questions only (Question 4 must be included).

Question 1: What is the difference between:
   i. Information and Information Technology.
   ii. CSMA/CD and CSMA/CA

Question 2: List:
   i. Objectives of ISs (only 4).
   ii. Basic communication modes (only 2).
   iii. Advantages of fiber optic (only 2).

Question 3: Sketch 2 only of the followings:
   i. Generalized DB architecture.
   ii. Generation and utilization of Information.
   iii. Information system lifecycle.

Question 4: Develop a suitable data model for one of the followings (10 marks):
   i. Machining Processes.
   ii. Cutting Process.
   # why do you choose this model? (3 marks).
   # define data model (3 marks).
   # what are the advantages of this model? (6 marks)
   # If this data should be structured in a DB what type of DB you suggest to be utilized in
   the design department? (4 marks).

-Good Luck-
ملاحظة: الإجابة عن أربعة أسئلة فقط.

س 1// تعد حضارات وادي الرافدين من أقدم الحضارات البشرية وأبرزها اهتماماً بحقوق الإنسان، اشرح بشكل تفصيلي المراحل الزمنية التي مرت بها هذه الحقوق في وادي الرافدين.

س 2// نص الدستور العراقي لسنة 2005 على مجموعة من الحقوق والحريات، ما هي هذه الحقوق عددًا واعطي رأيك بشكل علمي وموضوعي في أحد هذه الحقوق.

س 3// اجب عن الفرعين التاليين:

ا. ما هو الدستور، ومما تتميز القواعد الدستورية على غيرها من القواعد القانونية بالاعتدال.

ب. تكلم بشكل مفصل عن مبدأ سيادة القانون.

س 4 // اجب عن الفرعين التاليين:

ا. يتميز اعلان حقوق الإنسان والمواطن الفرنسي سنة 1793 ببعض الأمور والحقوق التي تميزه عن غيره من الدستور والاعلانات التي سبقته، ذكر أهم ما يتميز به هذا الاعلان.

ب. اشرح بشكل مفصل الاعلان العالمي لحقوق الإنسان، وموضحاً فيه القيمة القانونية للإعلان العالمي لهذه الحقوق، وهل يوجد تناقض فيما بينه وبين الشريعة الإسلامية.

س 5// نص اعلان حقوق الإنسان والمواطن الفرنسي 26/ اب/1889 على مجموعة من الحريات والحقوق، تكلم بشكل تفصيلي عن هذا الاعلان.

مع تمنياتي لكم بالمؤ克拉 والنجاح.
ملاحظة: الإجابة عن أربعة أسئلة فقط.

س١/ ما هي الديمقراطية، تكلم بأي حال من الأحوال عن الديمقراطية في جزيرة العرب والديمقراطية عند أحمد سوكارنو.

س٢/ ما هو مضمون الديمقراطية شبه المباشرة، وما هي مظاهرها لشرح ذلك بالتفاصيل.


س٤/ تتميز الديمقراطية ببعض السمات والخصائص ذات الطابع العالمي والطابع الخصوصي، أذكر هذه السمات والخصائص بشكل مفصل.

س٥/ ناقش إحدى عبارتين.

- (حكومة من الشعب يختارها الشعب من أجل الشعب يجب ان لا تزول من وجه هذه الأرض).

- (متى استعذبتم الناس وقد وردتهم امهاتهم احراراً).

مع تمنياتي لكم بالمؤقتة والنجاح.
اائلامتحان الفصل الدراسي الأول للعام 2011-2012


ملاحظة الإجابة عن ثلاث أسئلة فقط.

س1 (5 درجات): أ- ادّعّم ect من النقطتين P1 و P2. اكتب برنامج لإيجاد طول الخط المستقيم و الانحدار لهذا الخط (slope) الذي يربط بين النقطتين؟
ب- اكتب برنامج لحساب عدد الأقمار في حالة معرفة القيمة الكلية للشراء و سعر الفرد؟
ج- حول الإعداد التالية من النظام الثنائي إلى العشري و بالعكس:
1011101, 101101, 121, 2500, 153, 101101, 1011101

