# Answer Sheet

## 106 إحص (الاختبار النهائي)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **اسم الطالبة :** | ـــــــــــــــــــــــــــــــــــــ |  | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **رقم الطالبة :** | ـــــــــــــــــــــــــــــــــــــ |  |  |  |  |  |  |  |  |
| **رقم المجموعة :** | ـــــــــــــــــــــــــــــــــــــ |  | درجة الامتحان الفصلى |  |  |
| **رقم التسلسل :** | ـــــــــــــــــــــــــــــــــــــ |  | درجة الامتحان النهائى |  |  |
| **رقم الشعبة :** | ـــــــــــــــــــــــــــــــــــــ |  | **الدرجة الكلية** |  |  |
| **أستاذة المقرر:** | ـــــــــــــــــــــــــــــــــــــ |  | **التقدير** |  |  |

Question 1 (14.4 marks - 0.9 each)

 1) (a) (b) (c) (d) (e) (f) 9) (a) (b) (c) (d) (e) (f)

 2) (a) (b) (c) (d) (e) (f) 10) (a) (b) (c) (d) (e) (f)

 3) (a) (b) (c) (d) (e) (f) 11) (a) (b) (c) (d) (e) (f)

 4) (a) (b) (c) (d) (e) (f) 12) (a) (b) (c) (d) (e) (f)

 5) (a) (b) (c) (d) (e) (f) 13) (a) (b) (c) (d) (e) (f)

 6) (a) (b) (c) (d) (e) (f) 14) (a) (b) (c) (d) (e) (f)

 7) (a) (b) (c) (d) (e) (f) 15) (a) (b) (c) (d) (e) (f)

 8) (a) (b) (c) (d) (e) (f) 16) (a) (b) (c) (d) (e) (f)

Question 2 (9 marks – 0.9 each)

 17) (a) (b) (c) (d) (e) (f) 22) (a) (b) (c) (d) (e) (f)

 18) (a) (b) (c) (d) (e) (f) 23) (a) (b) (c) (d) (e) (f)

 19) (a) (b) (c) (d) (e) (f) 24) (a) (b) (c) (d) (e) (f)

20) (a) (b) (c) (d) (e) (f) 25) (a) (b) (c) (d) (e) (f)

 21) (a) (b) (c) (d) (e) (f) 26) (a) (b) (c) (d) (e) (f)

Question 3 (10.8 marks – 0.9 each)

27) (a) (b) (c) (d) (e) 33) (a) (b) (c) (d) (e)

 28) (a) (b) (c) (d) (e) 34) (a) (b) (c) (d) (e)

 29) (a) (b) (c) (d) (e) 35) (a) (b) (c) (d) (e)

 30) (a) (b) (c) (d) (e) 36) (a) (b) (c) (d) (e)

31) (a) (b) (c) (d) (e) 37) (a) (b) (c) (d) (e)

 32) (a) (b) (c) (d) (e) 38) (a) (b) (c) (d) (e)

Question 4 (13.5 marks – 0.9 each)

39) (a) (b) (c) (d) (e) 47) (a) (b) (c) (d) (e)

 40) (a) (b) (c) (d) (e) 48) (a) (b) (c) (d) (e)

 41) (a) (b) (c) (d) (e) 49) (a) (b) (c) (d) (e)

 42) (a) (b) (c) (d) (e) 50) (a) (b) (c) (d) (e)

43) (a) (b) (c) (d) (e) 51) (a) (b) (c) (d) (e)

 44) (a) (b) (c) (d) (e) 52) (a) (b) (c) (d) (e)

45) (a) (b) (c) (d) (e) 53) (a) (b) (c) (d) (e)

1. (a) (b) (c) (d) (e)

Question 5 (7.2 marks – 0.9 each)

54) (a) (b) (c) (d) (e) 58) (a) (b) (c) (d) (e)

55) (a) (b) (c) (d) (e) 59) (a) (b) (c) (d) (e)

56) (a) (b) (c) (d) (e) 60) (a) (b) (c) (d) (e)

57) (a) (b) (c) (d) (e)

The conclusion is:

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Question 6 (2.7 marks – 0.9 each)

