

Questions

Select the one false option for each question. The answer key is separated from the question section.

01	<p>All of the following are true EXCEPT:</p> <ul style="list-style-type: none">A. <i>Giardia lamblia</i> is also known as <i>Giardia duodenalis</i> or <i>Giardia intestinalis</i>.B. The trophozoite of <i>Giardia lamblia</i> is heart-shaped and has four pairs of flagella.C. <i>Giardia</i> cysts are ellipsoid, thick-walled, highly resistant, and about 8-14 micrometers long.D. <i>Giardia</i> is the only common pathogenic protozoan found in the duodenum and jejunum of humans.E. Mature <i>Giardia</i> cysts contain two nuclei.
02	<p>All of the following are true EXCEPT:</p> <ul style="list-style-type: none">A. <i>Brucella abortus</i> typically infects cattle.B. Brucellae are aerobic, nonmotile, nonspore-forming Gram-negative coccobacilli.C. Brucellae are characteristically intracellular organisms.D. <i>Brucella melitensis</i> requires 5-10% CO₂ for growth, whereas the other major species grow in air.E. Human brucellosis is also called undulant fever or Malta fever.
03	<p>All of the following are true EXCEPT:</p> <ul style="list-style-type: none">A. <i>Vibrio cholerae</i> O1 characteristically produces an acidic polysaccharide capsule.B. <i>Vibrio cholerae</i> O1 and O139 are associated with epidemic and pandemic cholera.C. <i>Vibrio cholerae</i> produces yellow colonies on TCBS agar because it ferments sucrose.D. <i>Vibrio parahaemolyticus</i> and <i>Vibrio vulnificus</i> produce green colonies on TCBS agar.E. The El Tor biotype produces a hemolysin and is resistant to polymyxin B.
04	<p>All of the following are true EXCEPT:</p> <ul style="list-style-type: none">A. All members of Enterobacteriaceae are oxidase positive.B. Enterobacteriaceae are moderate-sized, non-spore-forming Gram-negative rods.C. Enterobacteriaceae ferment glucose.D. Enterobacteriaceae reduce nitrate.E. Most Enterobacteriaceae grow on nonselective media and on MacConkey agar.
05	<p>All of the following are true EXCEPT:</p> <ul style="list-style-type: none">A. ETEC may produce heat-labile toxin, heat-stable toxin, or both.B. Heat-labile toxin is functionally similar to cholera toxin.C. Heat-labile toxin increases intracellular cyclic AMP.D. Heat-stable toxin increases intracellular cyclic AMP.E. Colonization factor antigens facilitate attachment of ETEC strains to intestinal epithelium.

06 All of the following are true EXCEPT:

- A. *Enterobius vermicularis* infection is initiated by ingestion of embryonated eggs.
- B. The Scotch tape test is best collected before bathing or defecation.
- C. Diagnosis is usually confirmed by finding eggs in routine fecal specimens.
- D. Eggs deposited on the perianal skin become infectious within hours.
- E. The entire family is usually treated simultaneously to reduce reinfection.

07 All of the following are true EXCEPT:

- A. *Helicobacter pylori* is a spiral-shaped Gram-negative rod.
- B. *H. pylori* is catalase positive.
- C. *H. pylori* is oxidase positive.
- D. *H. pylori* is urease positive.
- E. *H. pylori* is nonmotile and lacks flagella.

08 All of the following are true EXCEPT:

- A. *E. histolytica* trophozoites containing red blood cells are pathognomonic.
- B. *E. histolytica* trophozoites are usually found in diarrheic feces.
- C. *E. histolytica* cysts may contain chromatoid bodies with rounded ends.
- D. *Entamoeba histolytica* and *Entamoeba dispar* are easily distinguished by routine microscopy.
- E. Amebic liver abscess may produce anchovy-paste-like material.

09 All of the following are true EXCEPT:

- A. Eggs are usually found in feces 15-20 days after initial infection.
- B. Adult *Ascaris lumbricoides* worms mature mainly in the jejunum.
- C. Larvae migrate through the liver, heart, and pulmonary circulation.
- D. Larvae may break into alveoli, then be coughed up and swallowed.
- E. Diagnosis may involve finding bile-stained knobby-coated eggs in concentrated stool.

10 All of the following are true EXCEPT:

- A. Salmonellae are non-spore-forming, facultative anaerobic Gram-negative bacilli.
- B. Most Salmonella isolates are motile with peritrichous flagella.
- C. Salmonellae almost never ferment lactose or sucrose.
- D. Bismuth sulfite medium permits detection of salmonellae as black colonies due to H₂S production.
- E. Salmonellae almost never produce hydrogen sulfide.

11 All of the following are true EXCEPT:

- A. *Cryptosporidium* oocysts are passed in feces in enormous numbers.
- B. *Cryptosporidium* commonly causes watery diarrhea.
- C. *Cryptosporidium* oocysts must mature in soil before becoming infectious.
- D. Disease may be severe and prolonged in immunocompromised patients.
- E. The small intestine is the most commonly infected site.