س2 (5 درجات): أ- اكتب برنامج لحساب مساحة مثلث و محيطه إذا علمت طول كل من ضلعيه القانونيين؟
ب- لديك ثلاث درجات امتحانية. اكتب برنامج لمعرفة الدرجة الوسطى من حيث القيمة. اطبع الدرجات الثلاثة حسب تسلسلها من القيمة الأعلى إلى الأدنى و طباعه عبرية مناسبة فيما إذا كانت الدرجات الثلاث متساوية؟

س3 (5 درجات): أ- إذا كان لديك أطوال ثلاث مستقيمات، اكتب برنامج باستخدام أداة الشرط switch - case للاستحساب ما يلي بالاعتماد على قيمة ال C المدخلة:

\[ C = \begin{cases} 1 & N2+N1 \\
2 & N2-N1 \\
3 & N2*NI \\
4 & N2/N1 \\
\end{cases} \]

ج- جد نتائج ما يلي:
11+11, 11110001+101111, 101101-110111

س4 (5 درجات): أ- لديك أطوال إضلاع مثلث، اكتب برنامج لبيان فيما إذا كان المثلث متساوي الالضلاع ام متساوي الساقين ام فسيكون قائم الزاويا؟
ب- اكتب برنامج لادخال اسمك و رقم دارك و الشارع و اسم المدينة و طباعه كل المعلومات في سطر و احد و طباعه كل معلومة في سطور؟
ج- جد نتائج ما يلي:
1011101*1010, 1011*11, 11001/101

مع امتناني بالموفقية
Subject: CIM
Date: 2/1/2012
4th yr.-1E Division

Note: Choose 3 questions only (Question 4 must be included).

Question 1: Define only 3.
CIM, Manufacturing System, WAN, Dial Indexing machine, Router.

(12 Marks)

Question 2:
1. What are the benefits of FMS?
2. List ISO/OSI layers.

(12 Marks)

Question 3:
Sketch 2 only of the followings:
1. PLC components.
2. CIM wheel.
3. Ethernet-Bus.

(12 Marks)

Question 4:
In the Fig below factory shop floor that consists of one assembly line:
1. Develop an integrative model for the whole manufacturing system using communications network? (10 marks).
2. List all the hardware, software that you choose (6 marks).
3. Suggest a suitable type of Robots (2 marks), why do you choose this type (4 marks).
4. List all the types of robot tooling’s (4 marks).

(26 Marks)

Note: M = Machine, R = Robot, D = Dial Indexing Machine.

-Good Luck-
Q.1 Answer (A) or (B)

(A) (1) What is polytropic process? How does it differ from an adiabatic process?

(2) Discuss the importance of the second law of thermodynamics?

(B) Prove that the change of entropy of a perfect gas in terms of volume and absolute temperature is:

$$\Delta S = m \left[ C_v \ln \frac{T_2}{T_1} + \left( C_p - C_v \right) \ln \frac{V_2}{V_1} \right]$$

Q.2

One kilogram of air is at an initial pressure and temperature of (1.73 MN/m²) and (175 °C); respectively. It is expanded isothermally to three times its initial volume and then further expanded adiabatically to six times its initial volume. Isothermal compression followed by adiabatic compression return the air to its original state. Name the cycle and determine:

a) The pressure, volume, and temperature at each corner of the cycle:

b) The thermal efficiency of the cycle.

c) The work done/cycle.

Take, (R = 0.29 KJ/Kg °K, γ = 1.4)

Q.3

Calculate the change of entropy when (1kg) of air changes from a temperature of (330°k) and volume (0.14 m³) to a temperature of (550°k) and a volume of (0.56 m³). If the gas expands according to the law $pv^\gamma = $constant, determine the value of index (n) and the heat absorbed or rejected by the air during the expansion. Show that it is approximately equal to the change of entropy multiplied by the mean absolute temperature and draw the process on P-V diagram.

(Take, R= 0.289 KJ/Kg. °K, $C_v = 0.72$ KJ/Kg. °K)

Q.4

(0.2m³) of gas at (5 bar) and (30 °C) is compressed adiabatically in a closed cylinder to (0.1m³) at the end of adiabatic compression. It is then cooled at constant volume until its pressure becomes (5bar). Finally it is heated at constant pressure to its original volume. Draw the processes on (P-V) diagram and calculate:

1. The net work done.
2. The net heat exchange with the surroundings.
3. The net in internal energy.

(Take for the air, $R = 0.287$ KJ/Kg. °K, $C_p = 1.005$ KJ/Kg. °K)
1.

