AI Project Cycle

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The first stage of the AI project cycle is:
(a) modelling **(b)** deployment
(c) data acquisition **(d)** problem scoping

2. Collecting rainfall readings from weather stations: which stage of the AI project cycle is this?
(a) data acquisition **(b)** deployment
(c) evaluation **(d)** modelling

3. On a 4Ws problem canvas, “What is known about the problem already?” belongs under which W?
(a) When **(b)** Who **(c)** What **(d)** How

4. Which of these is a learning-based model rather than a rule-based one?
(a) a model that learns from labelled photos to tell apples from oranges
(b) a grading program in which 90 and above is always an A
(c) a program that switches on a fan whenever the temperature is above 30 °C
(d) a quiz that checks each answer against a stored key

5. Which data feature is most useful for predicting bus arrival times?
(a) water flow readings over time **(b)** temperature each day
(c) number of patients booked **(d)** traffic speed along the route

6. A dataset has 700 rows. 90% are used for training and the rest for testing. How many rows are used for testing?
(a) 70 **(b)** 700 **(c)** 630 **(d)** 610

7. A sensor for a crop-watering project takes one reading every 10 minutes. How many readings does it take in 48 hours?
(a) 48 **(b)** 480 **(c)** 289 **(d)** 288

8. In the AI project cycle, which stage comes two stages after modelling?
(a) deployment **(b)** evaluation
(c) data labelling **(d)** problem scoping

Section B — Short answer — 8 × 2 = 16 marks

9. Name the six stages of the AI project cycle in order.

10. Put the stages of the AI project cycle in order. Write the letters in order.
(a) Problem scoping
(b) Deployment
(c) Data acquisition
(d) Data exploration
(e) Evaluation
(f) Modelling

11. A dataset of 1,800 labelled examples is split 90 : 10 into training and testing data. How many examples are in (a) the training set (b) the test set?

12. A weather sensor records a reading every 5 minutes. A model needs 11,300 readings. For how many whole days must the sensor run?

13. On a 4Ws problem canvas, under which W does each question go? (a) What is the problem? (b) Why will solving it help the stakeholders?

14. Is each model rule-based or learning-based? (a) a handwriting reader trained on thousands of written digits (b) a parking gate that opens only for number plates on a fixed list

15. At which stage of the AI project cycle does each happen? (a) Counting true positives and false negatives on test data (b) Writing a clear problem statement

16. A survey for an AI project gets 500 responses, and 80 of them are left incomplete. What percentage of the responses are complete?

Section C — Word problems — 4 × 4 = 16 marks

17. Fill in a 4Ws canvas for the problem of food waste in a school canteen.

18. An AI project has 1,500 labelled examples and keeps 75% for training. (a) How many examples are used for training? (b) How many for testing? (c) The model gets 224 test examples right. What is its accuracy, to one decimal place where needed?

19. A sensor for an air-quality project takes a reading every 30 minutes. (a) How many readings does it take in a day? (b) How many in 14 days? (c) How many whole days does it need to collect 8,000 readings?

20. Name one useful data feature for each project and say where you could collect it: (a) predicting tomorrow's air quality (b) predicting bus arrival times

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Answer key

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Q	Answer	Working
1	**(d) problem scoping**	—
2	**(a) data acquisition**	—
3	**(c) What**	—
4	**(a) a model that learns from labelled photos to tell apples from oranges**	—
5	**(d) traffic speed along the route**	—
6	**(a) 70**	10% of 700
7	**(d) 288**	48 × 60 = 2880 minutes; ÷ 10
8	**(a) deployment**	problem scoping → data acquisition → data exploration → modelling → evaluation → deployment
9	**Problem scoping, data acquisition, data exploration, modelling, evaluation, deployment.**	—
10	**a, c, d, f, e, b**	Problem scoping → Data acquisition → Data exploration → Modelling → Evaluation → Deployment
11	**(a) 1,620; (b) 180**	90% and 10% of 1,800
12	**40 days**	288 readings a day; 11,300 ÷ 288, rounded up
13	**(a) What; (b) Why**	—
14	**(a) learning-based; (b) rule-based**	rule-based follows rules written by people; learning-based finds its own rules from data
15	**(a) evaluation (b) problem scoping**	—
16	**84%**	420 ÷ 500 × 100
17	**Who: students, canteen staff; What: a lot of cooked food is thrown away daily; Where: the school canteen at lunch; Why: reducing waste saves money and food.**	—
18	**(a) 1,125; (b) 375; (c) 59.7%**	224 ÷ 375 × 100
19	**(a) 48; (b) 672; (c) 167**	1,440 ÷ 30; × 14; 8,000 ÷ 48, rounded up
20	**(a) e.g. wind speed and today's pollution level (b) e.g. traffic speed along the route**	—