Seat No: _____

# TC-02

**Business Statistics (Compulsory)**

**Time : 3 Hours]** **[Max. Marks : 70**

**Instructions :** (1) All questions carry equal marks.
(2) The use of simple calculator is allowed.
(3) Graph paper will be supplied on request.

**1. (a)** Explain Rank method to find coefficient of correlation. **04**

**(b)** From the following data, find the coefficient of correlation between Father's height ($x$) and their Son's height ($y$) by product moment method. **06**

| Father's height ($x$) | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
|---|---|---|---|---|---|---|---|---|
| Son's height ($y$) | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

**(c)** Find Yule's coefficient of association from the following data. **04**

N = 200, (A) = 80, ($\beta$) = 120 and (AB) = $\frac{2}{15}$ (20)

**OR**

**1. (a)** State the properties of coefficients of regression. **04**

**(b)** If the equations of two regression lines are $y = 4x + 40$ and $x = y + \frac{19}{3}$, find **06**

(i) means of $x$ and $y$
(ii) two coefficients of regression and
(iii) coefficient of correlation.

**(c)** Explain the meaning of Q = + 1, –1 and 0. **04**

**2. (a)** What is time series ? Explain the various components of it. **04**

**(b)** From the following data, obtain short term variations by using three yearly moving average method. **06**

| Year | 1984 | '85 | '86 | '87 | '88 | '89 | '90 | '91 |
|---|---|---|---|---|---|---|---|---|
| Sales | 80 | 88 | 98 | 92 | 84 | 88 | 80 | 100 |
| Year | '92 | '93 | '94 | '95 | '96 | '97 | '98 | '99 |
| Sales | 84 | 96 | 92 | 104 | 116 | 112 | 102 | 114 |

**(c)** Calculate seasonal Indices from the following data. **04**

| Year | $Q_1$ | $Q_2$ | $Q_3$ | $Q_4$ |
|---|---|---|---|---|
| 1995 | 109 | 131 | 107 | 93 |
| 1996 | 86 | 122 | 110 | 90 |
| 1997 | 77 | 106 | 94 | 79 |
| 1998 | 85 | 114 | 98 | 85 |
| 1999 | 108 | 117 | 106 | 83 |

**OR**

**2.** **(a)** What is Business forecasting ? Explain its importances. **04**

**(b)** The technology matrix for two industries A and B are as follows. **06**

$$\begin{array}{c} \\ A \\ B \end{array} \begin{array}{c} \begin{array}{cc} A & B \end{array} \\ \begin{bmatrix} 0.2 & 0.15 \\ 0.4 & 0.2 \end{bmatrix} \end{array}$$

If the final demands are 740 and 500 respectively, find the total production.

**(c)** Fit a straight line to the following data. Estimate the sales for the year 2005. **04**

| Year | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|
| Sales | 12 | 15 | 25 | 22 | 26 |

**3.** **(a)** What is Interpolation and Extrapolation ? Explain its importance. **04**

**(b)** From the following data, obtain the value of log 45 by using appropriate method of interpolation. **06**

log 40 = 1.6021, log 48 = 1.6812 and log 50 = 1.6990

**(c)** The population of city is 3,00,000 and of them 40% are females. 45% females of total females are in child bearing age. If the birth rate of that city is 32, estimate the number of children that will born during the next year. **04**

**OR**

**3.** **(a)** Explain registration method to obtain vital statistics. **04**

**(b)** From the following data, find crude and standarised death rates of two cities and compare them. **06**

| Age (in Year) | City A | | City B | |
|---|---|---|---|---|
| | Population | No. of deaths | Population | No. of deaths |
| 0-10 | 6,000 | 180 | 4,000 | 160 |
| 10-20 | 10,000 | 50 | 15,000 | 60 |
| 20-60 | 30,000 | 240 | 24,000 | 240 |
| Above 60 | 4,000 | 200 | 7,000 | 210 |

**(c)** If $u_0 = 8$, $u_1 = 12$, $u_2 = 19$, $u_3 = 29$ and $u_4 = 42$, find the value of $u_5$. **04**

**4.** **(a)** Obtain an equation of a straight line AB joining the points A $(x_1, y_1)$ and B $(x_2, y_2)$. **04**

**(b)** **Attempt any two :** **06**

(i) Prove that the straight lines $4x + 3y + 12 = 0$ and $6x - 8y + 1 = 0$ are perpendiculars to each other.

