كلية العلوم
جامعة أسيوط

جامعة أسيوط

Final Exam in Electrical Prospection Course (G358)
(50 marks total)

May: 2026 **Time: 2 hours**

ملحوظة: الرجاء الالتزام بالإجابة فقط على عدد النقاط المذكور في كل سؤال

A) Answer the following: *(Ten marks total)*

1) **With the help of drawing write on the basic theory of electromagnetic (EM) method** *(Five marks)*

2) **Define only five of the following:** *(Five marks total / One mark each)*

Chargeability	**Dielectric permittivity**	**Magnetic permeability**
Skin depth	**Membrane polarization**	**Reflection coefficient**
Vertical resolution in GPR		

B) Mark the following statements with True or False: *(Twenty marks total / One mark each)*

1) **DC resistivity method depends on the storage of current whereas the induced polarization method depends on the flow of current**
2) **The presence of metallic minerals in the subsurface will have no effect on the voltage decay during induced polarization measurements**
3) **Electrode polarization is smaller in magnitude than normal or background IP effect**
4) **Membrane polarization is largest when a rock contains clay materials scattered through the matrix**
5) **Surface area is the most important factor controlling the IP effect**
6) **The IP effect increases with the increasing in surface charge density at mineral-fluid interface**
7) **Dipole-dipole array is best suited for IP measurements to minimize the electromagnetic coupling effect**
8) **IP method can be used to map lithological variations in the subsurface**
9) **The GPR method is best suited for the archaeological investigation**

10) The depth of penetration in GPR is very limited (less than 100 m)
11) In GPR the attenuation of EM energy is primarily controlled by the electrical conductivity of the subsurface
12) The depth in GPR increases with the increasing of the subsurface electrical conductivity
13) There is a tradeoff between a penetration depth and resolution in GPR method
14) In GPR, the larger the Fresnel zone, the lower the horizontal resolution.
15) The diffraction hyperbola in GPR record result from a point source
16) The electromagnetic (EM) data can be acquired in the time domain only
17) The main disadvantage of the EM methods is that they require direct contact with the ground
18) In EM method, a secondary EM field is produced if a subsurface conductive anomaly is present
19) The EM systems are passive only
20) VLF method is very effective in locating subsurface zones of high electrical conductivity

C) Provide short notes of only Five of the following: *(Twenty marks total / Four marks each)* إجابات مختصرة مع إمكانية التوضيح بالرسم كلما أمكن

1) Different methods for data acquisition in GPR
2) Parameters that control the IP phenomena
3) The classifications of electrometric method
4) The source mechanisms of induced polarization effects
5) Different parameters that control the propagation of EM waves in the subsurface geologic media using GPR
6) Three different applications of GPR methods
7) Advantages and limitations of electromagnetic method relative to DC resistivity
8) Different methods for depth estimation in GPR

GOOD LUCK

End of Questions

Course Instructor Prof. Dr. Gamal Zidan AbdelAal

	Faculty of science	**Computer Security-4th Level**
	Assiut University	**50 Marks**
	1st Semester 2026	**2 Hour**

Question 1: Choose the correct answer **(40 points)**

1. Users A and B use the Diffie-Hellman key exchange technique with a common prime p = 13 and generator g=2. If user A has private key XA = 5, and if user B has private key XB = 6 .What is the shared secret key?

   a) 6
   b) 8
   c) 11
   d) 12

2. In RSA, if p=3, q=11, e=3 encrypt message M=4:

   a) 9
   b) 16
   c) 31
   d) 64

3. A Brute Force attack on a Simple substitution cipher (general Case) written in Arabic would require a maximum of ----------trials.

   a) 25!
   b) 26!
   c) 2^{88}
   d) 28!

4. In knapsack cryptosystem, let the private key be (2,3,7,14), and m = 3 and n = 31. If the ciphertext is 26, What is the original binary message?

   a) 1011
   b) 1101
   c) 0111
   d) 1001

5. The input to S-box 2 is 101010. Which one is the output?

S_2

15	1	8	14	6	11	3	4	9	7	2	13	12	0	5	10
3	13	4	7	15	2	8	14	12	0	1	10	6	9	11	5
0	14	7	11	10	4	13	1	5	8	12	6	9	3	2	15
13	8	10	1	3	15	4	2	11	6	7	12	0	5	14	9

   a) 1010
   b) 1111
   c) 0010
   d) 0100

6. Which of the following ciphered text would have NOT used transposition cipher for encryption of the plain text "CIPHER"?

   a) EPIHRC
   b) EHIPCR
   c) DTIPRC
   d) HRIPEC

7. In a single DES round, the function f(R,K) consists of:

a) E-box Expansion → XOR → S-boxes → P-box Permutation
b) XOR → E-box Expansion → P-box Permutation → S-boxes
c) P-box Permutation → XOR → E-box Expansion → S-boxes
d) S-boxes → XOR → E-box Expansion → P-box Permutation

8. The lengths of the three registers x,y,z in A5/1 are:

a) 18, 21, 22
b) 18, 21, 23
c) 19, 22, 23
d) 17, 23, 24

9. In Hill cipher using the key DDCF and a 2 x 2 matrix which one is the plain text corresponding to ciphertext "MF":

a) TR
b) ZX
c) EA
d) FZ

10. What will be the plain text corresponding to ciphered text "s" if an affine cipher is used with key values as a=7, b=3?

a) r
b) f
c) v
d) z

11. What will be the plain text if rail fence cipher is used for decrypting the cipher text "HelloWorld" with the key value given to be 3?

a) HLLOEWDOLR
b) HOLELWRDLO
c) HWEOLRLLOD
d) HLOOLELWRD

12. What will be the decrypted text corresponding to cipher text "CRYPTOGRAPHY" using columnar transposition cipher with the key 3124?

a) GPCPRTRHAOYY
b) GCPPRRTHAYOY
c) ROPYGHCTAPRY
d) YGHROPCTAPRY

13. Two parties are exchanging messages using public key cryptography. Which of the following statements describes the proper procedure for transmitting an encrypted message?

a) The sender encrypts the message using the sender's public key, and the receiver decrypts the message using the receiver's public key.
b) The sender encrypts the message using the sender's private key, and the receiver decrypts the message using the receiver's public key.
c) The sender encrypts the message using the receiver's public key, and the receiver decrypts the message using the receiver's private key.
d) The sender encrypts the message using the sender's public key, and the receiver decrypts the message using the sender's private key.

14. Using one time pad, what will be the ciphertext resulting from encrypting HELLO with key XMCKL modulo 26 ?

a) EQNVZ
b) KOSZU
c) QJKES
d) AEGCB

15. If a columnar transposition cipher uses 6 columns, how many possible keys exist?

a) 36
b) 64
c) 360
d) 720

16. What will be the cipher text corresponding to plain text "attack at four" , if Double Transposition Cipher is used with rows permutation from (1, 2, 3) → (2, 3, 1), columns permutation from (1, 2, 3, 4) → (4, 1, 3, 2)

a) TCAKRFUOAATT
b) CKATFOURATTA
c) TRACFAAUTKOT
d) CFAKOTAUTTRA

17. In RSA, if p=5, q=11 and e=3, what is the private key?

a) 7
b) 13
c) 27
d) 37

18. In RC4:given Key K=[1,2,3] and S-array S=[0,1,2,3,4], After the second KSA iteration, what is the value of j

a) 1
b) 3
c) 4
d) 2

19. What will be the cipher text corresponding to plain text "Hello" if playfair cipher is used with keyword "SECURITY"?

a) FUQOPN
b) UFQOMP
c) FUOQMP
d) UFQOMN

20. Using the Caesar cipher, the encryption of the plaintext "rmq" would be

a) SNR
b) OJN
c) UPT
d) JXF

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Write down the right answer (A or B or C or D) in this table									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Question 2: True or False (10 points)

1. Triple DES with two keys K1 and K2 are independent, and K3 = K1, has an effective key length of 112 bits.
2. DES performs 8 rounds of encryption.
3. Is the key a=13, b=7 is valid key for Affine cipher.
4. The mapping between letters and bits in vernam cipher is secret.
5. The sequence (1,2,4,8,16) , m=3, and n=31 is a valid private key for knapsack cryptosystem.
6. In A5/1, Keystream bit is XOR with rightmost bits of registers.
7. In Vigenère Tableau Cipher, the Key is repeated when it is shorter than the plaintext.
8. Is the Key $K = \begin{bmatrix} 2 & 4 & 1 \\ 3 & 6 & 2 \\ 1 & 2 & 0 \end{bmatrix}$ suitable for decryption in Hill cipher.
9. The right half of the DES block is expanded from 32 bits to 48 bits.
10. In RC4, PRGA the number of iteration depends on key length.

