SOLUTION TO QUESTIONS

CHAPTER 1

Practice questions 1b

1 (a) 2.9 cm (b) 2.1 cm; 2 (a) 11.08 cm (b) 3.27 cm (c) 1.55 cm (d) 4.99 cm; 4 (a) 13.95 cm (b) 8.15 mm

Practice questions 1c

2 (a) (i) 3.82 Ã— 10^7 g ; (ii) 38200 kg 2b (i) 4.8 Ã— 10^{-3} kg (ii) 4.8 Ã— 10^{-6} kg ; 2c. 0.049 N; 0.0085 N.

Practice questions 1d

1b. 1.435 Ã— 10^{17}s; **2b.** 0.84 s; 1.2 Hz ; **3.** 0.025 s

Practice questions 1e

2. 6.18 cm^3 **3b.** 0.09082g   **4.** 0.918 gcm^{-3}

Past questions (Objectives)

1. B
2. B
3. C
4. A
5. D
6. A
7. D
8. D
9. D
10. D
11. B
12. B
13. E
14. C
15. B
16. E
17. B
18. B
19. E
20. C

21. D
22. B
23. C
24. D
25. A
26. B
27. C
28. B

CHAPTER 2

Practice questions 2a

3. 1600 kmh^{-1}; 1100 km^{-1}

Practice questions 2b

2. 9.92 ms^{-1} **3.** 0.77 m s^{-2}
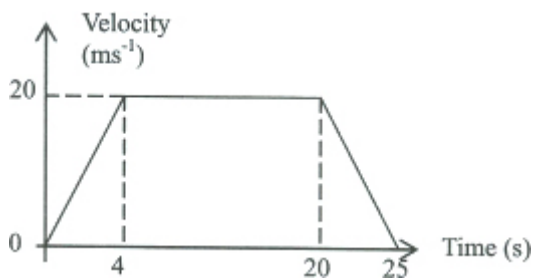
Practice questions 2c

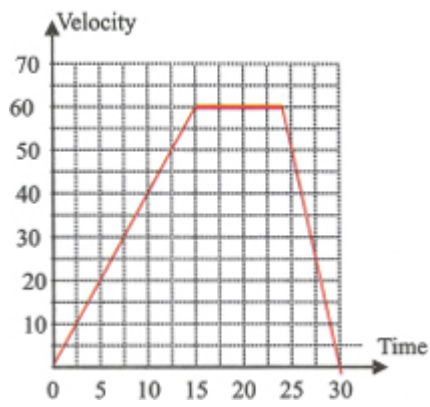**2 (a)**

2 (b) 5 ms^{-1}
2 (c) Stage 1 between 0–50 seconds, the cyclist is moving with constant speed. Stage 2 between 50 – 80 seconds, the cyclist is resting (stationary).
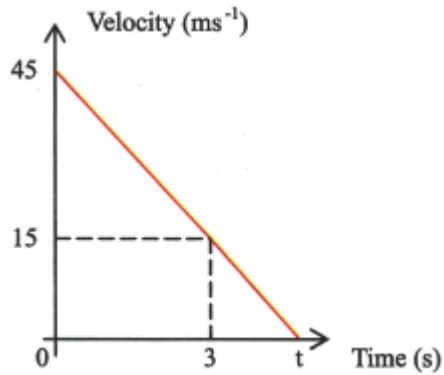
4.

4a. 5 m s^{-2} **4b.** 410 m **4c.** 16.4 m s^{-1}

5c. (i)

