

01	☐ A	☐ B	☐ C	☐ D	☐ E
02	☐ A	☐ B	☐ C	☐ D	☐ E
03	☐ A	☐ B	☐ C	☐ D	☐ E
04	☐ A	☐ B	☐ C	☐ D	☐ E
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31	☐ A	☐ B	☐ C	☐ D	☐ E
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35	☐ A	☐ B	☐ C	☐ D	☐ E
36	☐ A	☐ B	☐ C	☐ D	☐ E
37	☐ A	☐ B	☐ C	☐ D	☐ E
38	☐ A	☐ B	☐ C	☐ D	☐ E
39	☐ A	☐ B	☐ C	☐ D	☐ E

PRACTICE QUESTIONS

Elsevier Remotely Proctored Exams

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QUESTIONS

9

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Before you begin

What this is

9 practice questions for Elsevier Remotely Proctored Exams **APATH**, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

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Send us three things and we will check it:

- the exam code, **APATH**
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1

SINGLE CHOICE

A patient has developed increased muscle mass in the left ventricle due to chronic systemic hypertension. Which cellular adaptation does this represent?

- ☐ A Physiologic hyperplasia
- ☒ B Pathologic hypertrophy
- ☐ C Pathologic hyperplasia
- ☐ D Metaplasia

ANSWER B

WHY Cardiac myocytes are permanent (terminally differentiated) cells that cannot divide; therefore, they respond to increased workload by adding sarcomeres and increasing cell size, which is hypertrophy. The trigger (chronic hypertension) is pathologic, making this pathologic hypertrophy.

QUESTION 2

SINGLE CHOICE

Which of the following is the most damaging form of reactive oxygen species generated during ischemia-reperfusion injury?

- ☐ A Hydrogen peroxide (H_2O_2)
- ☐ B Superoxide anion ($\text{O}_2^{\bullet-}$)
- ☒ C Hydroxyl radical ($\bullet\text{OH}$)
- ☐ D Nitric oxide (NO)

ANSWER C

WHY The hydroxyl radical ($\bullet\text{OH}$) is the most reactive and damaging ROS, formed via the Fenton or Haber-Weiss reactions. It reacts at near diffusion-limited rates with virtually any adjacent biomolecule.

QUESTION 3 SINGLE CHOICE

An infant is born with a single transverse palmar crease, flat facial profile, and a heart murmur. Which karyotype abnormality is most likely responsible?

- ☐ A Trisomy 13
- ☐ B Trisomy 18
- ☒ C Trisomy 21
- ☐ D Monosomy X (45,XO)

ANSWER C

WHY Trisomy 21 (Down syndrome) classically presents with a single transverse palmar (simian) crease, flat facial profile, epicanthal folds, and congenital heart defects (most commonly endocardial cushion/AV septal defects).

QUESTION 4 SINGLE CHOICE

A patient with sepsis develops simultaneous bleeding from venipuncture sites and microvascular thrombosis causing tissue ischemia. Lab findings would most likely show:

- ☐ A Isolated prolonged PT with normal PTT
- ☐ B Elevated fibrinogen and decreased D-dimer
- ☒ C Decreased platelets, prolonged PT and PTT, elevated D-dimer, and decreased fibrinogen
- ☐ D Normal coagulation studies with isolated thrombocytopenia

ANSWER C

WHY DIC is characterized by widespread activation of coagulation consuming platelets and clotting factors (thrombocytopenia, prolonged PT/PTT, decreased fibrinogen) along with secondary fibrinolysis generating D-dimer fragments.

QUESTION 5 SINGLE CHOICE

A patient with diabetic ketoacidosis has a pH of 7.20, HCO_3^- of 14 mEq/L, and PaCO_2 of 30 mm Hg. Which interpretation is correct?

- ☐ A Respiratory acidosis with metabolic compensation
- ☒ B Metabolic acidosis with appropriate respiratory compensation
- ☐ C Mixed metabolic and respiratory acidosis
- ☐ D Respiratory alkalosis with metabolic compensation

ANSWER B

WHY Low pH and low HCO_3^- indicate metabolic acidosis. The PaCO_2 is lower than expected for a normal baseline (~40), showing hyperventilation as compensation. Using Winter's formula, expected $\text{PaCO}_2 \approx 1.5(14) + 8 \pm 2 = 29 \pm 2$, which matches the observed value, confirming appropriate respiratory compensation.

QUESTION 6 SINGLE CHOICE

A nurse experiences wheezing, hypotension, and urticaria within minutes after an antibiotic infusion is started. Which immunoglobulin class primarily mediates this reaction?

- ☐ A IgA
- ☒ B IgE
- ☐ C IgG
- ☐ D IgM

ANSWER B

WHY Type I (immediate) hypersensitivity reactions, including anaphylaxis, are mediated by IgE antibodies bound to mast cells and basophils. Upon re-exposure to antigen, cross-linking of IgE triggers degranulation and release of histamine and other mediators.

QUESTION 7

SINGLE CHOICE

Which neurohormonal compensatory mechanism is primarily responsible for the sodium and water retention that worsens congestion in chronic heart failure?

- ☐ A Decreased sympathetic nervous system activity
- ☒ B Activation of the renin–angiotensin–aldosterone system (RAAS)
- ☐ C Increased atrial natriuretic peptide (ANP) with no counter-effect
- ☐ D Suppression of antidiuretic hormone (ADH)

ANSWER B

WHY Reduced cardiac output in heart failure activates RAAS: renin converts angiotensinogen to angiotensin I, which becomes angiotensin II, stimulating aldosterone release. Aldosterone promotes sodium and water retention, increasing preload and pulmonary/systemic congestion.

QUESTION 8

MULTIPLE CHOICE

Which of the following findings are characteristic of obstructive lung disease? (Choose two.)

- ☒ A Decreased FEV1/FVC ratio (<0.70)
- ☐ B Increased total lung capacity (TLC)
- ☐ C Decreased diffusing capacity for carbon monoxide (DLCO)
- ☒ D Increased lung compliance with loss of elastic recoil

ANSWER A - D

WHY Obstructive lung disease (e.g., COPD, asthma) is characterized by a decreased FEV1/FVC ratio (<0.70) due to airflow limitation, and often increased TLC and compliance with loss of elastic recoil. Decreased DLCO is typical of restrictive disease with interstitial involvement (not all obstructive disease), and increased TLC alone is not the defining feature.

QUESTION 9

MULTIPLE CHOICE

Which of the following are causes of prerenal acute kidney injury? (Choose two.)

- ☒ **A** Severe hemorrhage with hypovolemia
- ☐ **B** Acute tubular necrosis from aminoglycoside toxicity
- ☒ **C** Cardiogenic shock with reduced cardiac output
- ☐ **D** Bladder outlet obstruction

ANSWER **A - C**

WHY Prerenal AKI results from decreased renal perfusion with intrinsically intact nephrons; causes include hypovolemia (hemorrhage, dehydration) and decreased effective circulating volume (cardiogenic shock, heart failure). Aminoglycoside toxicity is intrinsic (ATN), and bladder outlet obstruction is postrenal.