Write down the right answer (T or F) in this table									
1	2	3	4	5	6	7	8	9	10

Assiut University		(2025/2026)
Faculty of Science	**Final Exam of the 2nd Semester** **Mathematical Statistics**	Time: 3 h
	For 4th Year Mathematics Students Instructor: Prof. Abd EL-Baset A. Ahmad	50 Marks

Answer the following questions: (10 mark for each question)

(1) (a) Let X and Y be discrete random variables with bpmf

y \ x	1	2	3
1	3/32	8/32	5/32
2	6/32	6/32	4/32

Find: (i) $f_{Y|X}(y|3)$ (ii) $F_{Y|X}(y|3)$ (iii) $V[Y|X=3]$

(b) Let the random variables X and Y have the bpdf

$$f_{X,Y}(x,y)=\begin{cases}e^{-x}, & 0<y<x<\infty\\ 0, & o.w\end{cases}$$

Find $M_{X,Y}(t,s)$ and then use it to find $Cov(X,Y)$, and $\rho(X,Y)$.

(2) (a) $X_1, X_2, \dots, X_n$ is a random sample drawn from a population whose density function is Inverse Gaussian IG(μ,λ). Use the moment generating function given in the **helpful distributions and expressions** to show that the moment estimator of μ and λ are given by: $\hat{\mu}=\bar{x}$ and $\hat{\lambda}=\frac{n\bar{x}^3}{(n-1)S^2}$.

(b) If the bpdf of X and Y is given by

$$f_{X,Y}(x,y)=\begin{cases}2, & 0<x<y,\ 0<y<1,\\ 0, & o.w\end{cases}$$

Prove that: (i) $E[Y|X=x]=\frac{1+x}{2}$ (ii) $V[Y|X=x]=\frac{(1-x)^2}{12}$, $0<x<1$.

(3) (a) The pdf of a random variable X is given by $f_X(x)=\begin{cases}\frac{1}{3}e^{-\frac{x}{3}}, & x>0,\\ 0, & o.w.\end{cases}$ and if the random variable Z is such that $Z=\begin{cases}1, & X\in A\\ 2, & X\notin A\end{cases}$, where $A=\{x: 0<x<2\}$, then find the pmf of Z.

(b) Suppose that X and Y are independent random variables where $X \sim gamma(\alpha_1, \beta)$ and $Y \sim gamma(\alpha_2, \beta)$. Find the pdf of $Z = \frac{X}{X+Y}$

(4) (a) If $X_1, X_2, \dots, X_n$ is a random sample of size n from a normal distribution with unknown parameters μ and σ^2. (i) Find the moments estimators and maximum likelihood estimators for the unknown parameters. (ii) Show that the sample mean $\overline{X}$ is a MVUE for μ.

(b) Let $X_1, \dots, X_n$ be a random sample from Bin(1,p). Prove that $Y = \sum_{i=1}^{n} X_i$ is sufficient statistic for p.

(5) Two observations are taken on a discrete random variable with pmf $p(x|\theta)$, where $\theta = 1$, or 2 given as

$p_{X\|\Theta}$ \ θ	1	2
$p_{X\|\Theta}(x_1\|\theta)$	0.4	0.3
$p_{X\|\Theta}(x_2\|\theta)$	0.6	0.7

and the prior of θ is defined as

$$p_{\Theta}(\theta) = \begin{cases} 0.3, & \theta = 1, \\ 0.7, & \theta = 2, \\ 0, & o.w \end{cases}$$

Find the Bayes estimate for θ.

Helpful Formulas:

$$X \sim IG((\mu, \lambda) \Rightarrow M_X(t) = e^{\frac{\lambda}{\mu}\left[1-\left(1-\frac{2\mu^2 t}{\lambda}\right)^{\frac{1}{2}}\right]}$$

$$\overline{x^2} - \bar{x}^2 = \frac{(n-1)S^2}{n}$$

$$X \sim gamma(\alpha, \beta) \Rightarrow f_X(x) = \frac{\beta^{\alpha}}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x}, \qquad x > 0.$$

$$X \sim N(\mu, \sigma^2) \Rightarrow f_X(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(x-\mu)^2}, \qquad -\infty < x < \infty.$$

Best wishes,,, Prof. Abd EL-Baset Abdullah Ahmad

Faculty of Science **Assiut University** **1st Semester 2026**	**Software Engineering – 4th Level** **Time: 2 Hours** **Marks: 50**	

Question 1: Determine whether these statements are true (T) or false (F) (10 Points)

1. If the requirements are not clearly identified during generic software development, the developers consult the customer to clarify them.
2. Software maintenance is the process of fixing bugs and improving software after deployment.
3. Architectural design determines how the system will be distributed.
4. The Waterfall model is most suitable model for new technology that is not well understood.
5. Platform information becomes irrelevant in the design phase if the software is built from scratch without reusing any existing systems.
6. User requirements focus primarily on how the system will be implemented.
7. The velocity in Scrum is an empirical measure of how much product backlog effort a team completes per sprint.
8. During a sprint, the Product Owner can add new items to the Sprint Backlog if they are urgent, high priority business needs.
9. In sprint retrospective meeting, team members share what they did since the last meeting, identify obstacles, and plan their work for the next day.
10. Describing how a system should behave in exceptional situations is part of functional requirements.

Write down the right answer (T or F) in this table									
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.

Question 2: Choose the correct answer (40 Points)

1. Beta testing is conducted by ..... to validate the software before public release.

A) Developers B) Customers C) Testers D) End users

2. Payroll systems is an example of which type of software application?

A) Stand-alone application B) Interactive transaction-based application
C) Batch processing system D) Systems of systems

3. Which of the following is NOT part of software dependability?

A) Reliability B) Responsiveness C) Security D) Safety

4. A company is developing software for a radiation therapy machine. Which development model is best suited for this project?

A) Waterfall model B) Scrum C) Kanban D) XP

5. ..... helps developers uncover implicit user requirements that might not be stated explicitly.

A) Task analysis B) Feasibility study C) Risk analysis D) Performance analysis

6. In scrum, a potentially shippable product increment is typically delivered to the customer every ..... weeks.

A) 1–2 B) 2–4 C) 2–3 D) 1–3

7. Which stage involves searching for existing components and systems that could fulfill the required functionality?

A) Requirements refinement B) Software discovery and evaluation
C) Component adaptation and integration D) Application system configuration

8. In which of the following models does iteration happen within each development activity?

A) V model B) Scrum C) Kanban D) XP

9. The main output of requirements specification activity is ..... document.

A) User requirements B) System requirements C) System descriptions D) SRS

10. Which of the following is NOT usually considered part of a software system?

A) Configuration files B) Hardware documentation C) System documentation D) User documentation

11. Which group is LEAST likely to be concerned with system implementation details?

A) Software developers B) System architects C) Client managers D) Client engineers

12. Which XP practice MOST directly supports developer well-being while also improving long-term productivity?

A) Pair programming B) Small releases C) Sustainable pace D) Continuous integration

13. An online shopping system allows users to place orders and requires all transactions to be encrypted. Which of the following is a non-functional requirement?

A) Users shall be able to place orders online B) The system shall display order confirmation
C) The system shall calculate the total order price D) All transactions must be encrypted

14. Which Scrum role is primarily responsible for shielding the team from external interference?

A) ScrumMaster B) Product Owner C) Project Manager D) Development Team

15. Developers regularly restructure existing code to improve readability and maintainability without changing external behavior. Which XP practice is being applied?

A) Simple design B) Refactoring C) Coding standards D) Pair programming

16. The hardware and OS constraints are examples of ..... requirements.

A) Product B) Functional C) External D) Organizational

17. Which statement best describes the relationship between user stories and tasks in the XP release cycle?

A) Tasks are decomposed into user stories by the development team

B) Tasks are written and later generalized into user stories for release planning

C) Tasks are implementation-level realizations of user stories

D) User stories are derived from completed tasks

18. Which of the following XP practices MOST reflect the "Embrace Change" agile principle?

A) Small releases B) Collective ownership C) Sustainable pace D) None of these

19. An airline booking system should allow users to book flights, cancel reservations, and view flight schedules. Additionally, the system must be available 24/7. This aspect of the system is an example of ..... requirements.

A) Efficiency B) Reliability C) Security D) Usability

20. In a distributed Scrum environment, which of the following practices MOST effectively ensures that all team members are aware of the state of the product at any time?

A) Real-time communications B) Detailed documentation C) Status reports D) Continuous integration

Write down the right answer (A or B or C or D) in this table												
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
14.	15.	16.	17.	18.	19.	20.						

