



مركز القياس والتقويم التربوي
The Center for Educational Assessment and Measurement (CEAM)

امتحان دبلوم التعليم العام للمدارس الخاصة (ثنائية اللغة)

الفصل الدراسي الثاني - الدور الأول

للعام الدراسي ١٤٤٧/١٤٤٦ هـ - ٢٠٢٤ / ٢٠٢٥ م

تنبيه:
- المادة: تقنية المعلومات والاتصالات.
- الأسئلة في (٩) صفحات.
- زمن الإجابة: ثلاث ساعات.
- الإجابة في الورقة نفسها.

تعليمات مهمة:

- يجب الحضور إلى قاعة الامتحان قبل عشر دقائق على الأقل من بدء زمن الامتحان.
- يجب إحضار أصل ما يثبت الهوية وإبرازها للعاملين بالامتحانات.
- يجب الالتزام بالزي (الدشداشة البيضاء والمصر أو الكمة للذكور) والزي المدرسي للطالبات ، ويستثنى من ذلك الدارسون من غير العمانيين بشرط الالتزام بالذوق العام، ويمنع على جميع المتقدمات ارتداء النقاب داخل المركز وقاعات الامتحان.
- يحظر على الممتحنين اصطحاب الهواتف النقالة وأجهزة النداء الآلي وآلات التصوير والحواسيب الشخصية والساعات الرقمية الذكية والآلات الحاسبة ذات الصفة التخزينية والمجلات والصحف والكتب الدراسية والدفاتر والمذكرات والحقائب اليدوية والآلات الحادة أو الأسلحة أياً كان نوعها وأي شيء له علاقة بالامتحان.
- يجب على الممتحن الامتثال لإجراءات التفتيش داخل المركز طوال أيام الامتحان.
- يجب على الممتحن التأكد من استلام دفتر امتحانه، مغلفاً بغلاف بلاستيكي شفاف وغير ممزق ، وهو مسؤول عنه حتى يسلمه لمراقبي اللجنة بعد الانتهاء من الإجابة.
- يجب الالتزام بضوابط إدارة امتحانات دبلوم التعليم العام وما في مستواه وأية مخالفة لهذه الضوابط تعرضك للتدابير والإجراءات والعقوبات المنصوص عليها بالقرار الوزاري رقم ٥٨٨ / ٢٠١٥.
- يقوم المتقدم بالإجابة عن أسئلة الامتحان المقالية بقلم الحبر (الأزرق أو الأسود).
- يقوم المتقدم بالإجابة عن أسئلة الاختيار من متعدد بتظليل الشكل (⬭) وفق النموذج الآتي:

س – عاصمة سلطنة عمان هي:

⬭ القاهرة ⬭ الدوحة

⬬ مسقط ⬭ أبوظبي

ملاحظة: يتم تظليل الشكل (⬬) باستخدام القلم الرصاص وعند الخطأ، امسح بعناية لإجراء التغيير.

صحيح ⬬ **غير صحيح** ⬭ ◉ ◒ ⊗ ✓

مُسَوَّدَة، لا يتم تصحيحها

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Question One: (Items 1 – 8) (8 marks)

Shade in the bubble (⬭) next to the **correct** answer for each of the following items.

1. The stage that finds out how the current system works and what the requirements of the client are for the new system is:

- ⬭ Design
- ⬭ Analysis
- ⬭ Maintenance
- ⬭ Documentation

2. The principle that should be considered when designing a user screen layout is:

- ⬭ Use a very large font size to ensure the information is clear
- ⬭ Use many different colors and fonts to make the screen attractive
- ⬭ Arrange information appropriately and use colors based on their intended meaning
- ⬭ Place all the information on a single screen, even if it makes the layout look crowded

3. Testing the whole system in terms of structure and logic while covering all the paths through the system is called:

- ⬭ Beta testing
- ⬭ Alpha testing
- ⬭ Black box testing
- ⬭ White box testing

4. A hospital has implemented a new patient management system. To help staff use the system efficiently, the IT team provides a guide explaining how to enter patient records, schedule appointments, and retrieve medical history. What type of documentation is this?

- ⬭ User documentation
- ⬭ Technical documentation
- ⬭ Software development report
- ⬭ System specification document

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Question One Continued

5. The primary purpose of a prototype in system development is to:

- ⬭ Implement a final software solution
- ⬭ Provide an initial mock-up for user feedback
- ⬭ Test the hardware performance of the system
- ⬭ Replace traditional software development methods

6. A high-quality magazine layout is designed for professional printing. The layout includes multiple photographs and requires precise color reproduction to ensure consistency across a broad color spectrum. Which color system would be the most suitable for this application?

- ⬭ HSL
- ⬭ RGB
- ⬭ CMS
- ⬭ CMYK

7. Which of the following statements correctly define the terms "Canvas" and "Bezier Curve" in vector graphics?

- ⬭ Canvas is the workspace area, and a Bezier Curve is a flexible and scalable line defined by a path controlled through points
- ⬭ Canvas is a tool used for drawing straight lines, and a Bezier Curve is a preset shape
- ⬭ Canvas is a color selection tool, and a Bezier Curve is a filter applied to images
- ⬭ Canvas is a layer in an image, and a Bezier Curve is a pixelated line

8. During a school project, Sara uses an image editing tool to apply a high level of compression to a photo. What effect will this have on the image?

- ⬭ Increased color depth
- ⬭ Improved image sharpness
- ⬭ Conversion to a vector graphic
- ⬭ Reduced file size with potential loss of detail

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Question Two: (Items 9–19) (32 marks)

Answer ALL questions in the space provided.

9. In the field of data collection and analysis, both questionnaires and interviews are commonly used methods to gather information from users.

Compare these two methods based on the following features: (2 marks)

Feature	Questionnaires	Interviews
Sample Size		
Interaction		

10. A company is developing an inventory management system to improve efficiency.

a. Based on the need to see how employees interact with the current system in real-time, which research method should the analyst choose? (1 mark)

b. Explain **TWO** advantages of using this method for gathering system requirements compared to other methods. (2 marks)

1.

2.

