



Final Examination (2017-2018)

- Equal grades for each question will have (20 Marks)

slip

Q1: Answer two only:

(a) Solve the following linear equation by Grammar's rule:-

$$-x - 2y + 5z = 4$$

$$3x + y - 6 = 2z$$

$$-x + 5y + z - 6 = 0$$

(b) Find the angle between the vectors  $v = (2, 1, -1)$  and  $w = (3, -4, 1)$ .

C) Solve the following integrals:-

$$(1) \int \frac{3}{x\sqrt{4-x^2}} dx$$

$$(2) \int x \sec^2 x dx$$

Q2: Find  $dy/dx$  for the following function:- (Answer four only )

$$(1) y = \tan^{-1}(\cosh(2x - 3))$$

$$(2) \ln(x + y) = xy - y^3$$

$$(3) y = x^{\cos x}$$

$$(4) y = e^{3 \ln(2x+1)}$$

$$(5) x^2 - x \tan^{-1} y = \ln y$$

Q3: (a) find the following limits if exist:-

$$(1) \lim_{x \rightarrow 1} \frac{x^3 - 1}{x - 1}$$

$$(2) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x \sin x}$$

$$(3) \lim_{x \rightarrow \infty} \frac{-6x^4 + x^2 + 1}{2x^4 - x}$$

(b) Find the function whose tangent has slope  $x^3 - \frac{2}{x^2} + 2$  for each value of  $x$  and whose graph passes through the point  $(1, 3)$ .

Q4: Answer two only:

(a): If  $y = \cos u$ ;  $u = x^2$ , find  $\frac{dy}{dx}$ .

(b) : calculate the area of the triangle  $\Delta PQR$ , where  $P = (2, 4, -7)$ ,  $Q = (3, 7, 18)$  and  $R = (-5, 12, 8)$ .

(c): Find the domain and range for:-

$$(1) y = \frac{x^2 + 1}{x}$$

$$(2) y = \sqrt{9 - x^2}$$

Q5: Solve the following integrals:-

$$(1) \int \frac{2x}{(x+1)(x^2+1)} dx$$

$$(2) \int \frac{\sec^3 x + e^{\sin x}}{\sec x} dx$$

$$(3) \int \frac{dx}{\sqrt{x^2 - 6x + 8}}$$

$$(4) \int (3 - 2x)e^{-x} dx$$

GOOD LUCK .....

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