Biology Final study questions_June 2017
Answer Section

MODIFIED TRUE/FALSE

1. ANS: T PTS: 1 DIF: L2
   REF: p. 250 OBJ: 9.1.1 Explain where organisms get the energy they need for life processes.
   STA: F.12.10 TOP: Foundation Edition BLM: analysis
2. ANS: F, oxygen

   PTS: 1 DIF: L1 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
   STA: F.12.1 TOP: Foundation Edition BLM: knowledge
3. ANS: F, oxygen

   PTS: 1 DIF: L2 REF: p. 252 OBJ: 9.1.2 Define cellular respiration.
   STA: F.12.1 TOP: Foundation Edition BLM: comprehension
4. ANS: T PTS: 1 DIF: L2
   REF: p. 253 OBJ: 9.1.3 Compare photosynthesis and cellular respiration.
   STA: F.12.1 | F.12.9 TOP: Foundation Edition
   BLM: application
5. ANS: F, All

   PTS: 1 DIF: L3 REF: p. 253
   OBJ: 9.1.3 Compare photosynthesis and cellular respiration. STA: F.12.1 | F.12.9
   BLM: application
6. ANS: T PTS: 1 DIF: L2
   REF: p. 255 OBJ: 9.2.1 Describe what happens during glycolysis.
   STA: F.12.1 TOP: Foundation Edition BLM: comprehension
7. ANS: T PTS: 1 DIF: L1
   REF: p. 256 OBJ: 9.2.2 Describe what happens during the Krebs cycle.
   STA: F.12.1 TOP: Foundation Edition BLM: knowledge
8. ANS: T PTS: 1 DIF: L1
   REF: p. 256 | p. 258
   OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
   STA: F.12.1 BLM: knowledge
9. ANS: F, cell membrane

   PTS: 1 DIF: L2 REF: p. 258
   OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
   STA: F.12.1 BLM: comprehension
10. ANS: T PTS: 1 DIF: L2
    REF: p. 256 | p. 258
    OBJ: 9.2.4 Identify how much ATP cellular respiration generates.
    STA: F.12.1 TOP: Foundation Edition BLM: analysis
11. ANS: F, lactic acid fermentation

    PTS: 1 DIF: L2 REF: p. 263
    OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
    STA: F.12.1 TOP: Foundation Edition BLM: application

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12. ANS: F, oxygen

    PTS: 1 DIF: L3 REF: p. 252
    OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
    STA: F.12.1 BLM: synthesis
13. ANS: T PTS: 1 DIF: L3
    REF: p. 265 OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
    STA: F.12.10 BLM: application
14. ANS: F, ATP

    PTS: 1 DIF: L2 REF: p. 264 | p. 265
    OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
    STA: F.12.10 TOP: Foundation Edition BLM: comprehension
15. ANS: T PTS: 1 DIF: L1
    REF: p. 264 | p. 265
    OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
    STA: F.12.10 TOP: Foundation Edition BLM: knowledge
16. ANS: F, decreases

    PTS: 1 DIF: L2 REF: p. 275
    OBJ: 10.1.1 Explain the problems that growth causes for cells. STA: F.12.1
    TOP: Foundation Edition BLM: comprehension
17. ANS: F, larger

    PTS: 1 DIF: L2 REF: p. 274 | p. 275
    OBJ: 10.1.1 Explain the problems that growth causes for cells. STA: F.12.1
    TOP: Foundation Edition BLM: comprehension
18. ANS: T PTS: 1 DIF: L3
    REF: p. 275 OBJ: 10.1.1 Explain the problems that growth causes for cells.
    STA: F.12.1 BLM: analysis
19. ANS: F, asexual

    PTS: 1 DIF: L3 REF: p. 277 | p. 284
    OBJ: 10.1.2 Compare asexual and sexual reproduction. STA: F.12.1
    TOP: Foundation Edition BLM: synthesis
20. ANS: T PTS: 1 DIF: L2
    REF: p. 280 OBJ: 10.2.1 Describe the role of chromosomes in cell division.
    STA: F.12.1 TOP: Foundation Edition BLM: application
21. ANS: F, G_1

    PTS: 1 DIF: L2 REF: p. 281
    OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
    TOP: Foundation Edition BLM: application
22. ANS: F, nuclear envelope

    PTS: 1 DIF: L3 REF: p. 282
    OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
    STA: F.12.1 TOP: Foundation Edition BLM: analysis
23. ANS: F, prophase

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PTS: 1 DIF: L2 REF: p. 282
OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
STA: F.12.1 BLM: comprehension

24. ANS: T PTS: 1 DIF: L2
REF: p. 283 OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
STA: F.12.1 TOP: Foundation Edition BLM: comprehension

25. ANS: T PTS: 1 DIF: L1
REF: p. 284 OBJ: 10.2.4 Describe the process of cytokinesis.
STA: F.12.1 TOP: Foundation Edition BLM: knowledge

26. ANS: T PTS: 1 DIF: L2
REF: p. 286 OBJ: 10.3.1 Describe how the cell cycle is regulated.
STA: F.12.2 TOP: Foundation Edition BLM: application

27. ANS: T PTS: 1 DIF: L1
REF: p. 289 OBJ: 10.3.2 Explain how cancer cells are different from other cells.
TOP: Foundation Edition BLM: knowledge

28. ANS: T PTS: 1 DIF: L2
REF: p. 293 OBJ: 10.4.1 Describe the process of differentiation.
STA: F.12.2 TOP: Foundation Edition BLM: evaluation

29. ANS: F, pluripotent

PTS: 1 DIF: L1 REF: p. 295
OBJ: 10.4.2 Define stem cells and explain their importance. STA: F.12.2
BLM: knowledge

