Code No. 7204

FACULTY OF PHARMACY

B. Pharmacy I Year (Suppl.) Examination, November 2013

Subject: Mathematics

Time: 3 Hours **Max.Marks: 70**

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

1.(a) Prove that $\frac{1}{1+\log_a bc}+\frac{1}{1+\log_b ca}+\frac{1}{1+\log_c ab}=1.$

(b) If $\sin\alpha = \frac{1}{\sqrt{10}}$; $\sin\beta = \frac{1}{\sqrt{5}}$ and α, β are acute angles then show that $\alpha+\beta = \frac{\lambda}{4}$.

OR

(c) Find the value of xyz if $\frac{\log x}{y-z}=\frac{\log y}{z-x}=\frac{\log z}{x-y}$.

(d) Prove that $\frac{1}{\cos 290^\circ}+\frac{1}{\sqrt{3}.\sin 250^\circ}=\frac{4}{\sqrt{3}}$.

2.(a) Find the maximum and minimum values of $f(x) = x^3 + \frac{3}{x}$.

(b) If $xy = ae^x + bc^{-x}$ then prove that $xy'' + 2y' - xy = 0$.

OR

(c) If $z = \log\left(\frac{x^2+y^2}{xy}\right)$, verify that $\frac{\partial^2 z}{\partial x \partial y}=\frac{\partial^2 z}{\partial y \partial x}$.

(d) Prove that $x^3 - 3x^2 + 3x + 7$ has neither maximum nor minima.

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

(b) Evaluate $\int\frac{x\sin^{-1}x}{\sqrt{1-x^2}}dx.$

OR

(c) Evaluate $\int\frac{\sin x\cos x}{1+\sin^4 x}dx$

(d) Evaluate $\int\frac{x^2+2x+5}{(x+2)(x-1)(3x-1)}dx.$

..2.

4.(a) Define rank of a matrix and hence find the rank of the matrix A = $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \end{bmatrix}$.

(b) Solve the system of equations. 2x-y+8z=13; 3x+4y+5z = 18 and 5x-2y+7z = 20 by matrix inversion method.

OR

4.(c) Solve the system of equations x+2y+3z = 4; 2x+3y+5z = 5; 3x+4y+6z = 12 by Gaussian elimination method.

(d) If A = $\begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 2 \\ 3 & 4 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 3 & 2 \\ 1 & -1 & 2 \end{bmatrix}$ then find $(AB)^{-1}$.

5.(a) Define linear and non-linear graphs with an example.

(b) Find foci, latus rectum eccentricity, from $y^2+2y+3x+4 = 0$.

OR

(c) Derive the equation y = mx + c and explain the importance m and c.

(d) Find the radius and centre of the circle $x^2+y^2-4x+6y+4 = 0$.

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