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Question Two Continued

11. A teacher is creating a system where students get their exam scores (between 0 and 100). Explain the three validation checks below that can be used to make sure the data entered is correct. (3 marks)

Validation Type	Validation Check
Presence	
Range	
Type	

12. A bank has an online system where users must enter their salary to apply for a loan. The system only accepts salaries between $1500 and $10000. (3 marks)

If the system is tested with the following values, classify them as **valid, invalid, or extreme data**:

a. $2231: _____

b. $1255: _____

c. $10000: _____

d. $15000: _____

e. $1500: _____

f. $9047: _____

13. What is meant by evaluation in the system life cycle? (1 mark)

_____

_____

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Question Two Continued

14. A restaurant aims to develop a new online food ordering application. After a brief investigation, it plans to launch it in the shortest possible time that allows customers to browse the menu, place orders, and make payments.

a. Which type of prototyping is the most appropriate for the given scenario? (1 mark)

_____

b. Justify your selection. (1 mark)

_____

_____

_____

15. Identify and describe one vector image format used to save an image. (1 mark)

_____

16. An online platform is being developed to allow users to share their photographic work. A key requirement is balancing the visual quality of the images with the speed and efficiency of uploading and displaying them on the platform.

a. What **TWO** primary methods of image compression can be implemented to address this requirement? (1 mark)

1. _____

2. _____

b. Select the best method for the above situation and justify your selection. (2 marks)

Method: _____

Justification: _____

_____

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Question Two Continued

17. A university plans to upgrade its student information system. The IT department is evaluating three possible approaches according to the university's capability.

- **Option A:** Replacing the old system with the new system immediately.
- **Option B:** Running both the old and new systems together for a period of time (Parallel Implementation)
- **Option C:** Implementing the new system gradually, beginning with one department before extending it to others.

Identify the type of implementation strategy used in **Option A and C**. Then, **analyze** and **justify** the advantages of each implementation strategy (A, B and C) in the context of the university. (4 marks)

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Question Two Continued

18. A marketing team is designing promotional materials for a new product. They need to create a large billboard advertisement and a detailed product image for a website.

Explain how do bitmap and vector images differ, and how they should be used in different promotional materials: (4 marks)

- Differentiate between bitmap and vector images.
- Identify which type of image should be used for the billboard and which for the website.

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Question Two Continued

19. Read the following scenario and answer all the questions in the space provided:

> A high school has introduced a **new online attendance system** to streamline tracking for students and teachers. The system **automatically records attendance**, generates reports for administrators, and **notifies parents** of absences in real-time. This technology aims to **reduce errors, improve efficiency, and enhance communication** between teachers, students, and parents.
>
> While many appreciate the system's convenience, concerns have emerged about **its reliability**, potential **mis-recording of attendance**, and the **need for flexibility in correcting errors**. As the school continues to integrate this system, efforts are being made to **address these challenges and enhance its effectiveness**.

a. Define the term technical documentation and give one example of what it might include in the school's online attendance system. (2 marks)

b. Determine TWO types of system maintenance that may be required after the online attendance system is implemented. (1 mark)

c. A teacher reports that some students' names are missing from the attendance list due to a system error. Which type of maintenance is required to fix this issue, and why? (1 mark)

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Question Two Continued

d. The school is planning to move its attendance system from a website to a mobile app, allowing parents to view attendance records on their phones. Discuss one benefit and one challenge of making this change. (2 marks)

[End of Examination]

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SULTANATE OF OMAN
MINISTRY OF EDUCATION

Marking Guide of General Educational Diploma for Private Schools

2024/2025

Semester Two – First Session

Subject: ICT

مركز القياس والتقويم التربوي
The Center for Educational Assessment and Measurement (CEAM)

Note: There are 13 pages in this guide

First: Answers for the Multiple-Choice Items (8 Marks):

Item N.	Answer	Mark	Learning Outcome	Learning Level
1	B Analysis	1	AO1	Define the term analysis
2	C Arrange information appropriately and use colors based on their intended meaning	1	AO1	Identify the principles that should be followed while designing a screen layout.
3	D White box testing	1	AO1	Define the terms black box testing and white box testing
4	A User documentation	1	AO2	Explain why technical and user documentation is needed.
5	B Provide an initial mock-up for user feedback	1	AO1	Define the term prototype
6	D CMYK	1	AO2	Explain the properties of different color systems (RGB, HSL, CMYK, CMS)
7	A A Canvas is the workspace area, and a Bezier Curve is a flexible and scalable line defined by a path controlled through points	1	AO1	Define the terms Canvas and Bezier Curve
8	D Reduced file size with potential loss of detail	1	AO2	Discuss the effects of different methods of compression on images

Second: Answers for the Extended Answer Items (32 Marks):

General Notes

- There may be different ways of answering questions, but a basic requirement for all answers is that they are RELEVANT.
- If the answer is clearly not relevant, and the student has clearly made no attempt to answer the question that was set, NO marks should be awarded. However, if the student has genuinely attempted the answer, but his answer is only partly relevant, then a reduced mark (not zero) should be awarded.

سلطنة عمان
وزارة التربية والتعليم
دائرة الاختبارات وإدارة الامتحانات

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>9</td><td>

Answer:

Feature	Questionnaires	Interviews
Sample Size	Large	Small
Interaction	No interaction **OR** no contact.	Direct interaction **OR** direct contact.

Marking guidance and rubric:

Each comparison aspect is worth **0.5 marks** (0.5 *4 =**2 marks**)

Mark	Knowledge and Understanding AO1 – 2 Marks
0.5	Provides a correct, accurate, and clear answer.
0	The answer is completely incorrect, or the comparison aspect was not addressed.

Learning Outcome	Difference between Questionnaires and Interviews in terms of number of users.
Learning Level	AO1
Page	344-346

</td><td>2</td></tr>
<tr><td>10</td><td>

A sample answer:

a. Observation **(1 mark)**

b. Justification **(2 marks)**:
Advantage 1: Observation helps in gathering system requirements and uncovering hidden system needs that users may not mention in interviews or questionnaires. By watching daily operations, the analyst can identify practical challenges in real-time.
Advantage 2: By directly observing how tasks are performed, the analyst can identify system issues such as delays or errors and suggest appropriate improvements.

Marking guidance and rubric:

The answer above is just a sample answer; any other correct answers should be marked based on the following rubric:

</td><td>3</td></tr>
</table>

Mark	Criteria: Select the appropriate method (AO2 – 1 mark)	Mark	Criteria: Justifications (AO3 - 2 marks)
1	The research method provided is correct	2	The response provides two clear and relevant advantages of choosing a research method.
0	No correct answer provided or no response.	1	The response provides one clear and relevant advantage of choosing a research method.
		0	No clear and relevant advantages or no response provided.