30. ANS: F
destroys
kills

PTS: 1 DIF: L2 REF: p. 297
OBJ: 10.4.3 Identify the possible benefits and issues relating to stem cell research.
STA: G.12.3 | H.12.3 TOP: Foundation Edition
BLM: analysis

31. ANS: T PTS: 1 DIF: L1
REF: p. 309 OBJ: 11.1.1 Describe Mendel's studies and conclusions about inheritance.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

32. ANS: F, dominant

PTS: 1 DIF: L3 REF: p. 310
OBJ: 11.1.1 Describe Mendel's studies and conclusions about inheritance.
STA: F.12.3 BLM: application

33. ANS: F, separate

PTS: 1 DIF: L1 REF: p. 325
OBJ: 11.1.2 Describe what happens during segregation. STA: F.12.3
TOP: Foundation Edition BLM: knowledge

34. ANS: T PTS: 1 DIF: L3
REF: p. 324 | p. 325 OBJ: 11.1.2 Describe what happens during segregation.
STA: F.12.3 BLM: evaluation

35. ANS: T PTS: 1 DIF: L2

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REF: p. 313
OBJ: 11.2.1 Explain how geneticists use the principles of probability to make Punnett squares.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

36. ANS: F

50%

PTS: 1 DIF: L2 REF: p. 313 | p. 314
OBJ: 11.2.1 Explain how geneticists use the principles of probability to make Punnett squares.
STA: F.12.3 TOP: Foundation Edition BLM: application

37. ANS: F, contradicted

PTS: 1 DIF: L3 REF: p. 317
OBJ: 11.2.2 Explain the principle of independent assortment. STA: F.12.3
BLM: evaluation

38. ANS: T PTS: 1 DIF: L2
REF: p. 316 | p. 318
OBJ: 11.2.3 Explain how Mendel's principles apply to all organisms.
STA: F.12.3 TOP: Foundation Edition BLM: analysis

39. ANS: F, 50%

PTS: 1 DIF: L2 REF: p. 319
OBJ: 11.3.1 Describe the other inheritance patterns. STA: F.12.3
BLM: analysis

40. ANS: F, trait controlled by multiple alleles

PTS: 1 DIF: L2 REF: p. 320
OBJ: 11.3.1 Describe the other inheritance patterns. STA: F.12.3
TOP: Foundation Edition BLM: application

41. ANS: T PTS: 1 DIF: L2
REF: p. 323 OBJ: 11.4.1 Contrast the number of chromosomes in body cells and in gametes.
STA: F.12.4 TOP: Foundation Edition BLM: analysis

42. ANS: F, anaphase I

PTS: 1 DIF: L3 REF: p. 324 | p. 325
OBJ: 11.4.2 Summarize the events of meiosis. STA: F.12.4
BLM: analysis

43. ANS: F, four cells

PTS: 1 DIF: L1 REF: p. 326 | p. 327
OBJ: 11.4.3 Contrast meiosis and mitosis. STA: F.12.4
TOP: Foundation Edition BLM: knowledge

44. ANS: F, four

PTS: 1 DIF: L2 REF: p. 328 | p. 329
OBJ: 11.4.4 Describe how alleles from different genes can be inherited together.
STA: F.12.4 TOP: Foundation Edition BLM: analysis

45. ANS: F, together

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PTS: 1 DIF: L2 REF: p. 328 | p. 329
OBJ: 11.4.4 Describe how alleles from different genes can be inherited together.
STA: F.12.4 TOP: Foundation Edition BLM: application

46. ANS: T PTS: 1 DIF: L1
REF: p. 338 | p. 339 OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: knowledge

47. ANS: F, smaller

PTS: 1 DIF: L1 REF: p. 340
OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 TOP: Foundation Edition BLM: evaluation

48. ANS: F, DNA, genetic material

PTS: 1 DIF: L1 REF: p. 340 | p. 341
OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

49. ANS: T PTS: 1 DIF: L2
REF: p. 342 | p. 343 OBJ: 12.1.3 Identify the role of DNA in heredity.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

50. ANS: F, nucleotides

PTS: 1 DIF: L1 REF: p. 333
OBJ: 12.2.1 Identify the chemical components of DNA. STA: F.12.3
TOP: Foundation Edition BLM: knowledge

51. ANS: T PTS: 1 DIF: L2
REF: p. 344 | p. 345 OBJ: 12.2.1 Identify the chemical components of DNA.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

52. ANS: T PTS: 1 DIF: L2
REF: p. 345
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
BLM: comprehension

53. ANS: T PTS: 1 DIF: L2
REF: p. 346 | p. 347
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
BLM: comprehension

54. ANS: T PTS: 1 DIF: L3
REF: p. 341 OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 BLM: analysis

55. ANS: F, hydrogen

PTS: 1 DIF: L1 REF: p. 348
OBJ: 12.2.3 Describe the steps leading to the development of the double-helix model of DNA.
STA: C.12.5 | F.12.3 TOP: Foundation Edition
BLM: knowledge

56. ANS: F, 100%

PTS: 1 DIF: L3 REF: p. 345
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
BLM: analysis

57. ANS: F, two

PTS: 1 DIF: L2 REF: p. 350
OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
TOP: Foundation Edition BLM: application

58. ANS: F, histones

PTS: 1 DIF: L2 REF: p. 352
OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
STA: F.12.4 BLM: analysis

59. ANS: F, ATGCAA

PTS: 1 DIF: L3 REF: p. 350
OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
TOP: Foundation Edition BLM: application

60. ANS: F, two directions

PTS: 1 DIF: L2 REF: p. 352 | p. 353
OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
STA: F.12.4 TOP: Foundation Edition BLM: comprehension