Best Wishes

Dr. Rasha M. Kamel

	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Mathematics Department	Program: Biotechnology Level : (4) Date: 28/12/2025 Time: 2 hours	
Course Title: Bioinformatics		Code: 401BT	
Instructors: Dr. Fatma Hussein		Important: Solution on the same paper	
No. of pages 3	No. of questions 3	Total Mark: 50 degree	

Question No. 1: Choose the correct answer **(15 marks)**

1. Bioinformatics provide software tools for..... biological data.
   a) analyze b) retrieve c) storage d) all previous
2. Each database entry described by..... accession number.
   a) one b) double c) multiple d) non
3. Which database provides comprehensive information on protein-protein interactions?
   a) GenBank b) STRING c) Swiss-Prot d) KEGG
4. Which symbol is used to denote the beginning of a header line in a FASTA file?
   a) $ b) # c) > d) &
5. Which type of database typically contains more sequences?
   a) DNA databases b) Protein databases
   c) Both are equal in size d) unannotated Protein databases
6. In BLAST, what is a "hit"?
   a) A gap in the alignment b) A match found in the database
   c) A mismatched base pair d) An error in the alignment process
7. Uniprot has two main sections----------.
   a) Swissprot and DDBJ b) DDBJ and TrEMBL
   c) Swissprot and TrEMBL d) GenBank and EMBL
8. What is the secondary structure of a protein?
   a) 3D shape b) Amino acid sequence
   c) Beta sheets and alpha helices d) Multiple polypeptide chains
9. Which of the following is NOT a type of substitution matrix?
   a) PAM matrices b) BLOSUM
   c) FASTA d) None of these
10. The stepwise method for solving problems in computer science is called ... .
    a) Flowchart b) Algorithm c) Procedure d) Sequential design
11. Sequence databases store information on:
    a) Only nucleotide sequences b) Only protein sequences
    c) Nucleotide and protein sequences d) Protein families and domains
12. What type of alignment is the Smith-Waterman algorithm designed for?
    a) Global alignment b) Local alignment
    c) Multiple sequence alignment d) Profile alignmen

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13. Why are gap penalties used in alignment?
   a) Measure distance
   b) Penalize gaps
   c) Reward gaps
   d) Store data

14. What is "homology" in bioinformatics?
   a) Structural similarity
   b) Functional equivalence
   c) Evolutionary relationship
   d) Identical sequences

15. One of the in-silico techniques used to study the interactions between proteins is
   a) yeast 2-hybrid
   b) x-ray crystallography
   c) phylogenetic tree
   d) synthetic lethality

Question No. 1 answers

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer															

Question No. 2: Put T for true and F for false **(15 marks)**

1. Bioinformatics is a theoretical science so the results have not to be experimentally corroborated.
2. A query is a method to retrieve information from the database.
3. Dynamic programming methods require more computational time than heuristic methods.
4. UniProt is a comprehensive resource for protein sequence and functional information.
5. Orthologous genes are found in the same genome and arise from duplication events.
6. Pairwise sequence alignment involves aligning two sequences to identify the optimal pairing of the sequences.
7. In local alignment, only the regions with the highest density of matches are aligned.
8. STRING is a database and tool used for analyzing metabolic pathways.
9. Gap penalties are applied to discourage excessive gaps; these include higher penalties for extending a gap and lower penalties for opening it.
10. Bioinformatics tools are used to carry out sequences and structural analysis
11. Drug discovery and development is one of the applications of bioinformatics in biology
12. For saving storage space on computers, three letter code of amino acids is used on databases
13. Bigger databases make identifying meaningful alignments easier
14. BLASTn is used to compare protein sequences against a protein database.
15. The k-tuple size determines the length of the words used for comparison in heuristic methods.

Question No. 2 answers

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer															

Question No. 3: Answer the following questions **(20 marks)**

1. **Discuss the key differences between primary and secondary biological databases. Provide examples of each type.** **(6 marks)**
2. **Define sequence alignment and explain its importance in bioinformatics. Why is it essential to compare sequences, and what insights can be gained from sequence alignment.** **(5 marks)**
3. **In bioinformatics, FASTA and BLAST are commonly used tools for sequence analysis.** **(9 marks)**

   (a) What is FASTA, and what is its main use?
   (b) What is BLAST, and what is its main use?
   (c) State one key difference between FASTA and BLAST.

End of Exam

Best Wishes **Dr. Fatma Hussein**

Final Exam
Faculty of computer and Information
Fourth Year, Computer Science
حسابات موزعة ٤٥٢ رك
16-05-2026

Assiut University

Answer the following Questions

Q1. Write a simple complete OpenMP program to print numbers from 1 to 20, where this program contains five threads and each thread print 4 numbers. (8 Points)

Q2. Write HellWord program using MPI. (6 Points)

Q3. Write a simple complete OpenMP program to compute the value of Pi. (7 Points).

Q4. What are the main basic functions in MPI? (7 Points).

Q5. How can we avoid dead lock in OpenMP or MPI. (6 Points).

Q6. Explain the meaning of barrier and atomic in OpenMP. (6 Points)

Q7. Discuss the need of parallel processing in real world applications. (5 Points)

Q8. Can the Range-Kutta method be programmed directly be used OpenMP? Explain the reason for your answer. (5 Points)

Best Wishes, Dr. Ibrahim Elsemman

	Assiut University- Faculty of Science **second Semester- Final Exam 2025-2026** **Mathematic Department**	**Science** **Level : (4)** **Date: 14/5/2026** **Time: 3 h**	
Course Title: Operation Research (2)		**Code: 426 Math**	
Instructors: Prof. Dr. Mostafa Ali El khatteb			
Important:	**No. of pages 1**	**No. Of questions 5**	**Total Mark:50 degree**

أجب عن الأسئلة الآتية: كل سؤال (10 درجات)

السؤال الأول: (أ) برهن أن الشرط الكافي لنقطة التشبع x^* لكي تكون نقطة تطرف هو ان مصفوفة الهسين H تكون مصفوفة موجبة عندما تكون x^* نقطة نهاية صغرى وتكونمصفوقة عندما تكون $x = x^*$ نقطة نهاية عظمى.

(ب) حدد القيم القصوى للدالة $f(x) = 3x^4 - 20x^3 + 36x^2 + 16$.

السؤال الثاني : (أ) أوجد مصفوفة الهسين للدالة $f(\underline{x}) = x_1 x_3^2 + x_1 e^{x_2}$ حول النقطة $\underline{x}^* = (0,3,-2)$

(ب) أوجد النهايات العظمى والصغرى للدالة $f(\underline{x}) = x_1 + 2x_3 + x_2 x_3 - x_1^2 - x_2^2 - x_3^2$

السؤال الثالث : (أ) أستخدم التعويض المباشر في حل المسألة التالية $Mix\ \ f(x) = 4x_1^2 + 5x_2^2 \quad S.t \quad 2x_1 + 3x_2 = 6$

(ب) أستخدم طريقة مضروبات لاجرانج في حل المشكلة التالية

$Max\ \ f(x_1, x_2) = x_1 x_2^2 \quad S.t \quad g(x_1, x_2) = 3x_2^2 + 2x_1 x_2 = 24$.

ثم طبق الشرط الكافي لمعرفة ان النقطة نهاية عظمى .

السؤال الرابع : (أ) من الشرط الكافي من الرتبة الثانية $y^T \nabla_x^2 L(x^*, \lambda^*, u^*) y \succ 0$ أوجد حل المشكلة التالية

$$Mix\ \ f(x) = (x_1 - 2)^2 + x_2^2 \quad S.t \quad x_1 - x_2^2 \le 0$$

(ب) بأستخدام طريقة خطوة الانحدار الشديد أوجد طول الخطوة α للدالة

$f(\underline{x}) = 3x_1^2 + 2x_2^2 + 2x_1 x_2 + 7$ ثم اوجد الحل عند $(x_1^0, x_2^0) = (1,2)$.

السؤال الخامس : (أ) بأستخدام طريقة نيوتن اوجد القيمة الصغرى للدالة $f(\underline{x}) = 3x_1^2 + x_2^2 + 2x_1 x_2 = 7$

عندما $(x_1^0, x_2^0) = (5,10)$

(ب) أستخدم دالة الجزاء لحل المسألة التالية $Mix\ \ f(x) = (x_1 - 2)^2 + (x_2 - 1)^2 \ \ S.t\ h(x) = x_1 + x_2 - 7 = 0$

End of Exam

Best Wishes

Prof. Dr. Mostafa El kahteeb
Prof. Dr. Taha El Gindy

	Assiut University- Faculty of Science **Second Semester- Final Exam 2025-2026** **Mathematics Department**	**Program: Pure Mathematics** **Level: (4)** **Date: 19/5/2026** **Time: 3 h**	
Course Title: Numerical Analysis (II)			**Code: 424 Math**
Instructors: Prof. Dr. Abdalla El-Safty & Dr. Sayed A. Dahy			
Important:	**No. of pages 1**	**No. Of questions 6**	**Total Mark: 50 degrees**

Answer Only Five Questions of the Following

1) **A)** Prove that the eigenvalues of square matrix A and of the matrix $T^{-1}AT$ are a regular square matrix, are the same.

