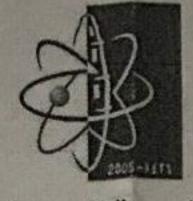
Kingdom of Saudi Arabia Ministry of Education Final Exam Degree: B.Sc. Year/Level: 2

Subject: Differential and Integral Calculus(II) Title Code: MATH 102



جامعة الجوف Aljour University Aljouf University
College of Engineering
Department of Mathematics
First Semester
Date: Sun 17/4/1438 (15/1/2017)
Exam Duration: 2 hours
No. of Pages:2
Total Marks: 60 Marks

Question 1: (15 marks: 3 for each part) Evaluate the following integrals.

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$$\int \left(5x^3 + \sin(6x)\right) dx \, , \int \frac{dx}{\sqrt{49x^2 + 25}} \, , \int \frac{1}{9x^2 + 5} dx \, , \int 6^x dx \, , \int_{-2}^3 |5x + 2| \, dx.$$

Question 2: (18 marks: 6+6+6)

a) Use integration by-parts to evaluate the following integral:

$$\int_{1}^{t} x \ln(x) dx.$$

b) Use method of substitution to evaluate the following integrals:

$$\int x \cos(x^2) dx, \qquad \int \frac{\tan(\ln(x))}{x} dx, \qquad \int x (2x^2 + 3) dx.$$

c) If, $f(x) = a + bx + cx^2$, $(a, b, c) \in \Re$, show that:

Question 3: (15 marks: 8+7) Solve {1) and 2)} OR {3) and 4)}

(1) Find the area of the region bounded by the graphs of the functions:

$$f(x) = -x^2 + 4$$
, $g(x) = 2x + 4$.

- 2 Evaluate: $\int \frac{x+4}{x(x^2-3x+2)} dx.$
- 3) Express in term of "n" $\sum_{k=1}^{n} (k^2 3k + 2)$.
- 4) Find the Area between the Curve, bounded the Graphs

$$y = \sqrt{x}$$
 and $y = x^2$ between the Lines $x = 0$ and $x = 1$.

Question 4: (12 marks: 3+3+3+3) Determine whether the Integral Converges or

Diverges:
$$\int_{10}^{+\infty} \frac{1}{6} dx$$
, $\int_{0}^{9} \frac{1}{8} dt$, $\int_{2}^{6} \frac{1}{\sqrt{x-2}} dx$, $\int_{-\infty}^{\infty} \frac{1}{1+x^{2}} dx$.