COMPLETION

1. ANS: the sun

PTS: 1 DIF: L2 REF: p. 250
OBJ: 9.1.1 Explain where organisms get the energy they need for life processes.
STA: F.12.10 TOP: Foundation Edition BLM: application

2. ANS: mitochondria

PTS: 1 DIF: L2 REF: p. 252 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: application

3. ANS: photosynthesis

PTS: 1 DIF: L3 REF: p. 253
OBJ: 9.1.3 Compare photosynthesis and cellular respiration. STA: F.12.1 | F.12.9
BLM: synthesis

4. ANS: cellular respiration

PTS: 1 DIF: L1 REF: p. 253
OBJ: 9.1.3 Compare photosynthesis and cellular respiration. STA: F.12.1 | F.12.9
TOP: Foundation Edition BLM: knowledge

5. ANS: pyruvic acid

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PTS: 1 DIF: L1 REF: p. 254
OBJ: 9.2.1 Describe what happens during glycolysis. STA: F.12.1
TOP: Foundation Edition BLM: knowledge

6. ANS: 2

PTS: 1 DIF: L3 REF: p. 256 | p. 257
OBJ: 9.2.2 Describe what happens during the Krebs cycle. STA: F.12.1
BLM: synthesis

7. ANS: H^+ ions

PTS: 1 DIF: L3 REF: p. 258
OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
STA: F.12.1 BLM: synthesis

8. ANS: electron transport chain

PTS: 1 DIF: L2 REF: p. 258
OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
STA: F.12.1 TOP: Foundation Edition BLM: comprehension

9. ANS: 2

PTS: 1 DIF: L2 REF: p. 254
OBJ: 9.2.4 Identify how much ATP cellular respiration generates.
STA: F.12.1 TOP: Foundation Edition BLM: comprehension

10. ANS: alcoholic

PTS: 1 DIF: L2 REF: p. 263
OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

11. ANS: 2

PTS: 1 DIF: L1 REF: p. 254 | p. 263
OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
STA: F.12.1 TOP: Foundation Edition BLM: knowledge

12. ANS: C

PTS: 1 DIF: L2 REF: p. 252 | p. 263
OBJ: 9.1.2 Define cellular respiration. STA: F.12.1 TOP: Foundation Edition
BLM: analysis

13. ANS: oxygen

PTS: 1 DIF: L1 REF: p. 265
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 BLM: knowledge

14. ANS: lactic acid

PTS: 1 DIF: L2 REF: p. 265
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 TOP: Foundation Edition BLM: application

15. ANS: more

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PTS: 1 DIF: L3 REF: p. 252
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 BLM: synthesis

16. ANS: less

PTS: 1 DIF: L1 REF: p. 274
OBJ: 10.1.1 Explain the problems that growth causes for cells. STA: F.12.1
BLM: knowledge

17. ANS: sexual, asexual

PTS: 1 DIF: L2 REF: p. 277
OBJ: 10.1.2 Compare asexual and sexual reproduction. STA: F.12.1
TOP: Foundation Edition BLM: comprehension

18. ANS: 92

PTS: 1 DIF: L3 REF: p. 280 | p. 282
OBJ: 10.2.1 Describe the role of chromosomes in cell division.
STA: F.12.1 TOP: Foundation Edition BLM: synthesis

19. ANS: mitosis

PTS: 1 DIF: L1 REF: p. 282
OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
TOP: Foundation Edition BLM: knowledge

20. ANS: binary fission

PTS: 1 DIF: L2 REF: p. 281
OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
TOP: Foundation Edition BLM: comprehension

21. ANS: 10

PTS: 1 DIF: L3 REF: p. 281 | p. 282
OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
TOP: Foundation Edition BLM: synthesis

22. ANS: anaphase

PTS: 1 DIF: L2 REF: p. 282
OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
STA: F.12.1 TOP: Foundation Edition BLM: comprehension

23. ANS: G_1 phase, Interphase

PTS: 1 DIF: L3 REF: p. 284
OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
TOP: Foundation Edition BLM: synthesis

24. ANS: cell plate

PTS: 1 DIF: L2 REF: p. 284
OBJ: 10.2.4 Describe the process of cytokinesis. STA: F.12.1
TOP: Foundation Edition BLM: application

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25. ANS: plant

    PTS: 1 DIF: L2 REF: p. 284
    OBJ: 10.2.4 Describe the process of cytokinesis. STA: F.12.1
    TOP: Foundation Edition BLM: analysis
26. ANS: apoptosis

    PTS: 1 DIF: L1 REF: p. 288
    OBJ: 10.3.1 Describe how the cell cycle is regulated. STA: F.12.2
    TOP: Foundation Edition BLM: knowledge
27. ANS: chemotherapy

    PTS: 1 DIF: L2 REF: p. 290
    OBJ: 10.3.2 Explain how cancer cells are different from other cells.
    TOP: Foundation Edition BLM: comprehension
28. ANS: differentiation

    PTS: 1 DIF: L2 REF: p. 293
    OBJ: 10.4.1 Describe the process of differentiation. STA: F.12.2
    TOP: Foundation Edition BLM: comprehension
29. ANS: differentiation

    PTS: 1 DIF: L2 REF: p. 294 | p. 295
    OBJ: 10.4.2 Define stem cells and explain their importance. STA: F.12.2
    TOP: Foundation Edition BLM: comprehension
30. ANS: adult

    PTS: 1 DIF: L3 REF: p. 297
    OBJ: 10.4.3 Identify the possible benefits and issues relating to stem cell research.
    STA: G.12.3 | H.12.3 BLM: evaluation
31. ANS: P

