Examiners' Report Paper B 2016 (Electricity/Mechanics)

I. General considerations

It is noted that any references in this text to the Guidelines for Examination at the European Patent Office refer to the version valid at the date of the examination.

1. Introduction

This year's paper relates to a warning system for a driveway crossing. When a vehicle exits from a driveway, the visibility is often decreased. The driver of the vehicle might therefore not see pedestrians approaching on the pavement. In order to further increase safety at driveway crossings, a solution is to provide a pavement sensor configured to detect pedestrians on the pavement approaching the driveway and to provide a first display means. Both the pavement sensor and the first display means are connected to a control unit that is configured so that the first display means gives a warning signal to the driver in response to the output of the sensor.

2. The communication cites three prior art documents D1, D2 and D3

D1 is already discussed in the application. It discloses a driveway sensor placed in a garage exit and connected to a display means in the form of warning lights that warn pedestrians on the pavement when a vehicle is approaching at the driveway crossing. In addition, safety mirrors are placed at the corners of the driveway crossing. The application mentions a drawback of D1, namely that the driver of the vehicle must rely on the behaviour of the pedestrians.

D2 discloses a warning system for a driveway crossing used by emergency vehicles. The system uses a driveway sensor, which is connected to a display means in the form of two electric warning panels through a control unit. Hence, pedestrians on the pavement are warned in case an emergency vehicle is exiting from the driveway. In order to reduce light pollution, the driveway sensor is only activated, when pedestrians are detected by optical sensors on the pavement.
D3 discloses a warning system for the crossing of an alleyway with a busy road. A display means in the alleyway is connected to sensors mounted in the supporting post of a traffic light on the busy road. The display means warns the driver of a vehicle in the alleyway when either a vehicle or a pedestrian is approaching the driveway crossing.

3. **The invention as presented in the application as filed**

The invention as initially claimed concerns a warning system for a driveway crossing (claim 1) and a warning pole (claim 5). The application further specifies that a driveway sensor is configured to detect a vehicle in the driveway and that the control unit activates the pavement sensor in response to the output of the driveway sensor. In a first embodiment, shown by figure 1, the warning system is foreseen for the exit of a building. In a second embodiment, shown by figure 2, the warning system is integrated in a warning pole placed at the exit of a property.

4. **The challenges of the paper**

The warning system of the application solves the problems of the prior art by providing a driveway sensor connected to the control unit and configured to detect a vehicle in the driveway approaching the driveway crossing, so that the control unit is configured to activate the pavement sensor in response to the output of the driveway sensor.

The main challenges of the paper were to:

a) Amend the client’s draft claim set **according to the wishes of the client** to fulfill the requirements of the EPC, while covering all embodiments of the application.

b) Write a reasoned letter of reply explaining the basis for all the amendments of the claims and arguing why the clarity objections have been overcome.
c) Provide arguments that the subject-matter of the amended independent claim is new and involves an inventive step in the light of the prior art documents D1-D3.

5. The marking scheme

Answer papers were marked on a scale of 0 to 100 marks:

Appropriate amendments to the draft set of claims: max. 30 marks, min. 0 marks.

Again this year, not the claim set as a whole, but the amendments carried out by the candidate received marks. However, from the marks awarded for the amendments, marks were deducted for unnecessary limitations or non-compliance with the EPC. The overall number of marks per claim could not be negative.

For the argumentation, max. 70 marks and min. 0 marks were available.

Unless otherwise stated, the individual marks referred to in the various sections of this Examiners’ Report apply to the example set of claims.

Although the marking scheme is divided into separate sections, namely the marks awarded for amendments to the claims and the marks awarded for argumentation, the answer paper as a whole was considered and the scheme reflects this.
II. Amended Claims

1. Example set of claims

   In the example set of claims below, the starting point taken is the client’s draft set of claims. Deletions with respect to the draft set of claims are shown in strikethrough (example) and insertions are shown in underline.

1. Warning system for a driveway crossing (3, 13), comprising:
   - a control unit (5),
   - a pavement sensor (7, 8, 17) connected to the control unit (5) and configured to detect pedestrians on a pavement (2, 12) approaching the driveway crossing (3, 13),
   - a first display means (6, 16) connected to the control unit (5),

   the control unit (5) being configured so that the first display means (6, 16) gives a warning signal to the driver of a vehicle in the driveway (1, 11) in response to the output of the pavement sensor (7, 8, 17),

   characterised by a driveway sensor (4, 14) connected to the control unit (5) and configured to detect a vehicle in the driveway (1, 11) approaching the driveway crossing (3, 13), the control unit (5) being configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14).

