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IQRA NATIONAL UNIVERSITY PESHAWAR

Mid Term Exam

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Subject: Applied Maths-1

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Department: B-Tech Civil Engineering

Paper Time: 2:00 PM to 6:00 PM

Date: 21/08/2020

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(2)

Q.No 01 (a) Integration

$$\int (x^2 e^x)\,dx$$

Solution:

(a) (a) $\int x^2 e^x\,dx$

$= \int x^2 e^x\,dx =$

Applying integration by parts

$$\int x^2 e^x dx = x^2 \int e^x dx - \int \left(\frac{d}{dx} x \int e^x dx\right) \qquad \frac{d}{dx}\, x = 1$$

$= x^2 e^x - \int 1 e^x dx \qquad \left[\int e^x dx = e^x\right]$

$= x^2 e^x - \int e^x dx \Rightarrow x^2 e^x - e^x + C$

$= e^x(x^2 - 1) + C$ Ans

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Q.No 03 : (01) Find integration

$$\int (5x^2 + x^{-2} + 15)\,dx$$

(B) Solution:

$$= \int (5x^2 + x^{-2} + 15)\,dx$$

$$= \int (5x^2 + x^{-2} + 15)\,dx =$$

$$\int 5x^2 dx + \int x^{-2} dx + \int 15\,dx$$

$$= 5\frac{x^{2+1}}{2+1} + \frac{x^{-2+1}}{-2+1} + 15x + C$$

$$= 5\frac{x^3}{3} + \frac{x^{-1}}{1} + 15x + C$$

$$= \frac{5}{3}x^3 - \frac{1}{x} + 15x + C$$

Ans

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Q.No 01 Integration

(c) $\int (x^3 + x^{-2} + 5)\,dx$

(c) Solution:

$$\int (x^3 + x^{-2} + 5)\,dx = \int x^3\,dx + \int x^{-2}\,dx + 5\int dx$$

$$= \frac{x^{3+1}}{3+1} + \frac{x^{-2+1}}{-2+1} + 5x + c$$

$$= \frac{x^4}{4} + \frac{x^{-1}}{-1} + 5x + c$$

$$= \frac{x^4}{4} - \frac{1}{x} + 5x + c$$

Ans

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Q No 02 (A) If 56% of the homes in a colony have a car. what % age of homes does not have a car?

Sol=

=> Home in a colony have a car = 56%

=> percentage of home:

=> $56\% = \frac{56}{100} = 0.56$

=> the percentage of home is 0.56

=> home percentage

=> 0.56

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Q.No 02 (B) There are 1029 Students in a School. 504 of them girls. Find the Ratio of Boys to the girls

⇒ Sol = total No.s of Students = 1029

⇒ No.s of girls = 504

⇒ No.s of Boys = 1029 - 504 = 525

⇒ Ratio of boys and girls

⇒ Boys : Girls

÷ by 3 (525 = 175, 504 = 168) : :

÷ by 7 (175 = 25, 168 = 24) : :

25 : : 24

So Ratio boys to girls is 25 : 24

No 02 C:. Amna scored 46 out of 50 in maths test, 64 out of 75 in Chemistry 72 out of 80 in Physics. In which subject did she perform

(C) Solution (C)

= Percentage of Maths Subject = $\frac{46}{80} \times \frac{2}{100}$

= = $46 \times 2 = 92\%$

= Percentage = of Chemistry Subject = $\frac{64}{75} \times 100$

$= \frac{6400}{75} = 85.33\%$

= Percentage: of Physics Subject

= $\frac{72}{80} \times 100$

$= \frac{7200}{80} = 90\%$

So Best in Maths.

Ans

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No 03

Derivative

① (a) $S = -4t^{-5} + 4/t + 5t + 1/4$

Sol =

$S = -4t^{-5} + 4/t + 5t + 1/4$

taken Derivative on B.S w.r.t "t"

$\frac{dS}{dt} = \frac{d}{dt}(-4t^{-5} + 4/t + 5t + 1/4)$

$\frac{dS}{dt} = \frac{d}{dt} - 4t^{-5} + \frac{d}{dt} 4/t + 5\frac{d}{dt} + \frac{d}{dt} 1/4$

$= -4\frac{d}{dt} t^{-5} + 4\frac{d}{dt} t^{-1} + 5(1) + 0$

$= -4(-5)t^{-5-1} + 4(-1)t^{-1-1} + 5$

$= -20t^{-4} - 4t^{-2} + 5$

$= -20t^{-4} - 4/t^2 + 5$

Ans

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Q.No 03 (B)

Derivative

$$y = x^5 + 3x^3 - x^2 + 4$$

Sol = $y = x^5 + 3x^2 - x^2 + 4$

$= y = x^5 + 3x^3 - x^2 + 4$

Taken derivative on both side w.r.t. (x)

$= d/dx\, y = d/dx\, x^5 + 3\, d/dx\, x^3 - d/dx\, x^2 + d/dx\, 4$

$dy/dx = 5x^{5-1} + 3(3)x^{3-1} - 2x^{2-1} + 0$

$dy/dx = 5x^4 + 9x^2 - 2x$

Ans

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Q.No. 03

Derivatives

(C) $T = 6x^{-3} + x^3 + 5x - 2$

Solution $T = 6x^{-3} + x^3 + 5x - 2$

Taken derivative on Both side to (x)

$$\frac{dT}{dx} = \frac{d}{dx}(6x^{-3} + x^3 + 5x - 2)$$

$$= 6\frac{d}{dx}x^{-3} + \frac{d}{dx}x^3 + 5\frac{d}{dx}x - \frac{d}{dx}2$$

$$= 6(-3)x^{-3-1} + 3x^{3-1} + 5(1) = 0$$

$$-8x^{-4} + 3x^2 + 5$$

$$\frac{-18}{x^4} + 3x^2 + 5$$

Ans

{ A Student is nothing without Teacher }