Learning Outcome	Analyze the advantages and disadvantages of each analysis method.
Learning Level	AO2, AO3
Page	346

11

A sample answer:

Validation Type	Validation Check
Presence	Ensure the student doesn't leave the score field empty. If they don't enter anything, the system will ask them to fill it in.
Range	Make sure the score is between 0 and 100. If a student enters 150, the system will reject it
Type	Make sure the input is a number. If the student enters a letter the system will reject it.

3

Marking guidance and rubric:

Type text here

Mark	Application (AO2) – 3 marks
3	Three validation checks are clearly, correctly and relevantly explained how they will be applied
2	Two validation checks are clearly, correctly and relevantly explained how they will be applied
1	One validation check is clearly, correctly and relevantly explained how it will be applied
0	No validation check is clearly, correctly and relevantly explained how it will be applied

Learning Outcome	Explain and apply validation routines.
Learning Level	AO2
Page	355

12

Answer:

a. $2231 → **Valid Data**
b. $1255 → **Invalid Data**
c. $10,000 → **Extreme Data**
d. $15,000 → **Invalid Data**
e. $1,500 → **Extreme Data**
f. $9047 → **Valid Data**

3

Marking Guidance Rubric:

0.5 mark for each correct answer (1*3=**3 marks**)

Learning Outcome	Explain the types of testing (valid, invalid, extreme and live data)
Learning Level	AO2
Page	356-357

13

A sample answer:

Evaluation is **a formal review of a project** that assesses how well the system meets user requirements, improves workflow, and functions efficiently.

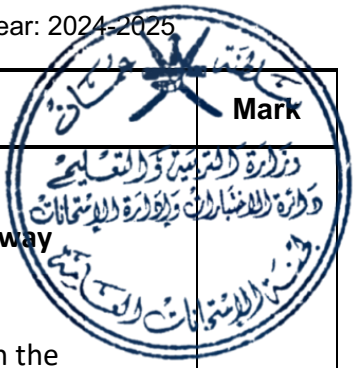
Marking Guidance and Rubric:

1 mark: The answer correctly defines evaluation as **a formal review of a project**, assessing system performance and user satisfaction.

0 mark: No answer provided or answer lacks relevance to the question.

1

Learning Outcome	Define the term evaluation.
Learning Level	AO1
Pages	364



<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>14</td><td>
<u>A sample answer:</u>
a. The most appropriate type of prototyping for this scenario is Throwaway Prototyping (also known as Rapid Prototyping).

b. Justification: Fast Development: Since the restaurant wants to launch the application as soon as possible, throwaway prototyping allows for a quick initial design to gather user feedback before full development.

<u>Marking guidance and rubric:</u>
The answer above is just a sample answer; any other correct answers should be marked based on the following rubric:
<table>
<tr><th>Mark</th><th>Criteria: Identifying appropriate types (AO2- 1 mark)</th><th>Mark</th><th>Criteria: Justification (AO3 – 1 mark)</th></tr>
<tr><td>1</td><td>The provided type is clear and relevant.</td><td>1</td><td>The response provides clear, relevant and reasonable analysis of choosing an appropriate prototyping type.</td></tr>
<tr><td>0</td><td>No type provided or incorrect.</td><td>0.5</td><td>Partial response with a clear, relevant and reasonable analysis of choosing an appropriate prototyping type.</td></tr>
<tr><td></td><td></td><td>0</td><td>No clear or reasonable analysis of the chosen prototyping type.</td></tr>
</table>
<table>
<tr><td>Learning Outcome</td><td>Explain different types of prototyping and explain why is needed.</td></tr>
<tr><td>Learning Level</td><td>AO2, AO3</td></tr>
<tr><td>Page</td><td>368</td></tr>
</table>
</td><td>2</td></tr>
</table>

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>15</td><td>
A sample answer:
(.SVG) Scalable Vector Graphic: It supports animations.
Another Answer:
(.pdf) Portable Document Format: Keeps documents as they were designed but in a common format.
Marking Guidance and Rubric:
The answer provided is just a sample answer; all other answers should be marked based on the following rubric:
<table>
<tr><th>Mark</th><th>Remembering and Understanding (AO1) – 1 mark</th></tr>
<tr><td>1</td><td>The response provides one vector image format with a relevant description.</td></tr>
<tr><td>0.5</td><td>The response provides one vector image format without any relevant description.</td></tr>
<tr><td>0</td><td>No response or incorrect format provided.</td></tr>
</table>
<table>
<tr><td>Learning Outcome</td><td>Identify different file formats (SVG, BMP, GIF, JPEG, PNG, TIFF, PDF) and image types (Bitmap, Vector).</td></tr>
<tr><td>Learning Level</td><td>AO1</td></tr>
<tr><td>Pages</td><td>408-409</td></tr>
</table>
</td><td>1</td></tr>
<tr><td>16</td><td>
A sample answer:
a.
1- Lossless Compression
2- Lossy Compression
b.
Method: lossy compression.
Justification: This method allows for a significant reduction in file size, making it faster to upload images and more efficient for online viewing. While it does involve some loss of image data, it can still retain a visually acceptable level of quality, especially when optimized for web display. In a scenario where the primary concern is ensuring images look good without lengthy upload times, lossy compression offers a practical solution.
</td><td>3</td></tr>
</table>

Marking Guidance and Rubric:

The answer provided is just a sample answer; all other answers should be marked based on the following rubric:

Mark	Criteria: Identifying Compression Methods (AO1- 1 mark)	Mark	Criteria: Method Selection and Justification (AO2 – 2 marks)
1	The answer provides two correct ways of compression.	**2**	The best method is selected with clear justification and specificity, demonstrating an understanding of the selective method of compression.
0.5	The answer provides one correct way of compression.	**1**	The best method is selected without any justification.
0	No answer or incorrect ways provided.	**0**	No answer or incorrect effect provided.