2. Warning system according to claim 1, comprising a second display means (9) configured to warn pedestrians on the pavement (2, 12) that a vehicle is exiting from the driveway (1, 11).

3. Warning system according to any of the previous claims, wherein the first display means (6) is an LCD screen, and wherein the control unit (5) is an integral component of the first display means LCD screen (6).

4. Warning system according to claim 2, wherein the control unit (5) is configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14).
5 4. Warning system according to the preamble any of claims 1-2, characterized by wherein the first display means (6) is a traffic light in the driveway, the system being configured so that the red light of the traffic light indicates the detection of a pedestrian on the pavement, if the pavement sensor (7, 8) detects a pedestrian on the pavement (2), the traffic light is on red.

6 5. Warning pole (20) comprising a warning system preferably according to any of the preceding claims 1.

2. **Expected amendments to the draft set of claims**

2.1. **General remarks**

The draft set of claims contains features which result in a claim, or claims, that are considered not to comply with the EPC. Marks were awarded for making appropriate amendments to the draft set of claims for bringing it into accordance with the EPC.

**10 marks** for the independent claim and **20 marks** for the dependent claims were available.

**No marks** were awarded for merely filing a claim provided by the client.

It is noted that full marks were awarded for amendments that differ from those of the example set of claims, provided their scope was comparable. This was considered on a case-by-case basis. Marking of the dependent claims was adapted correspondingly.

**Example**

a) Instead of example claim 3, a first dependent claim wherein the first display means (6) is an LCD screen, followed by a second dependent claim dependent on the first dependent claim, wherein the control unit (5) is an integral component of the LCD screen (6).
**No double penalisation:** if a single amendment, expression or feature resulted in a plurality of objections (for example, an unnecessary limitation, a lack of clarity and/or a lack of support), the maximum number of marks was deducted only once.

Marks for amendments were awarded irrespectively of whether the corresponding feature appeared in the expected claim or in another claim.

2.2. **Claim 1 (10 marks)**

The feature “the control unit (5) being configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14)” from original claim 4 was added. *(10 marks)*

This amendment was necessary because the feature that the driveway sensor is connected to the control unit is always disclosed only in combination with the activation of the pavement sensor in response to the output of the driveway sensor (see original claim 4). For the first embodiment this is emphasized on lines 2-5 and 8-10 of paragraph [011]. Lines 25-28 of paragraph [012] explain the activation for the second embodiment. No other control in response to the output of the driveway sensor is disclosed. The second display means is merely optional in the first embodiment and is not mentioned in the second embodiment. Contrary to the objection in point 5 of the communication, the additional features of original claim 4 in combination with the first feature of original claim 2 render the subject-matter of claim 1 inventive, because there is no incentive in the prior art to configure the control unit to activate the pavement sensor in response to the output of the driveway sensor.

2.3. **Claim 2 (1 mark)**

Remained as provided by the client, except that the reference numbers "11" and "12", which relate to the second embodiment, were deleted. *(1 mark)*
2.4. **Claim 3 (4 marks)**

The feature “wherein the first display means (6) is an LCD screen” was added and “the first display means” was replaced by “the LCD screen”. (4 marks)

In point 4 of the communication the examiner objects to the clarity of “the LCD screen”. Still, replacing the LCD screen by the first display means is not supported by the application. Line 15 of paragraph [008] mentions the integration of the control unit in the first display means, but only when the first display means is an LCD screen.

2.5. **Old Claim 4 (1 mark)**

Was deleted, because its features were added to claim 1. (1 mark)

2.6. **New Claim 4 (9 marks)**

The client’s wish to add a dependent claim to cover a further aspect should have been respected. However, the claim wording was clarified to remove any doubt regarding the relationship between the traffic light and the first display means of claim 1 (see paragraph [010]). (4 marks)

Moreover, the link between the detection of a pedestrian and the pavement sensor should have been sufficiently clear. This could have been done by rephrasing the feature to “if the pavement sensor (7, 8) detects a pedestrian on the pavement (2), the traffic light is on red”. (2 marks)

