Ministry of Higher Education
& Scientific Research
Al Muthanna University
College of Science
Dept. of biology

Subject:Adv.Microbiology
Stage:Msc
Date: / /2019
Time: 3 hours

03. 09. 2019

((Assessment of the final exam for the 2st semester))
Academic year 2018-2019

45

Q1// Mention ways of transmission of bacterial diseases and explain three of them . (15 Marks)

Q2// what we mean by: (15 Marks)

(a) . T-even phages
(b) . Prions
(c) . Viroids
(d) . Icosahedral

Q3//: What is a bacteriophage and what its structure ? (15 Marks)

Q4//Define the followings: (10 Marks)

a. Conidia & mycroconidia
b. Sporangia
c. Candida
d. Cryptococcosis
e. Sclerotia

Q5// Name ten different gram positive bacteria and ten different gram negative bacteria mentioning : (15 Marks)

(a). Which of them motile.
(b). Which of them capsulated.
(c). Which of them sporforming.
(d). Which of them strict anaerobic.
(e). Name diseases cause by each of them .

**Best of luck**

Lecturer
Prof . G.Al-Khatib

Head of Department
Assist . Prof . Dr. Laith

Ministry of Higher Education
& Scientific Research
Al-Muthanna University
College of Science
Department of Biology

Subject: Adv. Biochemistry
Stage: Post Graduate
Date: / / 2019
Time: 3 hours

03. 09. 2019

45

**Academic year 2018 / 2019**

**Assessment of the final exam for the second semester**

**Q1)** Show the enzymatic reactions of all metabolic processes of glucose degradation to produce energy for cells and how many ATP molecules can be obtained? **(10 Marks)**

**Q2) Why?** **(12 Marks)**

a) Why are bile and pancreatic juice containing large amounts of sodium bicarbonate?
b) Why is gluconeogenesis process happening in the cell?
c) Why shouldn't glycolysis process be stopped when the glucose is available more than immediate cell needs and glycogen is already stocked up to capacity?
d) Why was dinitrophenol used as a drug for losing excess body weight in the 1930s? support your answer with a scheme.

**Q3) Answer the following:** **(12 Marks)**

a) Clarify meaning of amphibolic pathways of metabolism in animals and humans with an example.
b) What is the biological significance of cholesterol?
c) Write the scheme showing transport of cholesterol between the liver and peripheral tissues.
d) Show the scheme that explain cholesterol synthesis which starts with acetyl-CoA in the mitochondrion.

**Q4) Answer the following.** **(12 Marks)**

a) In case that patient has lack of gastric acid, explain effect of this on his/her health and mention the reasons for that case.
b) In respiratory chain, the switch from the two-electron carrier NADH to the one-electron carrying Fe–S clusters within complex I is mediated by FMN. Express about this by equations only.
c) Explain significance of gastric acid and pepsin in protein digestion in human stomach with a scheme.
d) What is the function of coupling proteins in mitochondria brown fat tissue in human?

**Q5) Answer the following.** **(12 Marks)**

a) Explain the significance of metabolism in medicine.
b) Compare between catalytic mechanism of pyruvate dehydrogenase and α-Ketoglutarate dehydrogenase?
c) Explain and clarify (by diagram) fructose intolerance, which is a hereditary disease, with enzymes controlled that.
d) Show the significance of anaerobic bacteria in the large intestine.

**Q6) Describe the following:** **(12 Marks)**

a) Show the diagram of the hypothetical malate-oxaloacetate as auxiliary shuttle for the mitochondrial reoxidation of cytosolic NADH.
b) What are the similarities of cells at biological level?
c) Follow the Leloir pathway for galactose utilization in the liver.
d) Write irreversible reactions of gluconeogenesis process with their enzymes.

..... Good Luck .....

Instructor
Assist Prof. Dr. Jawad K. Muraih

Head of Department
Assist Prof. Dr. Laith Al Obaidi

وزارة التعليم العالي والبحث العلمي
جامعة المثنى
كلية العلوم
قسم علوم الحياة

المرحلة: الدراسات العليا
المادة: الاحصاء الحيوي المتقدم
التاريخ: 2 / 9 / 2019
الوقت : ثلاث ساعات

## ((أسئلة امتحان الدور الثاني 2019-2018 ))

س١ : باستخدام تصميم قطاعات كاملة العشوائية RCBD، اجريت تجربة لمعرفة تاثير 4 مستويات من النايتروجين (N)، ( 0,100,200,300 كغم/هكتار) على انتاج قصب السكر. لخصت نتائج التجربة على النحو المبين في الجدول ادناه:

| Blocks | Treatments | | | |
|---|---|---|---|---|
| | $N_0$ | $N_{100}$ | $N_{200}$ | $N_{300}$ |
| 1 | 48 | 56 | 62 | 62 |
| 2 | 53 | 62 | 65 | 68 |
| 3 | 50 | 56 | 66 | 77 |
| 4 | 42 | 58 | 60 | 67 |
| 5 | 42 | 59 | 61 | 65 |
| 6 | 51 | 58 | 58 | 69 |

المطلوب: ١- تلخيص جدول تحليل التباين لهذه التجربة.
٢- هل هناك فرق معنوي فيما يخص تاثير مستويات النايتروجين على انتاج قصب السكر ؟.
(استخدم مستوى معنوية α=0.01 و α=0.05). ( 15 درجات)