B) Use Le Verier- Faddeev method to find the characteristic equation of the matrix:

$$A=\begin{pmatrix}1 & 2 & -1\\ 1 & 0 & 1\\ 4 & -4 & 5\end{pmatrix},$$

then find A^2.

---

2) For the equation: $y'=2y, 0\le x\le 1, y(0)=1$ (Exact solution $y=e^{2x}$).

A) Find an upper bound of the error at $x=1$ in terms of the step size h.

B) Solve the difference equation which results from Euler's method.

C) Compare the bound obtained from **(A)** with the absolute error as obtained from **(B)** at $x=1$ for $h=0.1$.

---

3) Solve the following linear system by the method of iteration:

$$x_1+0.1x_2+0.2x_3=1.3,$$
$$x_1+10x_2+3x_3=14,$$
$$0.3x_1+0.2x_2+x_3=1.5.$$

A) Show that the process of iteration converges to the solution of the above system

B) What is the maximum error after performing 13 iterations.

---

4) **A)** Derive **Adams Bashforth method of order 4** to solve the initial value problem (IVP):

$$y'=f(x,y), \qquad y(x_0)=y_0.$$

B) Apply the driven method **(A)** to find $y(0.8)$ and $y(1)$ for the IVP:

$$y'=2y-\sqrt{x}, \quad y(0)=5, \quad y(0.2)=7.3887, \quad y(0.4)=10.8902, \quad y(0.6)=16.0738.$$

---

5) **A)** Derive **(Predictor- Corrector) Milne's** method to solve the initial value problem (IVP):

$$y'=f(x,y), \qquad y(x_0)=y_0.$$

B) Apply the derived method **(A)** to find $y(1)$ for the IVP:

$$y'=\sin(y-x), \quad y(0)=10, \quad y(0.25)=10.0599, \quad y(0.5)=7.9006, \quad y(0.75)=10.1169.$$

---

6) **A)** State the **Finite Differences formulas** for $y', y'',$ and y'''.

B) Use the formulas stated in **(A)** to solve the boundary value problem (BVP):

$$y''+25y=0, \quad y(0)=1, \quad y(1)=0 \quad \text{with step size } h=1/4.$$

End of Exam

Best Wishes **Prof. Dr.** *Abdalla El-Safty* **Dr.** *Sayed A. Dahy*

Computer Science Department
Faculty of Science
Assiut University
Final Exam
2025-2026 – May. 2026

Course: Compiler Theory
Code: CS412
4th year
Time: 2 Hours
Marks: 50

- **No. of pages: 3 - No. of questions: 3** **answer all questions**

Question 1 (8 pts)

a) Write a regular expression for all strings of a's and b's which contains an odd number of b's.
b) What are the main steps for compilation process? Describe each step briefly.

Question 2 (12 pts)

Consider the following grammar:

S→AB
A→BcD | aB
B→ Db | bCd
C → cC | d
D→ d | €

a- Construct First and Follow sets for each non terminal
b- Is this grammar LL(1)? Explain
c- Write a code that would implement the recursive decent method for the **A** nonterminal.

Question 3 (30 pts)

[1] Which one of the following regular expressions represents the language: the set of all binary strings having two consecutive 0s and two consecutive 1s?
a) (0|1)*0011(0|1)*| (0|1)*1100(0|1)*
b) (0|1)*(00(0|1)*11|11(0|1)*00) (0|1)*
c) (0|1)*00(0|1)*| (0|1)*11(0|1)*
d) 00(0|1)*11|11(0|1)*00

[2] The RE in which any number of 0's is followed by any number of 1's followed by any number of 2's is?
a) (0 | 1 | 2)*
b) 0*1*2*
c) 0* | 1 | 2
d) (0 | 1)*2*

[3] Which of the following rules is NOT a correct context-free rule, where non-terminals are {A, B}, and terminals are {a, b}
a) A → a | Ba
b) AB → a
c) a → Ba
d) Both b and c

[4] What is the output of lexical analyzer?
a) A set of RE
b) Syntax Tree
c) Set of Tokens
d) String Character

[5] Parsing is also known as _____

a) Lexical Analysis
b) Syntax Analysis
c) Semantic Analysis
d) code generation

[6] The set of all strings over $\sum = \{a,b\}$ in which strings consisting a's and b's and ending with in bb is

a) ab
b) a*bbb
c) (a|b)* bb
d) All of the mentioned

[7] When two parse trees are derived from the same grammar rules but both parse trees are different, this means, the grammar is .....

a) Ambiguous
b) Not LL(1)
c) Not LR(0)
d) Non ambiguous

[8] Users write the programs in which language?

a. Low-level Language
b. High-Level Language
c. Decimal-Format
d. Middle-Level Language

[9] Which of the following best defines the FIRST set of a non-terminal A in a context-free grammar?

A) The set of all terminals that can appear immediately to the right of A in any derivation
B) The set of all terminals that can begin strings derived from A, plus possibly ε if A can derive ε
C) The set of all non-terminals that can be derived from A in exactly one step
D) The set of all terminals that can follow A in any derivation

[10] Consider the following

$S \rightarrow aAB \mid \varepsilon$
$A \rightarrow b \mid \varepsilon$
$B \rightarrow c$

What is FIRST(S)?

A) { a }
B) { a, ε }
C) { a, b, ε }
D) { a, b, c }

[11] Consider the following

$E \rightarrow TX$
$X \rightarrow +TX \mid \varepsilon$
$T \rightarrow id$

What is FOLLOW(T)?

(Assume $ marks end of input, and E is the start symbol)

A) { $ }
B) { +,$ }
C) { id, $}
D) { +, id, $}

[12] For an LL(1) grammar, which of the following is true about the parsing table?

A) Every cell contains at most one production
B) Every cell contains exactly one production
C) The table has rows for terminals and columns for non-terminals
D) The table size is always equal to the number of productions

[13] Given the non-LL(1) grammar fragment: A → ab | ac Which of the following is the correctly left-factored version that could become LL(1)?

A → aB B → b | c	A → aB B → a B → c	A → aB B → b C → c	A → a | b | c

[14] Consider the grammar:

E → T + E | T

T → id

[15] When constructing the LL(1) parsing table, what conflict arises?

A) Multiple entries for M[T, id]

B) Multiple entries for M[E, +] and M[E, $]

C) Multiple entries for M[E, id]

D) No conflict; the grammar is LL(1)

[16] The following grammar is LL(1)?

S → Aa | b

A → a | ε

A) True

B) False

[17] What is the primary goal of the code optimization phase in a compiler?

A) To translate high-level language into assembly code

B) To improve the execution time and/or reduce the memory footprint of the generated code

C) To detect syntax errors in the source program

D) To generate an intermediate representation from the parse tree

[18] What is the primary task of the code generation phase in a compiler?

A) To convert source code into an abstract syntax tree

B) To translate the intermediate representation (IR) into target machine code or assembly language

C) To optimize loop structures for better cache performance

D) To parse the program and build a symbol table

[19] Given the left-recursive grammar:

E → E + T | T

T → id

Which of the following is the correctly transformed non-left-recursive version?

E → T E' E' → + T E' | ε T → id	E → T E' E' → + T E' | T T → id	E → E T | T T → id	E → T + E | T T → id

[20] Which of the following statements correctly distinguishes top-down parsing from bottom-up parsing?