The reference to “the preamble of claim 1” was deleted to avoid a second independent claim, cf. point 3.2.3 example (e). Furthermore, so as to have protection for the combination of the traffic light with the second display means on the pavement, the claim dependency included a reference to claim 2. However, as the traffic light only appears in the first embodiment as an alternative to the LCD screen, there could be no dependency on claim 3. (3 marks)
2.7. **New Claim 5 (5 marks)**

In reply to point 7 of the communication, the warning pole was drafted as a dependent claim. Paragraph [005] provides support for a warning pole with the warning system of the invention and permits generalizing "the display panel" of the second embodiment to "the first display means". The word “preferably” was however be deleted, as it does not make the claim dependent but includes protection for a warning pole comprising a different warning system. (2 marks)

Furthermore, only to the second embodiment defines a warning pole. Any reference to detailed aspects of the first embodiment not mentioned in conjunction with the second embodiment, such as in claims 2-4, was deleted. This means that new claim 5 could only be dependent on claim 1. (3 marks)

3. **Claims differing from the example claims**

Note: The overall number of marks per claim could not be negative.

3.1. **Deductions for unnecessary limitations**

Where an independent claim of an answer paper differed from that of the example claim given in section II.1 above and resulted in a claim which was considered to be inappropriate for protecting the client’s invention, e.g. because it did not give the applicant the broadest possible protection for his invention, marks were deducted.

Distinction was made between limiting features excluding an embodiment of the invention and those reducing the scope of protection but applying to both embodiments.

3.1.1. For the independent claim of an answer paper having one or more additional features that are considered to limit the claim unnecessarily, up to 10 marks were deducted from the total marks awarded for the claim. 5 marks were deducted per excluded embodiment, 3 marks were deducted if the limitation did not exclude an embodiment and 8 marks were deducted in case the limiting
feature excluded an embodiment and at the same time reduced the scope of protection of the other embodiment.

Examples:

a) Including the second additional feature of original claim 2 “a second display means (9) configured to warn pedestrians on the pavement (2, 12) that a vehicle is exiting from the driveway” (8 marks were deducted). The second embodiment does not have any display means to warn pedestrians. With respect to the first embodiment, the scope of protection was reduced.

b) Specifying that the driveway sensor is a weight sensor (8 marks were deducted). The driveway sensor of to the second embodiment is an optical sensor. The first embodiment was unnecessarily limited.

c) Adding information about the first display means. For example, limiting the first display means to an LCD screen or to a traffic light (8 marks were deducted). Such a claim did not only exclude the alternative option of the first embodiment, but also the display panel of the second embodiment. Specifying in claim 1 that the first display means is a display panel excluded the traffic light but not necessarily the LCD screen (3 marks were deducted).

d) A single independent claim defining a warning pole comprising a warning system according to the example claim 5. Such a claim excluded the first embodiment (5 marks were deducted).

e) Claim 1 according to the example claim 1, wherein the pavement sensor is an optical sensor (3 marks were deducted).

f) Claim 1 according to the example claim 1, wherein the feature "in response to the output of the driveway" was replaced by "only when the driveway sensor detects a vehicle in the driveway" (3 marks were deducted).
3.1.2. For a dependent claim of an answer paper having one or more additional features that were considered to limit the claim unnecessarily, up to 2 marks per claim were deducted from the total marks awarded for that claim.

On the other hand, if features that provided a good fall-back position for the client were deleted from the dependent claims, then up to 2 marks per claim were deducted from the total marks awarded for the claims. Again the overall number of marks per claim could not be negative.

Examples:

g) Specifying in claim 2 that the second display means is a display panel (1 mark was deducted).

3.2. Deductions for non-compliance with the EPC

Claim sets which were amended so that they differ from the client’s draft set of claims, but which resulted in claims which do not fulfil the requirements of the EPC, for example because they result in an unclear claim, did not receive full marks.

3.2.1. For an independent claim of an answer paper not fulfilling the requirements of the EPC, because the claim lacks novelty or the claim lacks an inventive step, no marks were awarded.

Examples:

a) Claim 1 as originally filed in combination with the second additional feature of claim 2 “a second display means (9) configured to warn pedestrians on the pavement that a vehicle is exiting from the driveway” lacks novelty with respect to D3.

b) Claim 1 as originally filed in combination with the feature “a sensor connected to the control unit and configured to detect a vehicle approaching the driveway crossing” lacks novelty with respect to D3, because the vehicles on Main Street approaching the driveway crossing are detected by a sensor.
c) Original claim 1 in combination with the first additional feature of claim 2 “a driveway sensor (4, 14) configured to detect a vehicle in the driveway approaching the driveway crossing” lacked an inventive step, because the absence in such a claim of any synergistic effect between the driveway sensor and the pavement sensor or the first display means would make it obvious for the skilled person starting from D3 to implement such a driveway sensor, e.g. in the form of an independent surveillance camera in the driveway).

