Due date: Friday 4th August 2017

Task weighting: 20 %

Total marks: 40

Task Description: This task consists of two parts.

Part A: Research Report 20 marks
A hard copy of the research report is to be handed in at the conclusion of the in-class test.

Part B: Test 20 marks
During class on Friday 4th August 2017. The Research Report may be used during the test.

A study of physics should enable students to tackle real problems in a broad set of contexts. They should evaluate major scientific advances, and understand how technology has changed the direction of scientific thinking.

- This task will assess skills in MODULE 8.1- Skills
- Students are required to submit a hard copy of a typed report and sit a 45 min test.
- The research topics are derived from the Prescribed Focus Areas (PFA’s) and Module 8.5 Cosmic Engine.
- Students will use sources they have found in the course of preparing their research report to answer the questions.

Students should demonstrate the following key competencies from the syllabus.

1. Collecting, analysing and organising information
2. Communicating ideas and information
Syllabus Outcomes

PFA’s

P3 Assess the impact of particular technological advances on understanding in physics.

P4 Describes applications of physics which affect society or the environment.

Skills

12.3 gather information by:
a) accessing information from a range of sources, including popular scientific journals, digital technologies and the Internet
b) practising efficient data collection techniques to identify useful information in secondary sources
d) summarising and collating information from a range of resources

13.1 present information by:
c) selecting and using appropriate methods to acknowledge sources of information.
e) using a variety of pictorial representations to show relationships and presenting information clearly and succinctly

14.1 analyse information to:
a) identify trends, patterns and relationships as well as contradictions in data and information

14.3 use available evidence to:
b) propose ideas that demonstrate coherence and logical progression and include correct use of scientific principles and ideas.

Syllabus Content 8.5 Cosmic Engine

Research questions are selected from the following dot points:

8.5.1. Our Sun is just one star in the galaxy and ours is just one galaxy in the Universe.

8.5.2. The first minutes of the Universe released energy which changed to matter, forming stars and galaxies.

Guidelines for the Written Report

Note: marks may be deducted if your report is not presented as described below

1. All submitted work must be relevant to the task and must address the questions.
2. The report must be your own work. See the HSC assessment policy in relation to plagiarism.
3. The following format must be used:
   - A title page with your name, class and the assessment title.
   - Font must be Times New Roman, 12pt with 1.5 spacing.
   - Minimum of 1 cm margins.
   - Report must be appropriately organised with headings and subheadings.
   - Diagrams and graphs must be included at the relevant point in the text and referenced in the text.
   - Report must be stapled together only.
   - The report, including all diagrams, references and title page must not exceed 10 pages.

4. The report must be direct and concise. Point form may be used when appropriate.
5. No special consideration will be given to computer/printing problems (refer to the School Assessment Policy).
Part A: RESEARCH REPORT Total: 20 marks

Suggested References
- Information should be accessed from a range of reputable internet sites and scientific journals. You will need to include these in your reference list.
- Year 11 Physics Textbook 1
- Year 11 Physics – Cosmic Engine Book

Question 1: (5 marks)
Outline the contributions made by each of the following scientists to the development of the model of the Universe; Aristotle, Ptolemy, Copernicus, Kepler, Galileo and Newton. Your research should include the period of time in which they worked, and the technology available to them.

Question 2: (5 marks)

a) Describe the assumptions made by Friedmann to infer that the Universe is expanding.
b) Describe the three different types of expanding universe models proposed by Friedmann.
c) Explain cosmological red shift.
d) Describe how Hubble proved the universe is expanding.

Question 3: (5 marks)

a) Summarise the stages in the formation of the universe from the ‘Big Bang’ to the present and highlight the drivers of change for each stage of evolution.
b) Describe cosmic background radiation and how it supports the Big Bang Theory.

Question 4: (3 marks)
Outline how galaxies and stars formed through accretion.

BIBLIOGRAPHY (2 marks)
Write a bibliography for sources used in this Research Task using the Harvard referencing system.

Part B: Test (45 minute plus 5 minutes reading time) Total: 20 marks

This part of the task will be an open book test (you will be able to use only your report) in which skills and knowledge incorporated in Part A (Research report) will be tested. The test will also include application and problem based questions using the context of the research. The test will be done in class on Friday 4th August 2017.

End of Task