

S.Y.B.Sc. I.T.
Sem III
Applied Mathematics
SAMPLE QUESTIONS

Q Choose correct alternative in each of the following

1) Modulus of complex number $1 - \sqrt{3}i$ is-----

a)1

b)2

c)3

d)4

2) Amplitude of complex number $1+i$ is -----

a) $\frac{\pi}{2}$

b) $\frac{\pi}{4}$

c) $\frac{\pi}{3}$

d) $\frac{\pi}{6}$

3) Polar form of -1 is -----

a) $\cos \pi + i \sin \pi$

b) $\cos 0 + i \sin 0$

c) $\cos \frac{\pi}{2} + i \sin \frac{\pi}{2}$

d) *None of these*

4) $(1 + i)^8 + (1 - i)^8 =$ -----

a) 16

b) 8

c) 32

d) 64

5) value of $\tanh \log \sqrt{5}$ is -----

a) $\frac{4}{3}$

b) $\frac{2}{3}$

c) $\frac{1}{3}$

d) $\frac{1}{2}$

6) $i^4 =$ -----

a) 1

b) 2

c) -1

d) -i

7) A matrix is called as singular if-----

a) $|A| = 0$

b) $|A| \neq 0$

c) $|A| = 1$

d) None Of these

8) Value of $e^{i\pi} = is$ --- --

a) 1

b) -1

c) -i

d) i

9) Necessary and sufficient condition for a square matrix be symmetric is --- -

a) $A = A'$

b) $|A| = 0$

c) $A = -A'$

d) None of these

10) Eigen values are roots of equation -----

a) $|A + \lambda I| = 0$

b) $|A - \lambda I| = 0$

c) $|A + \lambda I| \neq 0$

d) None of these

11) $L(e^{3t}) = \text{-----}$

a) $\frac{1}{s+3}$

b) $\frac{s}{s-3}$

c) $\frac{1}{s-3}$

d) None of these

12) $L(\sinh 2t) = \text{-----}$

a) $\frac{s}{s^2-4}$

b) $\frac{s}{s^2+4}$

c) $\frac{2}{s^2-4}$

d) None of these

13) $L(t^3) = \text{-----}$

a) $\frac{3!}{s^4}$

b) $\frac{3!}{s^3}$

c) $\frac{4!}{s^4}$

d) $\frac{4!}{s^3}$

14) $L(e^{-3t} \sin 2t) = \text{-----}$

a) $\frac{2}{(s+3)^2-4}$

b) $\frac{2}{(s+3)^2+4}$

c) $\frac{s+3}{(s+3)^2+4}$

d) $\frac{s+3}{(s+3)^2-4}$

15) $L(f(t)) = f(s)$ then $L(f'(t)) = \text{-----}$

- a) $sf(s) - f(0)$
- b) $sf'(s) - f(0)$
- c) $sf'(s) - f'(0)$
- d) None of these

16) $L(1) = \text{-----}$

- a) $\frac{1}{s^2}$
- b) $\frac{2}{s}$
- c) $\frac{1}{s}$
- d) None of these

17) $L^{-1}\left(\frac{1}{s}\right) = \text{-----}$

- a) 1
- b) e^t
- c) e^{-t}
- d) None of these

18) $L^{-1}\left(\frac{s}{s^2-4}\right) = \text{-----}$

- a) $\cosh 2t$
- b) $\sinh 2t$
- c) $\sin 2t$
- d) $\cos 2t$

19) $L^{-1}\left(\frac{1}{s-5}\right) = \text{-----}$

- a) e^{-5t}
- b) e^{5t}
- c) e^{st}
- d) None of these

20) $L^{-1}\left(\frac{s}{s^2+25}\right) = \text{-----}$

a) $\sin 5t$

b) $\cos 5t$

c) $\sinh 5t$

d) $\cosh 5t$

21) $\int_0^a \int_0^{\sqrt{a^2-x^2}} x^2 y \, dx dy = \text{-----}$

a) $\frac{a^4}{16}$

b) $\frac{a^5}{15}$

c) $\frac{a^4}{15}$

d) None of these

22) $\int_1^{\log 2} \int_0^x \int_0^{x+y} e^{x+y+z} \, dx dy dz = \text{-----}$

a) $\frac{5}{8}$

b) $\frac{3}{8}$

c) $\frac{1}{8}$

d) $\frac{7}{8}$

23) $\int_{-1}^1 dz \int_0^z dx \int_{x-z}^{x+z} (x+y+z) dy = \text{-----}$

a) 0

b) 1

c) 2

d) -1

$$24) \int_0^1 \int_{x^2}^x (x^2 + 3y + y^2) dx dy = \text{-----}$$

a) $\frac{5}{12}$

b) $\frac{7}{12}$

c) $\frac{11}{12}$

d) $\frac{13}{12}$

$$25) \int_0^1 \int_0^{x^2} e^{\frac{y}{x}} dy dx = \text{-----}$$

a) $\frac{1}{2}$

b) $\frac{1}{3}$

c) 1

d) $\frac{1}{4}$

$$26) \int_0^1 \int_0^{\sqrt{x}} (x^2 + y^2) dx dy = \text{-----}$$

a) $\frac{1}{35}$

b) $\frac{2}{35}$

c) $\frac{3}{35}$

d) $\frac{9}{35}$

$$27) \int_0^{4a} \int_{\frac{y}{2}}^y dx dy = \text{-----}$$

a) $\frac{1}{6}$

b) $\frac{1}{3}$

c) $\frac{1}{2}$

d) None of these

28) Value of $\iint xy dx dy$ over the area bounded by $x^2 = y$ and $y^2 = x$ is

