

|                                                                                   |                                                                                                                                                                                                                                               |                                                 |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|  | <b>SEKOLAH PENGAJIAN SISWAZAH</b><br><b>SCHOOL OF GRADUATE STUDIES</b>                                                                                                                                                                        | <b>SPS/19/2018/Pind.4/2025</b>                  |
|                                                                                   | <b>BORANG LAPORAN PEMERIKSAAN TESIS/DISERTASI</b><br><b>DOKTOR KEJURUTERAAN/INDUSTRI /PENDIDIKAN KEJURUTERAAN</b><br><b>EXAMINER'S REPORT FORM ON THESIS/DISSERTATION OF</b><br><b>DOCTOR OF ENGINEERING/INDUSTRIAL/ENGINEERING EDUCATION</b> | <b>Tarikh Kuat Kuasa :</b><br><b>10.06.2025</b> |

|                                                              |  |                                                                         |  |
|--------------------------------------------------------------|--|-------------------------------------------------------------------------|--|
| Nama Calon<br><i>Name of Candidate</i>                       |  | No. Matrik<br><i>Matric No.</i>                                         |  |
| Nama Program<br><i>Programme Name</i>                        |  | Fakulti<br><i>Faculty</i>                                               |  |
| *Tarikh Daftar<br><i>Registration Date</i>                   |  | Kod NEC & Deskripsi<br><i>NEC Code &amp; Description</i>                |  |
| *Tempoh Pengajian<br><i>Duration of Study</i>                |  | Nama Pemeriksa & Institusi<br><i>Name of Examiner &amp; Institution</i> |  |
| Tajuk Tesis/Disertasi<br><i>Title of Thesis/Dissertation</i> |  |                                                                         |  |

Nota / Note: \*Tarikh Daftar/ *Registration Date* - Tarikh pelajar berstatus aktif (A) untuk kali pertama./ *The date on which the student first obtained Active (A) status.*

\*Tempoh Pengajian/ *Duration of Study* – Tarikh pelajar daftar sehingga Tarikh Hantar Tesis/Disertasi / *The date of student registration until date of thesis/dissertation submission.*

**SILA TANDATANGAN DI DALAM RUANG YANG DISEDIAKAN UNTUK PERAKUAN**  
*(Please sign in the space provided for the recommendation)*

**TANDATANGAN**  
**SIGNATURE**

**1. Perakuan (Recommendation)**

Setelah memeriksa tesis/disertasi saya perakuan bahawa *(After examining the thesis/dissertation, I recommend that)*

a) Calon dianugerahkan ijazah Doktor Kejuruteraan/Doktor Falsafah *(The candidate be awarded the degree of Doctor of Engineering/Doctor of Philosophy);*.....  
atau (or)

b1) Calon dianugerahkan ijazah Doktor Kejuruteraan/ Doktor Falsafah setelah membuat pembetulan kecil kepada tesis/disertasi seperti yang disenaraikan dalam laporan ini dan disahkan telah berbuat demikian oleh Penyelia *(The candidate be awarded the degree of Doctor of Engineering/ Doctor of Philosophy subject to minor corrections as listed elsewhere in this report being made in the thesis/dissertation to the satisfaction of the Supervisor);*.....  
atau (or)

b2) Calon dianugerahkan ijazah Doktor Kejuruteraan/ Doktor Falsafah setelah membuat pindaan dan pembetulan kepada tesis/disertasi seperti yang disenaraikan dalam laporan ini dan disahkan telah berbuat demikian oleh Pemeriksa Dalam/Luar *(The candidate be awarded the degree of Doctor of Engineering/ Doctor of Philosophy subject to the amendments and corrections as listed elsewhere in this report being made in the thesis/dissertation to the satisfaction of the Internal/External Examiner(s));*.....  
atau (or)

c) Calon tidak dianugerahkan ijazah Doktor Kejuruteraan/ Doktor Falsafah tetapi dibenarkan menghantar semula tesis/disertasi untuk pemeriksaan setelah menjalani kajian dan penyelidikan lanjutan. *(The candidate not be awarded the degree of Doctor of Engineering/ Doctor of Philosophy but be permitted to resubmit the thesis/dissertation for further examination in a revised form after a further period of study and research);* .....  
atau (or)