12 All of the following are true EXCEPT:

- A. *Campylobacter jejuni* is a common cause of enteritis in humans.
- B. *Campylobacter* infection may follow ingestion of contaminated food, drink, or exposure to animals.
- C. *Campylobacter* requires a microaerobic atmosphere for optimal growth.
- D. Optimal culture uses reduced oxygen and increased carbon dioxide.
- E. *Campylobacter* grows best under routine fully aerobic incubation.

13 All of the following are true EXCEPT:

- A. Leptospirosis is a worldwide zoonosis caused by spirochetes of the genus *Leptospira*.
- B. Human leptospirosis usually results from leptospire penetrating intact dry skin.
- C. Human infection may occur through breaks in skin.
- D. Human infection may occur through mucous membranes.
- E. Specimens may include blood, CSF, tissues, urine, and serum for serology.

14 All of the following are true EXCEPT:

- A. Eggs of *A. duodenale* and *N. americanus* are easily differentiated by routine stool microscopy.
- B. The two major human hookworms are *Ancylostoma duodenale* and *Necator americanus*.
- C. Hookworm larvae can produce a rash at the site of skin penetration.
- D. Larval migration through the lungs can cause pneumonitis and eosinophilia.
- E. Stool examination reveals characteristic non-bile-stained segmented eggs.

15 All of the following are true EXCEPT:

- A. STEC O157:H7 does not ferment sorbitol on sorbitol MacConkey agar.
- B. STEC O157:H7 forms clear colonies on SMAC.
- C. STEC O157:H7 is positive for beta-glucuronidase on the MUG test.
- D. Enzyme immunoassays can detect Shiga toxins.
- E. PCR can detect Shiga toxin genes directly from stool samples.

16 All of the following are true EXCEPT:

- A. *Schistosoma mansoni* usually resides near branches of the inferior mesenteric vein.
- B. *S. mansoni* eggs are large and golden.
- C. *S. mansoni* eggs characteristically have a terminal spine.
- D. *S. mansoni* eggs have a sharp lateral spine.
- E. Stool examination may reveal *S. mansoni* eggs.

17 All of the following are true EXCEPT:

- A. Human *Echinococcus granulosus* infection is accidental.
- B. Humans are dead-end intermediate hosts.
- C. Larvae form unilocular hydatid cysts in humans.
- D. Humans serve as definitive hosts with adult tapeworms in the intestine.
- E. Human infection is associated with sheep-raising areas.

18 All of the following are true EXCEPT:

- A. *Hymenolepis nana* is called the dwarf tapeworm.
- B. *H. nana* infection may begin when embryonated eggs are ingested.
- C. *Hymenolepis nana* is usually 20-60 cm in length.
- D. *H. diminuta* is associated with rodents such as rats and mice.
- E. *H. nana* is smaller than *H. diminuta*.

19 All of the following are true EXCEPT:

- A. *Brucella suis* infection tends to be chronic with suppurative lesions.
- B. *Brucella melitensis* infection is generally more acute and severe.
- C. Human brucellosis commonly causes abortion because human placentas contain erythritol.
- D. *Brucella abortus* usually causes milder disease without suppurative complications.
- E. Osteomyelitis, meningitis, and cholecystitis may occur in brucellosis.

20 All of the following are true EXCEPT:

- A. Cholera toxin consists of A and B subunits.
- B. Cholera toxin is heat-stable.
- C. Subunit A1 increases intracellular cyclic AMP.
- D. Cholera causes electrolyte-rich diarrhea that may reach 20-30 L/day.
- E. Achlorhydria or PPI use lowers the infectious dose of *V. cholerae*.

21

All of the following are true EXCEPT:

- A. Gastrointestinal TB may result from swallowing infected sputum.
- B. Gastrointestinal TB may mimic Crohn disease.
- C. Granulomas with caseous necrosis may form in intestinal TB.
- D. The standard abdominal TB regimen consists of isoniazid and rifampicin only during the initial phase.
- E. PCR of mucosal biopsy has high specificity and is more sensitive than acid-fast stains and culture.

22

All of the following are true EXCEPT:

- A. Aeromonads are found in fresh and brackish water.
- B. Aeromonads are Gram-negative facultative anaerobic rods.
- C. Aeromonads require sodium chloride for growth in the same way as halophilic vibrios.
- D. *Aeromonas hydrophila* may cause wound infection after traumatic freshwater exposure.
- E. Aeromonads may resemble Enterobacteriaceae but are oxidase positive.

23

All of the following are true EXCEPT:

- A. Shigellae are slender nonmotile Gram-negative rods.
- B. Shigellae ferment glucose.
- C. Shigellae fail to produce H₂S on TSI agar.
- D. Shigella species and *E. coli* can be reliably differentiated by MALDI-TOF MS.
- E. Serology is not used to diagnose Shigella infections.

24

All of the following are true EXCEPT:

- A. *Strongyloides stercoralis* differs from hookworm because eggs hatch into larvae in the intestine.
- B. Diagnosis is usually made by finding characteristic eggs in stool.
- C. *Strongyloides* larvae can mature into filariform larvae within the host.
- D. Autoinfection can occur in strongyloidiasis.
- E. Stool larvae may be passed intermittently and in low numbers.

25

All of the following are true EXCEPT:

- A. *Fasciola hepatica* is the sheep liver fluke.
- B. Human infection occurs after ingestion of watercress containing encysted metacercariae.
- C. The parasite migrates from the duodenal wall toward the liver capsule and bile ducts.
- D. Sheep and cattle are important herbivore hosts.
- E. Praziquantel is the treatment of choice for *Fasciola hepatica*.