(A). In the 1950s and 60s, business executives paid relatively little attention to high-tech scheduling. This was due to a number of factors. State and explain briefly these factors.

(B). Define Scheduling, and Explain briefly what types of manufacturing scheduling.

2. There are many types of planning layouts in manufacturing plants, State briefly the classification of layouts. And Explain briefly with drawing scheme of the systematic layout planning methodology under manual layout design.

3.

(A). What is the direction of the technical development of the factory and what includes for long term planning?

(B). Briefly write the planning type of automatic production lines and their divisions.

4.

A. From the standpoint of planning, what are the advantages of continuous production line?

B. There are many methods of operational planning for production and control. Explain what is the bases of selection these methods.

Good Luck
First term Examination 2011-2012

Notice: Attempt any Four Questions

Question One:-
   a) Show by a diagram the steps of conventional design process! Explain briefly definition of problem step! (10 Marks)
   b) Give a meaning to Five of the following terms: Engineering design, Unity, Human factors, Porcelain enamel, Blanking, and Soldering! (15 Marks)

Question Two:-
   a) List the requirements which guide the design process? Explain briefly the functional requirements! Give and explain One example! (11 Marks)
   b) What are the Aristotle's causes of design? Explain each briefly! (10 Marks)
   c) List the basic steps of benchmarking! (4 Marks)

Question Three:-
   a) List Five common plastic molding processes? Illustrate by sketches two of them! (10 Marks)
   b) What are the characteristics and the uses of the following plastic materials: Melamine, and ABS? (8 Marks)
   c) Explain Fibrous Composites! What are the factors which influence their properties! (7 Marks)

Question Four:-
   a) Illustrate by sketch i) EDM cutting process ii) Anodizing process. (10 Marks)
   b) Explain with sketch the description and give examples on Three of the following manufacturing processes: Drilling, Turning, Rolling, and Forging! (15 Marks)

Question Five:-
   a) What are the ways to reduce the effect of hot environments in work area! (6 Marks)
   b) Give One example on each of the following movements; Continuous movement, and Repetitive movement! (4 Marks)
   c) Annual fixed costs of a product are $20,000 and net profit of $5,000; average monthly sale is 120 units. A new design involves an expenditure of $10,000, to be returned in two years. New production methods are expected raise P/V ratio by 10%. Find the new annual sales figure for same profit! (15 Marks)

GOOD LUCK
First Semester Examination Questions to 2011-2012

Note: Only Answer Three Questions

Q1: A- Define the following:
Design process, Design models, Form property, Surface of Revolution, Geometric Modeling. (3 marks)

B- what are the analytic surface entities? (2 marks)

Q2: A- Use the CSG-representation to represent the object (part) in figure (1). (3 marks)
B- Use the B-rep to represented the face (A). (2 marks)

Fig (1)

Q3: A- Give the transformation matrices to move the triangular (2,0),(4,0),(4,2) from position (A) to position (B) shown in figure (2) (3 marks)
B- what are the principle requirements for data structure of typical CAD system? And what are the general entities data? (2 marks)
Q4: Answer the following:

A- Define the Geometrical and topological information and what are the differences in Geometrical and topological information between shapes in (A) and shapes in (B) shown in figure (3). (2 marks)

B- Illustrate with simple sketches the differences between the steps of the general design process and CAD process (1.5 marks)

C- Explain with sketch the CAD system architecture. (1.5 marks)

Good luck
Q. 1. Determine the current passing through the resistances 5Ω & 3Ω using Kirchoff’s current law.

Q. 2. For the following circuit find Thevenin’s equivalent circuit then determined the current through the load resistance \( R_L = 10\, \Omega \).
Q. 3) Apply the Superposition theorem to find the current through the resistance 4Ω.

Q. 4) Use star to delta transformation to find the total equivalent resistance (R_\text{eq}) of the following circuit. Where: R_5 = 13Ω, R_1 = 3Ω, R_2 = 25Ω, R_3 = 75Ω, R_4 = 3Ω, R_5 = 5Ω, R_6 = 7.5Ω.
Q1/A

A new processing plant is to be located which will be receiving certain raw materials from three supply sources $S_1$, $S_2$, $S_3$ will be sending its finished products to two distribution points $D_1$ and $D_2$. The coordinate locations of the sources and distribution points along with weekly trips are shown in fig (1). Find out the best location of the new processing plant.

