B.Pharm I Year I Semester (R15) Supplementary Examinations February 2023
**REMEDIAL MATHEMATICS**

Time: 3 hours

Max. Marks: 70

### PART – A
(Compulsory Question)
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1        Answer the following: (10 X 02 = 20 Marks)
   (a)  Find the sum of an infinite GP whose first term is 28 and second term is 4.
   (b)  If $\alpha, \beta$ are the roots of $3x^2 - 5x + 7 = 0$ then find the value of $\alpha^3 + \beta^3$.
   (c)  Find the value of $\cot 15^0$.
   (d)  Simplify $\frac{\sin\theta + \sin 2\theta}{1 + \cos\theta + \cos 2\theta}$.
   (e)  Find the angle which the straight line $y = \sqrt{3}x - 4$ makes with the Y-axis.
   (f)  Find the equation of straight perpendicular to line $5x - 3y + 1 = 0$ and passing through point (4, -3).
   (g)  Evaluate $\lim\limits_{x \to 0} \frac{\sin(a+bx) - \sin(a-bx)}{x}$.
   (h)  Evaluate $\int_0^3 \frac{x\,dx}{\sqrt{x^2+16}}$.
   (i)  Form the differential equation for the family of curves $x^2 + y^2 = a^2$.
   (j)  Find the Laplace transformation of $te^t$.

### PART – B
(Answer all the questions: 05 X 10 = 50 Marks)

2        Find the sum of the series: $(45 + 47 + 49 + \cdots \ldots \ldots \ldots + 99)$.
**OR**
3        If $x^2 - 11x + a = 0$, $x^2 - 14x + 2a = 0$ have a common root, then find 'a'.

4        Prove that $\sin^2\left(\alpha - \frac{\pi}{4}\right) + \sin^2\left(\alpha + \frac{\pi}{2}\right) - \sin^2\left(\alpha - \frac{\pi}{2}\right) = \frac{1}{2}$.
**OR**
5        Find the values of: (i) $\sin 22\frac{1}{2}^0$.   (ii) $\cos 22\frac{1}{2}^0$.   (iii) $\tan 22\frac{1}{2}^0$.   (iv) $\cot 22\frac{1}{2}^0$.

6        Find the equation of a line whose slope is ½ and y-intercept equal to -5/4.
**OR**
7   (a)  Transform the equation x + y + 2 = 0 into the normal form.
    (b)  If the mid points of a triangle are (3, -3), (3, 1) and (1, 1) respectively then find the vertices of the triangle.

8        Evaluate:
$$\int_0^{\frac{\pi}{4}} \log(1 + \tan x)\,dx$$
**OR**
9        Find the derivative of $\sin^2 x$ with respect to $x$.

10       Find the Laplace transform of $e^{3t}sn^2t$.
**OR**
11       Solve $\frac{dy}{dx} + \frac{y^2+y+1}{x^2+x+1} = 0$.

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B.Pharm I Year I Semester (R15) Supplementary Examinations September 2022
**REMEDIAL MATHEMATICS**

Time: 3 hours

Max. Marks: 70

**PART – A**
(Compulsory Question)
*****

1       Answer the following: (10 X 02 = 20 Marks)
 (a)   Find the sum of an infinite GP whose first term is 28 and second term is 4.
 (b)   If $\alpha, \beta$ are the roots of $3x^2 - 5x + 7 = 0$ then find the value of $\alpha^3 + \beta^3$.
 (c)   Find the value of $\cot 75^0$.
 (d)   Simplify $\frac{(\sin 2\theta)}{(1 + \cos 2\theta)}$.
 (e)   Find the area of the triangle formed by the points (0, 0), (1, 0) and (0, 1).
 (f)   Find the angle between the lines $3x - y + 5 = 0, x + 3y - 2 = 0$.
 (g)   Find the derivative of $x \log x$ with respect to $x$.
 (h)   Find $\int \frac{1}{\cos hx + \sin hx} dx$ on R.
 (i)   Find the order and degree of $\left[\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^3\right]^{\left(\frac{6}{5}\right)} = 6y$.
 (j)   Find the Laplace transform of $(t^2 + 1)^2$.

**PART – B**
(Answer all the questions: 05 X 10 = 50 Marks)

2  (a)  If $x^2 - 11x + a = 0$, $x^2 - 14x + 2a = 0$ have a common root, then find 'a'.
   (b)  Find the 12$^{th}$ term of the series 2, 5, 8, .......
                      **OR**
3  (a)  If 4, 12, 20, …… are in AP then find the sum of first 20 terms.
   (b)  If α, β are the roots of $x^2 + x + 1 = 0$, then find $\alpha^2 + \beta^2$.

4      If A, B and C are angles of a triangle, then prove that:
          cos2A + cos2B + cos2C = -4cosA cosB cosC - 1.
                      **OR**
5      If $A + B + C = \frac{\pi}{2}$, then show that $\sin^2 A + \sin^2 B + \sin^2 C = 1 - 2 \sin A \sin B \sin C$.

