1. X and Y are two independent binomial random variables both with the same parameters of n and p.

(A) Derive the probability function \( P(X = m | X + Y = k) \). (5 分)

(B) Find \( E(X | X + Y = k) \). (5 分)

2. Two components with quality characteristics of \( X_1 \) and \( X_2 \), respectively, are assembled. The production processes for these two components are independent of each other. \( X_1 \) and \( X_2 \) are both normally distributed with \( X_1 \sim N(100, 4^2) \) and \( X_2 \sim N(60, 3^2) \). The quality dimension for the final assembly is \( Y = 3X_1 - 2X_2 \). The specification limits for the final assembly is 185±20.

(A) What fraction of the final assembly will meet specification? (8 分)

(B) Samples of size \( n = 15 \) are randomly drawn from the final assembly. If the probability of \( \left( \left| \bar{Y} - 180 \right| < M \right) = 0.8 \), what is the value of \( M \)? (7 分)

3. 亞太公司欲比較其兩家供應商(供應商 1 和供應商 2)的品質不良率 \( p_1 \) 和 \( p_2 \) 是否有差異。

(A) 在信賴水準 95% 下，欲使得 \((p_1 - p_2)\) 的估計誤差不超過±0.08，且假設兩家供應商的抽樣樣本數相同 \((n_1 = n_2 = n)\)，請問 \( n \) 最少應為多少？ (4 分)

(B) 今隨機抽樣兩家供應商所供應之產品，結果如下表。在信賴水準 90% 下，請建立 \((p_1 - p_2)\) 的估計區間。 (5 分)

<table>
<thead>
<tr>
<th>供應商</th>
<th>抽樣數</th>
<th>不良品個數</th>
</tr>
</thead>
<tbody>
<tr>
<td>供應商 1</td>
<td>( n_1 = 80 )</td>
<td>12</td>
</tr>
<tr>
<td>供應商 2</td>
<td>( n_2 = 50 )</td>
<td>10</td>
</tr>
</tbody>
</table>

(C) 根據(B)之抽樣結果，在 Significance level \( \alpha = 0.05 \) 下，欲檢定 \( H_0 : p_1 = p_2 \), \( H_a : p_1 \neq p_2 \)

請問這個檢定的 \( p\)-value 為多少？ (4 分)

請問這兩家供應商的品質能力是否有差異？ (2 分)
4. 某大型公司欲瞭解一項員工訓練計畫對於減少生產時間是否有效，今自該公司所有受過此
項訓練計畫的員工隨機抽樣六位，下列資料為這六位員工在受訓前後，生產相同產品每件
的生產時間。如果其它生產條件不變，假設生產時間的差異值(D = X_{後} - X_{前})服從常態分
配，在α=0.05 下，欲檢定此項訓練計畫是否具有效果。
(A) 求問該公司如何建立假設 H_0 和 H_a ？ (4分)
(B) 對(A)之假設進行檢定，請問此項訓練計畫是否有效 ? (6分)

<table>
<thead>
<tr>
<th>員工編號</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>受訓前生產時間(分) (X_{前})</td>
<td>12</td>
<td>30</td>
<td>16</td>
<td>37</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>受訓後生產時間(分) (X_{後})</td>
<td>10</td>
<td>26</td>
<td>14</td>
<td>35</td>
<td>25</td>
<td>16</td>
</tr>
</tbody>
</table>

5. 某飲料店開發新飲料(橙汁綠茶)，今分別調查中學年、大學年、社會人士的喜歡程度(喜歡、
普通、不太喜歡三種)，調查的人數如下表：

<table>
<thead>
<tr>
<th></th>
<th>喜歡</th>
<th>普通</th>
<th>不太喜歡</th>
</tr>
</thead>
<tbody>
<tr>
<td>中學生</td>
<td>125</td>
<td>95</td>
<td>30</td>
</tr>
<tr>
<td>大學生</td>
<td>200</td>
<td>165</td>
<td>35</td>
</tr>
<tr>
<td>社會人士</td>
<td>135</td>
<td>180</td>
<td>35</td>
</tr>
</tbody>
</table>

試以α=0.05 檢定不同分類的學生對橙汁綠茶的喜歡程度，是否獨立？ (15分)

6. 亞太工商管理學系第一次期中考，50位學生的統計學成績經統計後如下表：

<table>
<thead>
<tr>
<th>成績</th>
<th>40 以下</th>
<th>[40, 60)</th>
<th>[60, 80)</th>
<th>[80, 100]</th>
</tr>
</thead>
<tbody>
<tr>
<td>人數</td>
<td>11</td>
<td>16</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>P_i</td>
<td>0.2266</td>
<td>0.3721</td>
<td>0.2317</td>
<td>0.1696</td>
</tr>
</tbody>
</table>

