امتحان نهاية الفصل الدراسى الثانى (٢٠١٠ – ٢٠١١م)

الفرقة : الرابعـــة — الشعبـــة : رياضيات
الزمن : ٣ ساعات — التاريـــــخ : يونيو ٢٠١١م
المـــــــادة: بحوث عمليات — الدرجات: ١٠٥ درجة

أجب عن الاسئلة التالية:

**[Q-1] ( a ) Write the canonical formula for the following L.P.Problem** ( ١٠ درجات )

Min $Z = x + y - z$

S. t.

$$|x + y - z| \le 12,$$
$$-x + y + 3z = 10,$$
$$3x + y - 2z \ge 2, \quad x, y, z \ge 0$$

**[Q-1] ( b ) Solve the following L.P.Problem by using two different methods** ( ٢٠ درجة )

Max $Z = 3x + 2y$

S. t.

$$4x + y \le 8,$$
$$4x + 3y \le 12,$$
$$4x - y \le 8 \quad x, y \ge 0.$$

**[Q-2] ( a ) Write the dual problem for the following primal problem :** ( ١٠ درجات )

Max $Z = 5x_1 + 12x_2 + 4x_3$

Subject to

$$x_1 + 2x_2 + x_3 \le 10,$$
$$2x_1 - x_2 + 3x_3 = 8,$$
$$x_1, x_2, x_3 \ge 0$$

**[Q-2] ( b ) Define:** ( ١٥ درجة )

**( 1 ) Convex and non convex sets**
**( 2 ) The Dual problem for primal problem in Minimum case.**
**( 3 ) The degenerate solution**

**[Q-3] ( I ) Complete the following statements** ( ١٠ درجات )

**(a) The entering variable in the minimization problem is the non basic variable with the ..... Positive coefficient in Z-equation.**

**(b) If $Z(x_1) = Z(x_2)$, $x_1 \neq x_2$, then .....**

**(c) At any optimal solution the value of the primal problem ..... dual problem.**

**(d) If the value of any basic variable equal to zero in the table at any iteration , then this solution is called.....**

**(e) A set $M \subset R^n$ is said to be a convex set if .....**

أنظر خلفه ←

**[Q-3] ( II ) Solve the following L.P.P** ( ١٥ درجة )

Max $Z = 5x_1 + 12x_2 + 4x_3$

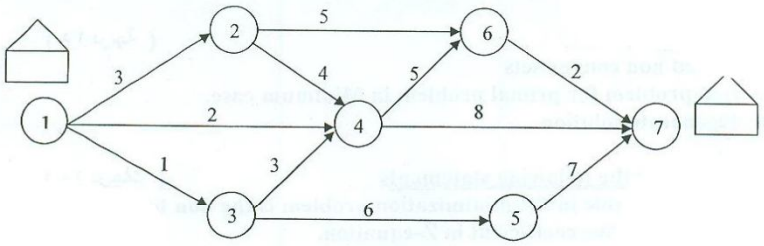
Subject to

$$x_1 + 2x_2 + x_3 \leq 10,$$
$$2x_1 - x_2 + 3x_3 = 8,$$
$$x_1, x_2, x_3 \geq 0$$

**[Q – 4] ( A ) Find The minimum cost for the following transportation problem:**
( ١٥ درجة )

| | M1 | M2 | M3 | Supply |
|---|---|---|---|---|
| W1 | 5 | 2 | 3 | 5 |
| W2 | 10 | 7 | 5 | 9 |
| W3 | 7 | 6 | 8 | 6 |
| | 8 | 7 | 5 | |

**[Q – 4] ( B ) Find The critical path for the following project and complete**
( ١٠ درجات )




مع خالص تمنياتي
د.