26

All of the following are true EXCEPT:

- A. *Vibrio parahaemolyticus* is associated with marine environments.
- B. Infection commonly follows ingestion of raw or undercooked seafood.
- C. *V. parahaemolyticus* produces yellow colonies on TCBS agar because it ferments sucrose.
- D. *V. parahaemolyticus* is halophilic.
- E. *V. parahaemolyticus* can cause gastroenteritis.

27

All of the following are true EXCEPT:

- A. Freshly passed stool is preferred for non-typhoidal Salmonella diagnosis.
- B. Blood cultures are often positive in the first week of enteric fever.
- C. Bone marrow culture has the highest sensitivity for enteric fever.
- D. Stool culture is the preferred definitive diagnostic specimen for enteric fever.
- E. Urine culture may become positive after the second week of illness.

28

All of the following are true EXCEPT:

- A. *Trichuris trichiura* is called whipworm.
- B. Trichuris eggs have polar plugs.
- C. Adult *Trichuris trichiura* mature mainly in the jejunum.
- D. Heavy infection may cause rectal prolapse.
- E. Clinical disease is related to worm burden.

29

All of the following are true EXCEPT:

- A. Acute Q fever is associated mainly with antibodies to phase I antigen.
- B. *Coxiella burnetii* causes Q fever.
- C. *C. burnetii* is an obligate organism that grows in cytoplasmic vacuoles.
- D. Acute Q fever may resemble influenza, atypical pneumonia, or hepatitis.
- E. Chronic Q fever is classically associated with high antibodies to phase I antigen.

30

All of the following are true EXCEPT:

- A. Cyclospora has a life cycle similar to Cryptosporidium and appears to involve only a single host.
- B. Direct person-to-person transmission through fecal exposure is unlikely in cyclosporiasis.
- C. Cyclosporiasis has been linked to fresh produce such as raspberries, mesclun, and basil.
- D. Diagnosis requires specific stool testing for acid-fast oocysts about 8-10 micrometers.
- E. Cyclospora oocysts are infectious immediately in freshly passed feces.

31 All of the following are true EXCEPT:

- A. Microsporidia are intracellular spore-forming parasites now classified as fungi.
- B. Microsporidia may cause intestinal disease in immunocompromised patients.
- C. *Balantidium coli* is a giant intestinal ciliate of humans and pigs.
- D. Ciliates have cilia distributed in rows or patches.
- E. Amebae use flagella as their defining locomotor organelle.

32 All of the following are true EXCEPT:

- A. Negative culture results exclude brucellosis even in acute disease.
- B. *Brucella* cultures should be observed for up to 3 weeks before being discarded as negative.
- C. Bone marrow and blood are the specimens from which brucellae are most often isolated.
- D. Tiny Gram-negative coccobacilli that are catalase positive and oxidase positive suggest *Brucella*.
- E. A positive urease test is characteristic of *Brucella* species.

33 All of the following are true EXCEPT:

- A. MacConkey agar helps separate lactose fermenters from non-lactose fermenters.
- B. *Escherichia coli*, *Klebsiella*, and *Enterobacter* are usually lactose fermenters.
- C. *Salmonella*, *Shigella*, *Yersinia*, and *Proteus* are usually non-lactose fermenters.
- D. The H antigen is a capsular polysaccharide antigen.
- E. *Klebsiella*, *Shigella*, and *Yersinia* are common nonmotile exceptions among Enterobacteriaceae.

34 All of the following are true EXCEPT:

- A. *Campylobacter* colonies on blood-containing agar are characteristically strongly hemolytic.
- B. Most campylobacters grow best at 42 degrees C.
- C. Primary plates for *C. jejuni* isolation should be incubated at 42 degrees C.
- D. Skirrow medium contains vancomycin, polymyxin B, and trimethoprim.
- E. *C. jejuni* and *C. coli* are oxidase positive.

35 All of the following are true EXCEPT:

- A. Non-typhoidal *Salmonella* gastroenteritis is typically self-limited.
- B. Antimicrobial therapy is uniformly recommended for all uncomplicated *Salmonella* gastroenteritis cases.
- C. Antimicrobial therapy is usually not necessary for uncomplicated non-typhoidal *Salmonella* gastroenteritis.
- D. Fluid and electrolyte replacement is essential in severe diarrhea.
- E. Antimicrobial therapy should be considered in neonates and immunosuppressed patients.

36 All of the following are true EXCEPT:

- A. *Leptospira interrogans* is the pathogenic species with many serovars.
- B. Leptospire grow best anaerobically at 42 degrees C on routine MacConkey agar.
- C. Leptospire are tightly coiled, thin, flexible spirochetes with one end forming a hook.
- D. Leptospire are best seen using a dark-field microscope.
- E. Leptospire can survive for weeks in water, particularly at alkaline pH.

37 All of the following are true EXCEPT:

- A. Nematodes are flat segmented worms with a scolex and proglottids.
- B. Adult tapeworms absorb nutrients directly from the host because they have no mouth or gut.
- C. Cestodes are flat and ribbon-like with segments called proglottids.
- D. The scolex attaches to the intestinal wall.
- E. Trematodes are usually acquired by ingestion of metacercariae, except schistosome cercariae penetrate skin.