For an independent claim containing added subject-matter or unclear features, up to 10 marks were deducted from the total marks awarded for that claim.

Examples:

d) Claim 1 according to the example set of claims without the first display means or without the function of the first display means (5 marks were deducted because such a claim violates Art. 123(2) EPC).

e) Claim 1 according to the example set of claims without the second additional feature of claim 4 “the control unit (5) being configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14)” (5 marks were deducted because such a claim violates Art. 123(2) EPC).

f) Claim 1 according to the example set of claims without the first additional feature of original claim 2 "a driveway sensor (4, 14) configured to detect a vehicle in the driveway" (5 marks were deducted because such a claim violates Art. 123(2) EPC).

g) Claim 1 according to the example set of claims without the first feature of original claim 4 (the driveway sensor is connected to the control unit) could arguably be supported by the original application, but only if it was implicit from the other features that such a connection must be foreseen (0 marks deducted).
h) Claim 1 according to the example set of claims omitting the control unit and formulating its function through a method step (“the first display means is controlled in response to the output of the pavement sensor”, “the pavement sensor is activated in response to the output of the driveway sensor”) (3 marks were deducted because of lack of clarity, Art. 84 EPC).

i) Statements trying to link the different elements of the warning system to their physical position (“pavement sensor placed on the pavement”, “pavement sensor placed close to the driveway crossing”, “first display means in the driveway”) referred to entities that are not part of the claimed scope of protection (3 marks were deducted because of lacks of clarity, Art. 84 EPC).

3.2.2. For a dependent claim of an answer paper not fulfilling the requirements of the EPC, for example due to added subject-matter or lack of clarity, up to 2 marks were deducted from the total marks awarded for the claims.

Examples:

a) Unclear back-references to the independent claim, wrong dependencies, addition of technical features from the description leading to unallowable intermediate generalisations (up to 2 marks were deducted).

b) Adding information about the function of the second display means in claim 2 with clear support in the original application can be allowable, e.g. “connected to the driveway sensor through the control unit” (0 marks were deducted).

c) Claim 3 amended in the following manner "wherein the control unit (5) is an integral component of an LCD screen (6)" contravened Art. 123(2) EPC, because there is no support for an LCD screen other than one warning the driver of a vehicle in the driveway (2 marks were deducted).
d) A back-reference in claim 4 to claim 3 was not supported by the application, cf. point 2.6 hereinbefore (2 marks were deducted).

e) If the reference to the preamble of claim 1 was not deleted in claim 4 according to the draft set of claims, then that claim was independent. In function of the features contained by the preamble of claim 1 of the answer paper, such a claim very likely violated either Art. 123(2) EPC or Art. 56 EPC. For example, a clarified claim 4 referring to the preamble of claim 1 drafted according to the example set of claims lacked an inventive step, because it only differed from D3 in that the traffic light is on red when the pavement sensor detects a pedestrian on the pavement. Replacing the flashing yellow signal of the first display means (306) by a red light does not have any inventive merit (no marks were awarded).

f) A claim to a warning pole referring to a previous claim other than claim 1 or comprising features that do not relate to the second embodiment violated Art. 123(2) EPC (2 marks were deducted).

g) A claim to a warning pole comprising a warning system with only some of the features of the example claim 1 risked being unallowable under Art. 123(2) EPC or Art. 84 EPC, (2 marks were deducted). It is noted that D3 discloses a warning pole (309) having a pavement sensor (307), a first display means (red and green lights) and a control unit, and that the sensor (327) is configured to detect a vehicle in a driveway. As in example (e) above, if the claim to a warning pole was drafted as an independent claim, the requirements of Art. 54(1) and (2) EPC and Art. 56 EPC were examined. In case it lacked novelty or inventive step no marks were awarded to that claim.

3.3. Formal matters (up to -2 marks)

For an answer paper having an independent claim according to the example claim set it was considered appropriate to use the two-part form with respect to one of prior art documents D1-D3 (cf. the example set of claims in II.1). 1 mark
was deducted only if the two-part form is not correct with respect to any one of these documents. Arguably, the sensor (327) of D3, which detects vehicles in Main Street, can be considered as a driveway sensor (see further under III.3, Example (iii)). Therefore, no marks were deducted in this section for a claim comprising the driveway sensor in the preamble.