試利用該數據以α=0.05 檢定該班統計分數的群體分配是否服從常態分配 N(55, 20^2) ？
(15分)

7. 某成衣公司分別收集了三年(36個月)的銷售金額(Y)及廣告費用(X_1), 銷售人員數(X_2)與銷
售數據點(x_3)，經電腦分析後得變異來源如下： (10分)

<table>
<thead>
<tr>
<th>變異來源</th>
<th>總方和</th>
<th>自由度</th>
</tr>
</thead>
<tbody>
<tr>
<td>回歸</td>
<td>SSR = (X_{1}X_{2}X_{3}) = 290</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SSR = (X_{1}X_{2}) = 270</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>SSR = (X_{3}</td>
<td>X_{1}, X_{2}) = 30</td>
</tr>
<tr>
<td>殘差</td>
<td>SSE = (X_{1}X_{2}X_{3}) = 40</td>
<td>6</td>
</tr>
</tbody>
</table>

(A) 試以顯著水準 α=0.05 檢定 X_3 是否值得引入模式中？
(B) 求偏相關係數 γ_{X_3,12} = ?
8. $A_i$ 为三种不同触媒剂，$B_j$ 为三种不同电镀方式，经二元重覆实验得如下的数据，及电脑分析后报告如下，唯报告上有些值遗漏，请利用仅有的数据，以 $\alpha = 0.05$ 分别检定三种不同触媒剂及三种不同电镀方式之间是否独立。触媒剂与电镀方式两者之间是否有交互作用？（10 分）

<table>
<thead>
<tr>
<th>二元重覆</th>
<th>$B_1$</th>
<th>$B_2$</th>
<th>$B_3$</th>
<th>$B_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_1$</td>
<td>86</td>
<td>84</td>
<td>74</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>83</td>
<td>76</td>
<td>81</td>
<td>80</td>
</tr>
<tr>
<td>$A_2$</td>
<td>71</td>
<td>78</td>
<td>59</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>67</td>
<td>68</td>
<td>60</td>
</tr>
<tr>
<td>$A_3$</td>
<td>93</td>
<td>85</td>
<td>101</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>89</td>
<td>96</td>
<td>98</td>
<td>103</td>
</tr>
</tbody>
</table>

**ANOVA**

<table>
<thead>
<tr>
<th>变源</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>臨界值</th>
</tr>
</thead>
<tbody>
<tr>
<td>樣本</td>
<td>3369.333</td>
<td>1684.667</td>
<td>71.56106</td>
<td>3.88529</td>
</tr>
<tr>
<td>樣本</td>
<td>7.458333</td>
<td>?</td>
<td>?</td>
<td>3.4903</td>
</tr>
<tr>
<td>交互作用</td>
<td>?</td>
<td>62.44444</td>
<td>?</td>
<td>2.996117</td>
</tr>
<tr>
<td>組內</td>
<td>282.5</td>
<td>23.54167</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>總和</td>
<td>4033.958</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
已知：\( \chi^2_{0.05}(1) = 3.841 \)  \( \chi^2_{0.05}(2) = 5.991 \)  \( \chi^2_{0.05}(3) = 7.814 \)  \( \chi^2_{0.05}(4) = 9.4877 \)
\( \chi^2_{0.05}(5) = 11.0705 \)  \( \chi^2_{0.05}(6) = 12.5916 \)
\( F_{0.05}(1,3) = 10.13 \)  \( F_{0.05}(2,3) = 9.55 \)  \( F_{0.05}(1,6) = 5.9874 \)  \( F_{0.05}(2,6) = 5.14 \)
\( F_{0.05}(3,6) = 4.76 \)
一、「Yield Management」又稱「Revenue Management」；請以航空業為例，解釋「Yield Management」，並說明其目的。 (10 分)

二、在「Supply Chain Management」的探討範疇中，有所謂的「Bullwhip Effect」。
(a) 解釋「Bullwhip Effect」。(5 分)
(b) 請以統計學的觀念說明「為何會有 Bullwhip Effect？」。 (5 分)

三、下列為與「物料需求規劃(Material Requirements Planning; MRP)」有關的子題。
(a) 解釋「Low-level Coding」，並說明「為何需要 Low-level Coding?」。(10 分)
(b) 解釋「Planned-order Releases」與「Scheduled Receipts」，並說明兩者的關聯。(10 分)
(c) 解釋「Cumulative Lead Time」。(5 分)
(d) 為什麼 Master Schedule 的計畫時程長度(Plan Horizon)須足以涵蓋「Cumulative Lead Time」？ (5 分)

