

THIS PLACEMENT TEST IS ONLY FOR:

- ✓ Architecture/Interior Design majors
- ✓ Computer Science majors
- ✓ All Engineering majors
- ✓ Environmental Science/Biology/Chemistry majors
- ✓ Physics Majors
- ✓ Mathematics majors

INSTRUCTIONS:

- ✓ The test consists of 30 multiple choice questions.
- ✓ Only Scientific Calculators are allowed.
- ✓ Duration of the exam is 90 minutes (around three minutes per question).

1. $\frac{y}{x} + \frac{x}{y}$ is equal to:
- $\frac{y^2 + x^2}{xy}$
 - $\frac{y^2 + x^2}{xy(x + y)}$
 - $\frac{y + x}{xy}$
 - None of the above.
2. The solution of $\frac{x}{x + 1} + \frac{1}{x - 1} = \frac{5}{x^2 - 1}$ is:
- $x = -2, 2$
 - $x = 2$ only
 - $x = 1, 3$
 - $x = 3, -3$
 - None of the above.
3. If $x, y > 0$, then $\frac{\sqrt[7]{x^8} \sqrt{y^6}}{\sqrt[7]{x} y}$ equals
- xy
 - xy^2
 - $x^{8/7}y$
 - $xy^{6/4}$
 - None of the above
4. The solution for $\frac{x - 1}{x - 2} > 0$ is
- $(1, 2)$ only
 - $(-\infty, 2]$ only
 - $(-\infty, 1)$ only
 - $(-\infty, 1) \cup (2, \infty)$
 - None of the above

5. The following lines $2x - y = 1$ and $4x - 2y = 7$ are
- (a) parallel
 - (b) Perpendicular
 - (c) Neither parallel nor perpendicular
 - (d) They intersect at the point (2,1)
 - (e) None of the above
6. $x^3 + 8 =$
- (a) $(x + 2)(x^2 - 2x + 4)$
 - (b) $(x + 2)(x^2 + 2x + 4)$
 - (c) $(x - 2)(x^2 + 2x + 4)$
 - (d) $(x - 2)(x^2 + 2x - 4)$
 - (e) None of the above
7. If $f(x) = 2/(x - 4)$ and $g(x) = x^2 - 1$, then $f(g(2)) =$
- (a) 2
 - (b) -2
 - (c) 3
 - (d) -3
 - (e) None of the above
8. $\frac{x - y}{\sqrt{x} - \sqrt{y}}, x > 0, y > 0$ is equal to:
- (a) $\frac{1}{\sqrt{x} + \sqrt{y}}$
 - (b) $\frac{1}{\sqrt{x} - \sqrt{y}}$
 - (c) $\sqrt{x} + \sqrt{y}$
 - (d) $\sqrt{x} - \sqrt{y}$
 - (e) None of the above

9. The domain for $f(x) = \ln(4 - x^2)$ is

- (a) All real numbers
- (b) $(0, \infty)$
- (c) $(-2, 2)$
- (d) $(2, \infty)$
- (e) None of the above

10. The domain of $f(x) = xe^{4x}$ is

- (a) $[0, \infty)$
- (b) $(-\infty, \infty)$
- (c) $[4, \infty]$
- (d) $(-\infty, 0)$
- (e) None of the above

11.
$$\frac{\left[\frac{12}{x^2 - 1} \right]}{\left[\frac{12}{x + 1} \right]} =$$

- (a) $\frac{1}{x - 1}$
- (b) $x - 1$
- (c) $x + 1$
- (d) $\frac{1}{x + 1}$
- (e) None of the above

12. $\frac{(2xy^4)^3 (x^3y)^{-2}}{xy^{10}}$ is equal to

(a) $\frac{8}{x^4}$

(b) $\frac{2}{x^4}$

(c) $\frac{6}{x^4}$

(d) $\frac{8y^{10}}{x^4}$

(e) None of the above

13. $x^3 - y^3 =$

(a) $(x - y)(x^2 + xy + y^2)$

(b) $(x + y)(x^2 + xy + y^2)$

(c) $(x - y)(x^2 - xy + y^2)$

(d) $(x - y)(x^2 + xy - y^2)$

(e) None of the above

14. If $e^y = 20$, then $y^2 =$

(a) $\ln 20$

(b) $\ln 40$

(c) $\ln 20$

(d) $(\ln 20)^2$

(e) None of the above

15. If $a > 5$, then $|5 - a| =$

(a) $5 - a$

(b) $5 + a$

(c) $a - 5$

(d) $-(5 + a)$

(e) None of the above

16. If $\frac{x^2 - 2x}{x + 7} = 0$, then $x =$

- (a) 2 only
- (b) 0, 2
- (c) 0 only
- (d) 0, 2, 7
- (e) None of the above

17. $\sin 2x =$

- (a) $2 \sin x$
- (b) $2 \cos x$
- (c) $2 \sin x \cos x$
- (d) $\sin^2 x$
- (e) None of the above

