

QUESTION BANK

BASIC MATHEMATICS (K- Scheme)

BMS (311302)

UT- 2

Unit-II (TRIGONOMETRY) CO-II

2- marks

- 1) If $\sin A = 0.4$, find $\sin 3A$.
- 2) Without using calculator ,find the value of $\cos (765^\circ)$
- 3) Without using calculator, find the value of $\frac{\tan 66^\circ + \tan 69^\circ}{1 - \tan 66^\circ \tan 69^\circ}$
- 4) Find x if $\sin^{-1}\left(\frac{3}{5}\right) = \tan^{-1} x$
- 5) Express as product and evaluate without using calculator: $\sin 99^\circ - \sin 81^\circ$

4- marks

- 6) Prove that $\frac{\sin 7x + \sin x}{\cos 5x - \cos 3x} = \sin 2x - \cos 2x \cdot \cot x$
- 7) Prove that $\tan^{-1}\left(\frac{3}{4}\right) + \tan^{-1}\left(\frac{3}{5}\right) - \tan^{-1}\left(\frac{8}{19}\right) = \frac{\pi}{4}$
- 8) In ΔABC , Prove that $\tan A + \tan B + \tan C = \tan A \cdot \tan B \cdot \tan C$
- 9) Prove that $1 + \tan A \cdot \tan 2A = \sec 2A$
- 10) Without using calculator , Prove that $\sin(420^\circ) \cdot \cos(390^\circ) + \cos(-300^\circ) \cdot \sin(330^\circ) = \frac{1}{2}$
- 11) Prove that $\frac{\cos 3A}{\cos A} + \frac{\sin 3A}{\sin A} = 4 \cos 2A$
- 12) Prove that $\cos^{-1}\left(\frac{4}{5}\right) + \tan^{-1}\left(\frac{3}{5}\right) = \tan^{-1}\left(\frac{27}{11}\right)$
- 13) If $\tan(x+y) = 3/4$ & $\tan(x-y) = 8/15$, prove that $\tan(2x) = 77/36$

Unit- III (STRAIGHT LINE)

CO-III

2 marks

- 1) Find the distance between the point $(-2, 3)$ and the line $3x + 2y + 26 = 0$

- 2) Find the distance between two parallel lines
 $3x + 2y - 6 = 0$ and $6x + 4y - 8 = 0$
- 3) Find the equation of straight line whose y – intercept is 4 units and inclination is equal to 150° .
- 4) Find the equation of line passing through the point (2, 5) and parallel to the line $6x + 2y = 12$

4 marks:

- 5) Find the equation of line passing through the point of intersection of line $2x + 3y = 13$ and $5x - y = 7$ and perpendicular to the line $3x - y + 17 = 0$
- 6) Find the equation of the line passing through the point of intersection of the lines $4x + 3y = 8$, $x + y = 1$ and parallel to the line $5x - 7y = 3$.
- 7) Find the acute angle between the lines : $3x-2y+4=0$ & $2x-3y-7=0$.
- 8) Find the equation of the perpendicular bisector of the line joining the points (4, 8) and (-2, 6).

Unit: IV (FUNCTION & DERIVATIVES) CO-IV

2 marks:

- 1) If $f(x) = x^3 + x$ find $f(1) + f(2)$
- 2) Show that $f(x) = 4x^4 + 3 \cos x + x \sin x + 1$ is an even function.
- 3) If $f(x) = x^3 - \frac{1}{x^3}$, show that $f(x) + f\left(\frac{1}{x}\right) = 0$
- 4) If $f(x) = ax^2 - bx - 1$, $f(2) = 5$, $f(-2) = 10$ then find 'a' and 'b'.
- 5) Find $\frac{dy}{dx}$ if $y = e^x \tan x$
- 6) Find $\frac{dy}{dx}$ if $y = \sec x \tan x$
- 7) Find $\frac{dy}{dx}$ if $y = \frac{\sin x}{1 - \cos x}$
- 8) Find $\frac{dy}{dx}$ if $y = \log(x^2 + 2x + 5)$

4 marks:

- 9) If $f(x) = \frac{x+3}{4x-5}$ and $t = \frac{3+5x}{4x-1}$ show that $f(t) = x$.
- 10) If $f(x) = \frac{3x+4}{4x-1}$ show that $(f \circ f)(x) = x$.
- 11) If $f(x) = \log\left(\frac{1+x}{1-x}\right)$ show that $f(a) + f(b) = f\left(\frac{a+b}{1+ab}\right)$.
- 12) Find $\frac{dy}{dx}$ if $x^3 + xy^2 = y^3 + yx^2$
- 13) Find $\frac{dy}{dx}$ if $x = a \cos^3\theta$, $y = b \sin^3\theta$
- 14) Differentiate w.r.t. x : $y = 7^{\sqrt{x^2+1}}$
- 15) Differentiate w.r.t. x : $y = \frac{e^x + e^{-x}}{e^x - e^{-x}}$
- 16) If $y = \tan^{-1}\left(\frac{13x}{1-42x^2}\right)$ find $\frac{dy}{dx}$
- 17) If $y = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$ find $\frac{dy}{dx}$
- 18) Find $\frac{dy}{dx}$ if $\sin y = \log(x + y)$
- 19) If $e^y = y^x$ Prove that $\frac{dy}{dx} = \frac{(\log y)^2}{\log y - 1}$
- 20) Differentiate $(\sin x)^{\tan x}$ w.r.t. x
- 21) Differentiate $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ w.r.t. $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$