四、考慮一 3 個部門(分別為 ?? ?? ??)及 3 個地點(分別為 ?? ?? ??)之設施佈置(Facility Layout)問題，其部門間之流量從至圖(From-to Chart for Flow)及地點間之距離從至圖(From-to Chart for Distance)分別如下表列，假設每一單位流量每一單位距離之搬運成本為 S1。

<table>
<thead>
<tr>
<th>部門間之流量從至圖(fij)</th>
<th>地點間之距離從至圖( dik)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From (i)</td>
<td>To (j)</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

(a) 決定一總搬運成本最小之最佳部門指派方式。 (15 分)
(b) 令 $x_{ik}$ =

\[
\begin{cases}
1 & \text{如果部門} - i \text{ 指定到地點} - k \\
0 & \text{否則}
\end{cases}
\]

寫出決定最佳部門指派方式之數學規劃模式。 註：寫出數學規劃模式即可，不須求解。 (10 分)

五、公司以訂購點模式 reorder point)管制其外購材料 A，A 之每日需求量符合期望值為 1之 Poisson distribution，且 A 之訂購前置時間(Lead Time)為 2 天。假設物料管理部門所
設定每一訂購週期(order cycle)之服務水準(service level)為 85%。
(a) 求 A 之訂購點 (ROP)。 註：答案須為整數。 (10 分)
(b) 求每一訂購週期 A 之期望預售量。 註：答案取至小數點後第六位。 (15 分)

本題可參考數據： $e^1 = 2.718282$， $e^{10} = 0.367879$， $e^2 = 7.389056$， $e^{-2} = 0.135335$。
1. Jason Jackson takes on various projects as an independent contractor. He works on several projects for a variety of companies. When a project is complete, he moves on to another project, often with a different company. Jason is a type of _____.
   a. contingent worker
   b. collateral worker
   c. manager
   d. consultant
   e. none of the above

2. Volvo stresses the safety of its cars. Volvo is following a _____ competitive strategy.
   a. cost leadership
   b. focus
   c. differentiation
   d. functional
   e. integration

3. Firms using _____ make an extra effort to hire and promote those in protected groups.
   a. ethical hiring practices
   b. affirmative action
   c. diversity management
   d. BFOQ
   e. network groups

4. Judy was up for a promotion when her supervisor, Will, encouraged her to develop a sexual relationship with him. He suggested that her promotion would be a sure thing if they were involved. When Judy declined his advances, Will fired her. Which form of sexual harassment is this?
a. quid pro quo
b. hostile environment created by supervisors
c. hostile environment created by co-workers
d. hostile environment created by nonemployees
e. none of the above

5. The Big Five personality dimensions include all of the following except
a. neuroticism
b. optimism
c. extraversion
d. conscientiousness
e. agreeableness

6. When interviewers put too much weight on the last few minutes of the interview, the _____ has occurred.
   a. context error
   b. contrast error
   c. order effect
   d. recency effect
   e. primacy effect

7. Rebekah was hired soon after graduation and assigned to complete a management trainee program. She will move to various jobs each month for a nine-month period of time. Her employer is utilizing the _____ form of training.
   a. job rotation
   b. understudy
   c. coaching
   d. special assignments
   e. informal learning

8. _____ is defined as the influence of a rater general impression on ratings of specific ratee qualities.
   a. Impression management
   b. Halo effect
   c. Central tendency
   d. Stereotyping
   e. Bias

9. Which of the following could contribute to the growing percentage of part-time workers?
   a. aging workforce
   b. phased retirement programs
   c. desire to balance work and family
10. Another term used for flexible benefits plan is _____.
   a. variable pay plan
   b. cafeteria benefits plan
   c. matching plan
   d. executive perquisite
   e. life plan

11. What is an open system?
   a. a structured social system consisting of groups and individuals working together to meet some agreed-upon objective
   b. a system of communication that promotes two-way conversation
   c. an interactive dialog incorporating feedback from all stakeholders
   d. a self-sustaining system that uses energy to transform resources from the environment into some form of output

12. A manager who prefers to recruit at large public colleges believing that their graduates are hard working and well-rounded, is acting upon
   a. the halo effect.
   b. stereotypes.
   c. attribution theory.
   d. prejudice.

13. The process of using multiple sources from around the organization to evaluate the work of a single individual is known as
   a. performance management.
   b. OB Mod.
   c. transfer of learning.
   d. 360° feedback.

14. In Holland theory of vocational choice, someone who is practical, shy, and materialistic would be classified as
   a. conventional.
   b. enterprising.
   c. realistic.
   d. investigative.
15. A major finding of the Hawthorne studies is that
   a. organizations are social systems.
   b. employees work best without close supervision.
   c. working conditions impact productivity.
   d. employees are economic creatures.

16. Expectancy theory claims that motivation is a function of
   a. individual traits and supervisory skills.
   b. expectancy, instrumentality, and valence.
   c. efforts, performance, and rewards.
   d. aptitude, training, and opportunity to perform.

