



Subject: Visual Basic
Branch : mathematics & physics
Examiner : Samaa Fuad

Class : 2nd year
Time : 3 hours
Date :

Note: Answer four questions only.

Q.1: A/ Correct the following statements.(6M)

- 1- lable 1. caption = "abc"
- 2- text1.text=science
- 3-for i=10 to 1 step2

B/ Write a program to find the function f where

$$f = \begin{cases} \frac{1}{x-1} & \text{if } x < 1 \\ x-1 & \text{if } x \geq 1 \end{cases} \quad (6.5M)$$

Q.2: A/ What are the following properties used for? (answer 3 only) (6M)

- 1) Multiline in text box
- 2) Forecolor
- 3) Sorted in list tool
- 4) interval in timer tool

B/ Write a program to compute y where $y = 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$ (6.5M)

Q.3: A/ What is the difference between: (6M)

- 1- cint, cst
- 2- inputbox, messagebox
- 3- do while, do untile

B/ Write a program to enter a mark of a student then print (pass) if his mark greater than or equal to 50 and print (fail) otherwise. (6.5M)

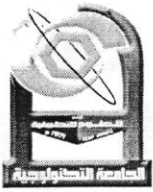
Q.4: A/ What is the meaning of string? How about the declaration? And how you find the length of the string? (6M)

B/ Design a form with a text box. Such that when user enters g, b and y the form colored to green, blue and yellow respectively. (6.5M)

Q.5: A/ How many methods of inputting variables in V.B.? give an example for each one. (6M)

B/ Write a program to find the average of (n) numbers. (6.5M)

Best wishes



University of Technology
Department of Applied Sciences
Final Examination 2016-2015
Second Attempt



Subject : Linear Algebra
Branch : Math. And Computer Applications
Examiner : Dr. Jehad R. Kider

Class : 2nd year
Time : 3 hours
Date :

Q₁:(a) When possible find an invertible matrix P such that $P^{-1}AP$ is a diagonal

matrix if $A = \begin{pmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{pmatrix}$.

(b): Write the dimension of the following vector spaces : $(V_3(\mathbb{R}) : \mathbb{R})$,

$(M_n(\mathbb{C}) : \mathbb{R})$, $(M_{m,n}(\mathbb{R}) : \mathbb{R})$

(14 marks)

Q₂:(a) Find a basis for the subspace W of $V_4(\mathbb{R})$ generated by the set

$S = \{v_1=(1,2,3,0), v_2=(-1,0,-1,2), v_3=(2,1,3,-3), v_4=(1,1,2,-1)\}$.

(b): Is the definition $\langle A, B \rangle = \text{trace}(BA)$, an inner product on $M_n(\mathbb{R})$.

(14 marks)

Q₃:(a) Show that the set $\{(3+\sqrt{2}, 1+\sqrt{2}), (7, 1+2\sqrt{2})\}$ is linearly dependent over \mathbb{R} .

(b): Extend the set $S = \{v_1=(-1,0,1), v_2=(1,0,-1)\}$ to obtain an orthonormal basis for $V_3(\mathbb{R})$.

(14 marks)

Q₄:(a) Prove that similar matrices have the same eigenvalues.

(b): Solve if the solution exists to the system : $x_1+x_2-2x_3+x_4+3x_5=1$

$2x_1-x_2+2x_3+2x_4+6x_5=-1$, $3x_1+2x_2-4x_3-3x_4-9x_5=2$

(14 marks)

Q₅:(a) Min $z = 30y_1+40y_2$, subject to :

$2y_1+y_2 \geq 12$, $y_1+y_2 \geq 9$, $y_1+3y_2 \geq 15$, $y_1 \geq 0$, $y_2 \geq 0$.

(b): Let $T: V_3(\mathbb{R}) \rightarrow V_2(\mathbb{R})$ be a linear transformation defined by :

$T(\alpha, \beta, \gamma) = (\alpha + \beta - \gamma, 2\alpha + \gamma)$. Find the matrix of T relative to the bases