(ii) Obtain an equation of a straight line passing through the point of intersection of $x + y + 1 = 0$ and $3x + y - 5 = 0$ and having a slope 2.

(iii) Obtain an equation of a straight line passing through (–2, 3) and making intercepts on two axes equal in magnitude but opposite in sign.

**(c)** The cost of manufacturing $x$ units of an item is $y$. If the cost of manufacturing 400 units is Rs. 1100 and that of manufacturing 600 units is Rs. 1400, find fixed cost. Also find the profit, if 800 units are sold at Rs. 2.50 each. **04**

**OR**

**4.** **(a)** What is Linear Programming ? State its assumptions. **04**

**(b)** Maximize an objective function $z = 20x + 30y$ under the following constraints. **06**

(i) $3x + 3y \leq 36$

(ii) $5x + 2y \leq 50$

(iii) $2x + 6y \leq 60$

(iv) $x \geq 0, y \geq 0$

**(c)** A Producer produces two items A and B. It requires 20 minutes for the production process for each unit of A and 15 minutes for the production process for each unit of B. The maximum time available for the production process is 150 minutes. 5 kgs of raw material is required for the production of A and 4 kgs of raw material for the production of B. The total raw material is 850 kgs. If the profit for each unit of A is Rs. 25 and profit for each unit of B is Rs. 35. Represent the above problem in the mathematical form of linear programming. **04**

**5.** **(a)** Define,

Zero matrix, Diagonal matrix, Symmetric matrix and Skew Symmetric matrix. **04**

**(b)** Solve the following equations by inverse matrix. **06**

(i) $x + y + z = 8$

(ii) $2x + 3y - z = 15$

(iii) $3x - 5y + z = 6$

**(c)** If $A = \begin{bmatrix} 2 & 1 & -2 \\ 3 & 2 & 1 \\ -1 & 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 & 3 \\ 2 & 1 & 2 \\ 3 & -1 & 4 \end{bmatrix}$ find 2A + B and A – 2B. **04**

**OR**

**5.** **(a)** In usual notations, write formulae of $n^{th}$ term and the sum of n terms of A.P. and G.P. **04**

**(b)** 7 + 77 + 777 + ..... obtain upto *n* terms and also find the sum of first *n* terms from it. **06**

**(c)** If the Arithmatic Mean and the Geometric mean of two numbers are 26.5 and 14 then find these two numbers. **04**

Seat No. :_____

# TC-02

## Business Statistics (Compulsory)

**Time : 3 Hours]** **[Max. Marks : 70**

**Í**Û˜Û¶ÛÛ ƒ

(1) -¡Á¡•¡ ¸ÛÉ¶ÛÛ¶ÛÛ •Û¨¨Û ÍÛ¾ÛÛ¶Û ™¡.

(2) ÍÛÛ-Û •¡ÅÛ•¿ÛÅÛ¤Á¡¶ÛÛ Š¸Û¿ÛÛ•Û •¡Á¡à ÉÛ•¡ÛÉÛ.

(3) •ÛÛº¡ ¸Û¸ÛÁ¡ ÜÈÛ¶Û©Ûà •¡Á¡ÈÛÛ¬Ûà ¾ÛÇÉÛ.