    PTS: 1 DIF: L2 REF: p. 310
    OBJ: 11.1.1 Describe Mendel's studies and conclusions about inheritance.
    STA: F.12.3 TOP: Foundation Edition BLM: application
32. ANS: gametes, sex cells

    PTS: 1 DIF: L2 REF: p. 314
    OBJ: 11.1.2 Describe what happens during segregation. STA: F.12.3
    TOP: Foundation Edition BLM: comprehension
33. ANS: 19

    PTS: 1 DIF: L3 REF: p. 324
    OBJ: 11.2.1 Explain how geneticists use the principles of probability to make Punnett squares.
    STA: F.12.3 TOP: Foundation Edition BLM: analysis
34. ANS: 1/2 x 1/2 x 1/2 x 1/2 x 1/2 = 1/32

    PTS: 1 DIF: L3 REF: p. 313
    OBJ: 11.2.1 Explain how geneticists use the principles of probability to make Punnett squares.

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STA: F.12.3 BLM: analysis

35. ANS: *TT* and *Tt*

PTS: 1 DIF: L2 REF: p. 314
OBJ: 11.2.1 Explain how geneticists use the principles of probability to make Punnett squares.
STA: F.12.3 TOP: Foundation Edition BLM: application

36. ANS: genes, chromosomes

PTS: 1 DIF: L1 REF: p. 317 | p. 329
OBJ: 11.2.2 Explain the principle of independent assortment. STA: F.12.3
TOP: Foundation Edition BLM: knowledge

37. ANS: round yellow seeds only

PTS: 1 DIF: L2 REF: p. 317
OBJ: 11.2.2 Explain the principle of independent assortment. STA: F.12.3
BLM: analysis

38. ANS: Mendel

PTS: 1 DIF: L1 REF: p. 318
OBJ: 11.2.3 Explain how Mendel's principles apply to all organisms.
STA: F.12.3 TOP: Foundation Edition BLM: application

39. ANS: polygenic trait

PTS: 1 DIF: L2 REF: p. 320
OBJ: 11.3.1 Describe the other inheritance patterns. STA: F.12.3
BLM: comprehension

40. ANS: light energy

PTS: 1 DIF: L3 REF: p. 321
OBJ: 11.3.2 Explain the relationship between genes and the environment.
STA: F.12.3 BLM: evaluation

41. ANS: genes and environmental conditions

PTS: 1 DIF: L1 REF: p. 321
OBJ: 11.3.2 Explain the relationship between genes and the environment.
STA: F.12.3 TOP: Foundation Edition BLM: knowledge

42. ANS: incomplete dominance

PTS: 1 DIF: L1 REF: p. 319 | p. 320
OBJ: 11.3.1 Describe the other inheritance patterns. STA: F.12.3
TOP: Foundation Edition BLM: analysis

43. ANS: half

PTS: 1 DIF: L2 REF: p. 323
OBJ: 11.4.1 Contrast the number of chromosomes in body cells and in gametes.
STA: F.12.4 TOP: Foundation Edition BLM: comprehension

44. ANS: prophase I

PTS: 1 DIF: L2 REF: p. 324 | p. 325

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OBJ: 11.4.2 Summarize the events of meiosis. STA: F.12.4
BLM: analysis

45. ANS: gene

PTS: 1 DIF: L1 REF: p. 328 | p. 329
OBJ: 11.4.4 Describe how alleles from different genes can be inherited together.
STA: F.12.4 TOP: Foundation Edition BLM: knowledge

46. ANS: developed pneumonia, died

PTS: 1 DIF: L2 REF: p. 339
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

47. ANS: protein coat

PTS: 1 DIF: L1 REF: p. 340
OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 TOP: Foundation Edition BLM: knowledge

48. ANS: reproductive

PTS: 1 DIF: L2 REF: p. 343
OBJ: 12.1.3 Identify the role of DNA in heredity. STA: F.12.3
BLM: analysis

49. ANS: nucleotide

PTS: 1 DIF: L2 REF: p. 345
OBJ: 12.2.1 Identify the chemical components of DNA. STA: F.12.3
TOP: Foundation Edition BLM: comprehension

50. ANS: AGCT

PTS: 1 DIF: L3 REF: p. 345
OBJ: 12.2.1 Identify the chemical components of DNA. STA: F.12.3
TOP: Foundation Edition BLM: application

51. ANS: double helix

PTS: 1 DIF: L1 REF: p. 347
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
BLM: knowledge

52. ANS: DNA, genes

PTS: 1 DIF: L2 REF: p. 338 | p. 339
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: analysis

53. ANS: Hydrogen bonds

PTS: 1 DIF: L2 REF: p. 348
OBJ: 12.2.3 Describe the steps leading to the development of the double-helix model of DNA.
STA: C.12.5 | F.12.3 TOP: Foundation Edition
BLM: knowledge

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54. ANS: replicate

    PTS: 1 DIF: L3 REF: p. 348
    OBJ: 12.2.3 Describe the steps leading to the development of the double-helix model of DNA.
    STA: C.12.5 | F.12.3 TOP: Foundation Edition
    BLM: evaluation
55. ANS: 20%

    PTS: 1 DIF: L3 REF: p. 345
    OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
    BLM: analysis
56. ANS: histones

    PTS: 1 DIF: L1 REF: p. 352
    OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
    STA: F.12.4 BLM: knowledge
57. ANS: enzymes

    PTS: 1 DIF: L2 REF: p. 351
    OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
    TOP: Foundation Edition BLM: analysis
58. ANS: telomeres

    PTS: 1 DIF: L1 REF: p. 352
    OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
    TOP: Foundation Edition BLM: knowledge
59. ANS: DNA, chromosome

    PTS: 1 DIF: L2 REF: p. 353
    OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
    STA: F.12.4 TOP: Foundation Edition BLM: synthesis
60. ANS: origins of replication

    PTS: 1 DIF: L3 REF: p. 353
    OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
    STA: F.12.4 BLM: synthesis

SHORT ANSWER

1. ANS:
   There are 1000 calories in 1 Calorie. Eating 2000 calories is the same as eating 2 Calories.

   PTS: 1 DIF: L3 REF: p. 250
   OBJ: 9.1.1 Explain where organisms get the energy they need for life processes.
   STA: F.12.10 BLM: synthesis
2. ANS:
   Cellular respiration is the process that releases energy by breaking down food molecules in the presence of oxygen.

