Code No. 7004

FACULTY OF TECHNOLOGY

B. Pharmacy I - Year (Supplementary) Examination, March 2010

Subject : MATHEMATICS

Time : 3 Hours). (Max. Marks: 70

Note: Answer All questions. All questions carry equal marks.

1.(a) If x = log , y = logr and z log then show that xyz = x + y + z + 2.

(b) If $\sin x + \sin y = \frac{1}{4}$ and $\cos x + \cos y = \frac{1}{3}$ then show that

$\tan\left(\frac{x+y}{2}\right) = \frac{3}{4}$ and $\cot(x+y) = \frac{7}{24}$

(c) If A + B + C = 180°, prove that $\sin A + \sin B + \sin C = 4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

OR

(d) If 8a is not an integral multiple of Tr, prove that
tan a + 2tan 2a + 4tan 4a + 8cot 8a = cota

(e) If A + B + C = 180°, prove that, $\sin A + \sin B - \sin C = 4\sin\frac{A}{2}\sin\frac{B}{2}\cos\frac{C}{2}$

(f) $\frac{\cos a}{a} \quad \frac{\sin a}{b}$ show that acos 2a + bsin 2a = a.

2.(a) If $u = x^3 + y^3 - x^2y + xy^2$, find $x\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y}$.

(b) Compute $\lim_{x\to 2}\frac{x-2}{x^3-8}$.

(c) Find $\frac{df}{dx}$ when y = logx using first principle.

OR

(d) Find the maximum value of $2x^4 - 3x^2 - 36x + 10$.

(e) If x = r cose, y = r sine, then find $\frac{\partial^2 o}{\partial x^2}, \frac{\partial^2 o}{\partial y^2}, \frac{\partial^2 o}{\partial x \partial y}$

(f) Differentiate, $\sqrt{\frac{1+x}{1-x^2}}$

3.(a) Evaluate $\int \frac{x^5}{1+x^{12}}\,dx$.

(b) Evaluate $\int \frac{2x+1}{x^2+x+1}\,dx$.

(c) Evaluate $\int \frac{}{1+\sin 2x}\,dx$

OR

(d) Evaluate $\int_0^{\pi} x\sin x\,dx$.

(e) Evaluate $\int \frac{}{\sqrt{1+\sin x}}\,dx$

(f) Find the area bounded between the curves $y^2 = 4ax$, $x^2 = 4by$.

4.(a) If $A = \begin{vmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{vmatrix}$, then show that $A^2 - 4A \quad 51 = 0$

(b) Define raw matrix, column matrix. Find the rank of the matrix. $A = \begin{vmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{vmatrix}$

OR

Ogo Solve the following equation by Gauss-Jordon method.

$3x + 4y + 5z = 18$

$2x \quad y + 8z = 13$

$5x - 2y + 7z = 20$

(d) If $A = \begin{bmatrix} 3 & -2 \\ 1 & 6 \end{bmatrix}$ $B = \begin{vmatrix} 4 & -1 \\ 2 & 5 \end{vmatrix}$, then find AB and BA.

5.(a) Define Boolean algebra. Discuss the set of postulates defining Boolean algebra.

(b) Construct logic circuit for the following Boolean function using AND / OR / NOT gates

$f = (A + B)(A \quad B)$

OR

(c) Show that the points (-1, 7) (3, -5) (4, -8) are collinear.

(e) Show that the points $2i + 3j - K$, $i - 2j + 2k$, $3i + 4j - 2k$ are coplanar.