A) Top-down parsers start from the start symbol and expand using productions; bottom-up parsers start from input tokens and reduce to the start symbol

B) Top-down parsers use LR items; bottom-up parsers use recursive descent

C) Top-down parsing is more powerful than bottom-up parsing

D) Bottom-up parsers cannot handle left-recursive grammars, but top-down parsers can

	Assiut University- Faculty of Science **Second Semester- Final Exam 2025-2026** **Mathematics Department**	**Level : (4)** **Date: 18/5/2026** **Time: 2 hrs**	
Course Title: Scientific Computation (1)		**Code: MC451**	
Instructors: Dr. Amira Allam			
Important:	**No. of pages 5**	**No. Of questions 5**	**Total Mark: 50 degrees**

Question 1: Choose the correct answer, put the answers in the table (5 Marks)

Suppose that you have been given the following joint probabilities

	A1	A2
B1	0.50	0.20
B2	0.25	0.05

1. Determine $P(A2)$.
   a) 0.25 b) 0.70 c) 0.75 d) 0.30
2. Determine $P(A2/B1)$.
   a) 0.1857 b) 0.2857 c) 0.3857 d) 0.4857
3. Determine $P(A1 \cup B1)$.
   a) 0.5 b) 0.95 c) 0.25 d) 1.45
4. Determine $P(A1 \cap B1)$.
   a) 0.50 b) 0.75 c) 0.70 d) 0.25
5. Determine $P(A2 \cap B2)$.
   a) 0.50 b) 0.75 c) 0.70 d) 0.20

Question 2: Choose the correct answer, put the answers in the table (5 Marks)

Suppose we have a universal set U = {1, 2, 3, 4, 5, 6}, and we define two events A and B as follows:

A: The event of rolling an even number on a fair six-sided die.
B: The event of rolling an odd number on a fair six-sided die.

1. The probability of the event of rolling an even number on a fair six-sided die. P(A) is
   a) 0.25 b) 3 c) 0.5 d) 12
2. The probability of $A \cap B$, P($A \cap B$)
   a) 1 b) 0.5 c) 6 d) 0
3. The probability of B^c is
   a) 0 b) 1 c) 0.5 d) 0.1
4. The probability of $(A \cup B)^c$ is
   a) {1,2,3,4,5,6} b) 1 c) 0 d) 0.5
5. The event of A^c is
   a) {1,2,3,4,5,6} b) {2,4,6} c) {1,3,5} d) 0

	Assiut University- Faculty of Science **Second Semester- Final Exam 2025-2026** **Mathematics Department**	**Level : (4)** **Date: 18/5/2026** **Time: 2 hrs**	
Course Title: Scientific Computation (1)		**Code: MC451**	
Instructors: Dr. Amira Allam			
Important:	**No. of pages 5**	**No. Of questions 5**	**Total Mark: 50 degrees**

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   a) 0.25 b) 0.70 c) 0.75 d) 0.30
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   a) 0.1857 b) 0.2857 c) 0.3857 d) 0.4857
3. Determine $P(A1 \cup B1)$.
   a) 0.5 b) 0.95 c) 0.25 d) 1.45
4. Determine $P(A1 \cap B1)$.
   a) 0.50 b) 0.75 c) 0.70 d) 0.25
5. Determine $P(A2 \cap B2)$.
   a) 0.50 b) 0.75 c) 0.70 d) 0.20

Question 2: Choose the correct answer, put the answers in the table (5 Marks)

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   a) 1 b) 0.5 c) 6 d) 0
3. The probability of B^c is
   a) 0 b) 1 c) 0.5 d) 0.1
4. The probability of $(A \cup B)^c$ is
   a) {1,2,3,4,5,6} b) 1 c) 0 d) 0.5
5. The event of A^c is
   a) {1,2,3,4,5,6} b) {2,4,6} c) {1,3,5} d) 0

Question 3: Choose the correct answer, put the answers in the table (10 Marks)

The random variable X has the following probability distribution.

P(x)	0.2	0.3	0.4	0.1

1. Is this probability distribution valid?
   a) True b) False
2. P(X ≥ 0) =
   a) 1 b) 0 c) 0.8 d) 0.9
3. P(2< X <5) =
   a) 0 b) 1 c) 0.2 d) 0.1
4. The probability that x = 1 is
   a) 1 b) 0.2 c) 0 d) 0.3
5. The expected value of X, E(X) is
   a) 2 b) 3.75 c) 3.2 d) 0
6. The variance value of X, V(X) is
   a) 23.5833 b) 13.56 c) 6.66 d) 3.333
7. The expected value of 10 , E(10) is
   a) 100 b) 0 c) 8 d) 10
8. The expected value of E(X+10) is
   a) 13.2 b) 3.2 c) 0 d) 13.75
9. The variance value of V(X+10) is
   a) 33.5833 b) 23.56 c) 23.5833 d) 13.56
10. The expected value of X, E(10X) is
    a) 320 b) 37.5 c) 32 d) 375

Question 4: Choose the correct answer, put the answers in the table (10 Marks)

1. If P(A|B)=P(A), then A and B are:
   a) Mutually exclusive b) Dependent c) Independent d) Exhaustive
2. Which measure of central tendency is most affected by outliers?
   a) Median b) Mode c) Mean d) Range
3. The position of the median for a dataset with 15 values is:
   a) 7th b) 8th c) 7.5th d) 15th
4. A measure of variation that has the same units as the original data is:
   a) Variance b) Range c) Standard deviation d) Coefficient of variation
5. If all values in a dataset are identical, the standard deviation is:
   a) 1 b) 0 c) negative d) positive
6. For an even number of observations, the median is:
   a) The middle number b) The smallest number c) The most frequent number d) The average of the two middle numbers
7. Which measure is not a measure of variation?
   a) Mode b) Range c) Variance d) Standard deviation
8. The variance can never be:
   a) 1 b) 0 c) negative d) positive

9. CV is calculated as:

a) (Mean / SD) × 100 b) (SD / Mean) × 100 c) (Range / Mean) × 100 d) (Variance / Mean) × 100

10. A coin is tossed 50 times and lands on heads 32 times. What is the empirical probability of getting tails?

a) 32/50 b) 18/50 c) 1/2 d) 50/18

The Answers Tables

Question 1:	1	2	3	4	5

Question 2:	1	2	3	4	5

Question 3:	1	2	3	4	5	6	7	8	9	10

Question 4:	1	2	3	4	5	6	7	8	9	10

Question # 5: (10 marks)

Write a MATLAB code using modified Eular method to find y(0.6) to solve the following equation

$$\frac{dy}{dx} = x + y,\ y(0) = 1 \ \text{(h=0.2)}$$

(*hint: using runge kutta of order four for initial values*)

Question # 5: (10marks) Write the outputs of the following codes

A=[1 2; 2 3]; X=A.*A; disp(X);	A=5; While (A<10) S=A/2; A=A+2; disp(S); end	C=1; for j=5:3:12 C = C*j; end disp(C)

End of Exam

Best Wishes Dr. Amira Allam

Faculty of Science	جامعة الشهباء	كلية العلوم
Department of Mathematics		قسم الرياضيات

امتحان نهائي الفصل الدراسي الثاني2026 - 2025

للفرقة: الرابعة علوم التاريخ: 20-5-2026

المادة: هيدروديناميكا ومرونة	الشعبة:رياضيات	الزمن: ساعتان
الدرجة الكلية : 50 درجة	رقم المقرر ورمزه: 431 ر	

اجب عن اربعة أسئلة فقط مما يلي:(درجة كل سؤال 12.5)

السؤال الأول:

1-(أ) استنتج العلاقات التي تربط بين الاجهادات الداخليه بالقوي الخارجية (6 در جات)

(ب) اذا كان ممتد الاجهادات المؤثرة علي النقطهO بالنسبة لمجموعة الاحداثيات (x, y, z) مقدره عناصره بالداين لكل متر مربع هو $\begin{bmatrix} 10 & 6 & -8 \\ 6 & 20 & -4 \\ -8 & -4 & 10 \end{bmatrix}$ ما هي مصفوفة الاجهادات (u, v, w) بالنسبة لمجموعة الاحداثيات الناتجة عن المجموعة الاولي بدوران قدره $45°$ حول محور ox ابتداءا من المحور oy (6.5درجه)

السؤال الثاني:

2-(أ) كيف يمكنك حساب الانفعال الطولي للعنصر المرن P_0Q_0 والذي يصنع مع المحاور (x, y, z) جيوب تمام اتجاه بالمقادير (l, m, n) (6 درجات)

(ب) استنتج مركبات الاجهاد بدلالة مركبات الانفعال (6.5 در جة)

السؤال الثالث:

3- (أ) مركبات الاجهاد عند نقطة في جسم مجهد هي:

$$\delta_x = ky^2 \quad \delta_y = -kx^2, \quad \delta_z = 0, \tau_{xy} = \tau_{yz} = \tau_{zx} = 0$$

عين مركبات الازاحة u(x ,y) , v(x ,y) حيث k ثابت (6 در جات)

(ب)أذكر ما تعرفه عن : اللزوجة وعلاقتها بالموانع النيوتونيه – الشد السطحي وعلاقته بالضغط (6 . 5 درجه)

السؤال الرابع :(12.5 در جة)

اشتق معادلةالاتصال بطريقتين وكذلك معادلة اويلر بطريقتين ومن ثم اكتبها بدلالة متجه الدوامه

السؤال الخامس :(12.5در جة)

ناقش مسألة رايلي –تايلور للاستقرار وأوجد معادلة التشتت وبين متي يكون النظام مستقر أو غير مستقر