38 All of the following are true EXCEPT:

- A. Shigellosis is often self-limited and many patients recover within 5-7 days.
- B. Antidiarrheal medications such as loperamide and opioids should be avoided in Shigella dysentery.
- C. Trimethoprim-sulfamethoxazole and ampicillin are no longer recommended as first-line agents because of resistance.
- D. Ceftriaxone should be avoided in children with shigellosis because it is ineffective.
- E. Ciprofloxacin and ceftriaxone are effective antibiotics of choice.

39 All of the following are true EXCEPT:

- A. Rapid urease testing detects urease activity by a redox color change within 24-48 hours.
- B. *H. pylori* culture requires 37 degrees C in a microaerophilic humid atmosphere.
- C. Culture incubation is usually 3-6 days, but may require up to 14 days if initially negative.
- D. Primary isolation may use chocolate agar or Skirrow medium.
- E. Urease activity breaks down urea into ammonia and CO₂.

40 All of the following are true EXCEPT:

- A. EPEC strains may be identified by O antigen and occasionally H antigen typing.
- B. EAEC confirmation is readily available in most clinical laboratories through simple Gram stain.
- C. A two-stage infection model using HEp-2 or HeLa cells can be used for EPEC in reference labs.
- D. Assays for ETEC LT include cell culture, immunologic assays, and gene detection.
- E. Plasmids encoding enterotoxins may also carry genes for colonization factor antigens.

41 All of the following are true EXCEPT:

- A. The infectious dose of *V. cholerae* is lowered in achlorhydria or hypochlorhydria.
- B. *V. cholerae* organisms attach to the microvilli of epithelial cells.
- C. Gastric acid suppression increases the infectious dose required for cholera.
- D. *V. cholerae* is pathogenic only for humans and grows in association with copepods and zooplankton.
- E. Contaminated food and water are important sources of infection.

42 All of the following are true EXCEPT:

- A. Agglutinating antibodies first appear 5-8 weeks after infection and peak at 5-7 days.
- B. The illness of leptospirosis is often biphasic.
- C. The second phase often begins when IgM antibody titers rise.
- D. Aseptic meningitis may appear in the second phase with intense headache, stiff neck, and CSF pleocytosis.
- E. Serovar-specific immunity follows infection, but reinfection with different serovars may occur.

43 All of the following are true EXCEPT:

- A. Nematode infections are commonly confirmed by detecting characteristic eggs in feces.
- B. Egg identification considers egg size and shape.
- C. Egg identification considers shell thickness and structures such as polar plugs, knobs, spines, and opercula.
- D. Nematodes are easily recognized because of large size and cylindric unsegmented bodies.
- E. Nematode egg identification is based mainly on Gram stain reaction and lactose fermentation.

44 All of the following are true EXCEPT:

- A. The O antigen is the outer polysaccharide component of lipopolysaccharide.
- B. The K antigen can contribute to immune evasion and virulence.
- C. The H antigen is present in motile organisms.
- D. Serotyping remains important for *Salmonella*, *Shigella*, and some diarrheagenic *E. coli* strains.
- E. Antigenic variation of O, K, and H antigens simplifies epidemiologic classification.

45 All of the following are true EXCEPT:

- A. *Coxiella burnetii* has a membrane similar to Gram-negative bacteria but does not stain with Gram stain.
- B. *C. burnetii* is resistant to drying and may survive for months in dried feces or milk.
- C. Phase I is the virulent infectious form.
- D. Phase II is noninfectious and occurs after serial passage in cell culture.
- E. Human Q fever is most commonly acquired by tick bite transmission directly from ticks.

46 All of the following are true EXCEPT:

- A. EAEC adheres to intestinal epithelial cells in an aggregative stacked-brick pattern.
- B. EAEC typically causes hemolytic uremic syndrome through Shiga toxin 2.
- C. EAEC may produce a mucus biofilm.
- D. EAEC is associated with acute or persistent diarrhea.
- E. EAEC is especially important in children and immunocompromised patients.

47 All of the following are true EXCEPT:

- A. *Aeromonas hydrophila* wound infection often follows traumatic exposure to fresh or brackish water.
- B. Cellulitis may develop within 48 hours.
- C. Fasciitis, myonecrosis, osteomyelitis, and systemic symptoms may occur.
- D. Clinically significant aeromonads are predictably susceptible to penicillin and ampicillin.
- E. *Aeromonas* sepsis occurs mainly in patients with hematologic malignancies and/or liver disease.

48 All of the following are true EXCEPT:

- A. Acid-fast bacillus staining and culture have high sensitivity and low specificity in abdominal TB.
- B. TST and IGRAs cannot differentiate active from latent TB.
- C. TST may yield false-negative results.
- D. IGRAs may help differentiate intestinal TB from Crohn disease.
- E. CT, MRI, barium studies, PET scans, and endoscopic ultrasound can support the diagnosis but rarely establish it alone.

