

**PART 1 FACEM**  
**PATHOLOGY EXAMINATION**

**45 questions, allow 60 minutes**

1. The human cell membrane:
  - a) is a phospholipid trilayer
  - b) has the fatty acid radicals on its outer edge
  - c) is permeable to alcohol
  - d) is permeable to glucose
  - e) all of the above
2. The peripheral proteins of the cell membrane:
  - a) act as ion channels
  - b) act as enzymes
  - c) act as cotransporters
  - d) act as hormone receptor sites
  - e) generate the negative charge of the cell membrane
3. The Golgi apparatus:
  - a) is closely related to the endoplasmic reticulum
  - b) form peroxisomes
  - c) contain oxidases to form hydrogen peroxide
  - d) contain a large number of ribosomes on their outer surface
  - e) is contained within the ectoplasm
4. The nuclear membrane:
  - a) allows molecules only of MW<1000 through its nuclear pores
  - b) is continuous with the endoplasmic reticulum
  - c) is lined with oxidative phosphorylation enzymes
  - d) is impermeable to RNA
  - e) consists of three distinct layers
5. ATP:

- a) is acetyl tetraphosphate
  - b) supplies the energy for muscle contraction
  - c) is largely formed in the endoplasmic reticulum
  - d) contains no nitrogen
  - e) stores energy in special sulphate bonds
6. Intracellular fluid:
- a) contains phosphate in similar concentrations to extracellular fluid
  - b) has a lower PCO<sub>2</sub> than extracellular fluid
  - c) has a potassium concentration of 110meq/L
  - d) has a pH of 7.5
  - e) contains more magnesium than extracellular fluid
7. Oedema can be caused by:
- a) raised capillary hydrostatic pressure
  - b) reduced colloid osmotic pressure
  - c) vitamin C deficiency
  - d) elevated Angiotensin II levels
  - e) all of the above
8. The process of blood coagulation involves:
- a) prothrombin activator converting fibrinogen to fibrin
  - b) the removal of peptides from each fibrinogen molecule
  - c) the action of plasmin on fibrin
  - d) alpha <sub>2</sub> macroglobulin
  - e) the action of antithrombin III to promote clotting

9. T lymphocytes:
- a) are involved in humoral immunity
  - b) are derived from the fetal liver and bone marrow
  - c) release performed antibodies
  - d) are the precursors of plasma cells
  - e) form memory cells
10. With regard to blood types:
- a) group A is the most common
  - b) anti A and anti B agglutinins increase into the sixth decade
  - c) there are 6 possible ABO genotypes
  - d) group AB persons have both anti A and anti B agglutinins
  - e) group O positive is the universal recipients blood type
11. Apoptosis:
- a) is usually stimulated by hypoxia
  - b) produces a moderate degree of inflammation
  - c) features chromatin aggregates
  - d) is the underlying process in caseous necrosis
  - e) is stimulated by decreased cytosolic calcium
12. All of the following are endogenous antioxidants EXCEPT:
- a) glutathione
  - b) transferin
  - c) superoxide dismutase
  - d) catalase
  - e) ferrous sulphate

13. Irreversible cell injury is characterised by:
- a) dispersion of ribosomes
  - b) cell swelling
  - c) lysosomal rupture
  - d) cell membrane defects
  - e) nuclear chromatin clumping
14. Dystrophic calcification can be caused by:
- a) sarcoidosis
  - b) multiple myeloma
  - c) advanced renal failure
  - d) advanced atherosclerosis
  - e) all of the above
15. Metaplasia:
- a) is an increase in the number and size of cells in a tissue
  - b) is the process that occurs in Barretts oesophagitis
  - c) is typically an irreversible process
  - d) in the respiratory tract preserves mucus secretion
  - e) can be caused by vitamin B12 deficiency
16. The first vascular response to injury is:
- a) slowing of the circulation
  - b) arteriolar vasoconstriction
  - c) capillary engorgement
  - d) recruitment of vascular beds
  - e) venular dilation

17. The classic cardinal signs of acute inflammation include all the following EXCEPT:
- a) tumor
  - b) calor
  - c) laesor
  - d) rubor
  - e) dolor
18. Leukocytes move into the tissues from the vasculature
- a) by the actions of actin and myosin
  - b) in response to the Fc fragment of IgG
  - c) in response to C3b
  - d) largely in the arterioles
  - e) predominantly as monocytes in the first day post injury
19. Regarding chemical mediators of inflammation:
- a) histamine is derived from plasma
  - b) serotonin is preformed in mast cells
  - c) nitric oxide is preformed in leukocytes
  - d) the kinin system is activated in platelets
  - e) C3B is within macrophages
20. Pain during an inflammatory process is mediated by:
- a) nitric oxide
  - b) C3B
  - c) C5A
  - d) PAF
  - e) bradykinin

21. Macrophages are derived from:
- a) monocytes
  - b) T lymphocytes
  - c) B lymphocytes
  - d) eosinophils
  - e) plasma cells
22. Granulomatous inflammation can be induced by:
- a) syphilis
  - b) foreign body
  - c) cat-scratch disease
  - d) silicosis
  - e) all of the above
23. For an incised surgical wound strength would be 10% at:
- a) 12 hours
  - b) 24 hours
  - c) 3 days
  - d) 1 week
  - e) 2 weeks
24. Heart failure will lead to increased levels of:
- a) renin
  - b) aldosterone
  - c) ADH
  - d) atrial natriuretic factor
  - e) all of the above