Learning Outcome	Identify the types of compression. Discuss the effects of different methods of compression on image.
Learning Level	AO1, AO2
Pages	420

Item N.	Correct Answer	Mark
17	**A sample answer:** Option A is **a Direct Implementation** and Option C is **a Phased Implementation.** **Advantages of Option A- Direct Implementation:** This approach involves an instant transition where the old system is completely replaced by the new system in one step. It is fast and cost-effective. **Advantages of Option B - Parallel Implementation:** In this method, both systems operate simultaneously for a certain period, allowing users to transition gradually. It reduces risk as the old system serves as a backup if issues arise with the new system. **Advantages of Option C- Phased Implementation:** This approach involves introducing the new system step by step, starting with a specific department before expanding. It allows for troubleshooting and adjustments at smaller scales before full deployment, reducing risks and improving user adaptability. **Marking Guidance and Rubric:** **0.5 mark for implementation strategy A and C , 1 mark for each analysis** The provided answer is just a sample answer, any other answers should be marked based on the following rubric:	4

Mark	Criteria: Identifying type of implementation (AO1- 1 mark)	Mark	Criteria: Appropriate reasoning for each type (AO3- 3 marks)
1	The two types provided are correct	**3**	The response provides clear, relevant and reasonable analysis for the three Implementation types
0.5	One type provided is correct.	**2**	The response provides clear, relevant and reasonable analysis for two Implementation types
0	No type provided or incorrect.	**1**	The response provides clear, relevant and reasonable analysis for one Implementation type
		0	No clear or reasonable analysis of the chosen Implementation type.

Learning Outcome	Explain the four methods of implementation.
Learning Level	AO1, AO3
Pages	360-362

18

A sample answer:

Bitmap and vector images differ in how they store and display graphics. Bitmap images are made up of pixels, meaning they provide **high detail but lose quality when resized**. In contrast, vector images use mathematical equations, allowing them to be **scaled without losing clarity.** When deciding which type to use, the billboard should be created using **a vector image.** On the other hand, the website product image should be a **bitmap image**.

Marking Guidance and Rubric:

The answer provided is just a sample answer; all other answers should be marked based on the following rubric:

Mark	Criteria: Differentiation of Bitmap & Vector (AO1 - 2 Marks)	Mark	Criteria: Identifying correct image type & justification (AO2- 2 Marks)
2	The answer fully explains both bitmap and vector images, highlighting their key differences.	**2**	The answer correctly identifies vector for the billboard **and** bitmap for the website.
1	The answer provides a basic definition of both image types but lacks detail on resizing and structure.	**1**	The answer identifies one of them correctly; vector for the billboard **or** bitmap for the website.
0	The answer is incorrect or does not describe bitmap and vector images.	**0**	The answer is incorrect.

Learning Outcome	Differentiate bitmap and vector images. Identify the deciding factors to select vector or bitmap images.
Learning Level	AO1, AO2
Pages	398-399

4

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>19.a</td><td>
<u>A sample answer:</u>

Suggested answer:
Technical documentation is an overview of the structure of the system, how it was put together, and how it works.
Example (specific to the school's online attendance system):
One example of technical documentation in the online attendance system could be a data dictionary, which details how student attendance records are structured within the system, including field names, data types, and validation rules.

Other examples can be:
An installation Guide, Buttons and links, security setting and hardware and software requirement.

<u>Marking Guidance and Rubric:</u>

<table>
<tr><th>Mark</th><th>Knowledge (AO1) 2 marks</th></tr>
<tr><td>2</td><td>Clearly defines technical documentation and provides a relevant example (e.g., data dictionary, system architecture, validation rules).</td></tr>
<tr><td>1</td><td>Provides a partial definition or a general example without enough detail.</td></tr>
<tr><td>0</td><td>No answer provided or answer lacks relevance to the question.</td></tr>
</table>

The answer provided is just a sample answer; all other related answers should be marked.

Type text here

<table>
<tr><td>Learning Outcome</td><td>Define the term technical documentation.</td></tr>
<tr><td>Learning Level</td><td>AO1</td></tr>
<tr><td>Pages</td><td>362</td></tr>
</table>
</td><td>2</td></tr>
<tr><td>19.b</td><td>
<u>Answer:</u>

Suggested answer:
Types of maintenance (Any two of the following is correct):
•Corrective maintenance.
•Adaptive maintenance.
•Perfective maintenance.
•Preventative maintenance.
<u>Marking Guidance and Rubric:</u>

1 mark for a correct identification of two types of system maintenance.
0.5 mark for a correct identification of one type of system maintenance.
0 marks if the answer provided lacks relevance to the question.

The answer provided is just a sample answer; all other related answers should be marked.
</td><td>1</td></tr>
</table>

Learning Outcome	Define the term maintenance**.**
Learning Level	AO1
Pages	365-366

19.c

A sample answer:

- Corrective maintenance is the required type. (0.5 marks)
- Explains that corrective maintenance is used to fix errors or bugs in the system after implementation. (0.5 marks)

Marking Guidance and Rubric:

The answer provided is just a sample answer; all other answers should be marked based on the following rubric:

Mark	Application (AO2) 1 mark
1	Correctly identifies corrective maintenance as the required type and explains that it is used to fix errors or bugs in the system after implementation.
0.5	Identifies corrective maintenance but does not clearly explain why it is needed.
0	No answer provided or answer lacks relevance to the question.

1

Learning Outcome	Explain corrective maintenance with an example.
Learning Level	AO2
Pages	366

19.d

A sample answer:

- Benefit: Clearly explains one benefit such as improved communication with parents, better student accountability, easier access to records**,** or easily adapt to change**. (1 mark)**
- Challenge: Identifies a valid challenge, such as security risks, higher costs, potential system compatibility issues, or training is needed. **(1 mark)**

Marking Guidance and Rubric:

The answer provided is just a sample answer; all other answers should be marked based on the following rubric:

Mark	Reasoning (AO3) 2 marks
2	Clearly explains one benefit (e.g., improved communication, accessibility for parents) and one challenge (e.g., security risks, system compatibility issues).
1	Mentions a relevant benefit or challenge but does not provide both or lacks sufficient explanation.
0	No answer provided or answer lacks relevance to the question.

Learning Outcome	Explain adaptive maintenance with example.
Learning Level	AO3
Pages	366-367

2

The End of the Marking Guide





امتحان دبلوم التعليم العام للمدارس الخاصة (ثنائية اللغة)

الفصل الدراسي الثاني- الدور الثاني

للعام الدراسي ١٤٤٧/١٤٤٦ هـ - ٢٠٢٥/٢٠٢٤ م

تنبيه:
- المادة: تقنية المعلومات والاتصالات.
- الأسئلة في (١٠) صفحات.
- زمن الإجابة: ثلاث ساعات.
- الإجابة في الورقة نفسها.