62) (a) (b) (c) (d) (e) 64) (a) (b) (c) (d) (e)

63) (a) (b) (c) (d) (e)

Question 7 (2.4 marks – 0.3 each)

65) (a) (b) (c) (d) (e) 69) (a) (b) (c) (d) (e)

66) (a) (b) (c) (d) (e) 70) (a) (b) (c) (d) (e)

67) (a) (b) (c) (d) (e) 71) (a) (b) (c) (d) (e)

68) (a) (b) (c) (d) (e) 72) (a) (b) (c) (d) (e)

بسـم الله الـرحمن الـرحـيم

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| --- | --- | --- |
| **جامعة الملك سعــود** |  | **الاخـتـبـار النهائى**  |
| **كـلـيـة الـعـلــــوم** |  | **الفصل الثاني 1423/ 1424هـ** |
| **قـسـم الإحصاء وبحوث الـعمليـات** |  | **مقـرر 106 احـص** |

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| --- | --- | --- |
| الأحد 15 / 4/ 1424 هـ |  | الفترة الصباحية 8 – 11  |

|  |  |
| --- | --- |
| اسم الطالبـة : |   |
| رقم الطالبـة : |   |
| رقم المجموعة: |  رقم التسلسل: |
| رقم الشعبــة |  |
| أستاذة المقرر: |  |

Not following the rules below will result in a deduction of 2 marks per rule!

|  |
| --- |
| Important Rules and Information |
| 1. There are 7 questions. |
| 2. Write in pencil on the answer sheet. |
| 3. Use an eraser to change your answers if needed. |
| 4. Put only your answer on the answer sheet. Do not show any work. |
| 5. For multiple-choice parts, completely shade in the letter for your answer. |
|  If your choice is (c), then do (a) (b) (c) (d) (e) (f) |

**Question 1:** (time: 40 minutes; 14.4 **marks**)

**{A}** For a sample of 60 women having children, we measure the age (in years). Complete the following table to give the values of the items mentioned:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Row | Age | True Classes | Midpoints | Frequency | Relative Frequency | Cumulative Frequency |
| 1 | 15 - 20 |  |  | 3 |  |  |
| 2 |  21 - 26 |  |  |  | 0.2 |  |
| 3 | - |  |  | 18 |  |  |
| 4 | - |  |  | 17 |  |  |
| 5 | - |  |  |  |  |  |
| Total |  |  |  |  |  |  |

[1] 4th class: (a) 32 – 38 (b) 32.5 – 38.5 (c) 33.5 – 38.5

(d) 33 – 38 (e) 32 – 37 (f) 33 – 39

[2]

[3] 3rd midpoint: (a) 29 (b) 29.5 (c) 28 (d) 28.5 (e) 27.5 (f) 59

[4] 2nd frequency: (a) 12 (b) 11 (c) 10 (d) 60 (e) 38 (f) 0

[5 ] 5th frequency: (a) 0 (b) 11 (c) 12 (d) 22 (e) 10 (f) 30

[6] 3rd relative frequency:(a) 0.2 (b) 0.25 (c) 0.18 (d) 0.7 (e) 0.5 (f) 0.3

[7] 2nd cum. frequency: (a) 15 (b) 12 (c) 16 (d) 13 (e) 48 (f) 60

**{B}** We measure the number of visits to the clinic made by 14 pregnant women in their pregnancy period:

15 12 13 11 14 9 17 16 12 8 15 14 13 14

[8] The type of the variable is:

(a) sample (b) discrete (c) number (d) continuous (e) visits (f) statistic

[9] The sample mean is:

(a) 183 (b) 14 (c) 14.077 (d) 13.0714 (e) 17 (f) 8.5

[10] The sample mode is:

(a) 17 (b) 12, 13 (c) 14 (d) 12,13,14 (e) 8 (f) no mode

[11] The sample median is:

(a) 7.5 (b) 7 (c) 14 (d) 13 (e) 13.5 (f) 12.5

[12] The sample standard deviation is:

(a) 2475 (b) 5.9235 (c) 2.4338 (d) 2.5257 (e) 5.924 (f) 6.379

[13] The coefficient of variation is:

