

**INSTITUTION OF RAILWAY SIGNAL ENGINEERS
2008 EXAMINATION**

MODULE 2 - SIGNALLING THE LAYOUT

TIME ALLOWED - 1 1/2 HOURS

10 MINUTES WILL BE ALLOWED BEFORE THE START TO READ THE PAPER

THIS PAPER SHOULD BE TREATED ON THE BASIS OF POWER SIGNALLING IN ACCORDANCE WITH THE PRACTICE WITH WHICH YOU ARE MOST FAMILIAR

ANSWER SHEETS WILL BE PHOTOCOPIED – PLEASE USE ONLY BLACK INK

**CANDIDATES SHOULD ANSWER EITHER
PART A (Main Line Practice) OR PART B (Rapid Transit Practice)**

PART A – TO BE ANSWERED USING LAYOUT 1 (Main Line Practice)

ALL **FOUR** QUESTIONS SHOULD BE ATTEMPTED AND CARRY MARKS AS SHOWN

Question 1

- a) Determine minimum braking distances for the permissible speeds and braking characteristics of the traffic on offer.
- b) Determine graphically, or by calculation, the headway at minimum signal spacing and the given speed for:
 - i) A fast passenger train following another fast passenger train; AND
 - ii) A fast passenger train following a stopping passenger train.

All calculations and graphs must be shown [20 Marks]

Question 2

Signal the layout in accordance with the notes thereon, numbering the signals (or equivalent) and defining all routes. [60 Marks]

Question 3

Number all power worked points and indicate their 'normal' position. Add any trap points necessary. Identify hand worked or ground operated points as such. [10 Marks]

Question 4

Mark the limits of all train detection equipment and identify each in sequence. [10 Marks]

END OF PART A

PART B – TO BE ANSWERED USING LAYOUT 2 (Rapid Transit Practice)

ALL FOUR QUESTIONS SHOULD BE ATTEMPTED AND CARRY MARKS AS SHOWN

Question 1

Determine theoretically, either by calculation or graphically, appropriate signal spacings for the braking characteristics and the intensity of traffic on offer. All calculations and graphs must be shown. Include a brief definition of the signalling arrangements and associated systems used, which must include a form of train protection.

[35 Marks]

Question 2

Signal the layout in accordance with the notes thereon, numbering the signals (or equivalent) and defining all routes.

[45 Marks]

Question 3

Number all power worked points and indicate their 'normal' position. Add any trap points necessary. Identify hand worked or ground operated points as such.

[10 Marks]

Question 4

Mark the limits of all train detection equipment and identify each in sequence.

[10 Marks]

END OF PART B

End Of Paper.