49 All of the following are true EXCEPT:

- A. The chronic carrier state of *Salmonella* Typhi may involve gallbladder colonization.
- B. *Salmonella* Typhi and Paratyphi are highly adapted to humans.
- C. Typhoidal strains are adapted for systemic spread.
- D. *Salmonella* Typhi primarily causes disease in reptiles and only rarely infects humans.
- E. The infectious dose for *Salmonella* Typhi is low compared with many other serovars.

50 All of the following are true EXCEPT:

- A. *H. pylori* can cause chronic gastritis, intestinal metaplasia, atrophic gastritis, and gastric adenocarcinoma.
- B. IgM antibodies persist for years and are the preferred test of cure after eradication therapy.
- C. About 90% of duodenal ulcer patients have *H. pylori* infection.
- D. Stool antigen detection by ELISA can diagnose active infection and is useful as a test of cure.
- E. Urea breath testing detects labeled CO₂ after ingestion of labeled urea.

51 All of the following are true EXCEPT:

- A. Antibiotics and antimotility agents are generally avoided in STEC infection.
- B. HUS is characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury.
- C. STEC complications are especially feared in children younger than 10 and older adults.
- D. Early intravenous fluids may reduce renal failure risk in children with STEC O157 infection.
- E. Antimotility agents are preferred early in STEC because they reduce Shiga toxin exposure.

52 All of the following are true EXCEPT:

- A. *Coxiella burnetii* acute infection is treated with doxycycline.
- B. Pasteurization at 56 degrees C for 30 seconds is the listed method that destroys viable *Coxiella* in milk.
- C. Newer macrolides may treat acute Q fever pneumonia.
- D. Chronic Q fever may require doxycycline plus hydroxychloroquine for 18 months or longer.
- E. Valve replacement may occasionally be required in chronic Q fever endocarditis.

53 All of the following are true EXCEPT:

- A. In strongyloidiasis, hyperinfection is most common in immunocompromised patients.
- B. Risk factors include malignancy, corticosteroid therapy, solid organ transplantation, and malnutrition.
- C. Albendazole and mebendazole are absolutely contraindicated alternatives in strongyloidiasis.
- D. Hyperinfection may disseminate to lung, liver, kidneys, brain, and meninges.
- E. Ivermectin is the drug of choice for strongyloidiasis.

54 All of the following are true EXCEPT:

- A. *Enterobius* larvae hatch in the small intestine and migrate to the large intestine.
- B. The adult female normally lays eggs deep in the jejunal mucosa.
- C. Adult maturation occurs in about 2-6 weeks.
- D. Fertilized females lay asymmetric eggs in the perianal folds.
- E. Autoinfection or retroinfection can occur when eggs hatch in the perianal folds and larvae migrate into the rectum and large intestine.

55 All of the following are true EXCEPT:

- A. Nonselective and selective media for mycobacterial culture include Middlebrook 7H10 and 7H11.
- B. Löwenstein-Jensen is an inspissated egg medium that may show growth in 3-6 weeks.
- C. Saprophytic mycobacteria grow more slowly than TB bacilli and are more acid fast.
- D. Broth media such as MGIT/BACTEC can give more rapid growth.
- E. TB bacilli may appear Gram-invisible or as clear ghosts on Gram stain.

56 All of the following are true EXCEPT:

- A. The Widal test detects antibodies against O and H antigens in suspected *S. Typhi* infection.
- B. A single Widal titer reliably establishes the definitive diagnosis of typhoid fever.
- C. At least two serum specimens obtained 7-10 days apart are needed to prove a rise in titer.
- D. False-positive and false-negative Widal results occur.
- E. A high titer to Vi antigen may occur in some carriers.

57 All of the following are true EXCEPT:

- A. Infection is usually acquired only in late adulthood and clears spontaneously within days.
- B. *H. pylori* transmission is mainly oral-oral and/or fecal-oral.
- C. Humans are likely the primary reservoir for *H. pylori*.
- D. Infection is usually acquired in early childhood.
- E. Without appropriate antibiotics, colonization may persist lifelong.

58 All of the following are true EXCEPT:

- A. Endotoxin is lipid A of lipopolysaccharide.
- B. Endotoxin may trigger fever, inflammation, shock, and disseminated intravascular coagulation.
- C. Capsules protect organisms from phagocytosis and may interfere with complement-mediated killing.
- D. Shiga toxins are structural components of the O antigen and are present in all Enterobacteriaceae.
- E. Adhesins help organisms bind epithelial surfaces and colonize the intestinal tract.

59 All of the following are true EXCEPT:

- A. Hookworm adult worms cause gastrointestinal symptoms such as nausea, vomiting, and diarrhea.
- B. Control depends mainly on avoiding undercooked pork containing cysticerci.
- C. Blood loss from feeding worms leads to microcytic hypochromic anemia.
- D. Iron therapy may be indicated to raise hemoglobin levels.
- E. Wearing shoes in endemic areas helps reduce infection.

60 All of the following are true EXCEPT:

- A. Severe or systemic *Campylobacter* illness may be treated with antibiotics.
- B. Early erythromycin can shorten fecal shedding.
- C. Postdiarrheal complications include Guillain-Barre syndrome, reactive arthritis, and Reiter syndrome.
- D. Poultry, cattle, sheep, pigs, birds, and pet dogs may serve as reservoirs for *Campylobacter* species.
- E. *Campylobacter* enteritis generally requires immediate multi-drug antimicrobial therapy in all uncomplicated cases.