اعداد: ا د محمود حامد عبد الله و د حسين السيد حماد مع التمنيات بالنجاح

Faculty of Science	جامعة أسيوط	كلية العلوم
Department of Mathematics		قسم الرياضيات

امتحان نهائي الفصل الدراسي الثاني2026 - 2025

للفرقة: الرابعة علوم التاريخ: 20-5-2026

المادة: هيدروديناميكا ومرونة	الشعبة:رياضيات	الزمن: ساعتان
الدرجة الكلية : 50 درجة	رقم المقرر ورمزه: 431 ر	

اجب عن اربعة أسئلة فقط مما يلي:(درجة كل سؤال 12.5)

السؤال الأول:

1-(أ) استنتج العلاقات التي تربط بين الاجهادات الداخليه بالقوي الخارجية (6 در جات)

(ب) اذا كان ممتد الاجهادات المؤثرة علي النقطهO بالنسبة لمجموعة الاحداثيات (x, y, z) مقدره عناصره بالداين لكل متر مربع هو $\begin{bmatrix} 10 & 6 & -8 \\ 6 & 20 & -4 \\ -8 & -4 & 10 \end{bmatrix}$ ما هي مصفوفة الاجهادات (u, v, w) بالنسبة لمجموعة الاحداثيات الناتجة عن المجموعة الاولي بدوران قدره 45° حول محور oxابتداءا من المحور oy (6.5درجه)

السؤال الثاني:

2-(أ) كيف يمكنك حساب الانفعال الطولي للعنصر المرن P_0Q_0 والذي يصنع مع المحاور (x, y, z) جيوب تمام اتجاه بالمقادير (l, m, n) (6 درجات)

(ب) استنتج مركبات الاجهاد بدلالة مركبات الانفعال (6.5 در جة)

السؤال الثالث:

3- (أ) مركبات الاجهاد عند نقطة في جسم مجهد هي:

$$\delta_x = ky^2 \quad \delta_y = -kx^2, \quad \delta_z = 0, \tau_{xy} = \tau_{yz} = \tau_{zx} = 0$$

عين مركبات الازاحة u(x ,y) , v(x ,y) حيث k ثابت (6 در جات)

(ب)أذكر ما تعرفه عن : اللزوجة وعلاقتها بالموانع النيوتونيه – الشد السطحي وعلاقته بالضغط (6 . 5 درجه)

السؤال الرابع :(12.5 در جة)

اشتق معادلةالاتصال بطريقتين وكذلك معادلة اويلر بطريقتين ومن ثم اكتبها بدلالة متجه الدوامه

السؤال الخامس :(12.5در جة)

ناقش مسألة رايلي –تايلور للاستقرار وأوجد معادلة التشتت وبين متي يكون النظام مستقر أو غير مستقر

اعداد: أ.د محمود حامد عبد الله و د.حسين السيد حماد

مع التمنيات بالنجاح

	Faculty of Science 1st Semester - Final Exam 2025/2026 – Dec. 26/2025	Computer Architecture (421E) 421 هـ - بنية الحاسب Time: 2 Hours Marks: 50

Important remarks
- Number of Pages: 4 Questions/Answers
- Number of Questions: 4 (Attempt all questions, questions are not equal in marks.)
- الصفحات الفارغة المقابلة للأسئلة تستخدم كمسودة أو في حالة الحاجة للإجابة مع توضيح ذلك.
- If necessary, assume unstated data but indicate your assumption clearly.

Question one: Complete between brackets. Abbreviations are allowed. (11 points, 1 point each space)

a) [ ], [ ], and pipelining are examples of parallelism in uniprocessor systems.

b) Utilizing multiple processors by running independent programs (processes) simultaneously is known as [ ].

c) Replacing a processor with a faster version decreases the [ ], while adding more processors increases the [ ].

d) The instruction [ ] is the time that an instruction takes to complete its instruction cycle in a pipeline.

e) One of the application domains for DSA is [ ].

f) To close the gap between the fast clock rates of modern processors and the long time required to access DRAMs, [ ] are used.

g) To use the bus the DMA module must force the processor to suspend operation temporarily. This technique is more common and is referred to as [ ].

h) Like EEPROM; a [ ] uses an electrical erasing technology, but it does not provide byte-level erasure.

i) In an associative cache memory, once the cache has been filled, a [ ] algorithm is needed to load a new block from the main memory to the cache memory.

Question two: (18 points, show your answer steps)

P1 [2p]: Consider a program running on a single processor such that a fraction 80% of the execution time involves code that is infinitely parallelizable with no scheduling overhead.

(a) What is the speedup limit?

(b) Find the speedup with 12 processors.

P2 [1p]: Consider a microprocessor having 32-bit instructions composed of two fields: the first byte contains the opcode and the remainder contains a memory operand address. What is the maximum directly addressable memory locations?

P3 [2p]: A computer system has a cache and a main memory, 5 ns are required to access a referenced word if it is in the cache. Otherwise, 70 ns are required to fetch it to the cache. If the hit ratio is 80%, what is the average access time to a referenced word on this computer system?

P4 [2p]: Consider the following code:

```
for (i = 0; i < 20; i++)
        for (j = 0; j < 10; j++) a[i] = a[i]*j ;
```

a) One example of the spatial locality in this code is:

b) One example of the temporal locality in this code is:

P5 [4p]: Consider two different implementations, M1 and M2, of the same instruction set. There are five classes of instructions (A, B, C, D, and E) in the instruction set. M1 has a clock rate of 2 GHz and M2 has a clock rate of 4 GHz.

Class of instructions	A	B	C	D	E
Instructions distribution	25%	10%	10%	25%	30%
CPI for M1	1	2	3	2	2
CPI for M2	2	2	2	4	4

Given a program with instructions distributed into classes as given for both M1 and M2. Find:

Average CPI for M1 =

Average CPI for M2 =

Complete: M2 is .....times ..... than M1.

P6 [5p]: Using the half precision floating point format that is only 16 bits wide. The left most bit is the sign bit, the exponent is 5 bits, and the fraction is 10 bits long. Evaluate:

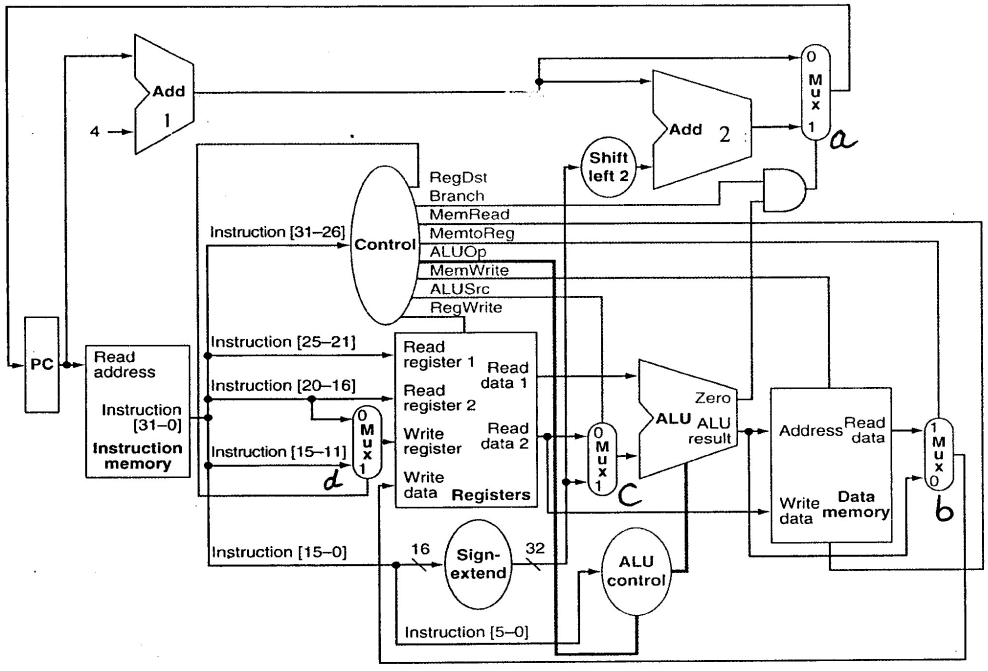
a) the decimal value for the binary number: 0111001111100000

b) the binary representation for the decimal number (63.375)

P7 [2p]: Consider a processor with six stages that has equal latency of 150 ps for each stage. What is the speedup for a pipelined processor running a program with 4000 instructions, assuming 10% stalls due to hazards and the pipeline is initially empty?