1 mark was deducted if the claims were missing reference signs.

3.4. **Solutions not based on the client’s draft set of claims**

The client provides a draft claim set that he proposes for filing, subject to any necessary amendments for fulfilling the requirements of the EPC, whilst giving him the broadest possible protection. Answer papers which had a claim set not based on the draft set of claims were not considered to be in the interest of the client and such claims therefore received fewer marks or no marks at all.

No marks were available for additional dependent claims because it was the explicit request of the client not to add new, i.e. further dependent claims. However, new dependent claims were not considered as new if they claim the originally claimed subject-matter or the subject-matter of the client’s draft claim set in a different way (see the example in section II.2.1).

**III. Letter of reply to the EPO (up to 70 marks available)**

1. **Basis of amendments**

1.1. **General remark**

It is noted that the examples for sections of a letter of reply given in the following are, unless otherwise stated, appropriate for the example set of claims. For an answer paper having a different claim set, the letter of reply may have differed and the answer paper was considered accordingly.

No marks were available for a letter to the applicant or for a letter to the marker. All the necessary information should have been contained in the letter of reply to the examining division.
1.2. **Source of amendments showing Art. 123(2) EPC compliance (23 marks)**

The amendments made in the claims had to be identified and a basis for them in the application as filed indicated. Brief explanations may have been necessary. **10 marks** were available for arguing the basis of the independent claim, **13 marks** were available for the dependent claims.

**1.2.1. Independent Claim 1 (10 marks)**

**10 marks** were available for indicating and explaining a basis for the independent claim: **2 marks** for mentioning the claims used as a basis; **3 marks** for mentioning the relevant passages in the relevant paragraphs of the description; **5 marks** were available for explaining the allowability of isolating the features concerned.

**Example:**
The first additional feature of dependent claim 2 and the additional features of dependent claim 4 are added to claim 1. (2 marks)

From the first sentence of par. [009] of the description (“Preferably”) and from the last sentence of par. [011] (“may also”) it is directly and unambiguously disclosed that the second additional feature of original claim 2, the second display means (9), is optional in the first embodiment. Furthermore, the second embodiment of figure 2 described in par. [012] does not disclose any second display means for warning pedestrians on the pavement. (3 marks)

The overall disclosure of the original application therefore justifies the generalising isolation of the first additional feature of original claim 2 and its introduction together with the additional feature of original claim 4 into claim 1, in line with the **Guidelines H-V, 3.2.1**. In the first embodiment, the interaction between the driveway sensor, the control unit and the pavement sensor can be detached from the second display means for warning pedestrians, as is clear from the original description (par. [009] and [011], see above). As the second embodiment remains silent about any second display means, there cannot be any inextricable link between such a second display means and any of the other features. In addition, the facultative constructions (“Preferably", "may also") used
in the first embodiment imply that, also here, the driveway sensor (4, 14) is not inextricably linked to the second display means (9). The goal of the driveway sensor in the first embodiment is primarily to activate the pavement sensor when a vehicle is detected in a driveway (5 marks available).

1.2.2. Claim 2 (1 mark)

Claim 2 is based on original claim 2 without the first additional feature, which is added to amended claim 1, see the argumentation above. (1 mark)

1.2.3. Claim 3 (3 marks)

Claim 3 is based on original claim 3, with the addition of the feature “wherein the first display means is an LCD screen”. Support therefor can be found in the third sentence of par. [008] of the description (2 marks). The dependency of original claim 4 on original claim 2 or 3 means that no added matter is introduced by the dependency of claim 3 on amended claim 1 according to the example set of claims (1 mark).
1.2.4. Claim 4 (3 marks)

Original claim 4 was deleted. Basis for the new claim 4 can be found in the first two sentences of par. [010] of the description (2 marks). From the last sentence of par. [011] it is clear that support is also present for the dependency of new claim 4 on claim 2 (1 mark).

1.2.5. Claim 5 (6 marks)

Amended claim 5 is a dependent claim based on original independent claim 5 (1 mark). The amendment is supported by par. [005] and by par. [012]. The reference in par. [005] to the warning system of the invention according to claim 1 ("a warning pole comprising such a warning system") makes the link between the warning pole and the warning system so that any allowable amendments to the warning system of claim 1 are also valid when a warning pole comprising such a warning system is claimed. In addition, the reference in par. [012] to the first embodiment ("in the same manner as described with respect to the first embodiment", cf. lines 26-27 on page 3) implies that the features added to claim 1 of the example set of claims can also be claimed as part of the warning system comprised by a warning pole. (5 marks).

