Assignment 5

PDE (MA20103)

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Solve the following and verify your answer — for particular integral

1. $(D^2 - 2DD' + D'^2)z = e^{x+2y} + x^3$

[Ans: $y = f_1(y+x) + x f_2(y+x) + e^{x+2y} + \frac{1}{20}x^5$]

2. $2r - s - 3t = 5e^x / e^y$

[Ans: $z = f_1(2y+3x) + f_2(y-x) + xe^{x-y}$]

3. $r + (a+b)s + abt = xy$

[Ans: $z = f_1(y-ax) + f_2(y-bx) + \frac{1}{6}x^3y - \frac{1}{24}(a+b)x^4$]

4. $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = \cos mx \cos ny$

[Ans: $z = f_1(y+ix) + f_2(y-ix) - \frac{1}{2(m^2+n^2)}[\cos(mx+ny) + \cos(mx-ny)]$]

5. $(D^2 - DD' - 2D'^2)z = (y-1)e^x$

[Ans: $z = f_1(y+2x) + f_2(y-x) + ye^x$]

6. $(r + s - 6t) = y\cos x$

[Ans: $z = f_1(y-3x) + f_2(y+2x) - y\cos x + \sin x$]

All the symbols have their usual meaning. Answers of P.I. may vary.

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