(a) 19.32% (b) 18.62% (c) 46.99% (d) 517.5% (e) 45.3%(f) none of these

**Question 2:** (time: 25 minutes; 9 **marks**)

**{A}** For a sample of patients with a certain kidney complaint, we measure the serum uric acid level (in μmol/l) obtaining:

|  |  |  |
| --- | --- | --- |
| Serum Uric Acid | Midpoint | Frequency |
| 100 - < 125 | 112.5 | 5 |
| 125 - < 150 | 137.5 | 10 |
| 150 - < 175 | 162.5 | 22 |
| 175 - < 200 | 187.5 | 20 |
| 200 - < 225 | 212.5 | 13 |

[17] How many patients had serum uric acid levels of 150 to less than 200?

(a) 2 (b) 22 (c) 42 (d) 20 (e) 55 (f) 70

[18] Which serum uric acid level class had the smallest percentage of these patients?

(a) 200-<225 (b) 100-<125 (c) 150-<175 (d) 100-<150 (e) 7.14% (f) 5%

**{B}** For asample of patients, we obtain the following graph for the level of HGB (in g/l),

****

[21] The type of the graph is:

(a) bar chart (b) polygon (c) lines (d) histogram (e) curve (f) not known

[22] The number of patients with the lowest level of HGB is:

(a) 7 (b) 4 (c) 28 (d) 115 (e) 155 (f) 130

[23] The sample size =

(a) 9 (b) 115 (c) 30 (d) 155 (e) 102 (f) 130

[24] The approximate level of HGB with the highest percentage of patients is:

(a) 155 (b) 7 (c) 6.86% (d) 27.45% (e) 115 (f) 130

[25]

[26] The mode takes a value near

(a) 130 (b) 135 (c) 28 (d) 155 (e) 115 (f) we can’t find it

**{B}**

**Question 4:**( 40 minutes; **13.5** **marks**)

**{A}** For a child, the variable X = the number of times he eat candy in a certain day, where 0 ≤ x ≤ 4. The following probabilities are given:

P(X = 2) = 0.2, P(X = 3) = 0.15, P(X ≥ 3) = 0.35, P(0 < X ≤ 2) = 0.55.

Then,

[39] P(X = 4) = (a) 0.1 (b) 0.3 (c) 0.15 (d) 0.2 (e) 0

[40] P(X = 0) = (a) 0.25 (b) 0.3 (c) 0.1 (d) 0.5 (e) 0

[41] The expected number of candy he ate in a day:

 (a) 1 (b) 4 (c) 0 (d) 0.5 (e) 2

**{B}** In a large population of people, 15% have RH negative blood. If we randomly choose 8 children and let X = the number in the 8 chosen that have RH negative blood, then

[42] The probability distribution of X, is P(X = x) =

 (a)(0.15)x (0. 85)8-x (b)(0.08)x (0. 92)15-x (c)(0.85)x(0.15)8-x (d) e-15(15)x / x! (e) e-8(8)x / x!

[43] The values that x takes are: (a) 1,2,…,8 (b) 1,2,…,15 (c) 0,1,…,85

(d) 0,1,…,8 (e) 0,1,…,∞

[44] P(X = 3) = (a) 0.9161 (b) 0.6141 (c) 0.0839 (d) 0.0026 (e) none of these

[45] The probability that at most there is one person have RH negative blood =

 (a) 0.3847 (b) 0.6572 (c) 0.3429 (d) 0.6153 (e) none of these

[46] The variance of X = (a) 1.2 (b) 0.1275 (c) 64

(d) 1.02 (e) none of these

**{C}** At a certain hospital, X = the number of kidney transplants in a year has a Poisson (5.4) distribution.

[47] The formula for P(X = 4) is:

(a) (0.54)x (0.46)4-x (b) e-4(5.4)4 / 4! (c)(0.46)x (0.54)4-x

(d) e-4(4)5.4 / 4! (e) e-5.4(5.4)4 / 4!

[48] P(X ≥ 2) = (a) 0.0045 (b) 0.9711 (c) 0.54 (d) 0.0289 (e) none of these

[49] What is the distribution of Y = the number of kidney transplants in 3 years.