Question three: (7.5 points)

Simple single cycle datapath for core MIPS architecture (add, sub, and, or, stl, lw, sw, beq)
Blocks: PC, IM, Registers, DM, ALU, Add1, Add2, Muxs a;b;c;d, shift-left2, sign-ex, ALU-CU, Control



(A) Consider the next instruction: **and rd, rs1, rs2** # Reg[rd] = Reg[rs1] AND Reg[rs2]
(There are 15 blocks in the given datapath, don't repeat blocks in the following.)

(i) Which resources (blocks) perform a useful function for this instruction? Name the block

(ii) Which resources (if any) produce no output for this instruction? Name the block

(iii) Which resources (if any) produce output that is not used? Name the block

(B) Complete the next table with the required control signals to perform the given MIPS instruction.

	RegDst	ALUSrc	MemRead	MemWrite	RegWrite	MemtoReg	Branch
sw							

(C) One instruction that will produce wrong results if MemtoReg is stuck to zero is:

(D) One reason to have multiple level of control (such as main control unit and ALU control).

Question four: (16.5 points)

(G1) [10.5p]: Complete the following as indicated.

(a) What are the major functions of an I/O module? [2.5]

1. 2. 3.

4. 5.

(b) The most common classes of interrupts are: [2]

1. 2. 3. 4.

(c) Methods of accessing units of data in different memory types include: [2]

1. 2. 3. 4.

(d) List three differences between SRAM and DRAM. [1.5]

1. SRAM while DRAM

2. SRAM while DRAM

3. SRAM while DRAM

(e) The performance of a program depends on: [2]

1. 2.

3. 4.

(f) Due to the slowing of Moore's Law; quadrupling DRAM capacity has taken [ ] years recently. [0.5]

(G2): (3 points each, use any blank page.)

(i) Draw a diagram for a taxonomy of parallel processor architectures.

(ii) Draw a flowchart (or write an algorithm) to show the floating-point multiplication (z = x * y).

END of Questions & Best wishes, *Dr. Hisham A. Aboulenien and the committee*

جامعة أسيوط	امتحان مقرر: القضايا المجتمعية	اليوم والتاريخ: السبت ٢٠٢٦/٥/٢٣م
كلية العلوم	الفصل الدراسي الثاني	الزمن:/ ساعتان
كود المقرر: 50 م.ج	العام الجامعي ٢٠٢٥/ ٢٠٢٦	عدد الصفحات: (4)

السؤال الأول: ضع علامة صح (T) أمام العبارة الصحيحة، وعلامة خطأ (F) أمام العبارة غير الصحيحة: (50 درجة)

١	يُعرف الفساد بأنه انتهاك القوانين ومخالفة الواجبات الوظيفية لتحقيق مكاسب عامة.	F	T
٢	يعتبر انخفاض مستوى الدخول من الأسباب السياسية للفساد المالي والإداري.	F	T
٣	سوء تعامل الموظفين مع الجمهور هو أحد الأسباب الإدارية لانتشار الفساد في الدولة.	F	T
٤	من الأسباب الإدارية لتفشي الفساد غياب الرقابة المركزية على الوحدات الإدارية الفرعية.	F	T
٥	يعتبر ضعف دور مؤسسات المجتمع المدني في الرقابة على الجهاز الإداري في الدولة أحد الأسباب الاقتصادية لارتكاب جرائم الفساد.	F	T
٦	ضعف القيم والضوابط الأخلاقية في المجتمع يساعد على انتشار ظاهرة الفساد المالي والإداري.	F	T
٧	جهل الأفراد بدورهم في مكافحة الفساد يؤدي إلى تنامي الفساد المالي والإداري.	F	T
٨	يساعد عدم الالتزام بالأحكام والقواعد المنظمة لأموال الدولة على انتشار الفساد المالي.	F	T
٩	تعتبر الرشوة من صور الفساد المالي.	F	T
١٠	من مظاهر الفساد الإداري التزوير في تقدير القيمة الضريبية وتحصيلها.	F	T
١١	يؤدي التعاون مع الزملاء، وإطاعة رؤساء العمل إلى تفشي الفساد الإداري.	F	T
١٢	يؤدي الفساد إلى حرمان الفقراء والمهمشين من الحصول على الخدمات العامة.	F	T
١٣	الاحتقان بين الأفراد وزيادة الفئات الضعيفة، من آثار الفساد على المستوى الاجتماعي.	F	T
١٤	تقتصر وسائل مكافحة الفساد على سلطات الدولة فقط.	F	T
١٥	تهدف الملاحقة الجنائية للمفسدين -بصفة أساسية- إلى الانتقام من المفسدين.	F	T
١٦	المعنى الضيق للديموغرافية يقتصر على دراسة حجم وتركيب السكان، والتغيرات التي تطرأ على السكان وتطلق عليها الديموغرافية الشكلية.	F	T
١٧	تتكون الديموغرافية من مجالين المجال الأول يختص بتركيب السكان والمجال الثاني يختص بديناميكية السكان.	F	T

١٨	لا ينظر إلى الزيادة السكانية كمشكلة في حد ذاتها وإنما ينظر إليها في ضوء التوازن بين السكان والموارد.	F	T
١٩	من الآثار المترتبة على الزيادة السكانية في مصر ارتفاع معدلات البطالة وخاصة بين الخريجين الجدد.	F	T
٢٠	من الآثار المترتبة على الزيادة السكانية في مصر زيادة الواردات من السلع الاستهلاكية وبصفة خاصة القمح	F	T
٢١	يجب عدم التركيز على فئة الشباب لترسيخ مفاهيم الأسرة الصغيرة والتخطيط الإيجابي لتحقيق الهدف القومي المتمثل في طفلين لكل أسرة.	F	T
٢٢	إستراتيجية التعامل مع تأخر سن الزواج من الإستراتيجيات الداعمة للاستراتيجية القومية للسكان والتنمية.	F	T
٢٣	لا تركز الإستراتيجية القومية للسكان والتنمية على تحسين خصائص السكان وتحقيق معدلات أعلى من التنمية البشرية والتماسك والترابط الاجتماعي والريادة الإقليمية.	F	T
٢٤	لا تهدف إستراتيجية التنمية المستدامة إلى تعزيز الفرص التنافسية لمصر وإحياء دورها التاريخى بوصفها الدولة الرائدة فى المنطقة وتحسين المستويات المعيشية للمواطن.	F	T
٢٥	يجب عدم التأكيد على أهمية التربية السكانية بالمدارس والجامعات والعمل على تطوير الخطط والبرامج الدراسية بحيث تصبح مادة إجبارية ضمن المناهج الدراسية.	F	T

السؤال الثاني: اختر الإجابة الصحيحة من بين الإجابات المذكورة: (٥٠ درجة)

٢٦	من سلبيات "تجريم عمليات الفساد" كإحدى وسائل مكافحة الفساد.....						
	A	احتمال النيل من سمعة الموظف العام والتشهير به	B	تحقيق الردع العام	C	الداخلية أ، ب معًا	
٢٧	يُقصد ب .....الالتزام بأن تكون كل مرافق الدولة تعمل وفقًا لقواعد معروفة للجميع من حيث الإجراءات والأهداف.						
	A	النزاهة	B	الكفاءة	C	الشفافية	
٢٨	يُقصد ب ..... في مجال الوظيفة العامة، مجموعة القيم المتعلقة بالصدق والأمانة والإخلاص والمهنية في العمل.						
	A	التخصص	B	النزاهة	C	الشفافية	
٢٩	عدم وضوح الاختصاصات داخل كل وحدة إدارية هو أحد الأسباب ..... لانتشار الفساد.						
	A	الاجتماعية	B	الإدارية	C	السياسية	
٣٠	الرقابة التي يمارسها الجهاز المركزي للمحاسبات على أداء الجهاز الإداري للدولة هى إحدى صور						
	A	المساءلة القضائية	B	مساءلة الهيئات الرقابية	C	المساءلة الدستورية	
٣١	جوهر المساءلة .....هو تعبير المواطنين عن رضاهم من عدمه بشأن أداء الجهاز الإداري للدولة، وذلك بكافة الوسائل كالانتخابات.						
	A	الشعبية	B	القضائية	C	الداخلية	
٣٢	من الأسباب الاقتصادية للفساد المالي والإداري						
	A	تدني الأجور والمرتبات	B	زيادة معدلات التضخم	C	جميع ما سبق	
٣٣	قصور نظم التعيين والترقية بالجهاز الإداري للدولة هو أحد الأسباب ..... لانتشار الفساد في الدولة.						