a) $\frac{1}{12}$

b) $\frac{1}{11}$

c) $\frac{1}{10}$

d) $\frac{1}{9}$

29) $\int_0^a \int_0^a \int_0^a (yz + zx + xy) dx dy dz = \text{-----}$

a) $\frac{3}{4} a^5$

b) $\frac{3}{2} a^5$

c) $\frac{3}{2} a^4$

d) $\frac{3}{4} a^4$

30) $\int_0^\infty \int_x^\infty \left(\frac{e^{-y}}{y}\right) dy dx = \text{-----}$

a) 1

b) 0

c) -1

d) None of these

31) Solution of equation $\sec^2 x \cdot \tan y dx + \sec^2 y \cdot \tan x dy = 0$ is

a) $\tan x \tan y = c$

b) $\sin x \sin y = c$

c) $\cos x \cos y = c$

d) None of these

32) Solution of $fydx + xdy = 0$ is - - - -

a) $xy = c$

b) $\frac{x}{y} = c$

c) $x^2 + y^2 = c$

d) None of these

33) $M dx + Ndy = 0$ is homogeneous non exact differential equation then IF is

a) $\frac{1}{Mx+Ny}$

b) $\frac{1}{Mx-Ny}$

c) $Mx + Ny$

d) None of these

34) $\frac{1}{f(D)} e^{ax} =$ - - - - -

a) $\frac{1}{e^{ax}} f(a)$

b) $\frac{1}{f(a)} e^{ax}$

c) $f(a)e^{ax}$

d) None of these

35) $\frac{1}{D} X =$ - - - - -

a) $\int X dx$

b) $\int \frac{1}{X} dx$

c) $\int x^2 dx$

d) None of these

36) C.F. of D.E. $(D^2+3D+2)y = e^{e^x}$ is-----

a) $c_1e^{-x} + c_2e^{-2x}$

b) $c_1e^{-x} + c_2e^{2x}$

c) $c_1e^x + c_2e^{2x}$

d) None of these

37) C.F. of D.E. $(D^2 + 6D + 9)y = 5^x - \log 2$

a) $(c_1 + c_2x)e^{-3x}$

b) $(c_1 + c_2x)e^{3x}$

c) $(c_1 + c_2)e^{3x}$

d) $(c_1 + c_2)e^{-3x}$

38) Solution of $y - x \frac{dy}{dx} = 0$ is - - - -

a) $x = cy$

b) $xy = c$

c) $x^2 = cy^2$

d) None of these

39) Which of the following is Bernoulli's Differential equation---

a) $\frac{dy}{dx} + xy = (\sin x)y^3$

b) $\frac{dy}{dx} + xy = \cos x$

c) $\frac{dy}{dx} + y = x$

d) $\frac{dy}{dx} + y \sin x = x^2$

40) Solution of $\frac{dy}{dx} + \frac{y}{x} = 1$ is-----

a) $yx = x + c$

b) $xy = x^2 + c$

c) $xy = \frac{x^2}{2} + c$

d) None of these

41) $\operatorname{erf}(0) =$ - - - - -

a) 1

b) 0

c) -1

d) None of these

42) $\operatorname{erf}(\infty) = \text{-----}$

- a) 1
- b) 0
- c) -1
- d) None of these

43) $\int_0^1 \frac{\log(1+x)}{1+x^2} dx = \text{-----}$

- a) $\frac{\pi}{8} \log 3$
- b) $\frac{\pi}{8} \log 2$
- c) $\frac{\pi}{4} \log 2$
- d) None of these

44) $\int_0^\infty x^{-4} e^{-x} dx = \text{-----}$

- a) 1
- b) 2
- c) 3
- d) 4

45) $\int_0^\infty x^7 e^{-2x^4} dx = \text{-----}$

- a) $\frac{1}{8}$
- b) $\frac{1}{4}$
- c) $\frac{1}{16}$
- d) None of these

46) $\int_0^{\frac{\pi}{4}} \log(1 + \tan \theta) d\theta = \text{-----}$

- a) $\frac{\pi}{8} \log 3$
- b) $\frac{\pi}{8} \log 2$
- c) $\frac{\pi}{4} \log 2$
- d) None of these

47) $\int_1^{\infty} \frac{(x-1)^7}{x^{12}} dx = \text{-----}$

- a) $\frac{1}{1300}$
- b) $\frac{1}{1310}$
- c) $\frac{1}{1320}$
- d) None of these

48) $\beta(m, n) = \text{-----}$

- a) $\frac{\Gamma m \cdot \Gamma n}{\Gamma m+n}$
- b) $\frac{\Gamma m + \Gamma n}{\Gamma m+n}$
- c) $\frac{\Gamma m \cdot \Gamma n}{\Gamma mn}$
- d) None of these

49) $\Gamma n + 1 = \text{-----}$

- a) $n\Gamma n$
- b) Γn
- c) n
- d) None of these

50) $\Gamma \frac{1}{4} \Gamma \frac{3}{4} = \text{-----}$

- a) $\pi\sqrt{2}$
- b) 2π
- c) $2\sqrt{\pi}$
- d) None of these