**1.** (...) ÍÛÐ¡ÍÛ¾ÛµÛÛ•¡ ÉÛÛµÛÈÛÛ ¾ÛÛ¤¡ ’¡¾ÛÛ•¡¶Ûà Á¡à©Û ÍÛ¾Û›¡ÛÈÛÛ. **04**

(¼Û) ¶Ûà˜Û ...Û¸ÛÅÛà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà Ü¸Û©ÛÛ¶Ûà ‹˜ÛÛ^ (*x*) ...¶Û ©Û¾Û¶ÛÛ ¸Ûª¡Û¶Ûà ‹˜ÛÛ^ (*y*) ÈÛ˜˜Û¶ÛÛ ÍÛÐ¡ÍÛ¾ÛµÛÛ•¡ •Û¨¨Û¶Û ¸Û–ÛÛ©Û¶Ûà Á¡à©Û¬Ûà ÉÛÛµÛÛ. **06**

| Ü¸Û©ÛÛ¶Ûà ‹˜ÛÛ† (*x*) | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
|---|---|---|---|---|---|---|---|---|
| ¸Ûª¡Û¶Ûà ‹˜ÛÛ^ (*y*) | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

(•¡) ¶Ûà˜Û ...Û¸ÛÅÛà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ¿ÛÅÛ¶ÛÛ •Û¨¨ÛÛ©¾Û•¡ ÍÛ¾ÛµÛÛ•¡ ÉÛÛµÛÛ. **04**

N = 200, (A) = 80, ($\beta$) = 120 (AB) $\frac{2}{15}$ 20

**...¬ÛÉÛÛ**

**1.** (...) Ü¶Û¿Û©Û ÍÛ¾ÛµÛÛ•¡¶ÛÛ •Û¨¨ÛµÛ¾ÛÛ ›÷¨¨ÛÛÈÛÛ. **04**

(¼Û) ›÷Û ¼Û Ü¶Û¿Û©Û ÍÛ¾ÛµÛ Á¡”ÛÛ¶ÛÛ ÍÛ¾ÛÛà•¡Á¡¨¨ÛÛ $y = 4x + 40$ ...¶Û $x =$ $y + 19/3$ ÐÛ¿Û ©ÛÛ **06**

(i) $x$ ...¶Û $y$ ¶ÛÛ ¾ÛµÛ¿Û•¡Û (ii) ¼Û Ü¶Û¿Û©Û ÍÛ¾ÛµÛÛ•¡Û ...¶Û

(iii) ÍÛÐ¡ÍÛ¾ÛµÛÛ•¡ ÉÛÛµÛÛ.

(•¡) Q = + 1, –1 ...¶Û 0 ¶ÛÛ ...¬Û ÍÛ¾Û›¡ÛÈÛÛ. **04**

**2.** (...) ÍÛÛ¾ÛÛ¿Û•¡ ËÛ¨¨Ûà ...¤ÅÛ ÉÛ ? ©Û¶ÛÛ ÜÈÛÛÈÛµÛ –Û¤•¡Û¶Ûà ˜Û˜ÛÛ •¡Á¡Û. **04**

(¼Û) ¶Ûà˜Û ...Û¸ÛÅÛà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ªÛ¨¨Û ÈÛÌÛ¶Ûà ˜ÛÛÅÛ©Û ÍÛÁ¡Á¡ÛÉÛ ³ÛÁ¡Û ...Å¸Û•¡ÛÅÛà¶Û ÈÛµÛ–Û¤Û ¾ÛÇÈÛÛ. **06**

| ÈÛÌÛ | 1984 | ’85 | ’86 | ’87 | ’88 | ’89 | ’90 | ’91 |
|---|---|---|---|---|---|---|---|---|
| È˜ÛÛ¨¨Û | 80 | 88 | 98 | 92 | 84 | 88 | 80 | 100 |
| ÈÛÌÛ | ’92 | ’93 | ’94 | ’95 | ’96 | ’97 | ’98 | ’99 |
| È˜ÛÛ¨¨Û | 84 | 96 | 92 | 104 | 116 | 112 | 102 | 114 |

