



University of Technology
Department of Applied Sciences
Final Examination 2014/2015



Subject : language C++ year: four stage
Division : الرياضيات التطبيقية Time : 3 hours
Examiner : Asst.prof.shymaa Hussain Salih Date :

Answer four Questions
All Questions have same marks

- Q1) (a) Write a program to replace the triangle upper the secondary diagonal with the triangle under secondary diagonal in matrix (4x4)?
(b) Write a program c++ to print name of day of week using Switch-case statements?
- Q2) (a) write a program to enter matrix (3x3) then replace the third row with first row ?
(b) Write c++ program to compute average of students using structures?
- Q3) (a) Write a program c++ to arrange ten value w[10] by ascending sort using function ?
(b) Write a program c++ to compute distance Room using structures?
- Q4) (a) Write a program c++ to compute the factorial of one number using do-while Loop?
(b) Write a program c++ to find $y=x + \left(\frac{x^2}{2!}\right) + \left(\frac{x^3}{3!}\right) + \dots + \left(\frac{x^n}{n!}\right)$
- Q5) (a) Write a program c++ to enter 10 value and then sorting in descending order ?

(b) Write a program c++ to find transpose of

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{bmatrix} \rightarrow A^T = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 2 & 2 & 2 & 2 \\ 3 & 3 & 3 & 3 \\ 4 & 4 & 4 & 4 \end{bmatrix}$$



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Subject: Optimization
Division: Applied Mathematics
Examiner: L. Vieanabduhmsin

Class: 4th year
Time: 3 hours
Date: --2015

Answer Five Questions

Q1/A/For these data ,Solve the problem 3F // Cmax .

	1	2	3	4	5	6
a_i	3	12	5	2	9	11
b_i	8	6	4	6	3	1
g_i	13	14	9	12	8	13

B/Find the min. no. of late jobs for the data:

	1	2	3	4	5	6	7	8
P_i	4	3	1	5	2	3	1	3
D_i	7	6	4	7	9	6	4	5

(12 m)

Q2/Find the stationary point using the necessary condition for the function

$F(x_1, x_2, x_3) = x_1 + 2x_3 + x_2x_3 - (x_1)^2 - (x_2)^2 - (x_3)^2$, then determine whether this point is max. or min. on the function. (12 m)

Q3/ Prove that the SPT rule is optimal for 1 // $\sum C_i$. (12 m)

Q4/ Using the Jacobian Method to find the optimal solution for the following problem :

$$\begin{aligned} \text{Min } f(x) &= (x_1)^2 + 2(x_2)^3 + 10(x_3)^2 \\ \text{sub. to } g_1(x) &= x_1 + x_2 + x_3 - 5 = 0 \\ g_2(x) &= x_1 + 5x_2 + x_3 - 7 = 0 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

(12 m)

Q5/ Find the Bordered Hessian Matrix .

where

$$\begin{aligned} \text{Min } F(x) &= -x_1 - x_2 - x_3 \\ \text{sub. to } g_1(x) &= (x_1)^2 + x_2 - 3 = 0 \\ g_2(x) &= x_1 + 3x_2 + 2x_3 - 7 = 0 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

(12 m)

Q6 / Monthly Production of a factory are averaged to 100 unit per-day and Demand rate for these produced units (D) equaled to 2000 unit , weekly holding per-unit cost is equaled to (10 %) \$ where the set-up cost (k) equaled to 600 \$.Determine :-the total time of production cycle , the time of production and the optimum cost quantity .Discuss the results that you have got .

12 m)

GOOD LUCK