	A	الاقتصادية	B	الاجتماعية	C	لا شيء مما سبق
٣٤	عدم الالتزام بمبدأ الفصل بين السلطات الثلاث التشريعية والتنفيذية والقضائية هو أحد الأسباب ..... لتفشي الفساد.					
	A	القانونية	B	الإدارية	C	السياسية
٣٥	من مظاهر الفساد المالي.....					
	A	التهرب الضريبي	B	الرشوة	C	جميع ما سبق
٣٦	منح الموظف امتيازات وتسهيلات لبعض المواطنين دون البعض الآخر دون الاستناد إلى قواعد موضوعية محددة هو أحد مظاهر الفساد.....					
	A	الإداري	B	السياسي	C	لا شئ مما سبق
٣٧	زعزعة الثقة في الحكم ومصداقيته هو أحد آثار الفساد على المستوي.....					
	A	السياسي	B	الاقتصادي	C	لا شئ مماسبق
٣٨	من أهم وسائل مكافحة الفساد.....					
	A	تجريم عمليات الفساد	B	استقلال والقضاء ونزاهته	C	أ،ب معًا
٣٩	من ضمانات فاعلية الملاحقة الجنائية للمفسدين					
	A	أن يكون الموظف العام في مأمن من الملاحقة القضائية	B	التزام سلطات التحقيق والمحاكمة باحترام حقوق الإنسان وحرياته الأساسية	C	جميع ما سبق
٤٠	لجان التحقيق البرلمانية هى إحدى صور ..... والتي يخضع لها الموظف العام.					
	A	المساءلة النيابية	B	المساءلة الداخلية	C	مساءلة الهيئات الرقابية
٤١	..... هو عدد الأفراد في مكان معين محدد ومعرفة ما إذا كان هذا العدد أكبر أو أصغر من عدد الأفراد في نفس المكان في وقت سابق، وكذلك ما هو المقدار الذي سيصل إليه هذا الحجم في المستقبل.					
	A	حجم السكان	B	حجم الموارد	C	حجم المصادر
٤٢	يعرف برسا (pressat)..... بأنها دراسة السكان والتغيرات التي تطرأ على المجتمع وعليهم نتيجة التفاعل بين المواليد والوفيات والهجرة.					
	A	علم السكان	B	علم الإنسان	C	علم الأنثروبولوجيا
٤٣	..... هو إن العملية الخاصة بتحول السكان من حالة تكون فيها الخصوبة الوفيات مرتفعة إلى حالة أخرى تتميز بانخفاض الخصوبة والوفيات، تسمى تحول ديموجرافي أو تغير سكاني. وللتغير السكاني ثلاثة عناصر، المواليد والوفيات والهجرة ومع توالي حالات الميلاد والوفاة والانتقال، فإن العدد الإجمالي للسكان في منطقة ما قد يتغير.					
	A	التحول الديموجرافي	B	التحول الديموقراطي	C	التحول الاقتصادي
٤٤	..... تشير إلى العلاقة ما بين السكان ومساحة الأرض التي يقطنها هؤلاء السكان، وتقاس من خلال قسمة عدد السكان على مساحة الأرض، ويعبر عنها بمجموع عدد الأشخاص في الهكتار الواحد، أو في الكيلو متر مربع أو الميل المربع.					

	A	الكثافة السكانية	B	الرشاقة التنظيمية	C	الكثافة المرورية
٤٥	..... وهو اختلاف حجم السكان في هذا المجتمع عبر الفترات الزمنية المتباينة.					
	A	نمو السكان	B	حجم السكان	C	تباين السكان
٤٦	..... يتدرج توزيع السكان بين المنطقة الكبيرة مثل القارة أو المنطقة الصغيرة أو القرية، أو يتم تقسيم السكان على أساس درجة التحضر والتصنيع.					
	A	تشتت السكان	B	توزيع السكان	C	تباعد السكان
٤٧	..... مجموع الذكور والإناث ومختلف أفراده في فئات السن المختلفة، ومن مهن وحرف وثقافة أو مستويات تعليمية وزواجية وريفية وحضارية متعددة.					
	A	حجم السكان	B	تكوين السكان	C	نوعية السكان
٤٨	يرى (Stan Becker)..... بأنه "دراسة السكان في كل الحالات الاستقرار والحركة، وتتمثل جوانب الاستقرار في: العمر والنوع، السلالة، الحالة الزواجية، الخصائص السكانية الاقتصادية، بينما تتمثل الجوانب الدينامية في: الخصوبة، الوفيات، الهجرة، الزواجية، النمو السكاني".					
	A	علم الاجتماع	B	علم السكان	C	علم الطبوغرافيا
٤٩	..... هي تلك الجهود العلمية لاستثمار وتعبئة كافة الموارد والإمكانيات المادية والبشرية لتحقيق أهداف المجتمع.					
	A	التنشيط	B	التنمية	C	النوعية
٥٠	..... هي التنمية ذات النسق الجامع بين كل من التنمية الاقتصادية والاجتماعية والثقافية والسياسية في إطار متكامل وخلق سياسة مرسومة ذات استراتيجية معلنة لإشباع الاحتياجات ومواجهة المشكلات الفردية والجماعية والمجتمعية خلال فترة زمنية محددة.					
	A	التنمية المستدامة	B	التنمية الشاملة	C	التنمية المتوازنة

انتهت الأسئلة، مع تمنياتنا بالنجاح والتوفيق ،،،

لجنة الممتحنين

قسم الرياضيات كلية العلوم امتحان نهاية الفصل الدراسي الثاني ٢٠٢٥/٢٠٢٦ م	الفرقة : المستوي الثالث المادة : الطرق الرياضية رقم المقرر : ٣٣٤ر	Department of Math. Faculty of Science الزمن: ساعتان التاريخ : ١٧ /٥/ ٢٠٢٦ م درجة الامتحان : (٥٠ درجه)

أجب عن أربعة أسئلة فقط مما يأتي: (١٢.٥ درجه لكل سؤال)

(١- أ) إذا كان $L\{F(t)\}=f(s)$ فأوجد بالبرهان قيمة كلاً من : $(i)L\{\text{erf}\sqrt{t}\}$, $(ii)L\{\cosh at\}$

(ب) أوجد قيمة كلاً مما يأتي : $(i)\ L\{(t^2-4t+6)\sin^2 4t\}$, $(ii)\ L\{te^{-4t}J_0(\sqrt{4}t)\}$

(٢-أ) أثبت أنه إذا كان $L\{F(t)\}=f(s)$ فإن

$$(i)\ L\{Ei(t)\}=\frac{1}{s}Ln(s+1) \quad , \quad (ii)\ L\{Si(t)\}=L\{\int_0^t \frac{\sin u}{u}du\}=\frac{1}{s}\tan^{-1}\frac{1}{s}$$

(ب) استخدم تحويلات لابلاس في حل المعادلة التفاضلية الجزئية الاتية :

$$\frac{\partial U}{\partial t}=\frac{\partial^2 U}{\partial x^2}-4U$$

$$U(0,t)=0 \quad , \quad U(\pi,t)=0 \quad , \quad U(x,0)=6\sin x-4\sin 2x$$

(٣-أ) أثبت أنه إذا كان $L^{-1}\{f(s)\}=F(t)$ فإن :

$$(i)\ L^{-1}\{f(s-a)\}=e^{at}F(t)$$

$$(ii)\ L^{-1}\{e^{-as}f(s)\}=\begin{cases}F(t-a) & , \ t>a\\ 0 & , \ t<a\end{cases}$$

(ب) احسب التكاملات الآتية:

$$(i)\int_0^\infty \frac{e^{-2t}-e^{-5t}}{t}dt \quad , \quad (ii)\int_0^\infty t^2e^{-t}\cos t\,dt \quad , (iii)\int_0^\infty ue^{-u^2}\text{erf}\,u\,du$$

(٤-أ) استخدم تحويلات لابلاس لحل المعادلة التكاملية الآتية:

$$Y(t)=t^2+\int_0^t Y(u)\cos(t-u)du$$

(ب) أوجد كلاً مما يأتي :

$$(i)L^{-1}\{\frac{(s+1)e^{-\pi s}}{s^2+s+1}\}, \quad (ii)L^{-1}\{\frac{1}{(s^2+25)(s^2+16)}\}, \quad (iii)L\{(2+te^{-2t})^3\}$$

(٥-أ) حل المعادلة التفاضلية الاتية:

$$Y'''(t)-3Y''(t)+Y'(t)-Y(t)=t^2e^t \quad , \quad Y(0)=1, y'(0)=0, Y''(0)=-2$$

(ب) أوجد كلاً مما يأتي : $(i)L\{e^{-3t}(5\cosh 2t-\sinh 2t)\}$, $(ii)\ L^{-1}\{\frac{5s^2-16s-11}{(s+1)(s+2)^2}\}$

انتهت الأسئلة مع التمنيات بالتوفيق ،،،،،،،،،،،

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