

الفترة الإمتحانية: 11-12:30

اسم المقرر: الرياضيات (2) نظام جديد اليوم و التاريخ السبت 2016/6/18

مدة الامتحان: ساعة ونصف

عدد الأسئلة: 4

عدد الصفحات: 1

المرحلة: الأولى

الفصل الثاني

العام الدراسي: 2018-2019

اسم المدرس: د. إسماعيل حمدان

Answer All Questions (15 Marks for each question)

Question 1

A diagonalization formula of the matrix A is given in the form $P^{-1}AP = D$, where

$$P = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & -1 \end{bmatrix} \text{ and } D = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

By inspection list:

- the eigenvalues of A .
- the corresponding eigen vectors of A .
- the basis of the eigen space E_λ for $\lambda = 2$.
- Use diagonalization formula to find A^3 .

Question 2

Obtain Taylor's expansion of $f(x, y) = x^2y + 3y - 2$ about the point $(0,0)$ up to 3rd order terms.

Question 3

a) use the fundamental theorem of calculus to compute $G'(x)$ for

$$G(x) = \int_x^{x^3} (x^2 + \sqrt{t^2}) dt.$$

b) Evaluate $\int_0^{\pi/2} \cos 3x \cdot \cos 2x \cdot dx$

Question 4 : answer only one question :

a) Use Recursive formula:

$$\int \sec^n x \, dx = \frac{1}{n-1} \sec^{n-2} x \tan x + \frac{n-2}{n-1} \int \sec^{n-2} x \, dx$$

To calculate the integral $\int \sec^5 x \, dx$

b) Use trigonometric substitution : $x = 2\sin \theta, \theta \in \left[-\frac{\pi}{2}, +\frac{\pi}{2}\right]$

To calculate $\int \frac{x^2}{\sqrt{4-x^2}} dx$

-----End Of Questions-----