MCQ Answers

Compact key first; brief explanations follow.

01 E	13 B	25 E	37 A	49 D
02 D	14 A	26 C	38 D	50 B
03 A	15 C	27 D	39 A	51 E
04 A	16 C	28 C	40 B	52 B
05 D	17 D	29 A	41 C	53 C
06 C	18 C	30 E	42 A	54 B
07 E	19 C	31 E	43 E	55 C
08 D	20 B	32 A	44 E	56 B
09 A	21 D	33 D	45 E	57 A
10 E	22 C	34 A	46 B	58 D
11 C	23 D	35 B	47 D	59 B
12 E	24 B	36 B	48 A	60 E

Brief Explanations

	False option and correction	Source
1 E	Mature Giardia cysts have four nuclei, while immature cysts have two nuclei. Corrected: Mature Giardia cysts contain four nuclei; immature cysts contain two.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, pp. 8-9, Giardia morphology
2 D	The special CO ₂ requirement is for <i>B. abortus</i> , not <i>B. melitensis</i> . Corrected: <i>B. abortus</i> requires 5-10% CO ₂ for growth; the other three species grow in air.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 3, Brucella morphology
3 A	The acidic polysaccharide capsule is described for O139/non-O1 strains and <i>V. vulnificus</i> , not <i>V. cholerae</i> O1. Corrected: O139, non-O1 <i>V. cholerae</i> strains, and <i>V. vulnificus</i> may produce acidic polysaccharide capsules.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, pp. 5-6, Vibrio cholerae identification
4 A	Enterobacteriaceae are oxidase negative, not oxidase positive. Corrected: Enterobacteriaceae are catalase positive and oxidase negative.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, p. 4, general properties
5 D	ETEC heat-stable toxin increases cGMP, not cAMP. Corrected: ETEC heat-stable toxin increases cyclic GMP and promotes intestinal fluid secretion.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, p. 10, ETEC toxins

	False option and correction	Source
6 C	Enterobius eggs are rarely seen in fecal specimens. Corrected: Diagnosis is confirmed by detecting eggs on the anal mucosa, classically by the sticky tape test.	GI helminths 3.pdf, pp. 3-5, Enterobius diagnosis
7 E	<i>H. pylori</i> is motile and has polar flagella. Corrected: <i>H. pylori</i> is motile and has single and/or multiple monopolar, typically sheathed flagella.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 22, <i>H. pylori</i> morphology
8 D	Routine microscopy cannot reliably distinguish <i>E. histolytica</i> from morphologically similar nonpathogenic species. Corrected: <i>E. histolytica</i> may require antigen, molecular, or other specific testing to distinguish it from similar species.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, Entamoeba topic
9 A	Ascaris eggs are detected later than 15-20 days after infection. Corrected: Eggs are found in feces about 60-75 days after initial infection.	GI helminths 3.pdf, pp. 7-9, Ascaris life cycle and diagnosis
10 E	Salmonellae usually produce H ₂ S. Corrected: Salmonellae usually produce H ₂ S and may form black colonies on bismuth sulfite medium.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 8, 12, Salmonella lab features
11 C	Cryptosporidium oocysts are immediately infectious when passed. Corrected: <i>Cryptosporidium</i> oocysts passed in feces are immediately infectious.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, Cryptosporidium topic
12 E	Campylobacter needs a microaerobic atmosphere, not routine aerobic conditions. Corrected: Campylobacter species require reduced O ₂ of about 5-7% and increased CO ₂ of about 10%.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 18, Campylobacter culture
13 B	Leptospire usually enter through breaks in skin or mucous membranes, not intact dry skin. Corrected: Human infection usually occurs through breaks in the skin and mucous membranes.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, pp. 26-28, Leptospira pathogenesis/diagnosis
14 A	The eggs of the two major hookworm species cannot be distinguished by routine stool examination. Corrected: The eggs of <i>A. duodenale</i> and <i>N. americanus</i> cannot be distinguished in routine stool exam.	GI helminths 3.pdf, pp. 15-16, hookworm diagnosis
15 C	O157:H7 is MUG negative, not positive. Corrected: STEC O157:H7 is negative for beta-glucuronidase on the MUG test.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 3-4, STEC diagnosis
16 C	A terminal spine is characteristic of <i>S. haematobium</i> , not <i>S. mansoni</i> . Corrected: <i>S. mansoni</i> eggs have a sharp lateral spine.	GI helminths 3.pdf, schistosomiasis topic
17 D	Humans are intermediate/dead-end hosts, not definitive hosts. Corrected: Dogs are typical definitive hosts; humans are accidental dead-end intermediate hosts.	GI helminths 3.pdf, Echinococcus topic
18 C	<i>H. nana</i> is much smaller than 20-60 cm. Corrected: <i>H. nana</i> is the dwarf tapeworm, about 2-4 cm long.	GI helminths 3.pdf, Hymenolepis topic
19 C	Human placenta lacks erythritol, so abortion is not part of human Brucella infection. Corrected: Animal placentas and fetal membranes may contain erythritol, but human placentas do not.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 6, Brucella pathology
20 B	Cholera toxin is heat-labile. Corrected: Cholera toxin is a heat-labile A-B enterotoxin.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 7, cholera toxin
21 D	Initial abdominal TB therapy is a four-drug regimen, not only two drugs. Corrected: Initial therapy uses isoniazid, rifampicin, pyrazinamide, and ethambutol for the first 2 months.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, pp. 18-24, abdominal TB diagnosis/treatment
22 C	Aeromonads are oxidase-positive aquatic rods, but they are not defined by the same salt requirement as halophilic vibrios. Corrected: Aeromonads inhabit fresh and brackish water and may grow on blood and enteric agars.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, pp. 16-17, Aeromonas
23 D	MALDI-TOF MS cannot reliably distinguish <i>Shigella</i> from <i>E. coli</i> . Corrected: <i>Shigella</i> species and <i>E. coli</i> cannot be reliably differentiated by MALDI-TOF MS.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 22-24, <i>Shigella</i> identification
24 B	Strongyloides eggs are generally not seen in stool; larvae are detected. Corrected: Diagnosis depends on detecting larval worms, often in concentrated stool sediment.	GI helminths 3.pdf, pp. 18-20, Strongyloides diagnosis