5c (ii) 40 m s^{-1}; 4 m s^{-2}; 12 m s^{-2}

6b (i). 10 m s^{-2}; (ii) 90 m; (iii) 4.5 s

Past questions

Objectives

1. C
2. A
3. D
4. B
5. C
6. B
7. A
8. B
9. C
10. A
11. C
12. D
13. D
14. C

15. B

16. B

17. D

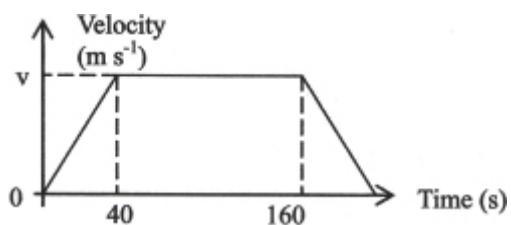18. C

19. C

20. B

21. B

22. D

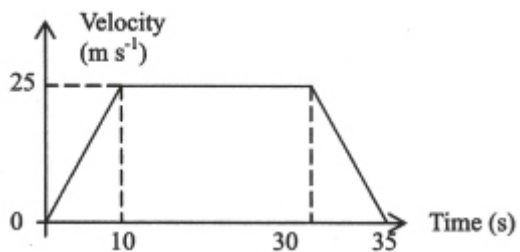23. --

24. B

25. A

26. C

Essay

27 (c)

13(c) i 40 m s^{-1}; ii 2 m s^{-2}.

14c

i 2.5 m s^{-1}; ii 5 m s^{-2}; iii 40 m

CHAPTER 3

Practice questions 3b

4. 297.6 N **7.** 0.2

Past questions

1. A

2. B

3. B

4. B

5. D

6. B

7. D

8. A

CHAPTER 4

Practice questions 4a

1 (a) Frictional force between the tyre and the road

(b) (i) Centripetal force increases.

(ii) Centripetal force decreases.

(iii) Centripetal force increases.

2 (i) Gravitational force.

(ii) Centripetal force decreases because mass is reduced.

(iii) Centripetal force decreases because radius is increased. Speed increases.

3 (ii) 266666.7 N

4 Minimum tension = 238 N

Maximum tension = 338 N

Practice questions 4b

1 (i) 2.0×10^{-8} rad s^{-1} (ii) 3.6×10^{20}N

2. 135°, 60°, 120°, 720° ; 3. 11 m s^{-1}; 3.63×10^{-4} N

Past questions Objectives

1. C

2. C

3. B

4. C

5. C

6. A

7. B

8. B

9. B

CHAPTER 5

Practice questions 5a

1. When the force and the distance moved are in the same direction.

2. When the force and the distance moved are perpendicular.

3. 690 J   **4.** 4550 J   **5**(a). 69.5 N

5 (b).8687.3 J   **6**(a). 18 975 J

6 (b). No work is done because the position of the weight did not change during the 35 seconds.

7(a) 3750 N   (b) 187500 J

Practice questions 5b

5(c) E_p = 0.02 J $Î½_{max}$ = *0.89 m s^{-1}*

6(b) E_p = 3360 J

6(c) E_p = 1560 J E_K = 1800 J

6(d) 66.9 m s^{-1} **7**(b) 6250 J

Practice questions 5c

1(b). 2 500 000 W

2(b). 501.6 W

3(b). 3 955 000 000 W

4. 360 000 J

5. 36.57.7 s or 10 hrs.

6. 120 000 J; 4 000 W

Past questions

Objectives

1. C
2. C
3. B
4. B
5. D
6. B
7. C
8. C
9. C
10. C
11. D

12. D

13. C

14. D

15. C

16. D

17. B

18. B

19. B

20. E

21. D

22. D

Essay

23 (b). (i) $F_1 = F_2$ (ii) 16 J (iii) 1.6 ms^{-2}

(iv) acceleration will decrease, (c) 8.4 KJ

24 (i) Potential energy = kinetic energy at the time of throw = 120 J.
(ii) 120 J

CHAPTER 6

Practice questions 6a

3. 45 Â°C; **10.** 30 Â°C; **11** 36.8 Â°C

Past questions

Objectives

1. C

2. B

3. B

4. C

5. A

6. B

7. A

8. A

9. E

10. D

11. A

12. E

13. C

14. C

15. C

16. B

17. E

18. D

19. B

20. A

Essay

24(iii) $5.65Ã—10^4$Pa;　**26c.** 15 Â°C

CHAPTER 7

4 (i) (ii)

Practice questions 7a

7 c). 1070.2 cm^3　**8.** 1.58 m

9. i = 0.50 m; ii = 0.000012 m; iii = 0.500012 m

Practice questions 7b

4　(b). 20.3 Â°C　　**5.** $2.446Ã—10^{-5}$ K^{-1}.