(a)Poisson(1.87) (b)Poisson(3) (c)Poisson(16.2) (d)Poisson(8.4) (e)Binomial (3,0.54)

**{D}** In a population of people, X = the body mass index (in kg/m2) is normally distributed with mean μ = 25 and standard deviation σ = 2. For a randomly chosen person,

[50] P(X < 21) = (a) 0.9772 (b) 0.4772 (c) 0.9821 (d) 0.0228 (e) none of these

[51] P(19 < X < 28) =(a) 0.9332 (b) 0.9319 (c) 0.9345 (d) 0.5332 (e) none of these

[52]

**{E}**

**Question 5:** (15 minutes; **7.2** **marks**)

In a sample of 80 lung cancer patients, the mean lifetime after diagnosis was 3.4 years. Assume that the population is not normal with variance 2.2. Use α = 0.05.

[54] The assumptions are:

(a) normal, σ known and n large (b) not normal, σ known and n large.

(c) normal, σ known and n small. (d) not normal, σ unknown and n large.

(e) normal, σ unknown and n large.

[55]

[57] The 95%confidence interval of µ is

 (3.075,3.725)

**Question 6:** (10 minutes; **2.7** **marks**)

In a sample of 50 Saudi men, the mean serum cholesterol was 4.6 with a standard deviation of 1.8. Assume that the population is normal.

[

[63] The correct formula for is:

(a)± t1-α/2 s/ (b) ± z1-α/2 s/ (c)± z1-α/2 σ/

(d) ± t1-α/2 σ/ (e) none of these

[64] The 90% confidence interval is:

 (4.1813,5.0187)

**Question 7:** (10 minutes; **2.4** **marks**)

|  |
| --- |
| Note: Each part is a separate question. There is only one correct answer for each. |

[65] Which of the following is an example of a discrete variable?

(a) the number of students got full mark in a certain exam.

(b) the height of buildings in a certain street.

(c) the time needed to recover from a certain disease.

(d) the speed of cars in a certain race.

(e) none of these.

[66] Which of the following is an example of a statistic?

1. the population variance. (b) the sample median. (c) the population mean.
2. the population mode. (e) none of these.

[67] Which of the following are examples of measures of dispersion?

(a) the median and the mode. (b) the parameter and the statistic.

(c) the mean and the variance. (d) the polygon and the histogram.

(e) the variance and the standard deviation.

[68]

[69]

[70] Which of the following is true for all Binomial distributions?

(a) It expected value is greater than the number of trials, n.

(b) It is determined by the parameters π and σ2.

(c) It is a continuous distribution.

(d) Each trial has two cases only (success and failure).

(e) all of these are true.

[71]

A Study of weights of 16 babies found the average of sample was 4.5 k.g . Assumed the population is normally distribution with standard deviation 0.5.

**(8) Point estimator for** $µ$ **is**

 (A) 0 (B) 10 (C)0.5 (D)4.5

**(9) The correct formula for calculating confidence interval is**

 (A) $\overbar{x}\mp t\_{1-\frac{α}{2}} \frac{σ}{\sqrt{n}}$ (B) $\overbar{x}\mp z\_{1-\frac{α}{2}} \frac{σ}{\sqrt{n}}$

 (C) $\overbar{x}\mp z\_{1-\frac{α}{2}} \frac{σ^{2}}{n}$ (D) $\overbar{x}\mp t\_{1-\frac{α}{2}} \frac{σ^{2}}{n}$

**(11) the 95% confidence interval is**

 (A) (4.255,4.745) (B) (4.469,4.531)

 (C) (4.632,4.832) (D) (4.531,4.891)

A researchers group has perfected a new treatment of a disease t. As evidence, they say that they have used the new treatment on 50 patients with the disease and cured 25 of them. Calculate a 95% confidence interval for the proportion of the cured.

**(27)The point estimate of *p* is equal to:**

 (A) 0.25 (B) 0.5 (C) 0.01 (D) 0.33

**(29) The 95% confidence interval is equal to: (0.3614,0.6386)**