(•¡) ¶Ûà˜Û ...Û¸ÛÂÛà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ¾ÛÛÍÛ¾Ûà ...Û•¡¶Ûà •Û¨¨Û©ÛÁ¡à •¡ÁïÛ. **04**

| ÈÛÌÛ | $Q_1$ | $Q_2$ | $Q_3$ | $Q_4$ |
|---|---|---|---|---|
| 1995 | 109 | 131 | 107 | 93 |
| 1996 | 86 | 122 | 110 | 90 |
| 1997 | 77 | 106 | 94 | 79 |
| 1998 | 85 | 114 | 98 | 85 |
| 1999 | 108 | 117 | 106 | 83 |

**...¬ÛÈÛÛ**

**2.** (...) µÛµÛÛ•ià¿Û ¸ÛÈÛÛ¶Û¾ÛÛ¶Û ...¤ÅÛ ÉÛ ? ©Û¶Û ¾ÛÐ«ÈÛ ÍÛ¾Û›·ÛÈÛÛ. **04**

(¼Û) ¼Û Š²Ù•ÛÛ A ...¶Û B ¾ÛÛ¤¡ ©ÛÛÛªÛ•¡ ...•Ù¶ÛÛ ËÛÜ¨Û•¡ ¶Ûà˜Û ¾Û›·¼Û ™¡. **06**

| | A | B |
|---|---|---|
| A | 0.2 | 0.15 |
| B | 0.4 | 0.2 |

›·Û ™ÈÛ¤¶Ûà ¾ÛÛ•Û ...¶Û'¡¾Û 740 ...¶Û 500 ÐÛ¿Û ©ÛÛ •¡ÅÛ Š©¸ÛÛ-¡¶Û ÉÛÛµÛÛ.

(•¡) ¶Ûà˜Û¶Ûà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ÍÛÁ¡"ÛÛ¶Û ...¶ÈÛÛ¿ÛÛ›·¶Û •¡ÁïÛ. ©Û ¸ÛÁ¡¬Ûà 2005¶ÛÛ ÈÛ˜ÛÛ¨Û¶Û ¸ÛÈÛÛ¶Û¾ÛÛ¶Û ¾ÛÇÈÛÛ. **04**

| ÈÛÌÛ | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|
| ÈÛ˜ÛÛ¨Û | 12 | 15 | 25 | 22 | 26 |

**3.** (...) ...©ÛÈÛÉÛ¶Û ...¶Û ¼ÛÛÐÈÛÉÛ¶Û ...¤ÅÛ ÉÛ ? ©Û¶Û ¾ÛÐ«ÈÛ ÍÛ¾Û›·ÛÈÛÛ. **04**

(¼Û) ¶Ûà˜Û ...Û¸ÛÂÛà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ...©ÛÈÛÉÛ¶Û¶Ûà ¿ÛÛ•¿Û ¸ÛµµÛÛ©Û ³ÛÁïÛ log 45 ¶Ûà Ý•¾Û©Û ¾ÛÇÈÛÛ. **06**

log 40 = 1.6021, log 48 = 1.6812 ...¶Û log 50 = 1.6990

(•¡) ...•¡ ÉÛÐÁ¡¶Ûà •¡ÅÛ ÈÛÍÛÜ©Û 3,00,000 ™¡. ›·¾ÛÛ ÍªÛà...Û¶Ûà ÍÛ"¿ÛÛ 40% ™¡. •¡ÅÛ ÍªÛà...Û¶Ûà ÍÛ"¿ÛÛ¶Ûà 45% ÍªÛà...Û ¸Û›·¶Û¶Û ÈÛ¿Û µÛÁïÛÈÛ ™¡. ›·Û ©Û ÉÛÐÁ¡¶ÛÛ ÍÛÛ-¡Û ¸Û›·¶Û¶Û-¡Á¡ 32 ÐÛ¿Û ©ÛÛ ...ÛÈÛ©ÛÛ ÈÛÌÛ -¡Á¡Û¾Û¿ÛÛ¶Û •¡ÅÛ •¡¤ÅÛÛ ¼ÛÛÇ•¡Û ›·¶¾ÛÉÛ ©Û¶Û ...¶Û¾ÛÛ¶Û •¡ÁïÛ. **04**