17. The social __________ phenomenon means that as the number of people contributing to an additive task increases, the less each individual contribution tends to be.
   a. facilitation
   b. coordination
   c. dynamics
   d. loafing

18. The managerial grid identifies moderate scores on both dimensions, the 5.5 pattern, as
   a. country club? management.
   b. middle-of-the-road management.
   c. impoverished management.
   d. organizational man? management.

19. Eleanor has a high LPC score and was ineffective in a group where situational control was extremely low. What should be done to improve group effectiveness?
   a. send Eleanor to a management training seminar
   b. reduce Eleanor LPC score
   c. replace Eleanor with a low LPC leader
   d. give Eleanor more situational control

20. A professor is able to award grades to students at the end of each semester, because the college has granted the professor
   a. legitimate power.
   b. coercive power.
   c. personal power.
   d. expert power.
21. Mountain Home University had invested heavily in IBM computers for years. Now Apple Computers was offering them a better machine at a lower price for one of its labs, however Mountain Home did not buy them because the ____________ costs were too high.
   a. transactional
   b. brand recognition
   c. psychological reputation
   d. switching

22. Virtual Baskets wants to develop its technology very fast, but with low cost and medium control. It would like to leverage its existing competencies, not develop new competencies, and may need to access the competencies of other firms. Which is the best mode of development for Virtual Baskets to meet these criteria?
   a. strategic alliance
   b. joint venture
   c. license out
   d. outsource

23. Which of the following is NOT true regarding outsourcing?
   a. it involves significant transaction costs
   b. it is a way to meet market demand without a long-term commitment
   c. it is a great way for a company to develop needed manufacturing capabilities
   d. there is some risk of the contract manufacturer exposing the technology to other customers

24. It is not legal for you to sell copies of your own original songs with a label that indicates the songs are by Madonna because
   a. that would be a patent violation
   b. that would be a trademark violation
   c. that would be a copyright violation
   d. that would be a trade secret violation

25. Steve wrote a book called *The Ten Commandments of Leadership* that he gave to persons attending his workshops on Leadership. The copyright protection for this book
   a. is nonexistent unless Steve registers it with the Copyright Office.
   b. is in effect from the time the book was printed.
   c. will last for only 28 years.
   d. will last until Steve dies.
26. MacDonald golden arches could receive legal protection by means of a
   a. patent.
   b. trademark.
   c. copyright.
   d. utility patent.

27. Xerox is noted for the quality of its copy machines and service. This could be considered a(n) ______________ of Xerox
   a. dependent path
   b. core competency
   c. entry barrier
   d. external opportunity

28. Flexible manufacturing technology allows a company to
   a. change from producing one product model to another smoothly and quickly.
   b. produce larger quantities of standardized products to lower costs.
   c. cut back on the amount of inventory it must carry.
   d. none of the above.

29. After Yahoo! was introduced as an easy way to search the World Wide Web, it was followed by other search engines, some of which had improved or faster ways to search the web. This is an example of how one innovative idea can
   a. ruin the business of someone else.
   b. slow down obsolescence.
   c. stimulate more innovations and create a new market.
   d. never be truly copied.

30. Other things being equal, the more suppliers there are providing similar supplies to a particular industry,
   a. the less powerful those suppliers will be
   b. the more powerful those suppliers will be
   c. the more competitors there will be in the industry
   d. the less powerful buyers will be

31. What type of interview might include the following statement? Imagine that you have just been assigned the task of winning the business of our competition biggest client. How would you proceed??
   a. situational
   b. behavioral
   c. stress
   d. puzzle
32. The process of converting a message back into the sender's original ideas is
   a. encoding.
   b. interpretation.
   c. feedback.
   d. decoding.

二、申論題（20 分）

繼「金磚四國」之後，日本權威研究機構「野村綜合研究所」的報告提出「大湄公河流域經濟圈」（greater Mekong Sub-region, GMS），中國延伸此概念喊出「一帶九城」或稱「黃金走廊」。您知道指的是哪一條走廊嗎？請問「黃金走廊」的優勢是什麼？台灣被排除在東協之外，且面對大湄公河經濟圈的形成，您認為台灣政府以及業界應該採取何種策略，才能在面對包括AFTA（東南亞國家自由貿易協定）、以及自由貿易協定（FTA）與經濟合作協定（EPA）所形成的經貿區域主義的整合趨勢中，突破瓶頸，獲得經濟利益？！

三、簡答題：請解釋以下專有名詞並闡述其在管理上的應用及重要性
   （每題 8 分，共 48 分）

1. Strategic planning
2. Organizational culture
3. Linear programming
4. Customer equity
5. Societal marketing concept
6. Cognitive dissonance