	False option and correction	Source
25 E	Fasciola is treated with triclabendazole, not praziquantel. Corrected: Triclabendazole is the treatment used for <i>Fasciola hepatica</i> .	GI helminths 3.pdf, Fasciola topic
26 C	<i>V. parahaemolyticus</i> is a non-sucrose fermenter and gives green colonies on TCBS. Corrected: <i>V. parahaemolyticus</i> produces green colonies on TCBS agar.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, pp. 5, 14, <i>V. parahaemolyticus</i>
27 D	Enteric fever is definitively diagnosed by isolating <i>S. Typhi</i> or <i>S. Paratyphi</i> from appropriate cultures; blood and bone marrow are important specimens. Corrected: For enteric fever, appropriate specimens include blood, bone marrow, other sterile sites, urine, or intestinal secretions.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 10-11, Salmonella specimens
28 C	<i>Trichuris</i> adults are associated mainly with the cecum, not the jejunum. Corrected: Ingested eggs hatch in the small intestine and the larvae migrate to the cecum, where they mature to adults.	GI helminths 3.pdf, pp. 11-12, <i>Trichuris</i>
29 A	Acute Q fever is associated with phase II antibodies, not phase I antibodies. Corrected: Acute Q fever is associated with antibodies to phase II antigen.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, pp. 29-30, Coxiella
30 E	<i>Cyclospora</i> oocysts take days or weeks to become infectious. Corrected: Unlike <i>Cryptosporidium</i> , <i>Cyclospora</i> oocysts take days or weeks to become infectious.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, pp. 22-23, <i>Cyclospora</i>
31 E	Amoebae use pseudopodia, not flagella, for movement. Corrected: Amoebae use pseudopodia to move; flagellates have whip-like flagella.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, p. 5, protozoan classification
32 A	Negative <i>Brucella</i> cultures do not exclude disease. Corrected: Negative culture results do not exclude brucellosis because organisms may be cultivated mainly during acute disease or recurrence.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 8, <i>Brucella</i> laboratory diagnosis
33 D	The H antigen is flagellar, not capsular. Corrected: The K antigen is capsular polysaccharide; the H antigen is flagellar.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, pp. 5-6, Enterobacteriaceae antigens
34 A	<i>Campylobacter</i> colonies are not hemolytic on blood-containing agar media. Corrected: <i>Campylobacter</i> colonies may be colorless or gray, watery/spreading or round/convex, and hemolysis is not observed.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 18, <i>Campylobacter</i> culture
35 B	Uncomplicated non-typhoidal <i>Salmonella</i> gastroenteritis is usually managed supportively without antibiotics. Corrected: Antimicrobial therapy is usually not necessary and not recommended for uncomplicated non-typhoidal <i>Salmonella</i> gastroenteritis.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, p. 17, <i>Salmonella</i> treatment
36 B	<i>Leptospira</i> grow aerobically at 28-30 degrees C in semisolid medium, not anaerobically on MacConkey at 42 degrees C. Corrected: <i>Leptospira</i> grow best under aerobic conditions at 28-30 degrees C in semisolid EMJH medium.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 26, <i>Leptospira</i> culture
37 A	Scolex and proglottids describe cestodes, not nematodes. Corrected: Nematodes are elongated, tapered at both ends, round in cross-section, and unsegmented.	5. Gastrointestinal parasitology (Pt. 1) 2.pdf, p. 6, helminth classification
38 D	Ceftriaxone is commonly used in children with shigellosis. Corrected: Ceftriaxone is commonly used for treatment of children with shigellosis.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 25-26, <i>Shigella</i> treatment
39 A	Rapid urease testing detects a pH color change quickly, not a redox change in 24-48 hours. Corrected: Rapid urease test detects urease activity within 1-2 hours by pH color change.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, pp. 23, 27, <i>H. pylori</i> identification
40 B	EPEC confirmation requires tissue culture adhesion assays that are not readily available in most clinical labs. Corrected: EPEC can be suspected clinically but requires confirmation by tissue culture adhesion assays.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, pp. 2, 5, diarrheagenic <i>E. coli</i> diagnosis
41 C	Reduced gastric acidity lowers, rather than raises, the infectious dose. Corrected: Achlorhydria, hypochlorhydria, or PPI use lowers the infectious dose of <i>V. cholerae</i> .	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 7, cholera pathogenesis
42 A	The timing is reversed. Corrected: Agglutinating antibodies first appear 5-7 days after infection and peak at 5-8 weeks.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, pp. 27-28, <i>Leptospira</i> immunity/diagnosis

