Code No: 231AA

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy I Year I Semester Examinations, May/June-2017

REMEDIAL MATHEMATICS

Time: 3hours **Max.Marks:75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A **(25 Marks)**

1.a) Resolve $\frac{x^2+1}{(x^2+4)(x-2)}$ into partial fractions. [2]

b) Define Triangular matrix and Transpose of a matrix give examples. [3]

c) If $\sin A = \frac{3}{5}, \cos B = \frac{9}{41}$ then find the value of $\sin(A-B)$ and $\sin(A+B)$. [2]

d) Find the distance of the point (7, 6) from point of intersection of straight lines $3x+2y=5$ and $x-5y=-4$. [3]

e) Define continuity and derivative of $f(x)$ at point a. [2]

f) Define Partial derivative of the function f of two variables x and y, also find first order partial derivatives of $z = x^3 - \tan xy + y^2$ [3]

g) Find the value of $\int \frac{1-\tan x}{1+\tan x}dx$ [2]

h) Find the value of $\int \frac{e^{-4x}}{x}dx$ [3]

i) Form the differential equation by eliminating the arbitrary constants a and b from the equation $y = a\cos x + b\sin x$ [2]

j) Define Order and Degree of a differential equation, also find the order and degree of

$$1+\left(\frac{d^2y}{dx^2}\right)^2 = \left[2+\left(\frac{dy}{dx}\right)^2\right]^{3/2}$$ [3]

PART-B **(50 Marks)**

2.a) Find numerically greater term in the expansion of $(3x+2)^{15}$ when $x = \frac{2}{5}$

b) Solve the simultaneous equations $2x - y + z + 3 = 0;\ 3x - z + 8 = 0;\ 2x + 6y - 2 = 0$, by Cramer's rule. [5+5]

OR

3.a) Find the middle term of $\left(x+\frac{1}{x}\right)^{2n}$

b) Prove that $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$

c) In how many ways, can five different messages be delivered by 3 messenger boys? [10]

4.a) Prove that $\cos\left(\frac{\pi}{9}\right)\cos\left(\frac{2\pi}{9}\right)\cos\left(\frac{3\pi}{9}\right)\cos\left(\frac{4\pi}{9}\right) = \frac{1}{16}$

b) Find the equation of line having intercepts a and b on the axes such that $a+b=5$ and $ab=6$ [5+5]

OR

5.a) The angles of elevation of the top of a tower from the top and foot of a pole of height 10 m are 30^0 and 60^0. Find the height of the tower.

b) Find the equation of the line whose slope is -4 and passing through the point of intersection of the lines $2x - y = 3;\ 3x + y = 7$. [5+5]

6.a) Find the maximum and minimum values of the function $f(x) = 2x^3 - 3x^2 - 12x - 6$

b) Show that $f(x) = \begin{cases} \frac{x^2+3|x|}{2x}, & when\ x \neq 0 \\ \frac{5}{2}, & when\ x = 0 \end{cases}$ is not continuous at $x = 0$. [5+5]

OR

7.a) Find the derivative of $\frac{(2x^2+4)^4}{\sqrt{x}}$

b) Find the value of $\lim_{x\to\infty}(\sqrt{x^2+x+1} - \sqrt{x^2+x-1})$

c) If $u(x,y) = (\sin x)(\cos y)$ then find $2u_{xx} + 3u_{yy}$ [10]

8.a) Find the value of $\int \frac{x\,dx}{\sqrt{x+1}+\sqrt{x-1}}$

b) Find the area of the region bounded by the curve $y = x^2$ and the line $y = x + 2$ [5+5]

OR

9.a) Find the value of $\int_0^2 x2^{x^2} e^{x^2} dx$

b) Find the value of $\int (e^{3x} + \log x)x^3 dx$ [5+5]

10.a) Solve the differential equation $\frac{dy}{dx} = \frac{xy}{x^2+y^2}$

b) Solve the differential equation $(y^2 - 2xy)dx = (x^2 - 2xy)dy$ [5+5]

OR

11.a) Solve the differential equation $\frac{dy}{dx} + \frac{3x^2y}{1+x^3} = \frac{\sin^2 x}{1+x^3}$

b) Solve the differential equation $(y^2 - 4xy - 2x^2)dy + (x^2 - 4xy - 2y^2)dx = 0$ [5+5]

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