d) Pencapaian calon tidak memuaskan untuk ijazah Doktor Kejuruteraan/ Doktor Falsafah. Calon perlu mendaftar semula sebagai pelajar Sarjana Penyelidikan dan membuat pembetulan kepada tesis/disertasi seperti yang disenaraikan dalam laporan ini dan disahkan telah berbuat demikian oleh Pemeriksa Dalam/Luar *(The candidate not be awarded the degree of Doctor of Engineering/ Doctor of Philosophy. The candidate will need to re-register as a Master of Research student and make corrections to the thesis/dissertation as listed elsewhere in this report being made in the thesis to the satisfaction of the Internal/ External Examiner(s);* .....  
atau (or)

e) Calon tidak dianugerahkan ijazah Doktor Kejuruteraan/ Doktor Falsafah. *(The candidate not be awarded the degree of Doctor of Engineering/ Doctor of Philosophy)* .....

Tandatangan (Signature): ..... Tarikh (Date): .....

## 2. Pendapat (*Opinion*)

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Saya berpendapat (*In my opinion*),

\* (Dibenarkan pilih lebih daripada satu kriteria dibawah/ *You may choose more than one criterion*).

- a) Tesis/disertasi ini mengandungi banyak sumbangan asli kepada  
(*The thesis/dissertation has substantial original contributions to*) .....
- i) industri/organisasi (*industry/organisation*) ..... ..
- ii) inovasi (*innovation*) ..... ..
- iii) pembangunan ilmu (*knowledge development*) ..... ..
- b) Keaslian tesis/disertasi dibuktikan dengan penemuan fakta-fakta baharu  
(*The thesis/dissertation affords evidence of originality by the discovery of new facts*); ..... ..
- c) Keaslian tesis/disertasi dibuktikan dengan kebolehan memberi kritikan yang bernas dan jelas  
(*The thesis/dissertation affords evidence of originality by the ability to give thoughtful and clear criticism*); ..... ..
- d) Tesis/disertasi ini memuaskan dari segi penyampaian  
(*The thesis/dissertation is satisfactory in regards to literary presentation*); ..... ..
- e) Sebahagian hasil kajian dalam tesis/disertasi ini sesuai untuk diterbitkan  
(*A significant amount of findings in the thesis/dissertation are worthy of publication*); ..... ..

## 3. Merit (*Merit*)

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\*Calon layak dianugerahkan 'merit' sekiranya keputusan pemeriksaan tesis/disertasi pada Bahagian 1 adalah "a" atau "b1)

(*The candidate is qualified to be awarded with 'merit' provided that the result of thesis/dissertation examination in Part 1 is "a" or "b1"*).

Dalam membuat perakuan di atas, saya sahkan calon cemerlang untuk ijazah ini dan layak dianugerahkan ijazah dengan **merit**.

(*In making the above recommendation, I consider that the candidate is outstanding for this degree and qualified to be awarded the degree with **merit***) ..... ..

## 4. Sila berikan ulasan dan penilaian terhadap perkara berikut sebagai asas perakuan

*Please provide your comments and assessment on the following items as the grounds for recommendation.*

\*Sila **bulatkan** mengikut skala pengukuran seperti berikut pada ruangan yang berkenaan  
\*Please **circle** the appropriate option based on the following rating scale in the designated space:

| 1                         | 2             | 3                         | 4            | 5                      |
|---------------------------|---------------|---------------------------|--------------|------------------------|
| Sangat Lemah<br>Very Weak | Lemah<br>Weak | Memuaskan<br>Satisfactory | Baik<br>Good | Cemerlang<br>Excellent |

### 4.1 Tajuk Tesis/Disertasi (*Title of Thesis/Dissertation*)

Sila ulas berkaitan kesesuaian tajuk dengan cadangan penyelidikan dan bidang NEC program/ *Please comments on the relevance of the title with the research proposal and NEC program field*

Tandatangan (*Signature*): ..... Tarikh (*Date*): .....

#### 4.2 Abstrak (*Abstract*)

PLO5 (CS): Candidate demonstrates a good and concise abstract writing.

\*Skala pengukuran/Scale of assessment: 1 2 3 4 5

#### 4.3 Pengenalan, Permasalahan Penelitian, Objektif, Skop, dll. (*Introduction, Research Problem, Objective, Scope, etc.*)

PLO1 (AKW): Candidate demonstrates critical understanding on Research Problem.