تعليمات مهمة:

- يجب الحضور إلى قاعة الامتحان قبل عشر دقائق على الأقل من بدء زمن الامتحان.
- يجب إحضار أصل ما يثبت الهوية وإبرازها للعاملين بالامتحانات.
- يجب الالتزام بالزي (الدشداشة البيضاء والمصر أو الكمة للذكور) والزي المدرسي للطالبات ، ويستثنى من ذلك الدارسون من غير العمانيين بشرط الالتزام بالذوق العام، ويمنع على جميع المتقدمات ارتداء النقاب داخل المركز وقاعات الامتحان.
- يحظر على الممتحنين اصطحاب الهواتف النقالة وأجهزة النداء الآلي وآلات التصوير والحواسيب الشخصية والساعات الرقمية الذكية والآلات الحاسبة ذات الصفة التخزينية والمجلات والصحف والكتب الدراسية والدفاتر والمذكرات والحقائب اليدوية والآلات الحادة أو الأسلحة أياً كان نوعها وأي شيء له علاقة بالامتحان.
- يجب على الممتحن الامتثال لإجراءات التفتيش داخل المركز طوال أيام الامتحان.
- يجب على الممتحن التأكد من استلام دفتر امتحانه، مغلفاً بغلاف بلاستيكي شفاف وغير ممزق ، وهو مسؤول عنه حتى يسلمه لمراقبي اللجنة بعد الانتهاء من الإجابة.
- يجب الالتزام بضوابط إدارة امتحانات دبلوم التعليم العام وما في مستواه وأية مخالفة لهذه الضوابط تعرضك للتدابير والإجراءات والعقوبات المنصوص عليها بالقرار الوزاري رقم ٥٨٨ / ٢٠١٥.
- يقوم المتقدم بالإجابة عن أسئلة الامتحان المقالية بقلم الحبر (الأزرق أو الأسود).
- يقوم المتقدم بالإجابة عن أسئلة الاختيار من متعدد بتظليل الشكل (▭) وفق النموذج الآتي:

س – عاصمة سلطنة عمان هي:

▭ القاهرة ▭ الدوحة

▬ مسقط ▭ أبوظبي

ملاحظة: يتم تظليل الشكل (▬) باستخدام القلم الرصاص وعند الخطأ، امسح بعناية لإجراء التغيير.

صحيح ▬ **غير صحيح** ▭ ◉ ◔ ☒ ☑

مُسَوَّدَة، لا يتم تصحيحها

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Question One: (Items 1 – 8) (8 marks)

Shade in the bubble (⬭) next to the **correct** answer for each of the following items.

1) The most suitable research method for collecting data from a large sample size is:

- ⬭ Interview
- ⬭ Observation
- ⬭ Questionnaire
- ⬭ Document Analysis

2) The term that shows how data moves around the system is:

- ⬭ System flowchart
- ⬭ Data flow diagram
- ⬭ Validation routines
- ⬭ Design specification

3) A characteristic of white box testing is:

- ⬭ Its test plan is difficult to design
- ⬭ It requires skilled testers to carry it out
- ⬭ It is performed by end users rather than developers
- ⬭ It does not require knowledge of the internal structure of the system

4) Sara is having trouble syncing her smartwatch with her phone. Which section of the user manual would likely help her troubleshoot this connection issue?

- ⬭ Troubleshooting section
- ⬭ System requirements
- ⬭ Instructions section
- ⬭ Installation guide

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Question One Continued

5) It is used during the design stage to demonstrate how a system will look and work (focused on the user interface):

- ▢ Implementation
- ▢ Development
- ▢ Prototyping
- ▢ Design

6) A web designer is creating graphics for an e-commerce website. The design must ensure vibrant colors on all digital screens, including computers, tablets, and smartphones. Which color system should the designer use?

- ▢ HSL
- ▢ RGB
- ▢ CMS
- ▢ CMYK

7) The main purpose of using Bezier curves in vector graphics is to:

- ▢ Apply a filter to an image
- ▢ Create pixel-based images
- ▢ Manipulate part of an image
- ▢ Generate smooth, scalable curves

8) A graphic designer is working on designing a background for a website interface. He chose to use a background that includes realistic graphics and images to create an attractive look. To speed up page loading, he decided to save the file using lossy compression. What is the likely effect on the background after downloading it?

- ▢ The file size will be smaller, but some fine details may be lost
- ▢ The background will load faster and have a higher resolution
- ▢ The background colors will remain the same and load quickly
- ▢ The background will keep its original quality with no loss in detail

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Question Two: (Items 9–19) (32 marks)

Answer ALL questions in the space provided.

9) A research team is studying the emotional and psychological impact of cancer treatment on patients. They want to capture the complex emotions, challenges, and coping mechanisms of patients.

a. Select the **most** appropriate research method that allows follow-up questions. (1mark)

_____

b. Provide **TWO** justifications for your choice. (2marks)

1._____

_____

2._____

_____

10) Complete the following table by defining different research methods. (2 marks)

Method of research	Definition
Questionnaires	_____ _____
_____	Involves the analyst watching the processes that take place within an organization to find out how everyday tasks are completed.

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Question Two Continued

11) In designing an electronic library system that allows students to reserve books.

a. Draw the appropriate flowchart symbol for each step of the book search process as described below: (2marks)

Purpose	Symbol
Student Inputs Book Title or Author	
System Searches the Database for the Book	
The following information in the system	
Generate and Print a Reservation Slip	

b. Which **validation type** should be applied to ensure that students do not leave the book title field blank? (1mark)

_____

12) Define the term Evaluation. (1 mark)

_____

_____

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Question Two Continued

13) Imagine you are a member of a game development team preparing to launch a new multiplayer video game. Identify the appropriate type of testing (Alpha or Beta) that must be applied in the following stages: (3 marks)

Stage	Type of Test (Alpha or Beta)
The test is carried out by real players.	
The software is used within a controlled environment.	
A new version is released to combine the player feedback.	