	False option and correction	Source
43 E	Gram stain and lactose fermentation are bacterial tests, not helminth egg identification features. Corrected: Nematode egg identification uses morphology such as size, shape, shell thickness, polar plugs, knobs, spines, and opercula.	GI helminths 3.pdf, p. 2, intestinal nematodes
44 E	Antigenic variation complicates classification. Corrected: Antigenic variation helps immune evasion and complicates epidemiologic classification.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, p. 6, Enterobacteriaceae antigenic structure
45 E	Ticks transmit Coxiella among animals, but tick transmission to humans is uncommon. Corrected: Human infection occurs mainly by inhalation of contaminated dust or aerosols from placenta, dried feces, urine, or milk.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 29, Coxiella epidemiology
46 B	HUS with Shiga toxin 2 is a STEC association, not typical EAEC. Corrected: EAEC commonly causes watery diarrhea and may contribute to prolonged disease and nutritional compromise.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, pp. 12, 15, EAEC/STEC
47 D	Clinically significant aeromonads are resistant to penicillin and ampicillin. Corrected: Clinically significant aeromonads are resistant to penicillin and ampicillin and often resistant to cefazolin and ticarcillin.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 17, Aeromonas treatment
48 A	AFB staining and culture have low sensitivity but high specificity in abdominal TB. Corrected: AFB staining and culture have low sensitivity but high specificity and remain important components of testing.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 22-23, abdominal TB diagnosis
49 D	S. Typhi is human-adapted, not primarily a reptile pathogen. Corrected: Salmonella Typhi is highly adapted to humans and does not cause disease in nonhuman hosts.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, pp. 21-22, Salmonella epidemiology/pathogenesis
50 B	IgM disappears rapidly and antibody testing is limited for active infection or cure. Corrected: Stool antigen testing or urea breath testing is useful for active infection/test of cure; IgM is of little diagnostic value.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, pp. 25, 27, H. pylori diagnosis
51 E	Antimotility agents are avoided in STEC. Corrected: Antibiotics and antimotility agents are generally avoided in STEC infection.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, p. 15, STEC management
52 B	The PDF lists pasteurization at 71.5 degrees C for 15 seconds. Corrected: Pasteurization at 71.5 degrees C for 15 seconds destroys viable Coxiella species.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, p. 30, Coxiella treatment/prevention
53 C	Albendazole and mebendazole are listed as alternatives. Corrected: Ivermectin is the drug of choice; albendazole or mebendazole may be alternatives.	GI helminths 3.pdf, pp. 19-20, Strongyloides treatment/hyperinfection
54 B	Enterobius eggs are laid in perianal folds, not deep in jejunal mucosa. Corrected: Fertilized female worms lay characteristic asymmetric eggs in the perianal folds.	GI helminths 3.pdf, pp. 3-4, Enterobius life cycle
55 C	Saprophytes grow more rapidly and are less acid-fast. Corrected: Saprophytes grow more rapidly than TB bacilli and are less acid-fast.	4. Brucella, Leptospira, Coxiella and Abdominal TB 3(1).pdf, pp. 20-21, TB culture/morphology
56 B	A single Widal titer is not reliable for definitive diagnosis. Corrected: Serologic tests cannot be relied upon to establish a definitive diagnosis of typhoid fever.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 4.pdf, p. 14, Salmonella serology
57 A	H. pylori is usually acquired in early childhood and can persist long-term. Corrected: Infection is usually acquired in early childhood and may persist lifelong without appropriate antibiotics.	Vibrio, Aeromonas, Campylobacter and Helicobacter PDF, p. 29, H. pylori epidemiology
58 D	Shiga toxins are exotoxins made by particular pathogenic strains, not universal O antigen components. Corrected: Exotoxins, including enterotoxins and Shiga toxins, explain many diarrheal syndromes caused by selected strains.	Enteric Gram-negative bacterial infections of the Gastrointestinal tract 3.pdf, p. 7, virulence factors
59 B	Avoiding undercooked pork with cysticerci applies to Taenia solium, not hookworm control. Corrected: Hookworm prevention includes sanitation, controlled disposal of human feces, and wearing shoes in endemic areas.	GI helminths 3.pdf, pp. 15-16, hookworm clinical disease/control

	False option and correction	Source
60 E	Uncomplicated <i>Campylobacter</i> enteritis is usually managed with fluid and electrolyte replacement, not routine multi-drug antibiotics for all cases. Corrected: <i>Campylobacter</i> enteritis generally requires only fluid and electrolyte replacement; severe or systemic illness may need antibiotics.	<i>Vibrio</i> , <i>Aeromonas</i> , <i>Campylobacter</i> and <i>Helicobacter</i> PDF, p. 19, <i>Campylobacter</i> treatment