س٢: يرغب باحث في معرفة تاثير دواء تجريبي معين على رفع مستوى كولسترول مصل الدم عند الانسان. اختير 12 شخصا" بالغا" وتم اعطائهم معاملتي الضبط والدواء. اخذت عينات دم بعد الحقن بالمعاملة الضابطة وايضا بعد الحقن بالدواء التجريبي، وقد اعطى تحليل عينات الدم البيانات التالية، حيث مستوى الكولسترول يعبر عنه بـ mg لكل 100ml :

| رقم الشخص | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| الضابطة | 178 | 240 | 210 | 189 | 200 | 191 | 150 | 220 | 210 | 165 | 188 | 214 |
| الدواء التجريبي | 184 | 243 | 210 | 189 | 200 | 191 | 150 | 226 | 220 | 163 | 192 | 216 |

المطلوب:١- هل تعتقد ان الدواء التجريبي يرفع مستوى الكولسترول؟ (α=0.01 و α=0.05).
٢- احسب فترة الثقة عند مستوى 95% .
( 15 درجات)

س٣: أكمل جداول تحليل التباين الاتي:

| S.o.v | d.f | S.S | M.S | F |
|---|---|---|---|---|
| Treatments | 3 | 60 | 20. | |
| Experimental error | 16 | 240 | 15 | ..... |
| Total | 19 | 300 | | |

مدرس المادة
أ.م.د صفاء كريم كاظم

رئيس القسم
أ.م.د ليث عبد الحسن

وزارة التعليم العالي والبحث العلمي
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التاريخ: 2/ 9 / 2019
الوقت : ثلاث ساعات

## ((أسئلة امتحان الدور الثاني 2019-2018 ))

| S.o.v | d.f | S.S | M.S | F |
|---|---|---|---|---|
| Treatments | 2 | 48 | …….. | بحيث F=3.75 |
| Experimental error | ..16 | .96. | 6.4 | |
| Total | 17 | ……. | | |

( 10 درجة)

س٤: اراد احد الباحثين في قسم الانتاج الحيواني معرفة تاثير ثلاثة انواع من انظمة التغذية A,B,C على احد انواع الابقار. اختار الباحث لتجربته 18بقرة تعيش في نفس الحظيرة وتحت نفس الظروف. وزع الباحث الابقار على نظام التغذية بواقع 6 ابقار بشكل عشوائ لكل نظام. وبعد فترة زمنية كافية وجد ان الزيادة بالوزن مقربة لاقرب كليو غرام هي كالاتي:

| | | | | | | |
|---|---|---|---|---|---|---|
| الزيادة في الوزن لنظام الغذاء A | 16 | 17 | 11 | 15 | 18 | 19 |
| الزيادة في الوزن لنظام الغذاء B | 9 | 13 | 12 | 11 | 15 | 12 |
| الزيادة في الوزن لنظام الغذاء C | 14 | 19 | 13 | 11 | 13 | 14 |

١- استخدم اسلوب تحليل التباين لمعرفة ما اذا كان هناك فرق معنوي في زيادة الوزن في انظمة التغذية الثلاثة ام لا؟، استخدم مستوى معنوية ($\alpha$=0.01 و $\alpha$=0.05).
٢- حدد منطقة القبول

( 15 درجة)

س٥: مجتمع مكون من القياسات التالية:

50, 43, 22, 20, 35

١- كم عينة ممكن سحبها من ذلك المجتمع بحجم n=3
٢- اكتب توزيع المعاينة الممكن الحصول عليه من هذا المجتمع
٣- اثبت ان متوسط المجتمع يساوي متوسط توزيع المعاينة
٤- احسب الخطا المعياري لتوزيع المعاينة

( 15 درجة)

ملاحظة: انظر المرفقات والتي تتضمن جداول الارقام الاحصائية الخاصة بالاختبارات الاحصائية.

تمنياتي للجميع النجاح

كلية العلوم - قسم علوم الحياة
الدراسات العليا
Biology Department

رئيس القسم
أ.م.د ليث عبد الحسن

مدرس المادة
أ.م.د صفاء كريم كاظم

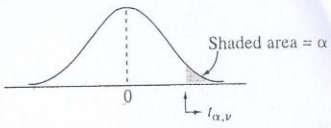


**TABLE 2**
Percentage points of Student's $t$ distribution

| df/$\alpha$ = | .40 | .25 | .10 | .05 | .025 | .01 | .005 | .001 | .0005 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.325 | 1.000 | 3.078 | 6.314 | 12.706 | 31.821 | 63.657 | 318.309 | 636.619 |
| 2 | 0.289 | 0.816 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 22.327 | 31.599 |
| 3 | 0.277 | 0.765 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 10.215 | 12.924 |
| 4 | 0.271 | 0.741 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 7.173 | 8.610 |
| 5 | 0.267 | 0.727 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 5.893 | 6.869 |
| 6 | 0.265 | 0.718 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 5.208 | 5.959 |
| 7 | 0.263 | 0.711 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 4.785 | 5.408 |
| 8 | 0.262 | 0.706 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 4.501 | 5.041 |
| 9 | 0.261 | 0.703 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 4.297 | 4.781 |
| 10 | 0.260 | 0.700 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 4.144 | 4.587 |
| 11 | 0.260 | 0.697 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 4.025 | 4.437 |
| 12 | 0.259 | 0.695 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 3.930 | 4.318 |
| 13 | 0.259 | 0.694 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 3.852 | 4.221 |
| 14 | 0.258 | 0.692 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 3.787 | 4.140 |
| 15 | 0.258 | 0.691 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 3.733 | 4.073 |
| 16 | 0.258 | 0.690 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 3.686 | 4.015 |
| 17 | 0.257 | 0.689 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 3.646 | 3.965 |
| 18 | 0.257 | 0.688 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 3.610 | 3.922 |
| 19 | 0.257 | 0.688 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 3.579 | 3.883 |
| 20 | 0.257 | 0.687 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 3.552 | 3.850 |
| 21 | 0.257 | 0.686 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 3.527 | 3.819 |
| 22 | 0.256 | 0.686 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 3.505 | 3.792 |
| 23 | 0.256 | 0.685 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 3.485 | 3.768 |
| 24 | 0.256 | 0.685 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 3.467 | 3.745 |
| 25 | 0.256 | 0.684 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 3.450 | 3.725 |
| 26 | 0.256 | 0.684 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 3.435 | 3.707 |
| 27 | 0.256 | 0.684 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 3.421 | 3.690 |
| 28 | 0.256 | 0.683 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 3.408 | 3.674 |
| 29 | 0.256 | 0.683 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 3.396 | 3.659 |
| 30 | 0.256 | 0.683 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 3.385 | 3.646 |
| 35 | 0.255 | 0.682 | 1.306 | 1.690 | 2.030 | 2.438 | 2.724 | 3.340 | 3.591 |
| 40 | 0.255 | 0.681 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 3.307 | 3.551 |
| 50 | 0.255 | 0.679 | 1.299 | 1.676 | 2.009 | 2.403 | 2.678 | 3.261 | 3.496 |
| 60 | 0.254 | 0.679 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 | 3.232 | 3.460 |
| 120 | 0.254 | 0.677 | 1.289 | 1.658 | 1.980 | 2.358 | 2.617 | 3.160 | 3.373 |
| inf. | 0.253 | 0.674 | 1.282 | 1.645 | 1.960 | 2.326 | 2.576 | 3.090 | 3.291 |