![Diagram showing locations of sources and distribution points with weekly trips](image-url)
B- Definition five from the following:-
Casting, grinding, metal cutting, drilling, bill of materials, fixture, planning sheet, operation process chart, process chart, industrial engineering, facility layout.

Q2/
A- List five factors for each considerations that affect in selection of the plant location.
B- Compare between two facility layout types.

Q3/
A- List the industrial engineering activity that related to the process.
B- Draw two of the following:-
1- Rolling operation.
2- Extruding operation.
3- Product layout.
4- Symbols of operations.

Q4/
A- Represent the following operations with symbols that refer to these operations in the operation flow chart.

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<th>Type</th>
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<td>2</td>
<td>Turning</td>
</tr>
<tr>
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<td>Drilling</td>
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</tr>
<tr>
<td>11</td>
<td>storage</td>
</tr>
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</table>

B- Determine the best location (A) location or (B) location based on the following noncost factors:-
### Noncost factors in plant location

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<th>Value</th>
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**Fig. 5.10. Hypothetical results on plant location.**

Results on plant location

مع امنياتي لكم بالموفقية والنجاح
Examination Questions to 1st term 2011 - 2012

Q1: A) Find the pivot in first basic infeasible solution of the following problem:

Maximize \( Z = 3X_1 + 2X_2 + 6X_3 \)

Subject to

- \( 2X_1 - 3X_2 \leq 3 \) \quad (1)
- \( X_1 + 2X_2 + 3X_3 \geq 5 \) \quad (2)
- \( 3X_4 + 2X_3 \leq 2 \) \quad (3)
- \( X_1, X_2, X_3 \geq 0 \)

B) Construct the dual of the problem:

Minimize \( Z = X_1 + X_2 + 3X_3 \)

Subject to

- \( 2X_1 + X_2 + 2X_3 \leq 3 \) \quad (1)
- \( 2X_1 + 2X_3 + X_3 \geq 7 \) \quad (2)
- \( X_1 + X_3 = 4 \) \quad (3)
- \( X_1, X_2, X_3 \geq 0 \)

(3 Marks)

Answer two questions

Q2: Find the optimum solution of the following problem

Objective function is to maximize profit:

\[
Z_{\text{max}} = 20X_1 + 30X_2
\]

Subject to the constraints

- \( 3X_1 + 2X_2 \leq 210 \) \quad (1)
- \( 2X_1 + 4X_2 \leq 300 \) \quad (2)
- \( X_2 \leq 65 \) \quad (3)
- \( X_1, X_2 \leq 0 \)

(7 Marks)
Q3: Three refineries with maximum daily capacity of (6, 8 and 10) millions gallons of gasoline supply to four distribution areas with daily demand of (7, 5, 9 and 6) millions gallons. Gasoline is transported to the distribution areas through a network of pipe lines. The mileage table summarized below shows the length of different pipe lines.

The transportation cost is estimated based on the length of pipe line as shown in the following table. Find the optimal transportation schedule.

<table>
<thead>
<tr>
<th></th>
<th>d. area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>10</td>
<td>12</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>16</td>
<td>9</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>22</td>
<td>12</td>
<td>7</td>
<td>15</td>
</tr>
</tbody>
</table>

(7 Marks)

Q4: Four different jobs can be done on four different machines. The set up and take down time costs are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees of producing jobs i on machine j.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>j1</td>
<td>5</td>
<td>7</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>j2</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>j3</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>j4</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

(7 Marks)

::: Good Luck :::
الملاحظة: الإجابة عن أربعة أسئلة فقط.

السؤال الأول: أوضحت الدراسات السابقة لأحد المعالل أن كلفة التشغيل والصيانة السنوية وسعار إعادة البيع لإحدى الماكينات البالغ سعر شرائها 3000 وحدة تقديرية كانت كما في الجدول أدناه. حدد فترة الإحلال المثلى لهذه الماكينة علماً أن الضريبة السنوية المدفوعة بلغت 8%.

