

الحل النموذجي لامتحان السراسي
الاول بقياسي جاسي المعطيات
حتم ترافضاد حسي

التمرين الاول -

1) صاها الفرقه 2

$$Z_2 = \frac{\alpha - \mu}{\sigma}$$

$$\begin{aligned} \mu_{12} &= \frac{1}{n} \sum x_{12} \\ \mu_{12} &= \frac{1}{2} (3-1) = 1 \\ \mu_{22} &= \frac{1}{2} (1+5) = 3 \\ \mu_{32} &= \frac{1}{2} (1+1) = 1 \end{aligned}$$

$$\begin{aligned} \sigma_{12}^2 &= \frac{1}{n} \sum (x_{12} - \mu_{12})^2 = \frac{1}{2} (2^2 + 2^2) = 4 \\ \sigma_{22}^2 &= 2 \\ \sigma_{32}^2 &= 1 \\ \sigma_{42}^2 &= 0 \end{aligned}$$

$$Z_2 = \begin{pmatrix} 1 & -1 & 0 \\ -1 & 1 & 0 \end{pmatrix}$$

$$r_2 = \frac{1}{n} \sum z_2^2$$

$$r_2 = \frac{1}{3} \begin{pmatrix} 1 & -1 \\ -1 & 1 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} 1 & -1 & 0 \\ -1 & 1 & 0 \end{pmatrix} = \frac{1}{3} \begin{pmatrix} 2 & -2 & 0 \\ -2 & 2 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

2) صاها الفرقه الاولى

فیزیالوژی

۱۱ - ۱۰ - ۱۴

$$X' = \begin{pmatrix} 1 & 0 & -1 \\ 0 & 1 & -1 \\ -1 & -1 & 2 \end{pmatrix}$$

۱۲ $\det(A - \lambda I) = 0$

$\lambda_3 = 0, \lambda_2 = 1, \lambda_1 = 3$ → ۲ و ۳

۱۳ $\det(A - \lambda I) = 0$

$\begin{pmatrix} -2 & 0 & -1 \\ 0 & -2 & -1 \\ -1 & -1 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = 0 \Rightarrow \begin{cases} x = y \\ z = 2x \end{cases} \Rightarrow \begin{pmatrix} x \\ x \\ -2x \end{pmatrix} \xrightarrow{b23} *$

$\Rightarrow x \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} \Rightarrow \mathbb{R} \left\{ (x, x, -2x) / x \in \mathbb{R}, x(1, 1, -2) \right\}$

$\mathbb{R} \left\{ (x, x, 0) / x \in \mathbb{R}, x(1, -1, 0) \right\}, \mathbb{R} \left(\begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix} \right) *$

$\mathbb{R} \left\{ (x, x, x) / x \in \mathbb{R}, x(1, 1, 1) \right\}, \mathbb{R} \left(\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \right) \xrightarrow{\lambda=0} *$

١٤ ما هي المتجهات الذاتية

$$A = \begin{pmatrix} 3 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

١٥ متجهات الوحدة

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

جزء الثاني

$$v = \frac{1}{\sqrt{10}} \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$$

١٦ ما هي المتجهات

$$v = \frac{1}{\sqrt{10}} \begin{pmatrix} 2 & -2 & 0 \\ -2 & 2 & 0 \\ 0 & 0 & 8 \end{pmatrix} = \begin{pmatrix} \frac{1}{\sqrt{5}} & -\frac{1}{\sqrt{5}} & 0 \\ -\frac{1}{\sqrt{5}} & \frac{1}{\sqrt{5}} & 0 \\ 0 & 0 & \frac{4}{5} \end{pmatrix}$$

١٧ المتجهات الذاتية $\lambda = \frac{2}{5}, \lambda = \frac{4}{5}$

$$|A - \lambda I| = 0$$

$$\lambda = \frac{4}{5}$$

$$\left| \begin{pmatrix} \frac{1}{5} - \frac{1}{5} & 0 & 0 \\ \frac{1}{5} & \frac{1}{5} & 0 \\ 0 & 0 & \frac{4}{5} \end{pmatrix} - \frac{4}{5} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \right| = \begin{vmatrix} -\frac{3}{5} & -\frac{1}{5} & 0 \\ -\frac{1}{5} & -\frac{3}{5} & 0 \\ 0 & 0 & 0 \end{vmatrix} = 0$$

$$\lambda = \frac{2}{5}$$

$$|A - \frac{2}{5} I| = 0$$

المتجهات الذاتية

$$h(v) = \frac{2}{5} v \Rightarrow \frac{6}{5} = \frac{4}{5} + \frac{2}{5} + \frac{2}{5} \Rightarrow \boxed{\lambda = 0}$$

सर्व शून्य अक्षरों के लिए (B)
 $\lambda_1 = \lambda_2 = \frac{4}{5} = 4$

$$(U - \lambda I) \begin{pmatrix} x \\ y \\ z \end{pmatrix} = 0$$

$$\left[\begin{pmatrix} \frac{1}{5} & -\frac{1}{5} & 0 \\ -\frac{1}{5} & \frac{1}{5} & 0 \\ 0 & 0 & \frac{4}{5} \end{pmatrix} - \begin{pmatrix} \frac{4}{5} & 0 & 0 \\ 0 & \frac{4}{5} & 0 \\ 0 & 0 & \frac{4}{5} \end{pmatrix} \right] \begin{pmatrix} x \\ y \\ z \end{pmatrix} = 0$$

$$\begin{pmatrix} -\frac{3}{5} & -\frac{1}{5} & 0 \\ -\frac{1}{5} & -\frac{3}{5} & 0 \\ 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = 0 \Rightarrow \begin{cases} yz - 3x \\ 3x - yz \end{cases}$$

$$F_1 \{ (x, -3x, a) / x, a \in \mathbb{R}, x(1, -3, a) \}$$

$$F_2 \begin{pmatrix} 1 \\ 3 \\ a \end{pmatrix}$$

$$\lambda = \frac{4}{5}$$

$$F_1 \{ (x, -x, 0) / x \in \mathbb{R}, x(1, -1, 0) \}$$

$$F_2 \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix}$$

$$\lambda = 0$$

$$F_1 \{ (x, x, 0) / x \in \mathbb{R}, x(1, 1, 0) \}$$

$$F_2 \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$$