INSTITUTION OF RAILWAY SIGNAL ENGINEERS
2010 EXAMINATION

MODULE 2 - SIGNALLING THE LAYOUT

TIME ALLOWED - 1 1/2 HOURS

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)

Paper continued on next page

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

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

Question 1

a) Determine the minimum braking distances for the permissible speeds and braking characteristics of the traffic specified on layout 1.

b) Determine graphically or by calculation the theoretical best headway (without any allowances) at minimum signal spacing and the given speed for application on layout 1 for:

i) a fast passenger train following another fast passenger train
and
ii) a fast passenger train following a stopping passenger train.

Explain how the results of the headway calculation determines your choice of signalling system.

[20 marks]

Question 2

Signal layout 1 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

Paper continued on next page

PART B – TO BE ANSWERED IF 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 layout 2 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.