ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY
(GIRIJANANDA CHOWDHURY INSTITUTE OF PHARMACEUTICAL SCIENCE)

Non University End Semester Examination (August-Jan 2020)

B. Pharm 1st Semester

Subject: Remedial Mathematics

Code no: BP106RMT

Time =2 hrs   Full Marks: 35

A. Solve any one:

(1) Evaluate the following: 5x2=10

i) $\lim_{x \to \infty} \left(\frac{x^3 - 2x + 1}{4x^3 - x^2 + 5} \right)$

ii) $\lim_{x \to 0} \left(\frac{\sqrt{x+1} - 1}{x} \right)$

(2) Find the determinant and cofactors of the matrix   1x10=10

$$\begin{bmatrix} 1 & 4 & -1 \\ 5 & 2 & 3 \\ 7 & 1 & 2 \end{bmatrix}$$

Or Find the adjoint of matrix $\begin{bmatrix} 1 & 3 & -1 \\ 2 & 0 & 1 \\ 5 & 2 & 4 \end{bmatrix}$

B. Answer any five out of the following: 5 x 5= 25

(1) Resolve into partial fractions: $\frac{x^3 - 6x^2 + 10x - 2}{x^2 - 5x + 6}$

(2) Prove: $\log\left(\frac{u^2}{vw}\right) + \log\left(\frac{v^2}{wu}\right) + \log\left(\frac{w^2}{vu}\right) = 0$

(3) If $\log\left(\frac{x+y}{2}\right) = \frac{1}{2}(\log x + \log y)$, prove x=y

(4) If $f(x) = 3x+1$, $g(x) = \dfrac{x}{2}$ and $h(x) = \dfrac{x^3}{3}$, find fog(1), goh(-1), fogoh(x), gohof(3)

(5) If $f(x) = \sin x$ and $g(x) = 1-\cos x$, find $(f+g)(\pi/4)$, $(f-g)(\pi/2)$, $(f \cdot g)(\pi/3)$

(6) Give the equation of the right bisector of the line joining (1,1) and (2,3).

(7) Give the condition for perpendicular lines with the help of diagram. If the line passing through the points (-4,y) & (1,3) is parallel to the line passing through (-2,5) & (0,7), find the value of y.

(8) Solve the following: $\int e^{ax} \cos bx\, dx$

(9) Solve: $\int_0^1 x(1-x)^5 dx$

(10) What is the order and degree of the DE : $\left(\dfrac{d^2y}{dx^2} + y\right)^{3/2} = e^x$. Solve the following DE: $\dfrac{dy}{dx} = e^{x-y} + x^2 e^{-y}$

(11) If $y = x^{1/x}$, find $\dfrac{dy}{dx}$

(12) if $x\sqrt{1+y} + y\sqrt{1+x} = 0$, find $\dfrac{dy}{dx}$