6  (a)  Find the distance between $(a\cos \theta, 0), (0, a\sin \theta)$.
   (b)  Find the area of the triangle formed by $(a + 3, a - 2), (a - 4, a + 5)$ and $(a, a)$.
                      **OR**
7  (a)  If the slopes of the line joining the points $A(x, 2)$, $B(6, -8)$ is -5/4, find the value of $x$.
   (b)  Find the equation of a line whose slope is ½ and y-intercept equal to -5/4.

8  (a)  Evaluate $\int (\sec x \tan x + \frac{3}{x} - 4)dx$.
   (b)  Evaluate $\lim_{x \to a} \frac{x^{12} - a^{12}}{x - a}$.
                      **OR**
9  (a)  Evaluate $\lim_{x \to 0} \frac{e^{3x} - 1}{x}$.
   (b)  Find $\int e^{\log(1 + \tan^2 x)} dx$.

10  (a)  Find Laplace transform of $\sin(wt + \alpha)$.
    (b)  Solve $xdy + 2ydx = 2y^2xdy$.
                      **OR**
11      Solve $y - \frac{xdy}{dx} = a(y^2 + \frac{dy}{dx})$.

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B.Pharm I Year I Semester (R15) Supplementary Examinations April/May 2022
**REMEDIAL MATHEMATICS**
(For 2015, 2016, 2017 & 2018 admitted batches only)

Time: 3 hours

Max. Marks: 70

**PART – A**
(Compulsory Question)
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1    Answer the following: (10 X 02 = 20 Marks)
(a) If $\alpha, \beta$ are the roots of $x^2 - 3x + 5 = 0$, then find the value of $\alpha^2 \beta^2$.
(b) Find the sum of infinite terms of $4, -2, 1, -\frac{1}{2} \ldots \ldots \ldots \ldots$
(c) Find the value of $\cot 15^0$.
(d) Simplify $\frac{\sin \theta + \sin 2\theta}{1 + \cos \theta + \cos 2\theta}$.
(e) Find the equation of the line passing through (3, 4) and (5, -1).
(f) Find the angle between the lines $x - y + 4 = 0, y = 7$.
(g) Find the derivative of $x \cos x$ with respect to x.
(h) Find $\int \frac{1}{1 + \cos x} dx$ on R.

(i) Find the order and degree of $\left[\left(\frac{dy}{dx}\right)^{\frac{1}{2}} + \left(\frac{d^2y}{dx^2}\right)^{\frac{1}{3}}\right]^{\frac{1}{4}} = 0$.

(j) Find the Laplace transform of $\sin 2t \cos 3t$.

**PART – B**
(Answer all the questions: 05 X 10 = 50 Marks)

2  (a)  If α, β are the roots of $3x^2 - 5x + 7 = 0$ then find $\alpha^3 + \beta^3$.
   (b)  Find the sum to infinite terms of GP, $\frac{1}{2} + \frac{1}{6} + \frac{1}{18} + \frac{1}{54} + \cdots \ldots \ldots \ldots \ldots$
OR
3  (a)  Find the sum of the series: $(45 + 47 + 49 + \cdots \ldots \ldots \ldots + 99)$.
   (b)  If the roots of the equation $12x^2 + mx + 5 = 0$ are in the ratio $5 : 4$ then find $m$.

4    If A, B and C are angles of a triangle, then prove that:
     $\cos 2A + \cos 2B - \cos 2C = 1 - 4 \sin A \sin B \cos C$.
OR
5    If $A + B + C = \frac{\pi}{2}$, then show that $\sin 2A + \sin 2B + \sin 2C = 4 \cos A \cos B \cos C$.

6  (a)  Find the angle made by the line $x + \sqrt{3}y - 6 = 0$ with the positive direction of X-axis.
   (b)  Find the ratio in which X-axis divides the line segment joining (2, -3) and (6, 7).
OR
7  (a)  Find the point of trisection of the line segment joining (-5, 2), (3, 6).
   (b)  Reduce the equation 6x+3y-5 = 0 to the slope intercept form and find its slope and y-intercept.

8 (a) Evaluate $\int \frac{[(3x+1)^2]}{2x} dx$.

   (b) Find the derivative of $\sin^2 x$ with respect to x.

<div align="center">OR</div>

9 (a) Differentiate $x^2 \tan x$.

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

10     A bacterial culture, growing exponentially increases from 200 to 800 grams in the period from 6AM to 9AM. How many grams will be present at noon?

<div align="center">OR</div>

11 (a) Find $L(t^3 + 5 \cos t)$.

   (b) Solve the differential equation $\frac{dy}{dx} + \sqrt{\frac{1+y^2}{1+x^2}} = 0$.

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