Source: Computed by M. Longnecker using Splus.

F

F Values for $\alpha = 0.01$

| $d_2$ | $d_1$ 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4052 | 4999.5 | 5403 | 5625 | 5764 | 5859 | 5928 | 5982 | 6022 |
| 2 | 98.50 | 99.00 | 99.17 | 99.25 | 99.30 | 99.33 | 99.36 | 99.37 | 99.39 |
| 3 | 34.12 | 30.82 | 29.46 | 28.71 | 28.24 | 27.91 | 27.67 | 27.49 | 27.35 |
| 4 | 21.20 | 18.00 | 16.69 | 15.98 | 15.52 | 15.21 | 14.98 | 14.80 | 14.66 |
| 5 | 16.26 | 13.27 | 12.06 | 11.39 | 10.97 | 10.67 | 10.46 | 10.29 | 10.16 |
| 6 | 13.75 | 10.92 | 9.78 | 9.15 | 8.75 | 8.47 | 8.26 | 8.10 | 7.98 |
| 7 | 12.25 | 9.55 | 8.45 | 7.85 | 7.46 | 7.19 | 6.99 | 6.84 | 6.72 |
| 8 | 11.26 | 8.65 | 7.59 | 7.01 | 6.63 | 6.37 | 6.18 | 6.03 | 5.91 |
| 9 | 10.56 | 8.02 | 6.99 | 6.42 | 6.06 | 5.80 | 5.61 | 5.47 | 5.35 |
| 10 | 10.04 | 7.56 | 6.55 | 5.99 | 5.64 | 5.39 | 5.2 | 5.06 | 4.94 |
| 11 | 9.65 | 7.21 | 6.22 | 5.67 | 5.32 | 5.07 | 4.89 | 4.74 | 4.63 |
| 12 | 9.33 | 6.93 | 5.95 | 5.41 | 5.06 | 4.82 | 4.64 | 4.50 | 4.39 |
| 13 | 9.07 | 6.70 | 5.74 | 5.21 | 4.86 | 4.62 | 4.44 | 4.30 | 4.14 |
| 14 | 8.86 | 6.51 | 5.56 | 5.04 | 4.69 | 4.46 | 4.28 | 4.14 | 4.03 |
| 15 | 8.68 | 6.36 | 5.42 | 4.89 | 4.56 | 4.32 | 4.14 | 4.00 | 3.89 |
| 16 | 8.53 | 6.23 | 5.29 | 4.77 | 4.44 | 4.20 | 4.03 | 3.89 | 3.78 |
| 17 | 8.40 | 6.11 | 5.18 | 4.67 | 4.34 | 4.10 | 3.93 | 3.79 | 3.68 |
| 18 | 8.29 | 6.01 | 5.09 | 4.58 | 4.25 | 4.01 | 3.84 | 3.71 | 3.60 |
| 19 | 8.18 | 5.93 | 5.01 | 4.50 | 4.17 | 3.94 | 3.77 | 3.63 | 3.52 |
| 20 | 8.10 | 5.85 | 4.94 | 4.43 | 4.10 | 3.87 | 3.70 | 3.56 | 3.46 |
| 21 | 8.02 | 5.78 | 4.87 | 4.37 | 4.04 | 3.81 | 3.64 | 3.51 | 3.40 |
| 22 | 7.95 | 5.72 | 4.82 | 4.31 | 3.99 | 3.76 | 3.59 | 3.45 | 3.35 |
| 23 | 7.88 | 5.66 | 4.76 | 4.26 | 3.94 | 3.71 | 3.54 | 3.41 | 3.30 |
| 24 | 7.82 | 5.61 | 4.72 | 4.22 | 3.90 | 3.67 | 3.50 | 3.36 | 3.26 |
| 25 | 7.77 | 5.57 | 4.68 | 4.18 | 3.85 | 3.63 | 3.46 | 3.32 | 3.22 |
| 26 | 7.72 | 5.53 | 4.64 | 4.14 | 3.82 | 3.59 | 3.42 | 3.29 | 3.18 |
| 27 | 7.68 | 5.49 | 4.60 | 4.11 | 3.78 | 3.56 | 3.39 | 3.26 | 3.15 |
| 28 | 7.64 | 5.45 | 4.57 | 4.07 | 3.75 | 3.53 | 3.36 | 3.23 | 3.12 |
| 29 | 7.60 | 5.42 | 4.54 | 4.04 | 3.73 | 3.50 | 3.33 | 3.20 | 3.09 |
| 30 | 7.56 | 5.39 | 4.51 | 4.02 | 3.70 | 3.47 | 3.30 | 3.17 | 3.07 |
| 40 | 7.31 | 5.18 | 4.31 | 3.83 | 3.51 | 3.29 | 3.12 | 2.99 | 2.89 |
| 60 | 7.08 | 4.98 | 4.13 | 3.65 | 3.34 | 3.12 | 2.95 | 2.82 | 2.72 |
| 120 | 6.85 | 4.79 | 3.95 | 3.48 | 3.17 | 2.96 | 2.79 | 2.66 | 2.56 |
| inf | 6.63 | 4.61 | 3.78 | 3.32 | 3.02 | 2.80 | 2.64 | 2.51 | 2.41 |