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PTS: 1 DIF: L1 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: knowledge

3. ANS:
The three stages are as follows: glycolysis (which occurs in the cytoplasm), the Krebs cycle (which occurs in the matrix of the mitochondria), and electron transport (which occurs in the inner mitochondrial membrane).

PTS: 1 DIF: L2 REF: p. 252 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: synthesis

4. ANS:
Arrow B represents cellular respiration, because it shows the flow of energy from plants to animals. Plants produce food (sugars), which animals use to fuel cellular respiration.

PTS: 1 DIF: L3 REF: p. 253
OBJ: 9.1.3 Compare photosynthesis and cellular respiration. STA: F.12.1 | F.12.9
BLM: analysis

5. ANS:
Photosynthesis releases oxygen into the atmosphere as a product, whereas cellular respiration uses oxygen as a reactant to release energy from food.

PTS: 1 DIF: L1 REF: p. 253
OBJ: 9.1.3 Compare photosynthesis and cellular respiration. STA: F.12.1 | F.12.9
TOP: Foundation Edition BLM: knowledge

6. ANS:
During glycolysis, the bonds of glucose are broken and rearranged to produce 2 molecules of pyruvic acid.

PTS: 1 DIF: L1 REF: p. 254
OBJ: 9.2.1 Describe what happens during glycolysis. STA: F.12.1
TOP: Foundation Edition BLM: knowledge

7. ANS:
Glycolysis requires an initial input of 2 ATP molecules and produces an output of 4 ATP molecules, for a net gain of 2 ATP molecules.

PTS: 1 DIF: L3 REF: p. 255
OBJ: 9.2.1 Describe what happens during glycolysis. STA: F.12.1
BLM: analysis

8. ANS:
Citric acid is the first compound formed in the process.

PTS: 1 DIF: L1 REF: p. 256
OBJ: 9.2.2 Describe what happens during the Krebs cycle. STA: F.12.1
TOP: Foundation Edition BLM: knowledge

9. ANS:
The movement of H^+ ions back across the inner mitochondrial membrane through ATP synthase converts ADP into ATP.

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PTS: 1 DIF: L1 REF: p. 258
OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
STA: F.12.1 TOP: Foundation Edition BLM: knowledge

10. ANS:
Oxygen is the final electron acceptor in the electron transport chain, which means that it is needed to get rid of low-energy electrons and H^+ ions.

PTS: 1 DIF: L2 REF: p. 258
OBJ: 9.2.3 Explain how high-energy electrons are used by the electron transport chain.
STA: F.12.1 TOP: Foundation Edition BLM: comprehension

11. ANS:
Sample answer: Lactic acid fermentation occurs in the muscles, and alcoholic fermentation occurs in rising bread dough.

PTS: 1 DIF: L2 REF: p. 263
OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
STA: F.12.1 TOP: Foundation Edition BLM: application

12. ANS:
Alcoholic fermentation produces carbon dioxide, alcohol, and NAD^+, whereas lactic acid fermentation produces lactic acid and NAD^+.

PTS: 1 DIF: L2 REF: p. 263
OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

13. ANS:
Pathway A and pathway B can both take place when there is no oxygen. When cells run out of oxygen, they can still produce some energy, even though they do so inefficiently.

PTS: 1 DIF: L3 REF: p. 262 | p. 263
OBJ: 9.3.1 Explain how organisms get energy in the absence of oxygen.
STA: F.12.1 BLM: synthesis

14. ANS:
Sample answer: Cellular respiration, shown in pathway C, is most efficient, because it produces the most ATP using the same amount of glucose as the other two pathways.

PTS: 1 DIF: L3 REF: p. 252
OBJ: 9.2.4 Identify how much ATP cellular respiration generates.
STA: F.12.1 BLM: analysis

15. ANS:
The body uses ATP that is already present in the muscle cells, ATP released from lactic acid fermentation, and ATP released from cellular respiration.

PTS: 1 DIF: L2 REF: p. 264 | p. 265
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 TOP: Foundation Edition BLM: comprehension

16. ANS:
As a cell grows larger, more demands are placed on its DNA, and the cell has more trouble moving enough nutrients and wastes across the cell membrane.

PTS: 1 DIF: L2 REF: p. 274 | p. 276
OBJ: 10.1.1 Explain the problems that growth causes for cells. STA: F.12.1
TOP: Foundation Edition BLM: comprehension

17. ANS:
A large cell carries out its activities less efficiently than a small one does.

PTS: 1 DIF: L2 REF: p. 274
OBJ: 10.1.1 Explain the problems that growth causes for cells. STA: F.12.1
BLM: application

18. ANS:
Because the offspring of asexual reproduction are genetically identical to parents, they have the characteristics that help them survive in the conditions in which the parent cells survived. They might not have characteristics to survive should the conditions change.

