

UNIT-3RD - ASSIGNMENT ON DIFFERENTIAL EQUATION

Q.1) Solve following differential equations ?

a) $\frac{d^2y}{dx^2} + 3 \frac{dy}{dx} + 2y = 0$

b) $\frac{d^2y}{dx^2} + 4 \frac{dy}{dx} + 4y = 0$

c) $\frac{d^2y}{dx^2} + 2 \frac{dy}{dx} + 2y = 0$

d) $\frac{d^2y}{dx^2} + 4 \frac{dy}{dx} + 5y = 0$

e) $\frac{d^4y}{dx^4} + 4y = 0$

f) $(D^4 + 8D^2 + 16)y = 0$

Q.2) Solve following nonhomogeneous differential equations ?

a) $(D^2 - 3D + 2)y = e^{5x}$

b) $(D^3 + 3D^2 + 3D + 1)y = e^{2x}$

c) $(D^2 + 1)y = \cos 2x$

d) $(D^2 + 3D + 2)y = (e^x + 1)^2$

e) $(D^2 + 3D + 2)y = e^{-2x}$

f) $(D^2 - 4)y = \cos^2 x$

g) $(D^2 - 5D + 6)y = \sin 3x$

h) $(D^3 + D^2 - D - 1)y = \cos 2x$

i) $(D^2 - 8D + 9)y = 40 \sin 5x$

j) $(D^2 - 4)y = x^2$

k) $(D^2 + 2D + 4)y = e^x \sin 2x$

l) $(D^2 - 3D + 2)y = xe^x$

m) $(D^3 + 3D^2 + 3D + 1)y = x^2 e^{-x}$

n) $(D^3 - 4D^2 + 5D - 2)y = 540x^3 e^x$

o) $(D^2 + 2D + 1)y = x \cos x$

p) $(D^2 - 2D + 1)y = x \sin x$

q) $(D^2 + 4)y = \cos 2x$

r)

Q.3) Solve following Double Integration ?

a) $\int_0^1 \int_0^x e^{y/x} dx dy$

b) $\int_0^2 \int_0^{\sqrt{1+x^2}} \frac{1}{1+x^2+y^2} dx dy$

c) $\int_0^2 \int_0^{x^2} e^{y/x} dx dy$

d) $\int_0^a \int_0^{\sqrt{ay}} xy dx dy$

Classes on (ED,BEEE,M1,M2,M3,NA,CONTROL,DSP & other GATE oriented Engineering Subjects)

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e) $\int_0^a \int_0^{\sqrt{a^2-y^2}} dy dx$

f) $\int_0^1 \int_0^{\sqrt{\frac{1}{2}(1-y^2)}} \frac{1}{\sqrt{1-x^2-y^2}} dx dy$

Q.4) Solve following Triple integration ?

a) $\int_0^3 \int_0^2 \int_0^1 (x + y + z) dx dy dz$

b) $\int_{-c}^c \int_{-b}^b \int_{-a}^a (x^2 + y^2 + z^2) dz dy dx$

c) $\int_0^2 \int_0^x \int_0^{x+y} e^x (y + 2z) dx dy dz$

d) $\int_0^1 \int_{y^2}^1 \int_0^{1-z} z dy dz dx$

e) $\int_1^3 \int_{1/x}^1 \int_0^{\sqrt{xy}} xyz dx dy dz$

f) $\int_0^a \int_0^b \int_0^{\sqrt{(1-x^2/a^2)}} \int_0^{\sqrt{(1-x^2/a^2-y^2/b^2)}} dx dy dz$

g) $\int_{x=0}^{\log 2} \int_{y=0}^x \int_{z=0}^{x+\log y} e^{x+y+z} dz dy dx$

h) $\int_1^e \int_1^{\log y} \int_1^{e^x} \log z dy dx dz$

Q.5) Solve following Double Integration by using change of order concept?

a) $\int_0^3 \int_0^{3-x} xy dy dx$

b) $\int_0^1 \int_{x^2}^{2-x} xy dy dx$

c) $\int_0^a \int_0^{\sqrt{a^2-y^2}} \sqrt{a^2 - x^2 - y^2} dx dy$

d) $\int_1^2 \int_0^x \frac{1}{x^2+y^2} dx dy$

e) $\int_0^2 \int_x^{3x-x^2} (3x^2 - 2xy) dx dy$

f) $\int_0^3 \int_0^{3-x} x dy dx$

g) $\int_0^1 \int_{x^2}^{2-x} x dy dx$

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Q.6) Solve following Surface Integration ?