**...¬ÛÈÛÛ**

**3.** (...) ÈÛÍÛÜ©Û ÜÈÛÌÛ¿Û•¡ ...Û•¡¦Û ...•¡¥Û •¡Á¡ÈÛÛ¶Ûà ¶ÛÛµÛ¨Ûà¶Ûà Á¡à©Û ÍÛ¾Û›·ÛÈÛÛ. **04**

(¼Û) ¶Ûà˜Û¶Ûà ¾ÛÛÜÐ©Ûà ¸ÛÁ¡¬Ûà ¼Û ÉÛÐÁ¡¶ÛÛ ÍÛÛ-¡Û ...¶Û ¸Û¾ÛÛÜ¨Û©Û ¾Û©¿Û-¡Á¡ ÉÛÛµÛÛ ...¶Û ÍÛÁ¡"ÛÛÈÛÛ. **06**

| <¾ÛÁ¡ (ÈÛÌÛ¾ÛÛ) | ÉÛÐÁ¡ A | | ÉÛÐÁ¡ B | |
|---|---|---|---|---|
| | ÈÛÍÛÜ©Û | ¾Û©¿Û ÍÛ"¿ÛÛ | ÈÛÍÛÜ©Û | ¾Û©¿Û ÍÛ"¿ÛÛ |
| 0-10 | 6,000 | 180 | 4,000 | 160 |
| 10-20 | 10,000 | 50 | 15,000 | 60 |
| 20-60 | 30,000 | 240 | 24,000 | 240 |
| 60 -Ûà ÈÛµÛ | 4,000 | 200 | 7,000 | 210 |

(•¡) ›·Û $u_0$ = 8, $u_1$ = 12, $u_2$ = 19, $u_3$ = 29 ...¶Û $u_4$ = 42 ÐÛ¿Û ©ÛÛ $u_5$ ¶Ûà Ý•¾Û©Û ÉÛÛµÛÛ. **04**

**4.** (...) A $(x_1, y_1)$ ...¶Û B $(x_2, y_2)$ ¶Û ›·Û¦©Ûà ÍÛÁ¡"ÛÛ AB ¶Û ÍÛ¾Ûà•¡Á¡¨Û ¾ÛÇÈÛÛ. **04**

**(¼Û)** **•Û¾Û ©Û ½Û •¡Á¡Û :** **06**

(i) ÍÛÛÜ¼Û©Û •¡Á¡Û •¡ ÍÛÁ¡"ÛÛ...Û $4x + 3y + 12 = 0$ ...¶Û $6x - 8y + 1 = 0$ ...•¡ ¼Ûàœ·¶Û ÅÛ¼Û ™¡.

(ii) $x + y + 1 = 0$ ...¶Û $3x + y - 5 = 0$ ¶ÛÛ ™¡–¶Û Ý½Û–¾ÛÛ¬Ûà ¸ÛÍÛÛÁ¡ ¬Û©Ûà 2 §ÛÇÈÛÛÇà ÍÛÁ¡"ÛÛ¶Û ÍÛ¾Ûà•¡Á¡¨Û ¾ÛÇÈÛÛ.

(iii) (–2, 3) ¾ÛÛ¬Ûà ¸ÛÍÛÛÁ¡ ¬Û©Ûà ...¶Û ¼Û¶Û ..."Û Š¸ÛÁ¡ ÍÛÁ¡"ÛÛ ¾ÛÛ¸Û¶ÛÛ ¸ÛÁ¡©Û ÜÈÛÄ¡µµÛ Ü˜ÛÐ¶Û¶ÛÛ ...©Û:"Û¦ ¼Û¶ÛÛÈÛ©Ûà ÍÛÁ¡"ÛÛ¶Û ÍÛ¾Ûà•¡Á¡¨Û ¾ÛÇÈÛÛ.