F Values for $\alpha = 0.01$

| $d_2$ | $d_1$ 10 | 12 | 15 | 20 | 24 | 30 | 40 | 60 | 120 | inf |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6056 | 6106 | 6157 | 6209 | 6235 | 6261 | 6287 | 6313 | 6339 | 6366 |
| 2 | 99.40 | 99.42 | 99.43 | 99.45 | 99.46 | 99.47 | 99.47 | 99.48 | 99.49 | 99.50 |
| 3 | 27.23 | 27.05 | 26.87 | 26.69 | 26.60 | 26.50 | 26.41 | 26.32 | 26.22 | 26.13 |
| 4 | 14.55 | 14.37 | 14.20 | 14.02 | 13.93 | 13.84 | 13.75 | 13.65 | 13.56 | 13.46 |
| 5 | 10.05 | 9.89 | 9.72 | 9.55 | 9.47 | 9.38 | 9.29 | 9.20 | 9.11 | 9.02 |
| 6 | 7.87 | 7.72 | 7.56 | 7.40 | 7.31 | 7.23 | 7.14 | 7.06 | 6.97 | 6.88 |
| 7 | 6.62 | 6.47 | 6.31 | 6.16 | 6.07 | 5.99 | 5.91 | 5.82 | 5.74 | 5.65 |
| 8 | 5.81 | 5.67 | 5.52 | 5.36 | 5.28 | 5.20 | 5.12 | 5.03 | 4.95 | 4.86 |
| 9 | 5.26 | 5.11 | 4.96 | 4.81 | 4.73 | 4.65 | 4.57 | 4.48 | 4.40 | 4.31 |
| 10 | 4.85 | 4.71 | 4.56 | 4.41 | 4.33 | 4.25 | 4.17 | 4.08 | 4.00 | 3.91 |
| 11 | 4.54 | 4.40 | 4.25 | 4.10 | 4.02 | 3.94 | 3.86 | 3.78 | 3.69 | 3.60 |
| 12 | 4.30 | 4.16 | 4.01 | 3.86 | 3.78 | 3.70 | 3.62 | 3.54 | 3.45 | 3.36 |
| 13 | 4.10 | 3.96 | 3.82 | 3.66 | 3.59 | 3.51 | 3.43 | 3.34 | 3.25 | 3.17 |
| 14 | 3.94 | 3.80 | 3.66 | 3.51 | 3.43 | 3.35 | 3.27 | 3.18 | 3.09 | 3.00 |
| 15 | 3.80 | 3.67 | 3.52 | 3.37 | 3.29 | 3.21 | 3.13 | 3.05 | 2.96 | 2.87 |
| 16 | 3.69 | 3.55 | 3.41 | 3.26 | 3.18 | 3.10 | 3.02 | 2.93 | 2.84 | 2.75 |
| 17 | 3.59 | 3.46 | 3.31 | 3.16 | 3.08 | 3.00 | 2.92 | 2.83 | 2.75 | 2.65 |
| 18 | 3.51 | 3.37 | 3.23 | 3.08 | 3.00 | 2.92 | 2.84 | 2.75 | 2.66 | 2.57 |
| 19 | 3.43 | 3.30 | 3.15 | 3.00 | 2.92 | 2.84 | 2.76 | 2.67 | 2.58 | 2.49 |
| 20 | 3.37 | 3.23 | 3.09 | 2.94 | 2.86 | 2.78 | 2.69 | 2.61 | 2.52 | 2.42 |
| 21 | 3.31 | 3.17 | 3.03 | 2.88 | 2.80 | 2.72 | 2.64 | 2.55 | 2.46 | 2.36 |
| 22 | 3.26 | 3.12 | 2.98 | 2.83 | 2.75 | 2.67 | 2.58 | 2.50 | 2.40 | 2.31 |
| 23 | 3.21 | 3.07 | 2.93 | 2.78 | 2.70 | 2.62 | 2.54 | 2.45 | 2.35 | 2.26 |
| 24 | 3.17 | 3.03 | 2.89 | 2.74 | 2.66 | 2.58 | 2.49 | 2.40 | 2.31 | 2.21 |
| 25 | 3.13 | 2.99 | 2.85 | 2.70 | 2.62 | 2.54 | 2.45 | 2.36 | 2.27 | 2.17 |
| 26 | 3.09 | 2.96 | 2.81 | 2.66 | 2.58 | 2.50 | 2.42 | 2.33 | 2.23 | 2.13 |
| 27 | 3.06 | 2.93 | 2.78 | 2.63 | 2.55 | 2.47 | 2.38 | 2.29 | 2.20 | 2.10 |
| 28 | 3.03 | 2.90 | 2.75 | 2.60 | 2.52 | 2.44 | 2.35 | 2.26 | 2.17 | 2.06 |
| 29 | 3.00 | 2.87 | 2.73 | 2.57 | 2.49 | 2.41 | 2.33 | 2.23 | 2.14 | 2.03 |
| 30 | 2.98 | 2.84 | 2.70 | 2.55 | 2.47 | 2.39 | 2.30 | 2.21 | 2.11 | 2.01 |
| 40 | 2.80 | 2.66 | 2.52 | 2.37 | 2.29 | 2.20 | 2.11 | 2.02 | 1.92 | 1.80 |
| 60 | 2.63 | 2.50 | 2.35 | 2.20 | 2.12 | 2.03 | 1.94 | 1.84 | 1.73 | 1.60 |
| 120 | 2.47 | 2.34 | 2.19 | 2.03 | 1.95 | 1.86 | 1.76 | 1.66 | 1.53 | 1.38 |
| inf | 2.32 | 2.18 | 2.04 | 1.88 | 1.79 | 1.70 | 1.59 | 1.47 | 1.32 | 1.00 |