PTS: 1 DIF: L3 REF: p. 278
OBJ: 10.1.2 Compare asexual and sexual reproduction. STA: F.12.1
TOP: Foundation Edition BLM: evaluation

19. ANS:
Packaging genetic material into chromosomes helps the cell separate the DNA precisely during cell division. If the genetic material was spread out into smaller pieces, some of the material might get lost more easily when the cell divided into two cells.

PTS: 1 DIF: L2 REF: p. 280
OBJ: 10.2.1 Describe the role of chromosomes in cell division.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

20. ANS:
Chromatids are two identical DNA strands joined by a centromere, and chromatin is the material (DNA and proteins) that makes up chromosomes.

PTS: 1 DIF: L3 REF: p. 280 | p. 282
OBJ: 10.2.1 Describe the role of chromosomes in cell division.
STA: F.12.1 TOP: Foundation Edition BLM: synthesis

21. ANS:
A: G_1 phase, cell growth; B: S phase, DNA replication; C: G_2 phase, preparation for mitosis; D: M phase, cell division (mitosis and cytokinesis).

PTS: 1 DIF: L2 REF: p. 281 | p. 282
OBJ: 10.2.2 Name the main events of the cell cycle. STA: F.12.1
TOP: Foundation Edition BLM: analysis

22. ANS:
1 is anaphase. 2 is prophase. 3 is interphase (or G_2 phase). 4 is telophase. 5 is metaphase.
They occur in the following order: 3, 2, 5, 1, and 4 (or: 2, 5, 1, 4, 3).

PTS: 1 DIF: L3 REF: p. 280 | p. 282
OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

23. ANS:

In metaphase the sister chromatids are still attached to one another and are found in the middle of the cell, whereas in anaphase the sister chromatids have separated and are beginning to move to opposite sides of the cell.

PTS: 1 DIF: L2 REF: p. 280 | p. 282
OBJ: 10.2.3 Describe what happens during the four phases of mitosis.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

24. ANS:
In plant cells, a cell plate forms in the cytoplasm midway between each new nucleus. The cell plate gradually develops into a separating membrane, and a cell wall begins to appear in the cell plate. In animal cells, there is no cell plate. The cell membrane is drawn inward until the cytoplasm is pinched into two nearly equal parts.

PTS: 1 DIF: L3 REF: p. 284
OBJ: 10.2.4 Describe the process of cytokinesis. STA: F.12.1
TOP: Foundation Edition BLM: synthesis

25. ANS:
A cell that lacked cyclins would probably not undergo mitotic division, and then it would continue to grow, have DNA overload, and exchange materials inefficiently until it dies.

PTS: 1 DIF: L3 REF: p. 286
OBJ: 10.3.1 Describe how the cell cycle is regulated. STA: F.12.2
BLM: evaluation

26. ANS:
Cancer cells do not respond to the signals that control the growth of normal cells. As a result, cancer cells form tumors and can spread throughout the body.

PTS: 1 DIF: L2 REF: p. 289
OBJ: 10.3.2 Explain how cancer cells are different from other cells.
TOP: Foundation Edition BLM: comprehension

27. ANS:
Cancer cells are not constrained by crowding and would probably continue to grow after forming a thin layer covering the bottom of the petri dish.

PTS: 1 DIF: L3 REF: p. 289
OBJ: 10.3.2 Explain how cancer cells are different from other cells.
BLM: synthesis

28. ANS:
Differentiation is the process by which cells become specialized.

PTS: 1 DIF: L1 REF: p. 293
OBJ: 10.4.1 Describe the process of differentiation. STA: F.12.2
TOP: Foundation Edition BLM: knowledge

29. ANS:
Embryonic stem cells come from embryos and are pluripotent, whereas adult stem cells come from adults and are only multipotent.

PTS: 1 DIF: L2 REF: p. 295
OBJ: 10.4.2 Define stem cells and explain their importance. STA: F.12.2
TOP: Foundation Edition BLM: analysis

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30. ANS:
Harvesting adult stem cells do not generally harm the donor, whereas harvesting embryonic stem cells usually destroys the embryo.

PTS: 1 DIF: L2 REF: p. 297
OBJ: 10.4.3 Identify the possible benefits and issues relating to stem cell research.
STA: G.12.3 | H.12.3 BLM: evaluation

31. ANS:
Garden pea plants produce many offspring, they have traits that come in only two forms, and crosses between the plants can be controlled easily.

PTS: 1 DIF: L3 REF: p. 308 | p. 309
OBJ: 11.1.1 Describe Mendel's studies and conclusions about inheritance.
STA: F.12.3 TOP: Foundation Edition BLM: synthesis

32. ANS:
Allowing the F_1 pea plants to self-pollinate caused the recessive phenotype to reappear in the F_2 generation. Self-pollination of the F_1 plants also allowed the 3:1 phenotype ratios to occur, supporting Mendel's theory. Self-pollination showed that traits controlled by recessive alleles could reappear in the F_2 generation.

PTS: 1 DIF: L3 REF: p. 311 | p. 312
OBJ: 11.1.2 Describe what happens during segregation. STA: F.12.3
BLM: synthesis

33. ANS:
If all of the individuals in a generation receive one dominant allele and one recessive allele, then they would all show the dominant trait. If they are bred, then they will pass on the dominant allele to some of their offspring and the recessive allele to others. Offspring receiving two recessive alleles will show the recessive trait, so it will reappear.

PTS: 1 DIF: L2 REF: p. 312 | p. 317
OBJ: 11.1.2 Describe what happens during segregation. STA: F.12.3
TOP: Foundation Edition BLM: analysis

34. ANS:
The phenotype ratio is 9 round, yellow seeds : 3 round, green seeds : 3 wrinkled, yellow seeds : 1 wrinkled, green seed.

