IQRA NATIONAL UNIVERSITY, PESHAWAR

Department Of AHS

Summer-2020

Subject: Applied Mathematics-I **Duration:** Minutes

Instructor: Anwar Shamim **Total Marks:** 30

Semester: Summer Semester

Note: Attempt all questions. Manage your time properly.

Q.No. (01) *(3+3+4)*

Find the Integration of the following.

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

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

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

Q.No. (02) *((3+3+4)*

Find the solution of the following.

a) If 56% of the homes in a colony have a car. What %age of homes does not have a car?

b) There are 1029 students in a school.504 of them are girls. Find the ratio of boys to the girls.

c) Amna scored 46 out of 50 in a math test,64 out of 75 in a chemistry test and 72 out of 80 in a physics test.In which subject did she perform best?

Q.No. (03) *(3+3+4)*

Find the derivatives of the following.

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

b) $Y = x^5 + 3x^3 - x^2 + 4$

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

Date: .....

Sun Mon Tue Wed Thu Fri Sat

Name : Natasha Khan
Student ID: 15981
Department : HND

Q#1 :-
Find Solution of the following.

a) If 56% of the homes in a colony have a car. What %age of homes does not have a car.

Solution:

Percentage of homes with car = 56%
Without car = 100 - 56
= 44%

44 % of homes does not have car.

b) There are 1029 students in a school. 504 of them are girls. Find the ratio of boys to the girls.

Solution :-

No of girls = 504
No of boys = 525

→ $\frac{525}{1029} : \frac{504}{1029}$

→ $\frac{525 \div 21}{1029 \div 21} : \frac{504 \div 21}{1029 \div 21}$

→ $\frac{25}{49} : \frac{24}{49}$

→ $\frac{25}{49} \times 49 : \frac{24}{49} \times 49$

→ 24 : 25 (Ans)

c) Amna scored 46 out of 50 ---------- In which subject did she perform best.

Solution:

→ Maths = $\frac{46}{50} \times 100$

= 92 %.

→ Chemistry = $\frac{64}{75} \times 100$ = 85.3 %.

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

= 90 %.

She performed the best in maths.

Date:

Sun Mon Tue Wed Thu Fri Sat

Page #3:

Q#3:

Find the derivates of the following.

a) $S = -4t^{-5} + \frac{4}{t} + 5t + \frac{1}{4}$.

Solution:

→ $S = -4t^{-5} + 4t^{-1} + 5t + \frac{1}{4}$

→ $\frac{ds}{t} = (-4)(-5)t^{-5-1} + 4(-1)t^{-1-1} + 5(1)t^{1-1}$

→ $20t^{-6} - 4t^{-2} + 5$

→ $20t^{-6} - \frac{4}{t^2} + 5$ (Ans)

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

Solution:

→ $\frac{dy}{dx} = \frac{d}{dx}(x^5) + \frac{d}{dx}(3x^3) - \frac{d}{dx}(x^2) + \frac{d}{dx}(4)$

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

→ $\frac{dy}{dx} = 5x^4 + 9x^2 - 2x + 0$ (Ans)

Date: .....

Sun Mon Tue Wed Thu Fri Sat

PAGE #4

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

Solution:

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

$$\frac{dT}{dx} = -18x^{-4} + 3x^2 + 5 - 0$$

$$\frac{dT}{dx} = -18x^{-4} + 3x^2 + 5 - 0 \quad \text{(Ans)}$$

Q# 1:

Find the integration of the following.

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

Solution:

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

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

$$\frac{5x^3}{3} - \frac{1}{x} + 15x + C \quad \text{(Ans)}$$

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

Solution:

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

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

$$\frac{x^4}{4} - \frac{1}{x} + 5x + C \quad \text{(Ans)}$$

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

Solution:

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

$$\left[\left(\frac{x^{2+1}}{2+1} \right) e^x\, dx \right]$$

$$\frac{x^3}{3} e^x + C \quad \text{(Answer)}$$