Only **ONE** correct answer:

1. If $f(x) = \cos|x| + \left[\left|\frac{\sin x}{x}\right|\right]$ where [.] denotes the G.I. function then f(x) is
   A) even B) odd
   C) neither even nor odd D) both even and odd simultaneously

2. If $f(x) = \sqrt{x-1}$, $g(x) = -\ln x$, the domain of gof(x) is:
   A) (0, 1/e) B) $(1, \infty)$ C) (1,e) D) none

3. $4\sin 50^0 - \sqrt{3}\tan 50^0$ is equal to: A) 0 B) 1 C) 2 D) none

4. The range of $\sin^{-1} x - \cos^{-1} x$ is
   A) $[-3\pi/2, -\pi/2]$ B) $[-\pi/2, \pi/2]$ C) $[0, \pi]$ D) $[-3\pi/2, \pi/2]$

5. Let $f : R \to [0, \pi/2)$ be a function defined by $f(x) = \tan^{-1}(x^2 + x + a)$. If f is onto then 'a' is equal to A) 0 B) 1 C) ½ D) ¼

6. If $f(x) = \begin{cases} [x] & x \geq 0 \\ 1 + [x] & x < 0 \text{ and } x \notin I \\ x & x < 0 \text{ and } x \in I \end{cases}$ then
   A) f(x) is periodic function B) f(x) is many one
   C) f(x) is one-one D) none of these

7. $y = \log_4 \log_2 \log_{1/2} x$. The domain of this function is
   A) $x \in (0, ½)$ B) $x \in [0, ½]$ C) $x \in (0, ½]$ D) $n \in [0, ½)$

8. The domain of the function $y = \log_{[x^2]}^{(4-|x|)}$ is where [] denotes G.I. function
   A) $x \in [\sqrt{2}, 4]$ B) $x \in (1, \infty)$ C) $x \in (0, \infty)$ D) $R - \{0, 1\}$

9. The domain of the function $y = \sqrt{\sin^{-1}(\log_2^x)}$ is
   A) [1, 2] B) (1, 2) C) $x > 0, x \neq 1$ D) $x > 1$

10. $\operatorname{cosec}\frac{2\pi}{7} + \operatorname{cosec}\frac{4\pi}{7} + \operatorname{cosec}\frac{8\pi}{7}$ is equal to: A) 0 B) 1 C) 2 D) none

11. Let $f(x) = \frac{3^{1+\ln x}}{x^{\ln 3}}$. Then f(1993) is A) 3 B) 4 C) 5 D) 6

12. If $\cos\alpha + \cos\beta = \cos(3\pi/7)$, $\sin\alpha + \sin\beta = \sin(3\pi/7)$ then $\sin^2(\alpha-\beta)/2$is equal to:
    A) 1/4 B) 3/4 C) -3/4 D) -1/4

13. $\operatorname{cosec} 10^0 - 4\sin 70^0$ is equal to: A) 0 B) 1 C) 2 D) 3

14. If $\sin^4 x + \sin^2 x = 1$ then $\tan^4 x - \tan^2 x$ is: A) 0 B) 1 C) 2 D) none

15. In a right angled Δ, the hypotenuse is four times as long as perpendicular drawn to it from the opposite vertex. One of the acute angle is: A) 15^0 B) 30^0 C) 45^0 D) 60^0

16. In ΔABC, $\frac{r_1 + r_2}{1 + \cos c}$ is equals to: A) $\frac{2\Delta}{abc}$ B) $\frac{2abc}{\Delta}$ C) $\frac{abc}{2\Delta}$ D) $\frac{abc}{\Delta^2}$

17. If twice the square of the diameter of a circle is equal to half the sum of squares of the sides of inscribed ΔABC, then $\sin^2 A + \sin^2 B + \sin^2 C =$ A) 1 B) 2 C) 4 D) 8

18. Show that f: $[-2\pi, 2\pi] \to R$ defined by $f(x) = \frac{\cos x}{[x/5\pi] + 0.5}$ wher [ ] step function is odd function.

19. If f(a-x) = f(a+x) and f(b-x) = f(b+x) where a and b are real numbers and a>b, show that f is periodic and find its period

20. If f is a one-one odd function, find x for which $f(x) + f\left(\frac{x-4}{x+2}\right) = 0$.

21. If CosA + CosB – Cos(A+B) = 3/2 and A and B are acute, find A and B.

22. Solve for x and y : $\mathrm{Cos}y\sqrt{\mathrm{Sin}x} = 0$ and $2\sin^2 x - \cos 2y - 2 = 0$,

23. Solve : $\sin^2 4x + \cos^2 x = 2\sin 4x \cos^4 x$.