(•¡) ...•¡ ÈÛÍ©Û¶ÛÛ *x* ...•¡¾ÛÛ Š©¸ÛÛ–¶Û •¡Á¡ÈÛÛ¶Û "Û˜Û Ä¡. *y* ™¡. ›·Û ©Û ÈÛÍ©Û¶ÛÛ 400 ...•¡¾ÛÛ Š©¸ÛÛ–¶Û •¡Á¡ÈÛÛ¶Û "Û˜Û Ä¡. 1100 ÐÛ¿Û ...¶Û 600 ...•¡¾ÛÛ Š©¸ÛÛ–¶Û •¡Á¡ÈÛÛ¶Û "Û˜Û Ä¡. 1400 ÐÛ¿Û ©ÛÛ ÜÍ¬ÛÁ¡ "Û˜Û ÉÛÛµÛÛ. ©Û¾Û›· 800 ...•¡¾ÛÛ Ä¡. 2.50 ½ÛÛÈÛ ÈÛ˜ÛÈÛÛ¾ÛÛ ...ÛÈÛ ©ÛÛ •¡¤ÅÛÛ ¶Û°Û ¬ÛÉÛ. **04**

**...¬ÛÈÛÛ**

**4.** (...) ÍÛÁ¡"Û ...Û¿ÛÛ›·¶Û ...¤ÅÛ ÉÛ ? ©Û¶Ûà µÛÛÁ¡¨ÛÛ...Û ›·¨ÛÛÈÛÛ. **04**

(¼Û) Ð©ÛÅÛ"Ûà ÜÈÛµÛ¿Û $z = 20x + 30y$ ¶Û ¶Ûà˜Û¶ÛÛ ¸ÛÜ©Û¼ÛµÛÛ¶Û ...ÛµÛÛÁ¡ ¾ÛÐ¡«Û¾Û ¼Û¶ÛÛÈÛÛ. **06**

(i) $3x + 3y \leq 36$

(ii) $5x + 2y \leq 50$

(iii) $2x + 6y \leq 60$

(iv) $x \geq 0, y \geq 0$

(•¡) ...•¡ Š©¸ÛÛ–¡•¡ A ...¶Û B ...¾Û ¼Û ¸Û•¡ÛÁ¡¶Ûà ÈÛÍ©Û...Û¶Û Š©¸ÛÛ–¶Û •¡Á¡ ™¡. A ÈÛÍ©Û¶ÛÛ ...•¡¾Û¶ÛÛ Š©¸ÛÛ–¡¶Û ¸ÛÜ'¡¿ÛÛ ¾ÛÛ¤ 20 ¾Ûà¶Ûà¤ Š¿ÛÛÁ¡ B ÈÛÍ©Û¶ÛÛ ...•¡¾Û¶ÛÛ Š©¸ÛÛ–¡¶Û ¾ÛÛ¤ 15 ¾Ûà¶Ûà¤ ÅÛÛ•Û ™¡. Š©¸ÛÛ–¶Û ¸ÛÜ'¡¿ÛÛ ¾ÛÛ¤ ÈÛµÛ¾ÛÛ ÈÛµÛ 150 ¾Ûà¶Ûà¤ ¸ÛÛ¿Û ™¡. A ÈÛÍ©Û¶ÛÛ ...•¡¾Û Š©¸ÛÛ–¶Û ¾ÛÛ¤ 5 Ü•¡•ÛÛ. •¡Û˜ÛÛ ¾ÛÛÅÛ ...¶Û B ÈÛÍ©Û¶ÛÛ Š©¸ÛÛ–¶Û ...•¡¾Û ¾ÛÛ¤ 4 Ü•¡•ÛÛ. •¡Û˜ÛÛ ¾ÛÛÅÛ ›·ÄÁ¡à ™¡. •¡ÅÛ •¡Û˜ÛÛ ¾ÛÛÅÛ 850 Ü•¡•ÛÛ. ™¡. A ÈÛÍ©Û¶ÛÛ ...•¡¾Û -à¥ ¶Û°Û Ä¡. 25 ...¶Û B ÈÛÍ©Û¶ÛÛ ...•¡¾Û–à¥ ¶Û°Û Ä¡. 35 ™¡. Š¸ÛÁ¡¶Ûà ÍÛ¾ÛÍ¿ÛÛ¶Û ÍÛÁ¡"Û ...Û¿ÛÛ›·¶Û¶ÛÛ •ÛÜÜ¨ÜÛ©Û•¡ ÍÈÜÄ¡Û –ÉÛÜÈÛÛ. **04**

