REVISION (MULTIPLE CHOICE)

Ch. 17

Q1. B

$\log_a 8 = 3$

$\therefore a^3 = 8$

$a = 2$

Q2. B

$5^{n-1} \times 5^{n+1} = 5^{n-1+n+1}$

$= 5^{2n}$

Q3. B

$2^x = \frac{1}{64}$

$\therefore 2^x = 2^{-6}$

$\therefore x = -6$

Q4. E

$125^a \times 5^b = (5^3)^a \times 5^b$

$= 5^{3a} \times 5^b$

$= 5^{3a+b}$

Q5. D

$4^x = 10 - 4^{x+1}$

Let $4^x = p$ $\therefore 4^{x+1} = 4 \times p$

$p = 10 - 4p$ $\therefore 5p = 10$ $\therefore p = 2$

$\therefore 4^x = 2$ so $x = \frac{1}{2}$

Q6. A

$$\frac{7^{n+2}-35(7^{n-1})}{44(7^{n+2})} = \frac{7^{n+2}}{44\times 7^{n+2}} - \frac{35(7^{n-1})}{44(7^{n+2})}$$

$$= \frac{1}{44} - \frac{35\times 7^{n-1-n-2}}{44}$$

$$= \frac{1}{44} - \frac{35\times 7^{-3}}{44}$$

$$= \frac{1}{44} - \frac{35}{7^3\times 44}$$

$$= \frac{1}{44} - \frac{5}{49\times 44}$$

$$= \frac{1}{44}\left(1-\frac{5}{49}\right)$$

$$= \frac{1}{44}\times\frac{44}{49} = \frac{1}{49}$$

Q7. D

$$f(2x)-f(x) = (2+3^{2x})-(2+3^{x})$$

$$= 3^{2x}-3^{x}$$

$$= 3^{x}(3^{x}-1)$$

Q8. C

$$7^{2x}\times 49^{2x-1}=1$$

$$7^{2x}\times(7^{2})^{2x-1}=1$$

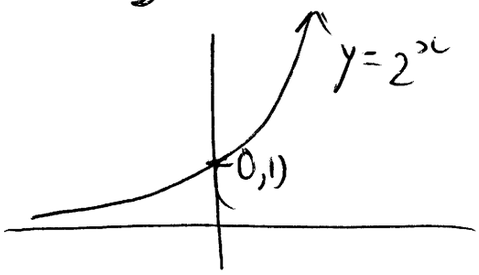
$$7^{2x}\times 7^{4x-2}=1$$

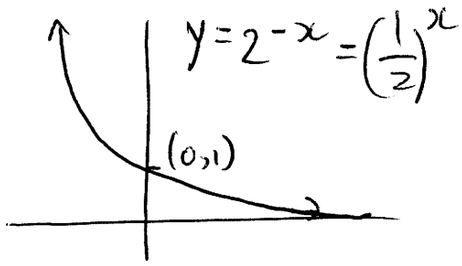
$$\therefore 7^{2x+4x-2}=1$$

$$7^{6x-2}=1$$

$$\therefore 6x-2=0 \quad \therefore x=\frac{1}{3}$$

Q9. B





Q10. A

$$f(x) = 1 + x^{-\frac{2}{3}}$$

$$f(8) = 1 + 8^{-2/3} = 1 + \frac{1}{(\sqrt[3]{8})^2}$$

$$= 1 + \frac{1}{4}$$

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

Q11. A

$$\log a^2 + \log b^2 - 2\log ab$$

$$= 2\log a + 2\log b - 2\log ab$$

$$= 2(\log a + \log b - \log(ab))$$

$$= 2(\log(ab) - \log(ab)) = 0$$

Q12 D

$180° = \pi^c$

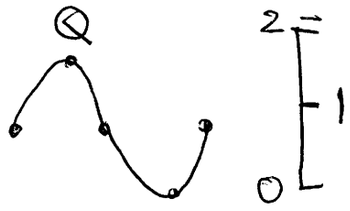
$\therefore 1^c = \frac{180}{\pi}°$ $\quad \therefore (2x)^c = \frac{180 \times 2x}{\pi}° = \frac{360x}{\pi}°$