<table>
<thead>
<tr>
<th>السنة</th>
<th>السعر في نهاية السنة</th>
<th>كلفة التشغيل والصيانة السنوية</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>200</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>250</td>
<td>600</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
<td>850</td>
</tr>
<tr>
<td>3</td>
<td>600</td>
<td>1300</td>
</tr>
<tr>
<td>2</td>
<td>850</td>
<td>1650</td>
</tr>
<tr>
<td>1</td>
<td>1300</td>
<td>1450</td>
</tr>
</tbody>
</table>

السؤال الثاني: البيانات التالية لشركة تصنيع محركات كهربائية والمطلوب تقدير حجم مبيعات الشركة لعام 2012 باستخدام طريقة الاتجاه الخطي مع التحقق من الحل.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>المبيعات المحركات</td>
<td>19</td>
<td>16</td>
<td>13</td>
<td>11</td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>بالآلاف الوحدات</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ملاحظة: اعتبار سنة 2004 هي سنة الأساس (صفر) وتطرح منها باقي السنوات لغرض تبسيط الحل.

السؤال الثالث: حجم مطار استقبال (8) طائرات/ساعة في المتوسط، فإذا كان معدل وصول الطائرات (6) طائرات/ساعة في المتوسط، وجد متوسط الانتفاض من الخدمة ومتوسط عدد الوحدات والزمن في كل من الخط والنظام واحتمال وجود أكثر من طائرتين في الخت.
السؤال الرابع: اوجد الامثلة وال استراتيجيات الخاصة وقيم المباريات التالية:

\[ y = \begin{bmatrix} 4 & 12 \\ 8 & 4 \end{bmatrix} \]

\[ x = \begin{bmatrix} 2 & 3 & 1 \\ 8 & 4 & 6 \\ 1 & 2 & 1 \end{bmatrix} \]

\[ y = \begin{bmatrix} 8 & 2 \\ 2 & 6 \end{bmatrix} \]

\[ x = \begin{bmatrix} 2 & 6 \\ 5 & 7 & 8 \end{bmatrix} \]

السؤال الخامس: اجب عن الفرعين التاليين:

أ- لدراسة حاجة السوق من الامارات نوع 185/14 تحتويا الشريحة العامة لصناعات الامارات المضافة بالاقترح. بحجم الطلب لغرض جدولة إنتاجها. بينت القرارات والدراسات السابقة أن حجم الطلب السنوي للسنة القادمة يشابه السنة الحالية.

ب- تعتمد بيانات المبيعات لـ12 شهر السابقة المبينة في الجدول أدناه.

<table>
<thead>
<tr>
<th>ل</th>
<th>حزيران</th>
<th>نيسان</th>
<th>أيار</th>
<th>شباط</th>
<th>آب</th>
<th>تموز</th>
<th>آب</th>
<th>كأبل</th>
<th>أبلول</th>
<th>كأبل</th>
<th>كأب</th>
<th>أب</th>
<th>كأب</th>
<th>أب</th>
<th>كأبل</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>192</td>
<td>175</td>
<td>220</td>
<td>180</td>
<td>200</td>
<td>220</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

باعتبارك مهندس صناعي في الشركة أعلاه تنبأ بكمية الطلب للسنة القادمة باستخدام:

الطريق التالية:

- أسلوب الفترة السابقة
- أسلوب المتوسط المتحرك لسنت فترات سابقة
- أسلوب اوان المتوسط المتحرك لاربع فترات زمنية باعتبار الأوان المتوقعه 0.1, 0.2, 0.3, 0.4 على التوالي

ب- لماذا تعتني اثنين من نماذج الانتظار أدناه:

(M/M/2) : (LCFS/10/∞) -1
(M/G/1) : (GD/∞/∞) -2
(M/M/10) : (SIRO/∞/∞) -3
(D/G/K) : (FCFS/N/∞) -4

مع أطيب التمنيات بالنجاح.
* Answer three questions. Each question equal five degrees.

* Enhance your answers with sketches and equations.

Q1- Answer two questions:

A- The production can be viewed from different points of view. Talk about these points of view?

B- List the factors that influence on the choice of manufacturing systems.

C- Dispatching is one of production control activities, what are the functions of dispatching?

Q 2- A- Forecasting methods and techniques are used in different situation according to their limitations due cost and accuracy. Show this in sketch? Name the most accuracy method and most predictable method, and explain why.

