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Code No. : B-412(A)

Roll No.....

Total No. of Section : 03

Total No. of Printed Pages : 04

OR

If , then prove that

Code No. : B-412(A)

Annual Examination - 2017

BCA-II

BCA-201

THEORETICAL FOUNDATION OF COMPUTER SCIENCE

Paper - II

DIFFERENTIATION AND INTEGRATION

Max.Marks : 50

Time : 3 Hrs.

Min Marks : 20

Q.4 Evaluate $\int \frac{3x+5}{\sqrt{x^2+6x+5}} dx$

OR

Prove that $\int_0^{\pi/2} \log \sin x dx = -\frac{\pi}{2} \log 2$

Q.5 Prove that the whole length of the curve $x = a \cos^3 t, y = a \sin^3 t$ is $6a$.

OR

Change the order of integration in the following integral

-----X-----

Note : Section 'A' containing 10 very short answer type questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

Section-'A'

Very short answer type questions. Answer in one or two lines. (1x10=10)

- Q.1 Write the nth derivative of
Q.2 Write the statement of first mean value theorem.
Q.3 Find the radius of curvature of the point of the cycloid
Q.4 Write the condition for point of inflexion.
Q.5 If then find fx(1,2)
Q.6 If u = ax + by and then find
Q.7 Find the value of integral sin^7 x dx.

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Q.8 Evaluate $\int \tanh^2 2x dx$.

Q.9 Change the order of integration

Q.10 Evaluate $\int_0^1 \int_0^2 (x+y) dx dy$.

Section-'B'

Short answer type questions with word limit 150-200

(3x5=15)

Q.1 Verify Rolle's theorem in the interval [2,4] for the function $f(x) = x^2 - 6x + 8$.

OR

If then show that $(1-x^2)y_2 - xy_1 + m^2y = 0$.

Q.2 Find the asymptotes of

OR

Find the interval of concavity and the points of inflexion for the curve

Q.3 If then prove that

OR

Find the directional derivative of $\phi = xy + yz + zx$ in the direction of the vector at the point

Q.4 Show that

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OR

Evaluate $\int \frac{dx}{2x^2 + x - 1}$.

Q.5 Find the value of $\int_1^2 \int_0^{\sqrt{2x-x^2}} x dx dy$.

OR

Find the complete area of circle $x^2 + y^2 = a^2$.

Section-'C'

Long answer type questions with word limit 300-350

(5x5=25)

Q.1 Expand in powers of

~~Q.1 Expand in powers of $(1-x)^{-1}$ in powers of x up to x^3 .
Q.2 Find the radius of curvature at any point (r, θ) of the cardioid $r = a(1 + \cos \theta)$.
Q.3 If $y^m + y^{-m} = 2x$, then prove that $\frac{dy}{dx} = \frac{2ab}{x^2 + y^2}$.~~

Q.2 Find the radius of curvature at any point (r, θ) of the cardioid

OR

Trace the curve $y^2(2a-x) = x^3$

Q.3 If show that $\frac{\partial^3 u}{\partial x \partial y \partial z} = (1 + 3xyz + x^2y^2z^2)e^{-xyz}$