14) A company developing a mobile banking app is concerned about how customers interact with and navigate the app before finalizing the design.

a. Explain how prototyping can help address this concern. (1 mark)

b. Why might a company choose evolutionary prototyping instead of throwaway prototyping when developing a new system? (1 mark)

15) Identify the terms that match the following descriptions: (1 mark)

a. A lack of transparency, that is how solid and non-see through the image is:

b. One of the file formats that does not support transparency, causing any transparent background to be stored as white or black areas:

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Question Two Continued

16) "Compression techniques are widely used in various fields depending on whether maintaining quality or reducing file size is the priority"

Based on this argument, answer the following questions:

a. In the following applications determine whether the compression is **lossless or lossy.** (2marks)

(1) An educational platform uploads video-based lesson explanations on cloud storage in a compressed format to save space and ensure faster streaming for students.

_____

(2) A hospital is storing MRI scan images of patients and ensuring that no image data is lost, while maintaining full diagnostic accuracy for future reference.

_____

(3) High-quality photos and videos uploaded by a content creator on social media platforms such as Instagram and Facebook appear in a smaller size when uploaded.

_____

(4) A graphic designer is designing banner advertisements for a website and aims to ensure they upload quickly on the webpage.

_____

b. What is it meant by Color Depth? (1 mark)

_____

_____

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Question Two continued

17) A company specializing in the development of operating systems for computers and tablets continuously enhances its systems by introducing new features and improvements. Due to the vast amount of data and the extensive global user base, the company has opted for a pilot implementation approach. This strategy ensures a smooth transition to the new system while minimizing disruptions to overall functionality.

Define the term "pilot implementation" and discuss THREE benefits that may arise from adopting this method in developing operating systems. (4 marks)

The definition:

Benefits:

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Question Two continued

18) While preparing a front-page article for a newspaper, the editor decided to use an AI-generated image to enhance the visual appeal of the layout. After inserting the image into the design and reviewing it before printing, he noticed that the image showed clear signs of pixelation, which affected its clarity and quality. Explain how to ensure high quality images in professional publishing:

- **Identify** the type of image that is affected by pixelation and **explain** its impact on the image.
- **Suggest** an appropriate solution to avoid pixelation and maintain image quality and **justify** your proposed solution. (4 marks)

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Question Two continued

19) Read the following scenario and answer all the questions in the space provided:

A private clinic implemented an **Electronic Health Record (EHR)** system to improve patient care and streamline operations. A **multidisciplinary team** of healthcare professionals, IT specialists, and administrators led the project, starting with a feasibility study and user consultations to define key requirements. The system was designed with **user-friendly interfaces, secure data storage, and integration with lab and imaging systems**. Implementation involved **seamless data migration, rigorous testing, and iterative development** to ensure reliability. After deployment, a **dedicated maintenance plan** was established for continuous support and enhancements based on user feedback.

a. "The clinic has received user feedback regarding slow system performance and intermittent errors in the prescription management module of the Electronic Health Record (EHR) system. As a member of the maintenance team, **determine** and **define** which type of software maintenance would be the most appropriate to address these issues. (2 marks)

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Question Two continued

b. After deployment of an Electronic Health Record (EHR) system in the clinic, staff provided feedback that while the appointment scheduling feature worked as expected, it lacked an automated patient reminder system, leading to frequent no-shows.

Explain the concept of **perfective maintenance** and how it applies to this scenario.

(2 marks)

c. As part of the implementation process, user documentation was created to guide healthcare professionals and administrative staff in using the system effectively.

List **TWO** key sections that should be included in the user documentation.

(2 marks)

[End of Examination]

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SULTANATE OF OMAN
MINISTRY OF EDUCATION

Marking Guide of General Educational Diploma for Private Schools

2024/2025

Semester Two – Second Session

Subject: ICT

مركز القياس والتقويم التربوي
The Center for Educational Assessment and Measurement (CEAM)

Note: There are 13 pages in this guide

First: Answers for the Multiple-Choice Items (8 Marks):

Item N.	Answer	Mark	Learning Outcome	Learning Level
1	C Questionnaire	1	AO1	Identify the methods of researching.
2	B Data flow diagram	1	AO1	Define the term DFD.
3	B It requires skilled testers to carry it out	1	AO1	Describe the differences between black box testing and white box testing
4	A Troubleshooting section	1	AO2	Explain why technical and user documentation is needed.
5	C Prototyping	1	AO1	Define the term prototype
6	B RGB	1	AO2	Explain the properties of different color systems (RGB, HSL, CMYK, CMS)
7	D Generate smooth, scalable curves	1	AO1	Define the terms Canvas and Bezier Curve
8	A The file size will be smaller, but some fine details may be lost	1	AO2	Discuss the effects of different methods of compression on images

Second: Answers for the Extended Answer Items (32 Marks):

General Notes

- There may be different ways of answering questions, but a basic requirement for all answers is that they are RELEVANT.
- If the answer is clearly not relevant, and the student has clearly made no attempt to answer the question that was set, NO marks should be awarded. However, if the student has genuinely attempted the answer, but his answer is only partly relevant, then a reduced mark (not zero) should be awarded.

Item N.	Correct Answer	Mark
9	**Answer:** a. Interviews. ~~**(1 mark)**~~ b. - To gain deeper insights, elaboration, further details. - Expand upon answers. - allowed patients to express their experiences and expressions in their own words. This approach provided rich qualitative data. - offering a more comprehensive understanding of the psychological effects of cancer treatment. **(2 marks)** **Any two answers from the above justification are worth 2 marks (for each 1 mark)** **Marking guidance and rubric:** The answer above is just a sample answer; any other correct answers ***should be marked*** based on the following rubric:	3

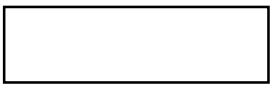
Mark	Criteria: Select the appropriate method (AO2 – 1 mark)	Mark	Criteria: Justifications (AO3 - 2 marks)
1	The research method provided is correct	**2**	The response provides two clear and relevant justifications of choosing a research method.
0	No correct answer provided or no response.	**1**	The response provides one clear and relevant justification of choosing a research method.
		0	No clear or reasonable analysis of the chosen research method or no response provided.