B- Show how the errors of forecasting can be measured? Explain the usage of each one. And what is/are the differences between them?

Q 3 - The demand history of Motors Company is given for 5 months, as listed in the table.

<table>
<thead>
<tr>
<th>Month</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>1100</td>
</tr>
<tr>
<td>Feb.</td>
<td>1300</td>
</tr>
<tr>
<td>March</td>
<td>800</td>
</tr>
<tr>
<td>April</td>
<td>1300</td>
</tr>
<tr>
<td>May</td>
<td>900</td>
</tr>
</tbody>
</table>

1- Use a three period moving average to make a forecast for June.

2 - Make a forecast for June using a weighted moving average with weights of:

0.4, 0.3, 0.2, and 0.1

3 - Show which method is better to be used by the manager.
Q 4- Assume that the weekly Demand for product A is 25 units. And each unit of A requires two units of B and three units of C. Each unit of B requires two units of D and three units of E. Each unit of C requires one unit of E and two units of F. Each unit of F requires one unit G and two units of D:

1- Draw the product structure tree, and name the levels.

2 - Find the BOM (Bill Of Materials) for this product.

Q 5- A company wants to match a product demands for 7-months as far as possible by adopt hiring and layoff strategy. Knowing that there is another strategy might cost the company $ 1,216,000, 000.00 . Which strategy is the best for the company?

Given data below:
Hiring cost = $ 200/worker
Firing cost = $ 100/worker
Regular pay = $ 5000/worker/month
Productivity = 40 unit /worker/month
Workforce size available = 25 workers.

<table>
<thead>
<tr>
<th>month</th>
<th>Demand</th>
<th>Work force size</th>
<th># of workers hired</th>
<th>Hiring cost</th>
<th># of workers laid off</th>
<th>layoff cost</th>
<th>Labor pay roll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>1100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.</td>
<td>1500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar.</td>
<td>1130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apr.</td>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun.</td>
<td>700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jul.</td>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Good luck

Dr. May George
Examinations question to 1st term 2011-2012

Notice: answer three question only

Q1: Suppose a researcher wished to do a study on the number of (50)
Miles the employees of a large department store traveled to work
Each day, making frequency distribution table if we know the
Number of class (6).

1 2 6 7 12 13 2 6 9 5 18 7 3 15 15 4 17 1 14 5

4 16 4 5 8 6 5 18 5 2 9 11 12 1 9 2 10 11 4 10

9 18 8 8 4 14 7 3 2 6

Q2: Find the median for frequency distribution to salary for (60)
Worker in oil company as represented in the following table.

<table>
<thead>
<tr>
<th>Class limits</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>32-35</td>
<td>10</td>
</tr>
<tr>
<td>36-39</td>
<td>6</td>
</tr>
<tr>
<td>40-43</td>
<td>8</td>
</tr>
<tr>
<td>44-47</td>
<td>4</td>
</tr>
<tr>
<td>48-51</td>
<td>8</td>
</tr>
<tr>
<td>52-55</td>
<td>9</td>
</tr>
<tr>
<td>56-59</td>
<td>15</td>
</tr>
<tr>
<td>∑</td>
<td>60</td>
</tr>
</tbody>
</table>
Q3- The table below represented frequency distribution for times to answer questions for (50) students in exam.

<table>
<thead>
<tr>
<th>Class limits</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>32-36</td>
<td>3</td>
</tr>
<tr>
<td>37-41</td>
<td>8</td>
</tr>
<tr>
<td>42-46</td>
<td>9</td>
</tr>
<tr>
<td>47-51</td>
<td>8</td>
</tr>
<tr>
<td>52-56</td>
<td>17</td>
</tr>
<tr>
<td>57-61</td>
<td>5</td>
</tr>
<tr>
<td>Σ</td>
<td>50</td>
</tr>
</tbody>
</table>

Find :-

1- The standard deviation .
2- Draw the frequency polygon

Q4:- If the probability for student absences in first lecture equal (0.20),

Then the Probability for absences in second lecture equal (0.15), and

The probability absences in first and second lecture equal (0.05):-

1- What is probability for absences the student from one of these two lecture ?
2- What is Probability for not absences from two lecture ?