Past questions

Objectives

1. C

2. C

3. D

4. B

5. B

6. A

7. C

8. A

9. B

10. B

11. B

12. D

13. E

14. C

15. B

16. A

17. B

18. A

19. D

20. C

21. A

22. E

23. B

24. A

25. B

Essay

26 b (i) 0.00072 m or 7.2×10^{-4} m

27c 0.00109 K^{-1} or $1.09 \times 10^{-3-1}$

CHAPTER 8

Practice questions 9a

4b. 126.3 seconds   7. 28.8 watts

Past questions

Objectives

1. D

2. E

3. D

4. B

5. D

6. C

7. D

8. B

9. D

10. C

11. C

12. B

13. B

14. A

15. C

16. A

17. B

18. D

19. B

20. D

21. D

CHAPTER 10

Past questions

Objectives

1. B

2. D

3. D

4. D

5. A

6. D

7. D

8. A

9. C

10. C

CHAPTER 11

1. B

2. B

3. C

4. A

5. B

6. C

7. A

8. D

9. C

10. E

11. E

12. B

13. A

14. B

15. D

CHAPTER 12

Practice questions 12c

3b. 5 Ω **3**c. 0.6A **5**b. 0.826 Ω

5c. The resistance is decreased to one-quarter of its initial value or 0.207 Ω.

6c. 49×10^{-8} Ωm **8**c. 620.2Ω **9**b. 7.5 V

Practice questions 12d
1b (i). 20 Ω (ii) 16 Ω (iii) 9.6 V
2b (i). 1.5 Ω (ii) 10 A (iii) 7.5 A
3 (a). 1.0 A (b) 9 V, 9 V, 10 V (c) 19 V (d) 9 Ω (e) 7.6Ω
4(a).10 Ω, 1.2 A; (b) 2.4 Ω, 2.5 A; (c) 6.5 Ω, 1.85 A
5(a).4 Ω; (b) 1.5 Ω.

Practice questions 12e
1b (i). 1920 watts; (ii) 1 152 000 J
2 (a). 960 Ω, 576 Ω; (b) 1 536 Ω; (c) 0.156 A
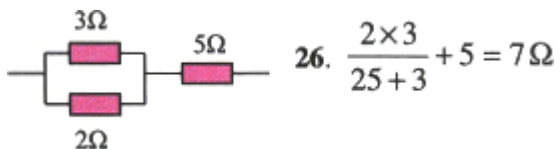**3** N4 060:00

Objectives

1. B

2. A

3. C

4. B

5. D

6. C

7. A

8. A

9. A

10. C

11. D

12. D

13. C

14. A

15. D

16. D

17. B

18. C

19. A

20. C

21. D

22. D

23. B

24. D

25. D

Essay

26. $\dfrac{2\times3}{25+3}+5=7\,\Omega$

CHAPTER 13

Practice questions 13a

4 (c). 1.85×10^{-7} cm.

Past questions

Objectives

1. D

2. D

3. C

4. C

5. C

6. B

7. B

8. B

9. B

10. E

11. D

12. D

13. D

14. D

15. D

16. B

17. C

18. A

19. C

CHAPTER 14

Practice questions 14a

1b. (i) 1000 N m^{-1}; (ii) 1.25 J

2c. (i) 500 N m^{-1}; (ii) 15 cm; (iii) 0.225 J
3d. (i) 0.05 m or 5 cm; (ii) 300 N m^{-1}; (iii) 0.375 J
4 (i) 2.5Ã—10^8 N m^{-1} (ii) 6.942Ã—10^{-3} N/m (iii) 0.208 N m^{-2}.
5b. (i) 0.00006; (ii) 1.2xl0^7 N m^{-2}(iii) 0.0065 m

Past questions

Objectives

1. B

2. C

3. C

4. E

5. A

6. D

7. B

8. D

9. C

10. A

11. A

12. C

13. D

14. A

15. E

Essay

18b. 0.675 J;

21b. (i) $1.273 \times 10^7 Nm^{-1}$; (ii) 6.0×10^{-5}

23c. (ii) 0.135 J; 24a. (ii) 27.5 N; 25c. 2.84

26b. 0.058 N; (c) $1.273 \times 10^7 N\ m^{-1}$;
    (ii) 6.0×10^{-5} **27b.** 104 g