F Values for $\alpha = 0.05$

| $d_2$ | $d_1$ 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 161.4 | 199.5 | 215.7 | 224.6 | 230.2 | 234.0 | 236.8 | 238.9 | 240.5 |
| 2 | 18.51 | 19.00 | 19.16 | 19.25 | 19.3 | 19.33 | 19.35 | 19.37 | 19.38 |
| 3 | 10.13 | 9.55 | 9.28 | 9.12 | 9.01 | 8.94 | 8.89 | 8.85 | 8.81 |
| 4 | 7.71 | 6.94 | 6.59 | 6.39 | 6.26 | 6.16 | 6.09 | 6.04 | 6.00 |
| 5 | 6.61 | 5.79 | 5.41 | 5.19 | 5.05 | 4.95 | 4.88 | 4.82 | 4.77 |
| 6 | 5.99 | 5.14 | 4.76 | 4.53 | 4.39 | 4.28 | 4.21 | 4.15 | 4.10 |
| 7 | 5.59 | 4.74 | 4.35 | 4.12 | 3.97 | 3.87 | 3.79 | 3.73 | 3.68 |
| 8 | 5.32 | 4.46 | 4.07 | 3.84 | 3.69 | 3.58 | 3.50 | 3.44 | 3.39 |
| 9 | 5.12 | 4.26 | 3.86 | 3.63 | 3.48 | 3.37 | 3.29 | 3.23 | 3.18 |
| 10 | 4.96 | 4.10 | 3.71 | 3.48 | 3.33 | 3.22 | 3.14 | 3.07 | 3.02 |
| 11 | 4.84 | 3.98 | 3.59 | 3.36 | 3.20 | 3.09 | 3.01 | 2.95 | 2.90 |
| 12 | 4.75 | 3.89 | 3.49 | 3.26 | 3.11 | 3.00 | 2.91 | 2.85 | 2.80 |
| 13 | 4.67 | 3.81 | 3.41 | 3.18 | 3.03 | 2.92 | 2.83 | 2.77 | 2.71 |
| 14 | 4.60 | 3.74 | 3.34 | 3.11 | 2.96 | 2.85 | 2.76 | 2.70 | 2.65 |
| 15 | 4.54 | 3.68 | 3.29 | 3.06 | 2.90 | 2.79 | 2.71 | 2.64 | 2.59 |
| 16 | 4.49 | 3.63 | 3.24 | 3.01 | 2.85 | 2.74 | 2.66 | 2.59 | 2.54 |
| 17 | 4.45 | 3.59 | 3.20 | 2.96 | 2.81 | 2.70 | 2.61 | 2.55 | 2.49 |
| 18 | 4.41 | 3.55 | 3.16 | 2.93 | 2.77 | 2.66 | 2.58 | 2.51 | 2.46 |
| 19 | 4.38 | 3.52 | 3.13 | 2.90 | 2.74 | 2.63 | 2.54 | 2.48 | 2.42 |
| 20 | 4.35 | 3.49 | 3.10 | 2.87 | 2.71 | 2.60 | 2.51 | 2.45 | 2.39 |
| 21 | 4.32 | 3.47 | 3.07 | 2.84 | 2.68 | 2.57 | 2.49 | 2.42 | 2.37 |
| 22 | 4.30 | 3.44 | 3.05 | 2.82 | 2.66 | 2.55 | 2.46 | 2.40 | 2.34 |
| 23 | 4.28 | 3.42 | 3.03 | 2.80 | 2.64 | 2.53 | 2.44 | 2.37 | 2.32 |
| 24 | 4.26 | 3.40 | 3.01 | 2.78 | 2.62 | 2.51 | 2.42 | 2.36 | 2.30 |
| 25 | 4.24 | 3.39 | 2.99 | 2.76 | 2.60 | 2.49 | 2.40 | 2.34 | 2.28 |
| 26 | 4.23 | 3.37 | 2.98 | 2.74 | 2.59 | 2.47 | 2.39 | 2.32 | 2.27 |
| 27 | 4.21 | 3.35 | 2.96 | 2.73 | 2.57 | 2.46 | 2.37 | 2.31 | 2.25 |
| 28 | 4.20 | 3.34 | 2.95 | 2.71 | 2.56 | 2.45 | 2.36 | 2.29 | 2.24 |
| 29 | 4.18 | 3.33 | 2.93 | 2.70 | 2.55 | 2.43 | 2.35 | 2.28 | 2.22 |
| 30 | 4.17 | 3.32 | 2.92 | 2.69 | 2.53 | 2.42 | 2.33 | 2.27 | 2.21 |
| 40 | 4.08 | 3.23 | 2.84 | 2.61 | 2.45 | 2.34 | 2.25 | 2.18 | 2.12 |
| 60 | 4.00 | 3.15 | 2.76 | 2.53 | 2.37 | 2.25 | 2.17 | 2.10 | 2.04 |
| 120 | 3.92 | 3.07 | 2.68 | 2.45 | 2.29 | 2.17 | 2.09 | 2.02 | 1.96 |
| inf | 3.84 | 3.00 | 2.60 | 2.37 | 2.21 | 2.10 | 2.01 | 1.94 | 1.88 |