2. Clarity and conciseness (4 marks)

In point 4 of the communication, the examiner objected to original claim 3 because of a lack of clarity. In addition, objections against Art. 84 EPC in combination with Rule 43(2) EPC were raised in point 7. Answer papers should have responded to these points. For marking purposes, it did not matter if the response to the clarity objections was formulated as part of the basis for amendments or in a separate section.

Example:
(i) The lack of clarity of original claim 3 has been remedied by introducing "wherein the first display means (6) is an LCD screen" in the claim. This defines the LCD screen through a feature already comprised by claim 1. Hence, claim 3 is clear (Art. 84 EPC) (3 marks).
(ii) Claim 5 is now dependent on claim 1. Therefore, the claims are concise and Art. 84 EPC in conjunction with Rule 43(2) EPC is complied with (1 mark).

3. **Novelty of the independent device claim (6 marks)**

In order to obtain full marks, it was sufficient to mention a single technical feature of the independent claim that clearly renders claim 1 novel with respect to each of D1, D2 and D3. However, if it was arguable whether the identified feature is known from the respective prior art document, an argumentation explaining the difference was expected. In particular, as the communication includes a novelty objection against original claim 1 in the light of D3, the difference identified with respect to D3 should have been carefully examined.

**Example:**

(i) Claim 1 is novel with respect to D1 (Art. 54(1) and (2) EPC) because D1 does not disclose a pavement sensor (2 marks).

(ii) Claim 1 is novel with respect to D1 (Art. 54(1) and (2) EPC) because D1 does not disclose a first display means (1 mark). Although the mirrors (150, 160) indicate to the driver of a vehicle in the driveway the presence of pedestrians on the pavement, they are not connected to the control unit, nor do they give a warning signal in response to the output of a pavement sensor (1 further mark).

(iii) In D2 there is no first display means configured to give a warning signal to the driver of a vehicle (A) in the driveway (201) (2 marks). In contrast, warning panels (209, 210) are second display means for warning pedestrians on the pavement (202). Their warning signal is not visible to the driver of a vehicle (A) in the driveway (201).

(iv) D3 does not disclose that the control unit is configured to activate the pavement sensor (307) in response to the output of a driveway sensor (2
marks). The pavement sensor (307) remains active at all times, cf. paragraph [004].

(v) D3 does not disclose a driveway sensor in the sense of claim 1 (1 mark). The driveway (Alley 301) does not have any driveway sensor. If sensor (327) is considered as a driveway sensor configured to detect a vehicle in the driveway (Main Street) approaching the driveway crossing (303), the traffic light (309) must be the first display means in the sense of claim 1, because, unlike the traffic light (306), it is adapted to give a warning signal to the driver of a vehicle in the driveway (Main Street). However, the warning signal (red light) of the traffic light (309) is not given in response to the output of the pavement sensor (307) (one further mark).

4. Inventive step argumentation for the independent claim (37 marks)

It was considered appropriate to provide arguments which are structured to follow the problem solution approach (see Guidelines G-VII, 5).

4.1. Identifying the closest prior art (7 marks)

4.1.1. Stating the closest prior art (1 mark)

For stating an item of prior art as being the closest prior art in a consistent manner with the two-part form of the independent claim, 1 mark was available.

For the example independent claim, D3 was considered to represent the closest prior art, since it addresses the same purpose as that of the invention; for a clear statement to this effect, 1 mark was available.

The warning systems of D1 and D2 were considered to be less relevant. For a statement identifying D1 or D2, no marks were awarded.
4.1.2. Arguments justifying the choice of closest prior art (6 marks)

In selecting the closest prior art, the first consideration was that it should be directed to a similar purpose or effect as the invention, or at least belong to the same or a closely related technical field as the claimed invention (see Guidelines G-VII, 5.1).

A discussion of D1 (2 marks), of D2 (2 marks) and of D3 (2 marks) was expected giving arguments justifying the choice. Full marks were available even if D3 was not chosen as closest prior art, but if sound reasoning was provided for each of the three documents, why the document is arguably considered as closest prior art or not.