Learning Outcome	Analyze the advantages and disadvantages of each analysis method.
Learning Level	AO2, AO3
Page	345-346

Item N.	Correct Answer	Mark
10	**A sample answer:** **Method of research** — **Definition** Questionnaires — **A method that is used when information is required from a large number of users, so the results can be quantified and compared.** **Observation** — Involves the analyst watching the processes that take place within an organization to find out how everyday tasks are completed. **Marking Guidance and Rubric:** **1 mark** for the definition, **1 mark** for the method of research. The answer above is just a sample answer; any other correct answers ***should be marked*** based on the following rubric:	2

Mark	Understanding and Remembering (AO1) – 2 marks
2	The response provides a clear and relevant definition and correct method of research.
1	The response provides a clear and relevant definition and incorrect method of research **OR** the response provides incorrect or unclear definition and correct method of research.
0	No response or incorrect definition and incorrect method of research.

Learning Outcome	Identify the methods of research
Learning Level	AO1
Page	344-346

Item N.	Correct Answer	Mark
11.	**Answer:** a. Purpose / Symbol Student Inputs Book Title or Author  System Searches the Database for the Book  The following information in the system Generate and Print a Reservation Slip  **Marking Guidance and Rubric:** Each correct symbol is worth **0.5 mark** (0.5 *4=**2 marks**) Learning Outcome: Identify the elements, purpose and symbols of flowcharts. Learning Level: AO2 Page: 350 + 355 b. Presence **Marking Guidance and Rubric:** **1 mark** for correct validation type. **0 mark** for incorrect validation type Learning Outcome: Explain and apply validation routines. Learning Level: AO2 Page: 355	3

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>12</td><td>
A sample answer:

A formal review of a project

Marking guidance and rubric:

The answer above is just a sample answer; any other correct answers should be marked based on the following rubric:
<table>
<tr><th>Mark</th><th>Remembering and Understanding (AO1) – 1 mark</th></tr>
<tr><td>1</td><td>Accurate definition is provided.</td></tr>
<tr><td>0.5</td><td>Partial or somewhat accurate definition is provided.</td></tr>
<tr><td>0</td><td>No response or incorrect definition is provided.</td></tr>
</table>
<table>
<tr><td>Learning Outcome</td><td>Define the term Evaluation.</td></tr>
<tr><td>Learning Level</td><td>AO1</td></tr>
<tr><td>Page</td><td>364</td></tr>
</table>
</td><td>1</td></tr>
<tr><td>13</td><td>
Answer:

<table>
<tr><th>Stage</th><th>Type of Test
(Alpha or Beta)</th></tr>
<tr><td>The test is carried out by real players.</td><td>Beta</td></tr>
<tr><td>The software is used within a controlled environment.</td><td>Alpha</td></tr>
<tr><td>A new version is released to combine the player feedback.</td><td>Beta</td></tr>
</table>
Marking Guidance and Rubric:

1 mark for each correct answer (1*3=3 marks)
<table>
<tr><td>Learning Outcome</td><td>Describe the differences between alpha and beta testing.</td></tr>
<tr><td>Learning Level</td><td>AO2</td></tr>
<tr><td>Page</td><td>358</td></tr>
</table>
</td><td>3</td></tr>
</table>

Item N.	Correct Answer	Mark
14. a,b	**A sample answer:** a. Prototyping allows the company to test the app's interface and gather user feedback, helping to identify usability issues before full development. **Marking Guidance and Rubric:** The answer provided is just a sample answer; all other answers should be marked based on the following: **1 mark**: The answer correctly states at least one valid benefit, such as testing user experience, gathering feedback, or identifying usability issues. **0 mark**: No answer provided or answer lacks relevance to the question. Learning Outcome: Explain different types of prototyping and explain why each is needed. Learning Level: AO2 Pages: 368 b. Evolutionary prototyping **allows for continuous improvements** based on user feedback, ensuring that the final product is refined over multiple iterations rather than being discarded **Marking Guidance and Rubric:** The answer provided is just a sample answer; all other answers should be marked based on the following: **1 mark**: The answer provides a logical explanation for choosing evolutionary prototyping, such as allowing continuous improvements based on user feedback. **0 mark**: No answer provided or answer lacks relevance to the question. Learning Outcome: Evaluate advantages and disadvantages of each type of prototyping. Learning Level: AO3 Pages: 368-369	2

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>15. a,b</td><td>
<u>Answer:</u>
a. Opacity [0.5]
<table>
<tr><td>Learning Outcome</td><td>Define Opacity and Transparency.</td></tr>
<tr><td>Learning Level</td><td>AO1</td></tr>
<tr><td>Page</td><td>409</td></tr>
</table>
b. JPEG / JPG / Joint Photographic Experts Group. [0.5]
<table>
<tr><td>Learning Outcome</td><td>Identify different file formats (SVG, BMP, GIF, JPEG, PNG, TIFF, PDF)</td></tr>
<tr><td>Learning Level</td><td>AO1</td></tr>
<tr><td>Page</td><td>409</td></tr>
</table>
<u>Marking guidance and rubric:</u>

0.5 mark for each correct answer (0.5*2=1 mark)
</td><td>1</td></tr>
<tr><td>16</td><td>
<u>Answer</u>:
a.
1. Lossy
2. Lossless
3. Lossy
4. Lossy
<u>Marking guidance and rubric:</u>
0.5 mark for each correct answer (05*4=2 marks)
<table>
<tr><td>Learning Outcome</td><td>Describe Lossless and lossy compression</td><td></td></tr>
<tr><td>Learning Level</td><td>AO2</td><td></td></tr>
<tr><td>Page</td><td>420</td><td>3</td></tr>
</table>
b. The color depth is the number of colors that can be represented in the image.
<table>
<tr><th>Mark</th><th>Knowledge and Understanding
AO1 – 1 Mark</th></tr>
<tr><td>1</td><td>The definition is clear and accurate</td></tr>
<tr><td>0</td><td>The definition is incorrect or not provided.</td></tr>
</table>
<table>
<tr><td>Learning Outcome</td><td>Define color depth</td><td></td></tr>
<tr><td>Learning Level</td><td>AO1</td><td></td></tr>
<tr><td>Page</td><td>420</td><td></td></tr>
</table>
</td><td></td></tr>
</table>

