The Erythrocytic Sedimentation Rate (ESR) (mm/1st hour) of 10 subjects suffering from Lyme arthritis before and after 6 weeks of parenteral penicillin therapy is presented in the following table. (Assuming that: level of significance or α=0.05, and two-sided test)

Case #	ESR (mm/1st hour)		B-A	$(X-\bar{X})^2$
	Before	After		
1	10	6	4	$(4-3)^2$ 1
2	13	9	4	1
3	6	3	3	0
4	11	10	1	4
5	10	10	0	9
6	7	4	3	0
7	8	2	6	9
8	8	5	3	0
9	5	3	2	1
10	9	5	4	1 (36) المجموع

1. The suitable test to be used in this problem to check the effectiveness of the penicillin therapy is

A. Independent (2 sample t-test)
B. Paired t-test
C. Chi square
D. One sample t –test
E. ANOVA

* لما يكون عنا one sample ؟ Before + After

2. The calculated value of t-test is

A. 2.47
B. 5.58
C. 3.11
D. 7.12
E. None of the above

Paired t-test بما انه ← $\frac{\bar{X}-\mu}{S/\sqrt{n}}$ ← طرح zero ← يطلع الجدول من الجدول

$S^2 = \frac{\sum(X-\bar{X})^2}{n-1}$

$S^2 = \frac{26}{9} =$

$S = \sqrt{\frac{29}{9}} = 1.69$

$\frac{3-0}{\frac{1.69}{\sqrt{10}}} = 5.6$

3. The critical (tabulated) value of t-test is

A. 1.83
B. 5.58
C. 2.26
D. 3.25
E. 2.23

* بحسب أول شي df ← n-1 ← ١٠-١ = ٩
* روح على الجدول وطلع منه ٢ لانه ماذكر لي اذا افترضها كم

t-table Degrees of Freedom	Probability, p			
	0.1	0.05	0.01	0.001
1	6.31	12.71	63.66	636.62
2	2.92	4.30	9.93	31.60
3	2.35	3.18	5.84	12.92
4	2.13	2.78	4.60	8.61
5	2.02	2.57	4.03	6.87
6	1.94	2.45	3.71	5.96
7	1.89	2.37	3.50	5.41
8	1.86	2.31	3.36	5.04
9	1.83	2.26	3.25	4.78
10	1.81	2.23	3.17	4.59

4. The decision to be taken according to your calculated value is to:

A. Reject the null hypothesis
B. Accept the null hypothesis
C. Can't be determined and need more information
D. Reject the alternative hypothesis
E. None of the above

* القرار انه ارفض H_0

H_0 ← هي انه ماني فرق او =

H_1 ← ماني انت بتكون فرضتها > او <

* مثلاً العمر اطول عمره من الغير ...

If it is known that, the mean Hb% of adult females in a community is 90 % (u), and we want to test whether pregnancy has an effect on hemoglobin level. The sample size is 36 pregnant women, their arithmetic mean of Hb% is 85%, and standard deviation (sd) is 4.14

1. The suitable test to be used in this problem to check the effect of pregnancy on Hb%

A. Independent (2 sample t-test)
B. Paired t-test
C. Chi square
D. One sample t –test
E. ANOVA

Population الـ Mean و العينة $\bar{X}$ اعطانا
one sample
Before بدون
After

2. The Calculated value (t) is

A. 1.5
B. 5.77
C. 3.22
D. 7.24
E. None of the above

$$= \frac{\bar{X} - \mu}{S/\sqrt{n}} = \frac{85 - 90}{\frac{4.14}{\sqrt{36}}} = 7.2$$

حتى لو مالبسنا ١١

3. The Critical value at the 5% level (2-sided)

A. 1.68
B. 2.77
C. 3.22
D. 2.02
E. 3.55

36 - 1 = 35
لو ماقي بالجدول الا كبر
باخذ الاقرب منه

20	1.72	2.09	2.85	3.85
21	1.72	2.08	2.83	3.82
22	1.72	2.07	2.82	3.79
23	1.71	2.07	2.82	3.77
24	1.71	2.06	2.80	3.75
25	1.71	2.06	2.79	3.73
26	1.71	2.06	2.78	3.71
27	1.70	2.05	2.77	3.69
28	1.70	2.05	2.76	3.67
29	1.70	2.05	2.76	3.66
30	1.70	2.04	2.75	3.65
40	1.68	2.02	2.70	3.55
60	1.67	2.00	2.66	3.46
120	1.66	1.98	2.62	3.37
infinity	1.65	1.96	2.58	3.29

4. The decision to be taken according to your calculated value (t) is to:

A. Accept the null hypothesis
B. Can't be determined and need more information
C. Reject the alternative hypothesis
D. Accept the alternative hypothesis
E. None of the above

t > tc
7.24 > 2.02
X H_0
✓ H_1

If we want to know, whether Japanese doctors are smarter than Jordanian doctors according to their intelligent quotient (IQ). In addition, we know the following information for Japanese doctors: sample size = 100, mean IQ = 92, sd= 5. And for Jordanian doctors: sample size = 100, mean IQ = 90, sd= 4

1. The suitable test to be used in this problem is

A. ANOVA
B. Independent (2 sample t-test)
C. Paired t-test
D. Chi square
E. One sample t –test

2. The calculated value (t) is

A. 1.56
B. 2.77
C. 3.12
D. 4.24
E. None of the above

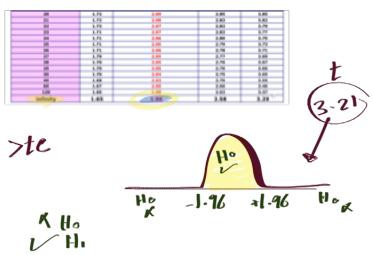
$$S_p^2 = \frac{S_1^2(n-1) + S_2^2(n-1)}{n_1+n_2-2} = \frac{25\times 99 + 16\times 99}{198} = 20.5$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}}}$$

3. The decision to be taken according to your calculated value (t) is to:

A. Accept the null hypothesis
B. Can't be determined and need more information
C. Reject the null hypothesis
D. Accept the alternative hypothesis
E. C+D

df = n_1+n_2-2 = 198



$t > t_c$

H_0
H_1

4. When using alpha level of 0.01 then the test considered statistically not significant if:

A. p = 0.004
B. p = 0.005
C. p = 0.001
D. p = 0.05
E. None of the above

$P > \alpha$ significant

$P < \alpha$