1. If $f(x)$ is a function such that $f(x+y)= f(x)+f(y)$ and $f(1)= 7$, then $\sum_{r=1}^{n} f(r)=$

(1) $\frac{7n}{2}$ (2) $\frac{7(n+1)}{2}$

(3) $7n(n+1)$ (4) $\frac{7n(n+1)}{2}$

2. If the function $f(x)= \frac{a^x+a^{-x}}{2}$, $(a > 2)$, then $f(x+y)+f(x-y)$ is equal to

(1) $2f(x)f(y)$ (2) $f(x)f(y)$

(3) $\frac{f(x)}{f(y)}$ (4) $2\frac{f(x)}{f(y)}$

3. If f is a real valued function such that $f(x+y)= f(x)+f(y)$ and $f(1)= 5$, then the value of $f(100)$ is

(1) 200 (2) 300

(3) 400 (4) 500

4. Let $f(x)= \frac{9^x}{9^x+3}$ and $f(x)+f(1-x)= 1$ then find value of $f\left(\frac{1}{1996}\right)+\left(\frac{2}{1996}\right)+.....+f\left(\frac{1995}{1996}\right)$.

5. If $5f(x)+3f\left(\frac{1}{x}\right)= x+2$ and $y = xf(x)$ then $\left(\frac{dy}{dx}\right)_{x=1}$ is equal to -

(1) $\frac{1}{4}$ (2) $\frac{7}{8}$

(3) 1 (4) None of these

6. Let the function $f : R \longrightarrow R$ be defined by $f(x)= 2x + sinx$, $x \in R$. Then f is

(1) One-to-one and onto (2) One-to-one but not onto

(3) Onto but not one-to-one (4) Neither one-to-one nor onto

7. For real x, let $f(x) = x^3 + 5x + 1$, then

(1) f is onto R but not one-one (2) f is one-one and onto R

(3) f is neither one-one nor onto R (4) f is one-one but not onto R

8. Let $f : R \to R$ be a function defined by $f(x)= \frac{x^2-8}{x^2+2}$ .Then, f is

(1) One - one but not onto (2) One - one and onto

(3) Onto but not one - one (4) Neither one - one nor onto

9. Let $f : R \to [2, \infty]$ be a function defined as $f(x)= x^2 - 12ax + 15 - 2a + 36a^2$. If $f(x)$ is surjective on R, then the value of a is equal to

(1) $\frac{9}{2}$ (2) $\frac{11}{2}$

(3) $\frac{13}{2}$ (4) $\frac{15}{2}$

10. The function $f : R \to R$ defined by $f(x)=(x-1)(x-2)(x-3)$ is

(1) One-one but not onto (2) Onto but not one-one

(3) Both one-one and onto (4) Neither one-one nor onto