Example for the example claim 1:

D3 is considered to be the closest prior art, because it is the only prior art document available which discloses a system for warning the driver of a vehicle in a driveway that pedestrians are detected on the pavement approaching the driveway crossing (2 marks).

D1 describes a warning system for warning pedestrians on the pavement that a vehicle is exiting from a driveway. As was already mentioned in the application, the warning lights (109, 110) are not configured to warn the driver that a pedestrian is crossing his path. Although the mirrors (150, 160) can be used by the driver to view part of the pavement and to spot approaching pedestrians, the mirrors as such are not configured to detect pedestrians. Therefore its purpose and effect is more remote than that of D3. (2 marks).

D2 discloses a system for warning pedestrians on the pavement that an emergency vehicle is exiting from a driveway. Although D2 also discloses the activation of a sensor in response to the output of another sensor, the driveway sensor (204) does not serve to activate the pavement sensors (207, 208) (2 marks).
4.2. **Formulation of the objective technical problem (5 marks)**

The next stage was to establish in an objective way the technical problem to be solved (see Guidelines G-VII, 5.2). This required the steps of:

(i) identifying, in terms of features, the difference between the claimed invention and the closest prior art, i.e. the distinguishing features of the claimed invention (**1 mark**);

(ii) stating the technical effects or the advantages of the difference (**2 marks**); and

(iii) formulating a problem which is derived from these technical effects (**2 marks**).

**Example:**

(i) The subject-matter of amended claim 1 differs from the warning system known from D3, in that the warning system comprises a driveway sensor connected to the control unit and configured to detect a vehicle in the driveway approaching the driveway crossing, and in that the control unit is configured to activate the pavement sensor in response to the output of the driveway sensor (**1 mark**).

(ii) The technical effect is that the pavement sensor and therefore also the first display means are not unnecessarily activated when pedestrians on the pavement approach the driveway crossing. Limiting their activation time reduces the electric consumption of the warning system. (**2 marks**).

(iii) The objective technical problem can therefore be formulated as to provide a warning system with reduced power consumption (**2 marks**).

4.3. **Arguments in support of inventive step (25 marks)**

Arguments had to support the features of the independent claim. They should have been convincing and well structured. In order to obtain full marks in this section, arguments which fully answer the question as to why the skilled person,
knowing the teaching of the prior art as a whole, would not arrive at the claimed subject-matter had to be presented (see Guidelines G-VII, 5.3). Such arguments could have been structured to consider the following aspects:

- Would the skilled person arrive at the subject-matter of the claim by considering the teaching of the closest prior art on its own?
- Would the skilled person consider combining the teaching of the closest prior art with that of other prior art documents in order to solve the objective technical problem?
- If the skilled person were to combine the teaching of the closest prior art with other items of prior art, would he arrive at the subject-matter of the claim?

**Example:**

The following example arguments are for D3 as the closest prior art. Note that where D1 or D2 has been chosen as the starting point, the arguments may be structured differently and other arguments might apply.

**Considering D3 on its own (7 marks)**

In D3 there is no mention of reducing power consumption. On the other hand, according to par. [004], the sensors of the warning system operate continuously, resulting in high running costs. This is an implicit hint that the power consumption caused by the sensors may be an issue. The skilled person would therefore solve the technical problem posed above by selectively interrupting the continuous operation of the sensors. However, during interruption intervals the warning signal given by the first display means (306) would be continuously on. In order to reduce power consumption, the skilled person would further apply common general knowledge and opt for low energy appliances (such as LED-type display means) or renewable energy sources (e.g. solar cells connected to rechargeable batteries). There is no hint, however, to add a driveway sensor to solve the problem.
Furthermore, par. [003] teaches that, only if, during a predetermined time period, the sensor (327) does not detect a vehicle and the sensor (307) does not detect a pedestrian, the first traffic light (306) will stop flashing yellow. This means that, only during periods of low traffic on Main Street, the power consumption of the warning light (306) is reduced. The skilled person would therefore find a further hint in D3 to reduce the power consumption, by changing the predetermined time period. The shorter the predetermined time period, the sooner the yellow flashing signal of the first traffic light (306) is interrupted. Still, there is no hint in D3 to include a driveway sensor in the warning system and to connect that driveway sensor to the control unit in such a manner that the pavement sensor (307) is activated in response to the output of that driveway sensor.

