Grade 11 Computing

Unit 10 · Building an App People Use

ANSWER KEY · FOR TEACHERS

Full marks 31

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. leading question
2. user story
3. acceptance criterion
4. minimum viable product
5. median
6. System Usability Scale
7. funnel
8. dark pattern

K · 4

Each carries 0.5 mark.

2 Multiple choice

i. **c.** What did you do with your books after last year's exams? U · 1

It asks about a real event in the person's past, which they remember and can't easily dress up to please you. The first and last ask for a guess about the future, and the second tells them the answer you want.

ii. **c.** As a parent, I want to see a book's edition, so that we don't take one the teacher won't use. U · 1

It names a real kind of user, something they want to do, and why. The first is a solution nobody wants for itself, the second a design task, and the last can't be tested.

iii. **b.** 38 seconds A · 1

With six values, the median is halfway between the two middle ones, the third and fourth: (36 + 40) ÷ 2 = 38 seconds. The mean, 64 seconds, is pulled up by the one long test.

iv. **c.** Testers rated it better than the average of about 68 in many studies. U · 1

A SUS score isn't a percentage of anything. It means something only compared with other scores: 75 is above the average of about 68 that Jeff Sauro found across about 500 studies.

v. **a.** between opening the app and choosing a grade, where 250 students stopped A · 1

The biggest drop is at the first step: most visitors never chose a grade. Maybe they were only curious, maybe the first screen confused them, maybe their grade wasn't there. The count shows where; watching or asking a few of them will show why.

3 The System Usability Scale

ANSWER A · 3

Odd statements (answer − 1): 4 + 3 + 3 + 4 + 3 = 17.
Even statements (5 − answer): 4 + 3 + 4 + 3 + 2 = 16.
Points: 17 + 16 = 33 of 40. Score: 33 × 2.5 = **82.5**, above the average of about 68.

MARKING SCHEME

- ✓ Odd statements 17 points.
- ✓ Even statements 16 points.
- ✓ 33 × 2.5 = 82.5, above 68.

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4 What does it print?

ANSWER **A · 5**

```
OUTPUT
1 0 0 1
[(1, '8B-14'), (2, '8A-3')]
```

A real server handles many requests at the same time. With two steps, two requests for the same book can both run their SELECT before either runs its UPDATE: both see the book free, both UPDATE, the second overwrites the first, and both students are told the book is theirs (a race condition). The single `UPDATE … WHERE kept_for IS NULL` is done by the database as one step, so only one of the two changes a row.

MARKING SCHEME

- ✓ 1 for the first keep, and 0 for the second try at book 1, which is no longer empty.
- ✓ 0 for book 3, which doesn't exist, and 1 for book 2.
- ✓ The table: book 1 kept for 8B-14, book 2 for 8A-3.
- ✓ Two requests at the same moment can both find the book free before either marks it, so both are told they have it.
- ✓ The one statement checks and changes in a single step nothing can come between, so only one request changes the row.

5 Did it meet its targets?

MARKING SCHEME **A · 3**

- ✓ 4 of 5 finished: met; median SUS 70 (the middle of the five): met.
- ✓ Median time halfway between 2:40 and 3:30, 3:05: not met.
- ✓ One honest sentence that gives the counts and says which target was missed.

6 Write user stories

ANSWER **A · 4**

Stories (any good ones, each with who, what and why):

- S1. As a student, I want to order my tiffin before the break, so that I don't spend half the break in the queue.
- S2. As a student, I want to see what is still available, so that I don't order something that has run out.
- S3. As the canteen didi, I want a list of orders by class an hour before break, so that I can prepare them in time.

Acceptance criteria for S1:

- **Given** it is before 10:30 and chowmein is available, **when** I choose chowmein and confirm with my class and roll number, **then** the order is saved and the app shows my order number and where to collect it.
- **Given** it is after 10:30, **when** I try to order, **then** the app tells me ordering has closed for today, and no order is saved.

MARKING SCHEME

- ✓ Three stories, each with who, what and why.
- ✓ At least two kinds of user (such as a student and the canteen staff).
- ✓ Two acceptance criteria for one story, each in Given, When, Then.
- ✓ Each criterion exact enough to test (a time, what is shown, what is saved or refused).

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7 Interviews that find the truth

MARKING SCHEME U · 3

- ✓ i. Asked about a real time in the past (the last time they looked for a tutor); the original asks for a guess, answered kindly.
- ✓ ii. Asked what they pay now and how they decided; the original is leading.
- ✓ iii. Asked what they have already spent; the original asks them to price something that doesn't exist.

8 Mean or median?

MARKING SCHEME A · 2

- ✓ Mean 50.6 seconds, median 27 seconds.
- ✓ The median, because one unusual slow test pulls the mean far up but hardly moves the median.

9 Think

ANSWER HA · 2

Probably not in that form. Even when the number is true, the red warning is there to hurry people, not to inform them: students would keep books they don't need "just in case", and a book kept and never collected is a book another student didn't get. That is the opposite of what the app is for. A fair design shows how many books there are, plainly (Sketch 2 already does: "Science and Tech., 2 books"), lets each student keep one book per subject, and lets them cancel. A number on a screen is honest when it helps the user decide; it is a **dark pattern** when it is there to push them (Grade 9). Explain this to the principal with the reason, and offer what would help: a notice in assembly a week before swap day.

MARKING SCHEME

- ✓ Not in that form: the red warning hurries students, so they keep books they don't need and other students miss out, the opposite of the app's purpose (a dark pattern, even if the number is true).
- ✓ Show the counts plainly, one book per subject, a way to cancel; explain the reason to the principal and offer something that helps, such as a notice in assembly.

10 Activity: Test a paper prototype

(not marked)

WHAT STUDENTS SHOULD FIND

Almost every first sketch has a screen where the tester hesitates: a word that means something to the team and not to the tester, a button that looks like a label, a step with no way back. Groups that stay quiet while the tester struggles find these; groups that help ("tap there") find nothing. Good groups count how many testers met each problem, fix what stopped people first, and test the new sketch again with a new tester.

Marks by level	Knowledge	Understanding	Application	Higher ability	**Total**
Marks	4	6	19	2	**31**

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