Solution

BAHRIA UNIVERSITY,
(KarachiCampus)
Department of Software Engineering
Quiz 3 - Fall 2022

COURSE TITLE: Applied Calculus & Analytical Geometry
Class BSE-I(B)
Course Instructor: Daniyal ur rehman
Date: 30-12-2022

COURSE CODE: GSC-110
Shift: Morning
Time Allowed: 20 min.
Max. Marks: 10 Marks

Question No. 1. Choose the correct answers **[CLO3: 10 Marks]**

i. nth derivative of sin(ax+b) is

a. $y_n = a^n \cos(ax + b + \frac{n\pi}{2})$

b. ✓ $y_n = a^n \sin(ax + b + \frac{n\pi}{2})$

c. $y_n = b^n \cos(ax + b + \frac{n\pi}{2})$

d. $y_n = b^n \sin(ax + b + \frac{3n\pi}{2})$

ii.

Find the area above the x-axis under the curve $y^2 = x, \quad x = 1, x = 3$

a. $\frac{3}{2}(3\sqrt{3} - 1)$

b. ✓ $\frac{2}{3}(3\sqrt{3} - 1)$

c. $(3\sqrt{3} - 1)$

d. None

iii.

Solve the differential equation $\frac{dy}{dx} = x\cos^2 y$

a. $\tan y = \frac{x}{2} + c$

b. $\tan y + x + c = 0$

c. $\tan x = \frac{x^2}{2} + c$

d. ✓ $\tan y = \frac{x^2}{2} + c$

$y = x + \tan x$

$y' = 1 + \sec^2 x$

$y' = \tan^2 x$

$y'' = 2\tan x \sec^2 x$

iv.

$\int x \ln x \, dx$

a. $x \ln x - x^2 + c$

b. ✓ $\frac{x^2}{2}\ln x - \frac{1}{4}x^2 + c$

c. $x \ln x + x + c$

d. None

v.

$\int \sin^2 x \cos x \, dx$

a. ✓ $\frac{\sin^3 x}{3} + c$

b. $\cos^2 x + c$

c. $\sin x \cos x + c$

d. None

$\cos^2 x (2\tan \sec^2 x) - 2(x + \tan x) + 2x = 0$

$= 2\tan x - 2x - 2\tan x + 2x$

$= 0$

proved.

Q2. Show that If $y = x + \tan x$ then $\cos^2 x \frac{d^2y}{dx^2} - 2y + 2x = 0$.

Q3. Find the sum of 1+2+3+...+50 by using the appropriate formula

$$S_{50} = \frac{50(50+1)}{2} = 1275$$