F Values for $\alpha = 0.05$

| $d_2$ | $d_1$ 10 | 12 | 15 | 20 | 24 | 30 | 40 | 60 | 120 | inf |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 241.9 | 243.9 | 245.9 | 248.0 | 249.1 | 250.1 | 251.1 | 252.2 | 253.3 | 254.3 |
| 2 | 19.4 | 19.41 | 19.43 | 19.45 | 19.45 | 19.46 | 19.47 | 19.48 | 19.49 | 19.5 |
| 3 | 8.79 | 8.74 | 8.70 | 8.66 | 8.64 | 8.62 | 8.59 | 8.57 | 8.55 | 8.53 |
| 4 | 5.96 | 5.91 | 5.86 | 5.80 | 5.77 | 5.75 | 5.72 | 5.69 | 5.66 | 5.63 |
| 5 | 4.74 | 4.68 | 4.62 | 4.56 | 4.53 | 4.50 | 4.46 | 4.43 | 4.40 | 4.36 |
| 6 | 4.06 | 4.00 | 3.94 | 3.87 | 3.84 | 3.81 | 3.77 | 3.74 | 3.70 | 3.67 |
| 7 | 3.64 | 3.57 | 3.51 | 3.44 | 3.41 | 3.38 | 3.34 | 3.30 | 3.27 | 3.23 |
| 8 | 3.35 | 3.28 | 3.22 | 3.15 | 3.12 | 3.08 | 3.04 | 3.01 | 2.97 | 2.93 |
| 9 | 3.14 | 3.07 | 3.01 | 2.94 | 2.90 | 2.86 | 2.83 | 2.79 | 2.75 | 2.71 |
| 10 | 2.98 | 2.91 | 2.85 | 2.77 | 2.74 | 2.70 | 2.66 | 2.62 | 2.58 | 2.54 |
| 11 | 2.85 | 2.79 | 2.72 | 2.65 | 2.61 | 2.57 | 2.53 | 2.49 | 2.45 | 2.40 |
| 12 | 2.75 | 2.69 | 2.62 | 2.54 | 2.51 | 2.47 | 2.43 | 2.38 | 2.34 | 2.30 |
| 13 | 2.67 | 2.60 | 2.53 | 2.46 | 2.42 | 2.38 | 2.34 | 2.30 | 2.25 | 2.21 |
| 14 | 2.60 | 2.53 | 2.46 | 2.39 | 2.35 | 2.31 | 2.27 | 2.22 | 2.18 | 2.13 |
| 15 | 2.54 | 2.48 | 2.40 | 2.33 | 2.29 | 2.25 | 2.20 | 2.16 | 2.11 | 2.07 |
| 16 | 2.49 | 2.42 | 2.35 | 2.28 | 2.24 | 2.19 | 2.15 | 2.11 | 2.06 | 2.01 |
| 17 | 2.45 | 2.38 | 2.31 | 2.23 | 2.19 | 2.15 | 2.10 | 2.06 | 2.01 | 1.96 |
| 18 | 2.41 | 2.34 | 2.27 | 2.19 | 2.15 | 2.11 | 2.06 | 2.02 | 1.97 | 1.92 |
| 19 | 2.38 | 2.31 | 2.23 | 2.16 | 2.11 | 2.07 | 2.03 | 1.98 | 1.93 | 1.88 |
| 20 | 2.35 | 2.28 | 2.20 | 2.12 | 2.08 | 2.04 | 1.99 | 1.95 | 1.90 | 1.84 |
| 21 | 2.32 | 2.25 | 2.18 | 2.10 | 2.05 | 2.01 | 1.96 | 1.92 | 1.87 | 1.81 |
| 22 | 2.30 | 2.23 | 2.15 | 2.07 | 2.03 | 1.98 | 1.94 | 1.89 | 1.84 | 1.78 |
| 23 | 2.27 | 2.20 | 2.13 | 2.05 | 2.01 | 1.96 | 1.91 | 1.86 | 1.81 | 1.76 |
| 24 | 2.25 | 2.18 | 2.11 | 2.03 | 1.98 | 1.94 | 1.89 | 1.84 | 1.79 | 1.73 |
| 25 | 2.24 | 2.16 | 2.09 | 2.01 | 1.96 | 1.92 | 1.87 | 1.82 | 1.77 | 1.71 |
| 26 | 2.22 | 2.15 | 2.07 | 1.99 | 1.95 | 1.90 | 1.85 | 1.80 | 1.75 | 1.69 |
| 27 | 2.20 | 2.13 | 2.06 | 1.97 | 1.93 | 1.88 | 1.84 | 1.79 | 1.73 | 1.67 |
| 28 | 2.19 | 2.12 | 2.04 | 1.96 | 1.91 | 1.87 | 1.82 | 1.77 | 1.71 | 1.65 |
| 29 | 2.18 | 2.10 | 2.03 | 1.94 | 1.90 | 1.85 | 1.81 | 1.75 | 1.70 | 1.64 |
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| 60 | 1.99 | 1.92 | 1.84 | 1.75 | 1.70 | 1.65 | 1.59 | 1.53 | 1.47 | 1.39 |
| 120 | 1.91 | 1.83 | 1.75 | 1.66 | 1.10 | 1.55 | 1.50 | 1.43 | 1.35 | 1.25 |
| inf | 1.83 | 1.75 | 1.67 | 1.57 | 1.52 | 1.46 | 1.39 | 1.32 | 1.22 | 1.00 |

Ministry of Higher Education
& Scientific Research
Al-Muthanna University
College of Science
Dept. of Biology

Subject: Advanced Cell Biology
Stage: Postgraduate Studies (M.Sc.
Date: / / 2019
Time: 3 hours

04. 09. 2019

((Assessment of the final exam for the 1st semester))
Academic year 2018-2019

45

Q1: Answer Two Branches (14 marks)

A- Explain how the energy changes accompanying passage of a hydrophilic solute through the lipid bilayer of a biological membrane.

