

NAME

STUDENT ID

DEGREE

Are You approved for Extra Time in Exams (LENS students only)

Examination Procedures

- This exam will start at 17:05, and will last 45 minutes.
- Each question will be worth either 2 or 3 Marks. There are 15 Marks worth of questions.
- All questions must be attempted (LENS students please see below)
- Write all of your answers in the exam script. Write the script number on any other documents you submit.
- It is your responsibility to return the script to collection box. An audit of scripts will take place immediately after the exam. If your script is account for in that audit, you are deemed to be absent, and will receive no marks.
- **LENS Student** Specifically approved LENS students have to answer any selection of questions that have an aggregate mark of 11 Marks.
 - They may skip any combination of questions that have a total mark of 4
 - The mark will be rescaled accordingly to give a result out of 15 marks.

(Type: A)

(i) (2 Marks) State the derivative $\frac{dy}{dx}$ of the following function

$$y = \cos(2x)$$

(ii) (3 Marks) Compute the following indefinite integral.

$$\int 4x^2 + 3x + 2 \, dx$$

(iii) (1 Mark) State the derivatives of $y = \cosh(x)$ and $y = \sinh(x)$.

(iv) (3 Marks) Compute the following indefinite integral.

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

(v) (2 Marks) Compute the following indefinite integral.

$$\int \ln(x+1) + \ln(x+2) \, dx$$

- (vi) (4 Marks) Use the substitution technique to solve the following indefinite integral.

$$\int \frac{4x}{(x^2 + 9)^{10}} dx$$