Q13. A

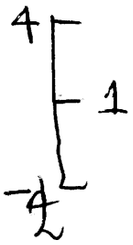
Period $= \frac{2\pi}{2} = \pi$

Quarter Period $= \frac{\pi}{4}$

$\therefore Q = \left(\frac{\pi}{4}, 2\right)$



Q14 D



Range $= [-2, 4]$

Q15. D

$y = 16 + 15\sin\left(\frac{\pi x}{60}\right)$

When $x = 10$, $y = 16 + 15\sin\left(\frac{\pi \times 10}{60}\right)$

$= 16 + 15\sin\left(\frac{\pi}{6}\right)$

$= 16 + 7.5$

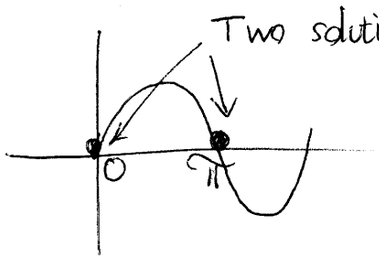
$= 23.5$

Q16. D

$\sin(\pi+\theta) + \cos(\pi+\theta)$

$= -\sin\theta - \cos\theta$

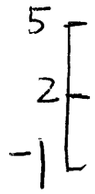
Q17. A



Q18. E

$y = \sin\left(\frac{\theta}{2}\right)$ Period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$

Q19. D



Range: $[-1, 5]$

Q20. D

Cosine graph shifted 30° to left Amp = 1

$\therefore y = \cos((x + 30)^\circ)$

Q21. E

$y = -2\cos(3x)$ Amp $= |-2| = 2$ Period $= \frac{2\pi}{3}$

Q22. A

$c^d = 3$ so $c^{4d} - 5 = (c^d)^4 - 5$

$= 3^4 - 5$

$= 81 - 5$

$= 76$

Q23. E

$\log_2 56 - \log_2 7 + \log_2 2$

$= \log_2 \left(\frac{56}{7}\right) + 1$

$= \log_2 8 + 1 = 3 + 1$

$= 4$

Q24. B

$\log_b a = c \quad \therefore b^c = a \quad (1)$

$\log_x b = c \quad \therefore x^c = b \quad (2)$

From (2) $b = x^c$

Substitute for b in (1):

$(x^c)^c = a$

$\therefore x^{c^2} = a$

$\therefore \log_a x^{c^2} = \log_a a$

$\therefore c^2 \log_a x = 1$

$\log_a x = \frac{1}{c^2}$

Q25. D

$$\cos(\theta) - \sin(\theta) = \frac{1}{4}$$

$$\therefore (\cos\theta - \sin\theta)^2 = \left(\frac{1}{4}\right)^2$$

$$\therefore \cos^2\theta - 2\sin\theta\cos\theta + \sin^2\theta = \frac{1}{16}$$

$$\cos^2\theta + \sin^2\theta - 2\sin\theta\cos\theta = \frac{1}{16}$$

$$\therefore 1 - 2\sin\theta\cos\theta = \frac{1}{16}$$

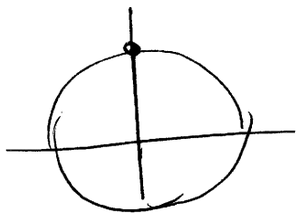
$$\therefore \frac{15}{16} = 2\sin\theta\cos\theta$$

$$\sin\theta\cos\theta = \frac{15}{32}$$

Q26. B

$$\frac{1}{2}\sin 2x = \frac{1}{2}$$

$$\sin 2x = 1 \quad , 0 \leq x \leq 2\pi$$



$$2x = \frac{\pi}{2}$$

$$x = \frac{\pi}{4}$$

$$\therefore \text{Intersection: } \left(\frac{\pi}{4}, \frac{1}{2}\right)$$