\*Skala pengukuran/Scale of assessment: 1 2 3 4 5

#### 4.4 Kajian Literatur (*Literature Review*)

PLO1 (AKW): The literature review is very comprehensive and describes relevant material.

\*Skala pengukuran/Scale of assessment: 1 2 3 4 5

PLO2 (CG) - The literature review is critically connected with the purpose of the study.

\*Skala pengukuran/Scale of assessment: 1 2 3 4 5

Tandatangan (*Signature*): ..... Tarikh (*Date*): .....

|                                                                                                                                                                                |   |   |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| <b>4.5 Metodologi/Bahan/Reka Bentuk dan Kaedah (Methodology/Material/Design and Methods)</b>                                                                                   |   |   |   |   |   |
|                                                                                                                                                                                |   |   |   |   |   |
| PLO3 (PS): Candidate demonstrates a good mastery of practical skills and scientific skills through methodology/material/design and methods to solve complex research problems. |   |   |   |   |   |
| *Skala pengukuran/Scale of assessment:                                                                                                                                         | 1 | 2 | 3 | 4 | 5 |

|                                                                                                                                                                                                |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| <b>4.6 Analisis dan Penyampaian Data/Keputusan (Analysis and Presentation of Data/Findings)</b>                                                                                                |   |   |   |   |   |
|                                                                                                                                                                                                |   |   |   |   |   |
| PLO5 (CS): <i>Communicate effectively the knowledge, skills, ideas, and research findings using appropriate methods to peers, scholarly communities, and societies through various medium.</i> |   |   |   |   |   |
| *Skala pengukuran/Scale of assessment:                                                                                                                                                         | 1 | 2 | 3 | 4 | 5 |
| PLO6 (DS): Use a broad range of information, media, and technology applications to support study or work.                                                                                      |   |   |   |   |   |
| *Skala pengukuran/Scale of assessment:                                                                                                                                                         | 1 | 2 | 3 | 4 | 5 |

|                                                                                                                        |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| <b>4.7 Perbincangan dan Interpretasi Keputusan Kajian (Discussion and Interpretation of Research Results/Findings)</b> |   |   |   |   |   |
|                                                                                                                        |   |   |   |   |   |
| PLO2 (CG): <i>Critically discuss and synthesis the Research Results/Findings.</i>                                      |   |   |   |   |   |
| *Skala pengukuran/Scale of assessment:                                                                                 | 1 | 2 | 3 | 4 | 5 |
| PLO7 (NS): <i>Interpret and Undertake critical evaluation of numerical and graphical data.</i>                         |   |   |   |   |   |
| *Skala pengukuran/Scale of assessment:                                                                                 | 1 | 2 | 3 | 4 | 5 |

Tandatangan (Signature): ..... Tarikh (Date): .....

#### 4.8 Kesimpulan dan Kepentingan Sumbangan kepada (*Conclusion and Significance of Contribution to*)

(i) industri/organisasi (*industry/organisation*)

(ii) inovasi (*innovation*)

(iii) pembangunan ilmu (*knowledge development*)

PLO2 (CG): *Contribution towards advance knowledge (Scholarship of Knowledge).*

\*Skala pengukuran/Scale of assessment:                      1                      2                      3                      4                      5

#### 4.9 Gaya Penulisan (*Writing Style*)

PLO5 (CS): *Communicate effectively through writing the knowledge, skills, ideas, and research findings to peers, scholarly communities, and societies.*

\*Skala pengukuran/Scale of assessment:                      1                      2                      3                      4                      5

#### 4.10 Kekuatan Tesis/Disertasi (*Strength of the Thesis/Dissertation*)

Tandatangan (*Signature*): ..... Tarikh (*Date*): .....

4.11 Kelemahan Tesis/Disertasi (*Weakness of the Thesis/Dissertation*)

4.12 Kepentingan Kajian (*Significance of the Study*)

4.13 Perakuan Penganugerahan (*Recommendation for the Award*)

4.14 Lain-lain ulasan (*Other comments*)

.....  
Tandatangan & Nama Pemeriksa / *Signature & Name of Examiner* :  
Tarikh / *Date* :

Tandatangan (*Signature*): ..... Tarikh (*Date*): .....