Item N.	Correct Answer	Mark
17	**A sample answer:** **Pilot implementation** takes place when part of an organization starts to use the new system while the rest of the organization continues to use the old system. **Potential Benefits:** • **Early Detection of errors and Fixing of Issues**: Early users can provide valuable feedback about new features, helping the developers make improvements based on the real-world usage. • **Minimize impact of the error**: by testing updates on smaller groups of users, potential errors will affect the pilot group only which reduces their impact when the system is fully deployed to all users. • **Easier User Training**: The users who use the system early can help train others. This makes it easier for everyone to learn how to use the new system. Other acceptable benefits: • **Cost Savings**: Testing the new operating system on a small scale at first helps the company detect technical or compatibility issues early. This reduces the need for costly fixes or major system downtime after the full rollout, helping to avoid additional future expenses that could result from update failures or system disruptions. **Marking guidance and rubric:**	4

Mark	Criteria: Define the pilot implementation (AO1 – 1 Mark)	Mark	Criteria: Discuss three benefits (AO3 – 3 Marks)
1	Accurate clear definition of pilot implementation is provided.	**3**	Three relevant, clear and well-explained benefits are discussed.
0.5	Partial definition of pilot implementation is provided. The definition lacks detail or precision.	**2**	Two relevant, clear and well explained benefits are discussed.
0	No definition or incorrect definition is provided.	**1**	One relevant, clear and well explained benefit is discussed.
		0	The answer is incorrect or not provided.

Learning Outcome	Explain the four methods of implementation.	
Learning Level	AO1+AO3	
Page	361+362	

Item N.	Correct Answer	Mark
18	**A sample answer:** The type of image that is affected by pixelation is **a bitmap image** because it is made up of small pixels. When the image is enlarged, the pixels are enlarged and become visible. So, this causes the image to become **blurry**, **unclear, lose detail** and **visual quality**. The appropriate solution to avoid pixelation is **using high-resolution images**. The Images with a higher resolution contain a greater number of pixels, which allow them to be enlarged without losing detail or showing signs of pixelation. **Another appropriate solution:** • **Using a vector image**. Vector images are not made up of pixels like bitmap images, they are created using mathematical equations. Vector images can be enlarged without affecting their clarity or losing quality. This makes them ideal with images that require scalability. • **Use advanced image tools**: using professional editing tools like photoshop or any AI professional applications that maintain image quality when enlarged or editing. **Marking guidance and rubric:**	4

Mark	Criteria: Identify the image type and explain pixelation impact on the image (AO1 – 2 Marks)	Mark	Criteria: Suggest solution and justify it (AO2 – 2 Marks)
2	Identification of **the image type** is correct and an accurate, clear explanation of the **pixelation impact on the image** is provided.	**2**	Suggestion solution is correct with a clear and well-explained justification.
1	Identification of **the image type** is correct, but no accurate, clear explanation of the **pixelation impact on the image** is provided or the identification **of the image type** is incorrect, but an accurate, clear explanation of the **pixelation impact on the image** is provided.	**1**	Suggestion solution is correct without providing a clear and well-explained justification.
0	The identification **of the image type** is incorrect and no accurate, clear explanation of the **pixelation impact on the image** is provided.	**0**	Suggestion solution is incorrect, or no answer is provided.

Learning Outcome	Define the term pixelation. Identify the deciding factors to select vector or bitmap images
Learning Level	AO1+ AO2
Page	398+399

<table>
<tr><th>Item N.</th><th>Correct Answer</th><th>Mark</th></tr>
<tr><td>19</td><td>

A sample answer:

a. In this scenario, the most appropriate type of maintenance that could be applied is:

Corrective Maintenance – This is required to **fix the occasional errors in prescription management**. These errors indicate that something is not working as intended, possibly due to software bugs, incorrect data processing, or system malfunctions. **Corrective Maintenance**: Focuses on **repairing faults** in the system, ensuring accurate and reliable prescription management.

Marking guidance and rubric:

<table>
<tr><th>Mark</th><th>Criteria: Determine the appropriate type of software maintenance (AO2-1 mark)</th><th>Mark</th><th>Criteria: Define the type of software maintenance (AO1- 1 mark)</th></tr>
<tr><td>1</td><td>The provided example is clear and relevant.</td><td>1</td><td>The response provides a clear, relevant and reasonable understanding of the scenario</td></tr>
<tr><td>0</td><td>No type provided.</td><td>0.5</td><td>Partial response with a clear, relevant and reasonable understanding of the scenario</td></tr>
<tr><td></td><td></td><td>0</td><td>No clear or reasonable understanding of the scenario.</td></tr>
</table>

<table>
<tr><td>Learning Outcome</td><td>Explain corrective maintenance with an example.</td></tr>
<tr><td>Learning Level</td><td>AO1, AO2</td></tr>
<tr><td>Pages</td><td>366</td></tr>
</table>

</td><td>2</td></tr>
</table>

b. Perfective maintenance refers to enhancements and modifications made to a software system to improve its performance, efficiency, or usability based on user feedback, even when no faults exist. Unlike corrective maintenance, which addresses system errors, perfective maintenance focuses on refining and optimizing functionalities to meet evolving user needs.

To improve the system, developers implemented **an automated SMS or email reminder features or phone calls**, notifying patients about upcoming appointments. This enhancement aligns with **perfective maintenance** because it does not fix a defect but instead improves an existing function to enhance the clinic's operational efficiency and patient engagement.

Students may suggest another implementation approach and they may have good justifications; their answer could be accepted according to the justifications they provide.

Marking guidance and rubric:

The provided answer is just a sample answer, any other answer should be marked based on the following rubric.

Mark	Criteria: Analysis (AO3 - 1 mark)	Mark	Criteria: Application (AO2 - 1 mark)
1	The response provides a clear, relevant and reasonable explanation of perfective maintenance.	**1**	The application example provided is clear and relevant.
0.5	Partial response with a clear and relevant explanation of perfective maintenance.	**0.5**	The application example provided is partially clear and relevant.
0	No clear or reasonable application of the scenario is provided.	**0**	No clear or reasonable application of the scenario is provided.

Learning Outcome	Explain perfective maintenance with an example
Learning Level	AO3
Pages	365

2

c. Any two of the following answers:

- User Guide
- Content Page (Table of Contents)
- Instruction Guide (Step-by-Step Instructions)
- Glossary
- Troubleshooting Section.

Marking Guidance and rubric:

Each element is worth **1 mark** (1*2=**2 marks**).

The provided answer is just a sample answer, any other answer should be marked based on the following rubric.

Learning Outcome	List the items included in the user documentation.
Learning Level	AO1
Pages	363

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