**5.** (...) È¿ÛÛ"¿ÛÛ ...Û¸ÛÛ :

ÉÛ¶¿Û ËÛÜ¨Û•¡, ÜÈÛ•¡¨Û ËÛÜ¨Û•¡, ÍÛÜ¾Û©Û ËÛÜ¨Û•¡ ...¶Û ÜÈÛÍÛÜ¾Û©Û ËÛÜ¨Û•¡ **04**

(¼Û) È¿ÛÍ©Û ËÛÜ¨Û•¡¶Ûà Áà©Û–Ûà ¶Ûà˜Û¶ÛÛ ÍÛ¾Ûà•¡Á¡¨ÛÛ Š•¡ÅÛÛ. **06**

(i) $x + y + z = 8$

(ii) $2x + 3y - z = 15$

(iii) $3x - 5y + z = 6$

(•¡) ›¡Û $A = \begin{bmatrix} 2 & 1 & -2 \\ 3 & 2 & 1 \\ -1 & 0 & 1 \end{bmatrix}$ ...¶Û $B = \begin{bmatrix} 1 & -1 & 3 \\ 2 & 1 & 2 \\ 3 & -1 & 4 \end{bmatrix}$ ÐïÛ¿Û ©ÛÛ $2A + B$ ...¶Û $A - 2B$ ÉÛÙµÛÛ. **04**

**...¬ÙÈÛÛ**

**5.** (...) ¸Û¯ÛÙÅÛ©Û ÍÛ•¡©ÛÛ¾ÛÛ ÍÛ¾ÛÛ©ÛÁ¡ ËÛ¨¨Ûà ...¶Û ÍÛ¾Û•Û¨¨ÛÛ«ÛÁ¡ ËÛ¨¨Ûà¶ÛÛ *n* ¾Û ¸Û-¡ ©Û¾Û›¡ *n* ¸Û–Û¶ÛÛ ÍÛÁ¡ÈÛÛÇÛ¶ÛÛ ÍÛªÛÛ ÅÛ"ÛÛ. **04**

(¼Û) $7 + 77 + 777 + .....$ *n* ¸Û–ÛÍÛµÛà ¾ÛÇÈÛÛ ...¶Û ©Û ¸ÛÁ¡–Ûà ¸Û–Û¾Û ¸ÛÛ˜Û ¸Û–Û¶ÛÛ ÍÛÁ¡ÈÛÛÇÛ ÉÛÛµÛÛ. **06**

(•¡) ¼Û ÍÛ"¿ÛÛ...Û¶ÛÛ ÍÛ¾ÛÛ©ÛÁ¡ ¾Ûµ¿Û•¡ ...¶Û •Û¨¨ÛÛ«ÛÁ¡ ¾Ûµ¿Û•¡ ...¶Û'¡¾Û 26.5 ...¶Û 14 ÐïÛ¿Û ©ÛÛ ©Û ¼Û ÍÛ"¿ÛÛ...Û ÉÛÛµÛÛ. **04**