B- Explain the targeting of nuclear proteins.

C- Lipids and proteins diffuse laterally in the bilayer. Explain the lateral diffusion rates of lipids by fluorescence recovery after photobleaching (FRAP) technique.

Q2: Answer All Branches (14 marks)

A- Epinephrine triggers a series of reactions in hepatocytes. Explain epinephrine cascade.

B- What is transmembrane electrical potential? Why is transmembrane potential important in excitable Cells? What are three states of the acetylcholine receptor?

Q3: Answer Two Branches: (14 marks)

C- What is the role of voltage-gated and ligand-gated ion channels in neural transmission?

D- Describe regulation of gene expression by insulin.

E- Describe activation of glycogen synthase by insulin.

Q4: Answer All Branches: (14 marks)

A- Describe the conversion of a regulatory gene to a viral oncogene.

F- What are membrane rafts? Explain how the caveolin forces inward curvature in membrane.

Q5: Answer All Branches (14 marks)

A- Describe how amphipathic lipid aggregates that form in water.

B- Describe desensitization of the β-adrenergic receptor in the continued presence of epinephrine.

Best of luck

Lecturer
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Ministry of Higher Education
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Al-Muthanna University
College of Science
Dept. of Biology

Subject: Advanced Cell Biology
Stage: Postgraduate Studies (M.Sc.
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04. 09. 2019

((Assessment of the final exam for the 1st semester))
Academic year 2018-2019

45

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Best of luck

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Ministry of Higher Education
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Al-Muthanna University
College of Science
Dept. of biology

Subject: Adv.plant physiology
Stage: Higher studied
Date: / /2019
Time: 3 hours

07. 09. 2019

((Assessment of the final exam for the 1st semester))
Academic year 2018-2019

45

**Note: Support your answer by draw.**

**Q1// Define the following:** **(10.Mark**

1. Field capacity 2.Aquaporins 3. Permanent wilting point
4.Tracheary elements 5. Stomatal complex 6. Transpiration ratio
7. Z scheme 8. P700 9. Root pressure 10. Rubisco

**Q2// The Cohesion–Tension Theory Explains Water Transport in the Xylem ?** **(10.Marks)**

**Q3//Give the reason for the fallowing** **(10.Marks)**

a) Some elements called essentials in plants ?
b) Water transport up tall trees ?
c) Plants they are seeming green color ?
d) The osmosis is special case of the diffusion ?
e) Existence the accessory pigments in plants ?

**Q4// The ability of plants to obtain both water and mineral nutrients from the soil is related to their capacity to develop an extensive root system. Who?** **(10.Marks)**

**Q5// Compare between Channels & Carrier in plasmamembrane ?** **(10.Marks)**

**Q6// Prove that a short wave carries high energy ?** **(10.Marks)**

**Q7// the excited chlorophyll has four alternative pathways for disposing of its available energy ? Describe that ?** **(10.Marks)**

**Good luck**

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Ministry of Higher Education
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Dept. of biology

Subject: Advance Histology
Stage: MSc
Date: / /2019
Time: 3 hours

08. 09. 2019

45

**((Assessment of the final exam for the 2st semester))**
**Academic year 2018-2019**

Q1/ A- Gives the main histological functions of the following: (10Marks)

1-langerhanse cells 2-Merkels cells 3- cilia 4- melanocytes 5- chondrocytes

B- Showed the histological structures of kidney and comparative between proximal and distal convoluted tubules? (5Marks)

Q2/ A- What are the types of intercellular junctions and gives the main role for each type ? (5Marks)

B- What are the specializations of the cell surface and gives the main role for each one? (5Marks)

Q3/ A- Gives the main characteristics of connective tissue fibers and comparative between ground substances? (5Marks)

B- Showed the main causes of striations in the skeletal and cardiac muscles with drawing? (5Marks)

Q4/ A- What are the important stages of skeletal muscle contractions? (5Marks)

B- Comparative between the deferent types of cartilage? (5Marks)

Q5/A- Showed the supportive cells functions and meninges in the C. N. S? (4Marks)

B- How can you differentiation between the following: (6Marks)

1-Axon and dendrites 2- Brain and spinal cord 3- thick and thin skin?

Q6/ A- Comparative between the deferent types of arteries? (5Marks)

B -Gives the main role of the following: (10Marks)

1- mucous neck cells 2- oxyntic (parietal cell) 3- stem cells 4- paneth cells 5- macula densa

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Ministry of Higher Education
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Al-Muthanna University
College of Science
Dept. of biology

Subject:Pathogenic bacteria
Stage:Msc
Date: / /2019
Time: 3 hours

11, 09, 2019

45

((Assessment of the final exam for the 2st semester))
Academic year 2018-2019

**Q1: Which mechanisms and tools used by the followings microorganisms to established the diseases caused by them :** **(20 Marks)**

a. *Staphylococcus aureus* b. *Leptospira Pomona* c.*Listeria monocytogenes* d. *Bacillus anthracis* e. *Salmonella typhi* .

**Q2: Define the followings:** **(10 Marks)**

1. X & V factors 2. Tetanolysine 3. RTD 4. Endoflagella 5. cold enrichment procedure

**Q3: How can you differentiate the followings:** **(20 Marks)**

1. Pathogenic & non pathogenic Leptospirae .
2. Pathogenic & non pathogenic Campylobacter.
3. Pathogenic & non pathogenic Bacilli.
4. Salomnella typhi & Salmonella gallinarium.

