PE.PT11 Calculating Training Intensity and Load: Percentages, Ratios and Overload

Total Marks

AQA 8582 · Calculators not allowed · about 40 minutes

Name: _____ Date: ____ / ____ / _____

Answer all questions. Show your working for calculation questions. Two of the questions require full sentences: the graph interpretation and the trend description. Time guidance: 40 minutes.

1 A coach records a trainee performing 12 repetitions of an exercise in one set. Which of the following is closest to the trainee performing one extra repetition as a percentage increase in repetitions?

- ☐ A) 6%
- ☐ B) 8%
- ☐ C) 10%
- ☐ D) 12%

(Total for Question 1 is 1 mark)

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2 State the term used for increasing a training variable, for example distance or repetitions, by a small amount each week to promote adaptation in progressive overload context.

(Total for Question 2 is 1 mark)

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3 A runner increases their weekly distance from 20 km to 22 km to apply overload. Calculate the percentage increase in weekly distance. Give your answer to 1 decimal place and show working.

(Total for Question 3 is 2 marks)

4 A trainee performs 4 sets of 8 repetitions. The coach applies a 15% increase in repetitions for the next week and rounds each new set to the nearest whole repetition. Calculate the new number of repetitions per set after the increase. Show working. Marks awarded for method and final number.

(Total for Question 4 is 3 marks)

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5 A gymnast completes 30 repetitions total across several practice sets. The coach asks for a 20% increase in total repetitions next session. Calculate the target total repetitions for the next session. Show working.

(Total for Question 5 is 2 marks)

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6 In an interval training session a coach prescribes work to rest ratio 1:3 for a cycling drill lasting 40 seconds per work bout. State how many seconds of rest to take between each work bout.

(Total for Question 6 is 1 mark)

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7 A sprinter uses a work to rest ratio of 1:4. If each sprint (work) lasts 10 seconds, calculate the rest time in seconds. Show your short working.

(Total for Question 7 is 2 marks)

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8 Table: A coach records three training sessions of a rower in one week. Complete the table to find totals. Sessions: Session 1 distance 6 km, Session 2 distance 7.5 km, Session 3 distance 8 km. Fill in total distance for the week and total number of sessions.

(Total for Question 8 is 3 marks)

9 A weight-training plan lists sets per session over four sessions as 3, 4, 3 and 5 sets. Calculate the mean number of sets per session for these four sessions. Give your answer to 1 decimal place and show working.

(Total for Question 9 is 2 marks)

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10 A coach records sprint distances of 30 m, 40 m and 50 m in a session. State the range of these distances in metres.

(Total for Question 10 is 1 mark)

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11 A circuit session includes 5 exercises. The athlete does 3 sets of each exercise, with 10 repetitions per set. Calculate the total number of repetitions performed in the whole circuit. Show working.

(Total for Question 11 is 1 mark)

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12 A runner increases mile time training distance from 10 km in week 1 to 12 km in week 2. Calculate the percentage increase in distance from week 1 to week 2. Give answer to 1 decimal place and show working.

(Total for Question 12 is 2 marks)

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13 A coach applies progressive overload of 10% each week to a trainee running distance. Starting week 1 at 5 km, calculate the planned distance for week 3. Show all working and round distances to 2 decimal places if needed.

(Total for Question 13 is 3 marks)

14 A coach provides a small line graph showing weekly total training distance for a cyclist over five weeks: Week 1 = 40 km, Week 2 = 44 km, Week 3 = 48 km, Week 4 = 52 km, Week 5 = 58 km. Describe the trend over these five weeks and give one possible coaching reason for that trend. Answer in full sentences.

(Total for Question 14 is 2 marks)

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15 Calculate the average weekly increase in distance over the five weeks given in Question 14. Show working and give your answer to 2 decimal places. Use values: Week 1 = 40 km, Week 5 = 58 km.

(Total for Question 15 is 3 marks)

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16 A trainee currently completes a total training load measured as sets x repetitions = 12 sets x 8 reps = 96 'load units'. A coach adds one extra set of 8 repetitions to each exercise, increasing sets from 12 to 13. Calculate the percentage increase in total load units. Give your answer to 1 decimal place and show working.

(Total for Question 16 is 3 marks)

Mark scheme · PE.PT11 Calculating Training Intensity and Load: Percentages, Ratios and Overload

Question 1

- **B1** B
- **Answer: B (8%)**

Question 2

- **B1** progressive overload
- **Answer: Progressive overload**

Question 3

- **M1** method: calculate increase 22-20 = 2 km and divide by original 20, 2/20
- **A1** final answer: 10.0%
- **Answer: 10.0%**

Question 4

- **M1** method: calculate 15% of 8 = 0.15 x 8
- **M1** method: add increase to original 8 to get new repetitions before rounding
- **A1** final answer: 9 repetitions per set
- **Answer: 9 repetitions per set**

Question 5

- **M1** method: calculate 20% of 30 = 0.20 x 30
- **A1** final answer: 36 repetitions
- **Answer: 36 repetitions**

Question 6

- **B1** 120 seconds
- **Answer: 120 seconds**

Question 7

- **M1** method: rest = 4 x 10 seconds
- **A1** final answer: 40 seconds
- **Answer: 40 seconds**

Question 8

- **M1** method: add distances 6 + 7.5 + 8
- **A1** final answer: total distance 21.5 km
- **A1** final answer: total sessions 3
- **Answer: Total distance = 21.5 km. Total sessions = 3.**

Question 9

- **M1** method: add sets 3+4+3+5 = 15 and divide by 4 sessions
- **A1** final answer: 3.8 sets
- **Answer: 3.8 sets**

Question 10

- **B1** 20 m
- **Answer: 20 m**

Question 11

- **B1** total reps = 5 exercises x 3 sets x 10 reps = 150
- **Answer: 150 repetitions**

Question 12

- **M1** method: increase = 12 - 10 = 2 km; percentage = (2/10) x 100
- **A1** final answer: 20.0%
- **Answer: 20.0%**

Question 13

- **M1** method week 2: 5 x 1.10 = 5.50 km
- **M1** method week 3: 5.50 x 1.10
- **A1** final answer: 6.05 km
- **Answer: 6.05 km**

Question 14

- **B1** description: distances increase steadily each week, showing progressive increase
- **B1** reason: coach increasing load progressively to improve endurance/adaptation while avoiding sudden large increases

Question 15

- **M1** method: total increase = 58 - 40 = 18 km
- **M1** method: average weekly increase = 18 km / (5 - 1) weeks = divide by 4
- **A1** final answer: 4.50 km per week
- **Answer: 4.50 km per week**

Question 16

- **M1** method: new load = 13 x 8 = 104 units
- **M1** method: increase = 104 - 96 = 8; percentage = (8/96) x 100
- **A1** final answer: 8.3%
- **Answer: 8.3%**