PTS: 1 DIF: L2 REF: p. 317
OBJ: 11.2.2 Explain the principle of independent assortment. STA: F.12.3
TOP: Foundation Edition BLM: application

35. ANS:
Thirty of the offspring are expected to be tall and have yellow seeds.

PTS: 1 DIF: L3 REF: p. 316 | p. 317
OBJ: 11.2.2 Explain the principle of independent assortment. STA: F.12.3
BLM: analysis

36. ANS:
Both pea plants and fruit flies are small organisms and can be easily manipulated. Both can produce large numbers of offspring in a relatively short period of time.

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PTS: 1 DIF: L2 REF: p. 318
OBJ: 11.2.3 Explain how Mendel's principles apply to all organisms.
STA: F.12.3 TOP: Foundation Edition BLM: synthesis

37. ANS:
100%

PTS: 1 DIF: L2 REF: p. 314 | p. 315 | p. 316
OBJ: 11.2.3 Explain how Mendel's principles apply to all organisms.
STA: F.12.3 TOP: Foundation Edition BLM: analysis

38. ANS:
Keep an arctic fox warm when its native environment would be cool.

PTS: 1 DIF: L3 REF: p. 321
OBJ: 11.3.2 Explain the relationship between genes and the environment.
STA: F.12.3 BLM: evaluation

39. ANS:
A diploid cell has two sets of chromosomes.

PTS: 1 DIF: L1 REF: p. 323
OBJ: 11.4.1 Contrast the number of chromosomes in body cells and in gametes.
STA: F.12.4 TOP: Foundation Edition BLM: knowledge

40. ANS:
Homologous chromosomes are the two sets of chromosomes found in a body cell—one set inherited from the male parent and the other inherited from the female parent.

PTS: 1 DIF: L2 REF: p. 323
OBJ: 11.4.1 Contrast the number of chromosomes in body cells and in gametes.
STA: F.12.4 TOP: Foundation Edition BLM: comprehension

41. ANS:
The number of chromosomes is cut in half.

PTS: 1 DIF: L1 REF: p. 324
OBJ: 11.4.2 Summarize the events of meiosis. STA: F.12.4
TOP: Foundation Edition BLM: knowledge

42. ANS:
Mitosis produces diploid body cells, whereas meiosis produces haploid gametes.

PTS: 1 DIF: L2 REF: p. 327 OBJ: 11.4.3 Contrast meiosis and mitosis.
STA: F.12.4 TOP: Foundation Edition BLM: analysis

43. ANS:
sex cells, gametes

PTS: 1 DIF: L1 REF: p. 323 | p. 325
OBJ: 11.4.3 Contrast meiosis and mitosis. STA: F.12.4
TOP: Foundation Edition BLM: knowledge

44. ANS:
The genes that Mendel studied were located on different chromosomes or were located far apart on the same chromosome.

PTS: 1 DIF: L2 REF: p. 328 | p. 329
OBJ: 11.4.4 Describe how alleles from different genes can be inherited together.
STA: F.12.4 BLM: evaluation

45. ANS:
Crossing-over occurs most frequently between the star eye gene and the black body gene.

PTS: 1 DIF: L3 REF: p. 328 | p. 329
OBJ: 11.4.4 Describe how alleles from different genes can be inherited together.
STA: F.12.4 BLM: synthesis

46. ANS:
The harmless living bacteria took in pneumonia-causing DNA (genes) from the heat-killed, pneumonia-causing bacteria, as a result of which the harmless bacteria changed into bacteria that cause pneumonia.

PTS: 1 DIF: L3 REF: p. 350 | p. 351
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 BLM: synthesis

47. ANS:
He concluded that a chemical factor, a gene, had transformed the bacteria.

PTS: 1 DIF: L1 REF: p. 339
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

48. ANS:
A bacteriophage is a kind of virus that infects and kills bacteria.

PTS: 1 DIF: L1 REF: p. 340
OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

49. ANS:
DNA stores, copies, and transmits information.

PTS: 1 DIF: L1 REF: p. 342 | p. 343
OBJ: 12.1.3 Identify the role of DNA in heredity. STA: F.12.3
TOP: Foundation Edition BLM: knowledge

50. ANS:
It is most important during the formation of reproductive cells, because the loss of any genetic material then means the loss of valuable information for offspring.

PTS: 1 DIF: L2 REF: p. 343
OBJ: 12.1.3 Identify the role of DNA in heredity. STA: F.12.3
BLM: synthesis

51. ANS:
The circles are the phosphate group, the pentagons are deoxyribose, and the A and T (adenosine and thymine) are the bases.

PTS: 1 DIF: L2 REF: p. 345
OBJ: 12.2.1 Identify the chemical components of DNA. STA: F.12.3
TOP: Foundation Edition BLM: application

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52. ANS:
The nucleotides in a strand of DNA are joined by covalent bonds between their sugar and phosphate groups, and by hydrogen bonds between the complimentary bases.

PTS: 1 DIF: L3 REF: p. 344
OBJ: 12.2.1 Identify the chemical components of DNA. STA: F.12.3
TOP: Foundation Edition BLM: synthesis

53. ANS:
Avery repeated Griffith's experiment, and identified the component of the cell that caused transformation.

PTS: 1 DIF: L3 REF: p. 338 | p. 339
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: synthesis

54. ANS:
Hershey and Chase labeled the DNA of a bacteriophage with ^{32}P, and found that after the bacteria were infected with the bacteriophage, the ^{32}P was in the bacteria.