**Q4: Name these microorganisms:** **(20 Marks)**

1. Gm-ve,aerobic and non motile causing a disease in chicken.
2. Gm-ve, non motile , very short organism causing disease in human with undulent fever .
3. Gm+ve,Diplococci capsulated causing serious respiratory disease in human.
4. Gm+ve,aerobic , bacilli,sporforming capsulated and non motile.
5. Gm-ve,strict aerobic,non motile, happen in pairs , toxigenic strains agglutinated RBC.
6. Gm+ve, bacilli, some time motile other time not, and it has characteristic motion.
7. Anaerobic and Highly toxigenic bacterium, it has terminal spores, motile , causing fetal disease in man .
8. A pathogenic bacterium ,motile by flagellum located inside the bacillus with characteristic motion.
9. Gm-ve, Diplococci and non motile.
10. Gm+ve large anaerobic bacilli, produce no toxin sporforming and motile.

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Ministry of Higher Education
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Al-Muthanna University
College of Science
Dept. of Biology

Subject: Advanced Immunology
Stage: MSc
Date: / /2019
Time: 3 hours

12. 09. 2019

((Assessment of the final exam for the 2nd semester))
Academic year 2018-2019

45

**Q1: What are the differences between Immunodeficiency and Immuno-tolerance, give examples? (10 Marks)**

**Q2: Give your scientific opinion; if there is a defect in phagocytic activity, what are the consequences? (10 marks)**

**Q3: Give Example for each of the followings, (Five only): (10 Marks)**

1. Syngeneic transplantation.
2. Primary immunodeficiency.
3. Bacterial Antigen that suppress adaptive immunity.
4. Specific immunity receptor.
5. Delayed type hypersensitivity.
6. Secondary immune-deficiency.

**Q4: Give two differences between the followings: (Five only) (10 Marks)**

1. Vaccination and Immunization.
2. IgG and IgM Function.
3. Serum and anti-serum.
4. Defense against pyogenic bacterial infection and viral infection.
5. T-dependent and T-independent Immune response.
6. AIDS and CGD.

**Q5: Match between the words in table B and their characteristics in table A in the followings: (12Marks)**

| Table A | | Table B |
|---|---|---|
| TCR, CD4, CD8 | | Macrophage |
| Cure and cleaning debris and microbes post infections | | |
| Target both healthy and unhealthy cells | | Gene Therapy |
| Use Liposomes and viruses | | |
| Have HLA encoding genes | | T-Cell receptors |
| MHC I, MHC II, Mannose receptor | | |

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د.وئام سعد عبد الحمزة

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Ministry of Higher Education
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Al-Muthanna University
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Dept. of Biology

Subject: Advanced Immunology
Stage: MSc
Date: / /2019
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12. 09. 2019

((Assessment of the final exam for the 2nd semester))
Academic year 2018-2019

45

**Q6: Draw a diagram shows anti-tumor immune response putting all necessary pointing? (10 Marks)**

**Q7: What are the properties that must be found in a vaccine prepared against pathogenic bacteria to be a protective one? (8 Marks)**

*Good Luck*

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Subject: Genetic markers
Stage: postgraduate (M.Sc.) studies
Date: / / 2019
Time: 3 hours

14. 09. 2019

**((Assessment of the final exam for the 2nd semester))**
**Academic year 2018-2019**

45

## Answer All Questions

**Q1:** Answer All Branches (14 marks)

A- Describe the polymorphic information content (PIC) of genetic markers.

B- Describe short tandem repeats (STRs) in forensic applications with drawing.

**Q2:** Answer All Branches (14 markers)

**A-** What is DNA methylation? which nucleotide base does methylation occur in humans? which enzyme is this process mediated by? and what is the effect of this process in gene expression?

**B-** How is mitochondrial DNA inherited in mammals? why does mitochondrial DNA is one of the best marker tools for population genetics and genetic diversity?

**Q3:** Answer All Branches (14 marks)

A- Explain what are differences between the principle and applications of random amplified polymorphic DNA (RAPD) and amplified fragment length polymorphism (AFLP) markers.

B-Draw schematic representation of restriction fragment length polymorphism (RFLP) analysis.

**Q4:** Answer All Branches (14 marks)

A- Explain the principles and applications of the specific mutations diagnosis in cancer susceptibility genes.

B- Explain BRCA genes are genetic markers for cancer.

**Q5:** Answer One Branch (14 marks)

A- Explain the expressed sequence tags (ESTs) is effecrive way to identify genes and analysis their expression.

B- Expain choice of genetic marker in genomic research and what is type of marker is most suitable in your project.

Best of luck

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**Head of Department**
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Ministry of Higher Education
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AlMuthanna University
College of Science
Department : Biology

Subject: Ad.Ecology
Stage: post graduate

Date: / /2019
Time: 3 hour

16. 09. 2019

45

**((Assessment of the final exam for the second semester))**
**Academic year 2018-2019**

Q1- Explain the positive interaction between living organisms (10M)

Q2/ Define food chain , give their type with clarify it, what is the best type according to accumulate energy and why ? (10M)

Q3/ A- What is the meaning of natural resources, classification them with explain (14 M)

B- How biodiversity measure and what is the best method for measuring it and why?

Q4/A- Explain grow curve for population (12 M)

B- How nitrogen gases transfer to atmosphere and aquatic system ? what's the relation between it and eutrophication

Q5/A- What is biodiversity pattern s (12M)

B- Explain the stage belong to xerosere succession

Q6/ A- Clarify the methods used for measuring productivity. What is the best method (12 M)

B- Give advantage of school camping

.....

Good Luck

**Lecturer**
**Assist.Prof. Ibtehal Aqeel**

**Head of department**
**Assist.Prof. Laith Abdulhassan**