25. Pulmonary embolism:
- a) leads to pulmonary infarction in 15% of cases
  - b) requires 25% of the pulmonary circulation occluded to cause acute right heart failure
  - c) is generally symptomatic
  - d) is the cause of death in 40-45% of hospitalised patients
  - e) is most commonly due to hereditary hypercoagulable states
26. White infarcts occur in the:
- a) small intestine
  - b) kidney
  - c) lung
  - d) sigmoid colon
  - e) oesophagus
27. Type II hypersensitivity reactions:
- a) involve cell mediated immune responses
  - b) include serum sickness as an example
  - c) explain many transfusion reactions
  - d) involve IgE on mast cells
  - e) explain the tuberculin skin test
28. Which of the following can be considered autoimmune diseases:
- a) rheumatoid arthritis
  - b) IDDM
  - c) myasthenia gravis
  - d) Hashimotos disease
  - e) all of the above

29. IgG is composed of:
- a) a gamma globulin with four antigen binding sites
  - b) a gamma globulin of MW 900,000
  - c) two IgA molecules linked together
  - d) two heavy and two light chain types
  - e) two heavy chains and four light chain units
30. Passive immunity is achieved by administering:
- a) live virus
  - b) attenuated virus
  - c) adsorbed toxin
  - d) activated T cells
  - e) all of the above
31. The majority of HIV/AIDS cases are reported from:
- a) homosexual males
  - b) IV drug users
  - c) haemophiliacs
  - d) recipients of blood products
  - e) heterosexual contact
32. Following a needlestick from an HIV positive patient the risk of HIV seroconversion is:
- a) 1 in 5
  - b) 1 in 10
  - c) 1 in 50
  - d) 1 in 250
  - e) 1 in 1,000

33. The HIV virus:
- a) is a retrovirus
  - b) primarily targets the CNS and haemopoietic systems
  - c) binds to the CD4 molecule on T cells
  - d) binds to the CD4 molecule on macrophages
  - e) all of the above
34. The most common malignancy in patients with AIDS is:
- a) non Hodgkins lymphoma
  - b) primary lymphoma of the brain
  - c) Kaposi's sarcoma
  - d) histoplasmosis
  - e) cervical carcinoma in women
35. With regard to tumours:
- a) dysplasia will always progress to cancer
  - b) cystic teratomas are malignant
  - c) squamous papillomas are benign
  - d) the presence of mitoses indicates neoplasia
  - e) hypochromasia is characteristic of anaplasia
36. Metastasis:
- a) unequivocally proves malignancy
  - b) is proven by lymph node enlargement adjacent to a tumour
  - c) of breast cancer is usually to supraclavicular nodes
  - d) is the commonest presentation of melanoma
  - e) all of the above

37. The most common cause of cancer death in women is:
- a) colorectal cancer
  - b) lung cancer
  - c) pancreatic cancer
  - d) breast cancer
  - e) lymphoproliferative tumours
38. The following viruses are considered to be oncogenic:
- a) hepatitis B
  - b) hepatitis C
  - c) Epstein Barr virus
  - d) human papilloma virus
  - e) all of the above
39. Bacterial endotoxin :
- a) is exemplified by streptokinase
  - b) is the cause of the severe form of diphtheria
  - c) is the cause of gas gangrene
  - d) is from the outer cell wall of gram positive bacteria
  - e) induces production of TNF
40. Exposure to benzene causes:
- a) mesothelioma
  - b) bladder carcinoma
  - c) stomach carcinoma
  - d) liver angiosarcoma
  - e) leukaemia

41. Endocarditis in IV drug users typically:
- a) involves the mitral valve
  - b) is caused by candida albicans
  - c) does not cause fever
  - d) has a better prognosis than other causes of endocarditis
  - e) is caused by staph aureus
42. All of the following are major risk factors for atherosclerosis EXCEPT:
- a) obesity
  - b) hyperlipidaemia
  - c) smoking
  - d) hypertension
  - e) diabetes
43. Regarding acute myocardial infarction all of the following are true EXCEPT:
- a) irreversible cell injury occurs after 3-4 hours
  - b) hormone replacement therapy is protective against AMI
  - c) isolated right ventricular infarction is uncommon
  - d) the macroscopic changes of AMI are visible at 18 hours post AMI
  - e) coagulative necrosis will be observed at 6 hours post infarction
44. Regarding pancreatitis:
- a) the second commonest cause is infectious agents
  - b) trypsin is implicated as an activator of the kinin system
  - c) elastase is the only pancreatic enzyme that acts to limit pancreatitis
  - d) the chronic form is usually due to gallstones
  - e) duct obstruction is not the mechanism of injury in alcoholic pancreatitis

45. Metabolic alkalosis can be caused by:
- a) administering sodium gluconate
  - b) severe diarrhoea
  - c) uraemia
  - d) excess aldosterone
  - e) administering ammonium chloride

## ANSWERS AND REFERENCES

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4.	Guyton 8th	15-16	B
5.	Guyton 8th	19-21	B
6.	Guyton 8th	39	E
7.	Guyton 8th	281-282	E
8.	Guyton 8th	391-396	B
9.	Guyton 8th	375-380	E
10.	Guyton 8th	385-387	C
11.	Robbins 5th	17-20	C
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18.	Robbins 5th	59-62	A
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22.	Robbins 5th	81	E
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24.	Robbins 5th	95	E
25.	Robbins 5th	111	A
26.	Robbins 5th	114-115	B
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28.	Robbins 5th	195	E
29.	Guyton 8th	377-378	D
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31.	Robbins 5th	219	E
32.	Robbins 5th	221	D
33.	Robbins 5th	221 - 222	E
34.	Robbins 5th	229	C
35.	Robbins 5th	243 - 247	C
36.	Robbins 5th	250 - 251	A
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40.	Robbins 5th	393	E
41.	Robbins 5th	395, 551-554	E
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