

BOARD OF INTERMEDIATE & SECONDARY EDUCATION, SAHRAWAL

(12)

SUBJECT: MATH EXAM 2nd Annual 2022 CLASS: Inter. P-I
GROUP: I DATE: 21-12-22

(GENERAL INSTRUCTIONS FOR MARKING KEY)

5(a)

L.H.S

$$\begin{vmatrix} b & -1 & a \\ a & b & 0 \\ 1 & a & b \end{vmatrix}$$

$$\begin{aligned} &= b(b^2 - 0) + 1(ab - 0) + a(a^2 - b) \quad (3M) \\ &= b^3 + ab + a^3 - ab \quad (1M) \\ &= a^3 + b^3 \quad (1M) \\ &= R.H.S \end{aligned}$$

5(b)

$$\begin{aligned} &4^x - 3 \cdot 2^{x+3} + 128 = 0 \\ &2^{2x} - 3 \cdot 2 \cdot 2^3 + 128 = 0 \\ &(2^x)^2 - 24 \cdot 2^x + 128 = 0 \\ &\text{Substitute } 2^x = y \\ &y^2 - 24y + 128 = 0 \quad (1M) \\ &y^2 - 16y - 8y + 128 = 0 \\ &y(y - 16) - 8(y - 16) = 0 \\ &(y - 16)(y - 8) = 0 \quad (1M) \end{aligned}$$

$$y = 16 \quad y = 8$$

$$\begin{aligned} 2^x &= 16 & 2^x &= 8 \\ x &= 4 & x &= 3 \end{aligned}$$

$$\therefore S.S = \{3, 4\}$$

6(a)

$$\begin{aligned} \frac{1}{(x-1)^2(x+1)} &= \frac{A}{(x-1)} + \frac{B}{(x-1)^2} + \frac{C}{(x+1)} \quad (1M) \\ 1 &= A(x-1)(x+1) + B(x+1) + C(x-1)^2 \quad (1M) \\ \text{for } x &= 1 \Rightarrow B = \frac{1}{2} \quad (1M) \\ \text{for } x &= -1 \Rightarrow C = \frac{1}{4} \quad (1M) \end{aligned}$$

$$\begin{aligned} 1 &= A(x^2 - 1) + B(x+1) + C(x^2 - 2x + 1) \\ \text{Comparing coefficients of } x^2, x, x^0 & \quad (1M) \\ x^2: A + C &= 0 \quad \text{--- (i)} \\ x: B - 2C &= 0 \quad \text{(no need)} \\ x^0: -A + B + C &= 1 \quad \text{(no need)} \quad (1M) \\ \text{from (i)} A &= -\frac{1}{4} \\ \frac{1}{(x-1)^2(x+1)} &= -\frac{1}{4(x-1)} + \frac{1}{2(x-1)^2} + \frac{1}{4(x+1)} \quad (1M) \end{aligned}$$

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