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NPTEL

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Courses » Ordinary and Partial Differential Equations and Applications

Announcements **Course** Ask a Question Progress Mentor FAQ

Unit 8 - Week 7

Course outline

Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-19, 23:59 IST.

1) *The Green's function for the boundary value problem* $y'' = 0,\ y(0) = y(1) = 0$ *is* — *1 point*

$$G(t,s) = \begin{cases} t(1-s), & t \geq s; \\ s(1-t), & t \leq s. \end{cases}$$

$$G(t,s) = \begin{cases} \frac{t(1-s)}{2}, & t \geq s; \\ \frac{s(1-t)}{2}, & t \leq s. \end{cases}$$

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$$G(t,s) = \begin{cases} \frac{t(1-s)}{2}, & t \leq s; \\ \frac{s(1-t)}{2}, & t \geq s. \end{cases}$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$G(t,s) = \begin{cases} t(1-s), & t \leq s; \\ s(1-t), & t \geq s. \end{cases}$$

2) *The Green's function for the boundary value problem* $y'' = f(x, y, y'),\ y(-1) = y(1) = 0$ *is* — *1 point*

$G(x,\xi) = |x-\xi| + x\xi - 1$

$G(x,\xi) = -\frac{1}{2}\left[|x-\xi| - x\xi + 1\right]$

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$G(x,\xi) = |x-\xi| - x\xi + 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$G(x,\xi) = -\frac{1}{2}\left[|x-\xi| + x\xi - 1\right]$

3) *The PDE obtained by eliminating the arbitrary functions from* $z = yf(x) + xg(y)$ *is given by* — *1 point*

$xy = px + qy - z$

$xys = px + qy - z$

$xys = px + qy - z^2$

$xy = px + qy - z^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$xys = px + qy - z$

4) *The PDE obtained by eliminating the arbitrary functions from* $z = xf_1(x+t) + f_2(x+t)$ *is given by* — *1 point*

$$\frac{\partial^2 z}{\partial x^2} - 2\frac{\partial^2 z}{\partial x\, \partial t} + \frac{\partial^2 z}{\partial t^2} = 0$$

$$\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{\partial^2 z}{\partial x^2} - 2\frac{\partial^2 z}{\partial x \partial t} + \frac{\partial^2 z}{\partial t^2} = 0$

5) *The PDE obtained by eliminating the arbitrary function from* $F(x+y+z,\ x^2+y^2+z^2)=0$ *is given by* **1 point**

- $x(y-z)p + y(z-x)q = z(x-y)$
- $p(x-2z) + 1(2z-y) = y-x$
- $z = px + qy - pq$
- $(y-z)p + (z-x)q = x-y$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(y-z)p + (z-x)q = x-y$

6) *The PDE obtained by eliminating the arbitrary function from* $z = y^2 + 2f(\frac{1}{x} + \ln y)$ *is given by* **1 point**

- $px + qy = 2y^2$
- $px^2 + qy = 2y^3$
- $px^2 + qy = 2y^2$
- $px + qy^2 = 2y$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$px^2 + qy = 2y^2$

7) **1 point**
The equation of the integral surface of the PDE $2y(z-3)p + (2x-z)q = y(2x-3)$ *which passes through the circle* $z=0,\ x^2+y^2 =$

- $x^2 + y^2 + z^2 - 2x + 4z = 0$
- $x^2 + y^2 - z^2 - 2x - 4z = 0$
- $x^2 + y^2 + z^2 - 2x - 4z = 0$
- $x^2 + y^2 - z^2 - 2x + 4z = 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x^2 + y^2 - z^2 - 2x + 4z = 0$

8) **1 point**
The particular integral of the PDE $(2xy-1)p + (z-2x^2)q = 2(x-yz),$ *where passes through the line* $x=1, y=0,$ *is*

- $x^2 + y^2 + z = 1 + xz + y$
- $x^2 + y + z = 1 + xz + y^2$
- $x^2 + y^2 + z = 1 + xz + zy$
- $x + y^2 + z = 1 + x^2 z + y$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x^2 + y^2 + z = 1 + xz + y$

9) **1 point**
The equation of the integral surface of the PDE $(x-y)p + (y-x-z)q = z,$ *which passes the through the circle* $z=1,\ x^2 + y^2 = 1$

- $(x-y+z)^2 + z^4(x+y+z)^2 - 2z(x-y+z) - 2z^4(x+y+z) = 0$
- $(x-y+z)^2 + z^2(x+y+z)^2 - 2z^2(x-y+z) - 2z^4(x+y+z) = 0$
- $(x-y+z)^2 + z^4(x+y+z)^2 - 2z^2(x-y+z) - 2z^4(x+y+z) = 0$
- $(x-y+z)^2 + z^2(x+y+z)^2 - 2z^2(x-y+z) - 2z^3(x+y+z) = 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(x-y+z)^2 + z^4(x+y+z)^2 - 2z^2(x-y+z) - 2z^4(x+y+z) = 0$

10) *The equation of the integral surface of the PDE* $y^2\,p + (y-x)\,x^2\,q = (x^2\ + y^2)z$, *through the curve* $xz = a^3,\ y = 0$ *is* **1 point**

- $z^3(x^3+y^3)^2 = a^9(x+y)^3$
- $z^3(x^3+y^3)^2 = a^9(x-y)^3$
- $z^3(x^3-y^3)^2 = a^9(x-y)^3$
- $z^3(x^3-y^3)^2 = a^9(x+y)^3$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$z^3(x^3+y^3)^2 = a^9(x-y)^3$

11) *The general equation of surfaces orthogonal to the family* **1 point**
$x(x^2+y^2+z^2) = c_1y^2$
is given by

- $x^2+y^2+z^2 = f\left(\frac{2x^2+y^2}{z}\right)$
- $x^2+y^2+z^2 = f\left(\frac{2x^2+y^2}{z^2}\right)$
- $x^2+y^2+z^2 = zf\left(\frac{2x^2+y^2}{z^2}\right)$
- $x^2-y^2+z^2 = f\left(\frac{x^2+y^2}{z}\right)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x^2+y^2+z^2 = zf\left(\frac{2x^2+y^2}{z^2}\right)$

12) *The equation of the system of surfaces orthogonal to the cones of the system* **1 point**
$x^2+y^2+z^2 = cxy,$
is

- $x^2+y^2+z^2 = f\left(\frac{x^2-y^2}{z^2}\right)$
- $x^2+y^2+z^2 = f\left(\frac{x^2-y^2}{z}\right)$
- $x^2-y^2+z^2 = zf\left(\frac{x^2-y^2}{z^2}\right)$
- $x^2-y^2-z^2 = f\left(\frac{x^2-y^2}{z}\right)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x^2+y^2+z^2 = f\left(\frac{x^2-y^2}{z^2}\right)$

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