**Considering D3 in combination with D1 (8 marks)**

The warning system of D1 has a different purpose than the one of D3, namely to warn pedestrians on the pavement about a vehicle exiting from a garage. In contrast, the warning system of D3 gives a warning signal to the driver of a vehicle waiting in an alleyway at a traffic junction. In addition, there is no indication in D1 how to solve the technical problem of reducing power consumption. The skilled person would therefore not consider combining these documents.

Even if the skilled person were to combine these documents, the claimed subject-matter would not be arrived at without exercising an inventive step. The only likely solution in D1 to the technical problem would be to switch off or to discard sensor and display means and to replace them with safety mirrors.

In any case, the teaching of D1 will not incite the skilled person to arrange a sensor in the driveway of D3. That is because such a measure would also oblige the skilled person to add the warning lights of D1 to the warning system of D3. Then there are two options: either these warning lights are used separately from the traffic light (309) to warn the pedestrians that a car is exiting from the alleyway, or their function is taken over by the second traffic light (309). The former option introduces a further power consuming component. In addition, a
link between the driveway sensor and the pavement sensor (307) would still be missing. The latter option would mean that the control unit of D3 must be reprogrammed, leaving it open to the skilled person how to control the second traffic light (309) in function of a total of three input sensors. Still, there would be no reason to trigger the pavement sensor (307) in response to the output of the driveway sensor.

**Considering D3 in combination with D2 (10 marks)**

D2 relates to a warning system with a different purpose than D3, namely for driveway crossings used (only) by emergency vehicles. As in D1, the warning system of D2 provides a warning signal to pedestrians on the pavement and not to the driver of a vehicle (A) in the driveway. As in the invention, D2 teaches the activation of a sensor in response to the output of a different sensor. However, contrary to the objection made at point 5 of the communication, the driveway sensor (204) is activated in response to the output of a pavement sensor (207, 208), i.e. exactly opposite to what happens in the invention. Furthermore, D2 does not mention the technical problem of reducing power consumption. Therefore, there is no incentive for the skilled person to combine D3 with D2.

Candidates only stating why the skilled person would not combine D3 with D2 did not earn more than 4 marks in this section. A detailed argumentation was expected that explains the result of adapting the warning system of D3 by applying the teaching of D2 in order to solve the technical problem posed.

If the skilled person were to apply the teaching of D2, namely the activation of a sensor by another sensor, on the warning system of D3, in order to reduce the power consumption, the control unit of D3 would have to be substantially reprogrammed. A driveway sensor would be introduced in D3, in the form of a weight sensor placed in the alleyway (301). As is taught by D2, the weight sensor will be activated in response to the output signal of a pavement sensor. This means that the adapted warning system according to D3 will activate the driveway sensor in response to the output of the pavement sensor (307).
This solution differs from the subject-matter of claim 1, according to which the pavement sensor is activated in response to the output of the driveway sensor.

Moreover, in order for the adapted warning system to work, the output signal of the new driveway sensor must generate a warning signal in the form of a red light by the traffic light (309) in Main Street. However, D3 only foresees the red light in case no pedestrian or vehicle are detected on Main street. If pedestrians are approaching the driveway crossing (303), the traffic light (309) must show green, irrespective of the presence of a vehicle in the driveway (301). In addition, even if the vehicle approaching the driveway crossing (303) in the driveway (301) generates a warning signal to the traffic on Main Street, the yellow flashing signal will still be on, giving him no decisive indication of what to do. These contradictory signals show that the adapted warning system would not work.

Finally, following the crux of D2, a sensor placed in a driveway must be kept in an inactive mode, as long as no pedestrians approaching the driveway crossing are detected by the pavement sensor. Only if a pedestrian is detected by the pavement sensor will the control unit activate the driveway sensor. However, in the combined D3-D2 warning system, it is not clear whether the inactive mode of the driveway sensor is triggered only by the pavement sensor (307) or by the combination of the pavement sensor (307) and the vehicle sensor (327). The control logic in D2 and D3 is so different that the adaptation resulting in a workable solution would require inventive merit.

For these reasons such an adapted warning system would not result in the subject-matter of claim 1 in a non-obvious manner.

It was not expected that candidates provide all the above-listed arguments. With convincing reasoning comprising many of the above-listed arguments, full marks could have been achieved. On the other hand, the above-listed arguments are not exhaustive and other convincing arguments may have attracted marks.
## EXAMINATION COMMITTEE I

### Paper B (Electricity/Mechanics) - 2016 - Marking Sheet

<table>
<thead>
<tr>
<th>Category</th>
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