18. If $\cos 2x = 0$, then $x =$

- (a) $\pi/2$
- (b) $\pi/4$
- (c) π
- (d) 2π

19. For $x > 0$, $y > 0$ and $z > 0$, $\ln\left(\frac{x^2y}{z}\right) + \ln z - \ln x =$

- (a) $\ln(xy)$
- (b) $2 \ln y$
- (c) $\ln x + \ln z$
- (d) $\ln x - \ln y$
- (e) None of the above

20. The graph of $y = 5x^2 - 2x - 1$
- (a) Is a parabola opens upward.
 - (b) Is a parabola opens downward
 - (c) Has no x -intercepts
 - (d) Has y -intercept at $y = 1$
 - (e) None of the above
21. $\sqrt[3]{-8y^6} =$
- (a) $2y$
 - (b) Undefined
 - (c) $2y^2$
 - (d) $-2y^2$
 - (e) None of the above
22. $\sec^2 x - \tan^2 x =$
- (a) -1
 - (b) $1/2$
 - (c) 1
 - (d) 2
 - (e) None of the above
23. $\ln e^{(6x^2-4)} =$
- (a) $6x^2$
 - (b) $6x^2 + 4$
 - (c) $6x^2 - 4$
 - (d) $e^{(6x^2-4)}$
 - (e) None of the above

24. If $f(x) = 6x^3 - 2k$ and $f(-1) = 2$, then $k =$:

- (a) 2
- (b) -2
- (c) 4
- (d) -4
- (e) None of the above

25. Knowing that $3\pi/2 < \alpha < 2\pi$, then

- (a) $\sin \alpha$ is always positive
- (b) $\sin \alpha$ is always negative
- (c) $\tan \alpha$ is always positive
- (d) $\cos \alpha$ is always negative
- (e) None of the above.

26. The domain of $f(x) = \frac{x}{x^2 - 1}$ is equal to:

- (a) $x = 1, -1$
- (b) All real numbers except $x = 1$.
- (c) All real numbers except $x = 1, -1$
- (d) All real numbers except $x = -1$
- (e) None of the above

27. If $\cos x = 0.7$, then $\cos(-x) =$

- (a) 0.7
- (b) 0.3
- (c) -0.7
- (d) -0.3
- (e) None of the above

28. The domain of $f(x) = \frac{5}{x^2 + 4}$ is
- (a) All real numbers
 - (b) All real numbers except $x = 2$.
 - (c) All real numbers except $x = 2, -2$
 - (d) All real numbers except $x = -2$
 - (e) None of the above
29. If $f(x) = -5 \sin x$, then the range of $f(x)$ is:
- (a) All real numbers.
 - (b) $(-5, 1)$
 - (c) $[-5, +\infty)$
 - (d) $[-5, 5]$
 - (e) None of the above.
30. The domain of $\frac{1}{\sqrt{x+3}}$ is
- (a) $(-\infty, -3]$
 - (b) $[-3, \infty)$
 - (c) $(-3, \infty)$
 - (d) $[0, \infty)$
 - (e) None of the above.

Solution:

Eng-Arch-MPT-Sample-2

| Question Number | Solution |
|------------------------|-----------------|
| 1 | B |
| 2 | A |
| 3 | B |
| 4 | D |
| 5 | A |
| 6 | A |
| 7 | B |
| 8 | C |
| 9 | C |
| 10 | B |
| 11 | A |
| 12 | A |
| 13 | A |
| 14 | D |
| 15 | C |
| 16 | B |
| 17 | C |
| 18 | B |
| 19 | A |
| 20 | A |
| 21 | D |
| 22 | C |
| 23 | C |
| 24 | D |
| 25 | B |
| 26 | C |
| 27 | A |
| 28 | A |
| 29 | D |
| 30 | C |