PTS: 1 DIF: L1 REF: p. 341
OBJ: 12.1.2 Describe the role of bacteriophages in identifying genetic material.
STA: F.12.3 TOP: Foundation Edition BLM: comprehension

55. ANS:
He systematically destroyed all the other kinds of molecules besides DNA in the dead-cell mixture before using the mixture to successfully transform harmless bacteria into helpful bacteria.

PTS: 1 DIF: L2 REF: p. 340
OBJ: 12.1.1 Summarize the process of bacterial transformation.
STA: F.12.3 TOP: Foundation Edition BLM: synthesis

56. ANS:
Rosalind Franklin used powerful X-ray beams to make diffraction photographs that gave Watson and Crick the clues they needed to determine DNA's structure.

PTS: 1 DIF: L2 REF: p. 346 | p. 347
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 TOP: Foundation Edition
BLM: synthesis

57. ANS:
The percentage of adenine would have increased by about 5 percent.

PTS: 1 DIF: L3 REF: p. 345
OBJ: 12.2.2 Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code. STA: F.12.3 BLM: analysis

58. ANS:
The hydrogen bonds between the base pairs must be broken, and the molecule must unwind.

PTS: 1 DIF: L2 REF: p. 350| p. 351
OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
TOP: Foundation Edition BLM: analysis

59. ANS:
The molecule is DNA polymerase, an enzyme that joins individual nucleotides to make a strand of DNA.

PTS: 1 DIF: L1 REF: p. 351
OBJ: 12.3.1 Summarize the events of DNA replication. STA: F.12.3
TOP: Foundation Edition BLM: knowledge

60. ANS:
In prokaryotes, DNA replication starts in one place, and in eukaryotes DNA replication starts in many places.

PTS: 1 DIF: L1 REF: p. 353
OBJ: 12.3.2 Compare DNA replication in prokaryotes with that of eukaryotes.
STA: F.12.4 TOP: Foundation Edition BLM: knowledge

SCIENCE SKILLS

1. ANS:
Sample answer: The equation for cellular respiration is $6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O$ + Energy. The mouse should give off CO_2 and H_2O.

PTS: 1 DIF: L2 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: application

2. ANS:
Sample answer: The mouse requires oxygen and sugar from food (glucose) to carry out cellular respiration. Fresh air containing oxygen flows in through the tubes from outside the flasks into flasks B, C, and D. Air mixed with whatever the mouse gives off flows from flask B into flask A. The mouse receives fresh air and should be able to survive in the chamber for the duration of the experiment.

PTS: 1 DIF: L2 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: analysis

3. ANS:
Sample answer: If the mouse is carrying out cellular respiration, it will give off CO_2. The CO_2 will flow into flask A, and the phenolphthalein in flask A will change from pink to clear.

PTS: 1 DIF: L2 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 TOP: Foundation Edition BLM: application

4. ANS:
Sample answer: The cricket, like all living organisms, is carrying out cellular respiration. However, the mouse is larger than the cricket and gives off more CO_2 than the cricket. After one hour, the cricket probably has not given off enough CO_2 to measure. If the scientist allows the experiment to continue for several hours, she will see that more CO_2 is given off by the cricket over time.

PTS: 1 DIF: L3 REF: p. 251 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 BLM: synthesis

5. ANS:

Sample answer: The mouse that had been exercising should give off more CO_2 because this mouse will be breathing more heavily. This mouse might even have an oxygen debt to repay, which means it is making up for the oxygen and energy it used up during the exercise.

PTS: 1 DIF: L2 REF: p. 265
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 BLM: analysis

ESSAY

1. ANS:
If the energy in glucose were released in just one step, most of the energy would be lost as heat. The gradual process of cellular respiration allows the cell to control the release of energy into packages of ATP that can be used more efficiently for cell activities.

PTS: 1 DIF: L3 REF: p. 250 OBJ: 9.1.2 Define cellular respiration.
STA: F.12.1 BLM: synthesis

2. ANS:
Sample answer: Glycolysis is the breakdown of glucose into 2 molecules of pyruvic acid, producing 4 ATP molecules. An initial input of 2 ATP molecules is required to start glycolysis; thus, there is a net gain of 2 ATP molecules. This process produces 2 high-energy electrons, which are passed to NAD^+ to form NADH. If oxygen is present, glycolysis leads to the Krebs cycle and the electron transport chain. If oxygen is not present, glycolysis is followed by the rest of fermentation.

PTS: 1 DIF: L2 REF: p. 254 | p. 262
OBJ: 9.2.1 Describe what happens during glycolysis. STA: F.12.1
TOP: Foundation Edition BLM: synthesis

3. ANS:
Sample answer: During the Krebs cycle, pyruvic acid is broken down into carbon dioxide in a series of energy-extracting reactions. Coenzyme A forms acetyl-CoA, which later becomes citric acid. Citric acid is then broken down, CO_2 is released, and electrons are transferred to energy carriers. One molecule of pyruvic acid gives 4 molecules of NADH, 1 molecule of $FADH_2$, and 1 molecule of ATP.

PTS: 1 DIF: L2 REF: p. 256 | p. 257
OBJ: 9.2.2 Describe what happens during the Krebs cycle. STA: F.12.1
TOP: Foundation Edition BLM: synthesis

4. ANS:
During brief periods of intense activity, muscle cells may use oxygen faster than it can be supplied by the body. When the oxygen supply gets very low, the electron transport chain cannot function because oxygen serves as its final electron acceptor. This forces the Krebs cycle to stop. In this anaerobic situation, the muscle cells can produce ATP only by means of lactic acid fermentation.

PTS: 1 DIF: L2 REF: p. 262 | p. 265
OBJ: 9.3.2 Identify the pathways the body uses to release energy during exercise.
STA: F.12.10 TOP: Foundation Edition BLM: analysis