

GENESIS

(Post Graduation Medical Orientation Centre)

Friday Mega Batch

Total Number- 100

Pass Mark- 70

Topic: Respiratory System & GP

Question 31-50 is based on Single answers

Time: 40 Min

Date: 24/01/2020

1. Compliance of lung greater in-

- a) Fluid filled alveoli
- b) Apex of lung
- c) Sitting position
- d) Forceful inspiration
- e) Infant than older age

TF(base)F(standing)F(quiet)F(older) [ref:Genesis 16]

2. Cells present in respiratory tract except respiratory bronchiole are

- a) Clara cell
- b) Type-I pneumocyte
- c) Brush cell
- d) Goblet cell
- e) Basal cell

FFTTT [ref:genesis:5]

3. Substance synthesized in lung and released into blood are-

- a) Histamine
- b) Serotonin
- c) Bradykinin
- d) Prostaglandins
- e) kallikrein

TTFTT [ref:genesis 8]

4. Functions of lung-

- a) Synthesize surfactant for systemic use
- b) Cause lysis of clot
- c) Excretion of ammonia
- d) Excretion of ketone body
- e) Convert angiotensinogen to angiotensin-II

F(local)TTTF(ang I to II) [ref:genesis 8]

5. During quiet breathing-

- a) Intra esophageal pressure lowest at mid inspiration
- b) Intra alveolar pressure highest at end of expiration
- c) Intra pleural pressure lowest at mid inspiration
- d) Intrapulmonary pressure highest at mid expiration
- e) Rate of air entry highest at mid inspiration

F(end of inspiration)F(end of expiration)F(end of inspiration)TT [ref:genesis 9]

6. Which are correct for lung volume and capacities

- a) Residual volume is 1100ml
- b) Tidal volume is 500ml
- c) Inspiratory capacity=TV+IRV
- d) Functional residual capacity=IRV+RV
- e) Vital capacity=VC+RV

F(1200)TTF(ERV+RV)F(IRV+TV+ERV) [ref:genesis:13]

7. During exercise which parameters remain unchanged-

- a) Arterial PO_2
- b) O_2 consumption
- c) Arterial PCO_2
- d) Venous P^H
- e) Arterial P^H

TF(increased)TFT [ref: genesis 17]

8. During inspiration base of lung has-

- a) High PO_2
- b) Low PCO_2
- c) More negative intrapleural pressure
- d) More ventilation
- e) More ventilation/perfusion ratio

F(low)TTTF(low) [ref: genesis 20]

9. Ventilation/perfusion ratio-

- a) Causing respiratory failure when mismatch occur
- b) Is infinity when no gas exchange
- c) Is zero when no gas exchange
- d) High represents physiological shunt
- e) Low represents physiological dead space.

TTTF (Physiological dead space) F (shunt) [ref: genesis 20]

10. Oxygen and carbon-di-oxide transport in blood

- a) About 7% CO_2 transport as dissolve in water
- b) 3% CO_2 transport as dissolve in water
- c) 7% O_2 transport in the form of HCO_3
- d) 97% O_2 transport as O_2 -Hb
- e) 23% CO_2 transport as carbamino compound

TF(7%)F(3%)TT [ref:genesis 26,27]

11. In case of reverse chloride shift-

- a) Cl⁻ efflux from RBC
- b) Cl⁻ influx into RBC
- c) CO₂ influx into RBC
- d) HCO₃⁻ influx into RBC
- e) Occurs in tissue level

TFF (efflux)TF(lung) [ref: genesis 28]

12. Acute changes in high altitude

- a) O₂-Hb dissociation curve shift to left
- b) Hb concentration increases
- c) PO₂ decreases
- d) PCO₂ increases
- e) Arterial P^H increases

TF(no change)TF(decreases)T [ref:genesis 29]

13. Following features are found in acclimatization

- a) Pulmonary oedema
- b) Venous thromboembolism
- c) Right ventricular hypertrophy
- d) O₂-Hb dissociation curve shift to left
- e) Polycythemia

TTTF(rt)T [ref:genesis 29]

14. Which are cause of stagnant hypoxia-

- a) CO poisoning
- b) Cyanide poisoning
- c) Shock
- d) Narcotics
- e) Congestive cardiac failure

FFFTT [ref:genesis 30]

15. Causes of histotoxic hypoxia

- a) CO poisoning
- b) Cyanide poisoning
- c) Narcotics
- d) Right to left shunt
- e) Decreased Hb

FTTFF [ref: genesis 30]

16. Which is not the central cause of hypercapnia

- a) Brain stem lesion
- b) Sleep apnea
- c) Multiple sclerosis
- d) Myasthenia
- e) Peripheral neuropathy

FFTTT [ref: Genesis 32]

17. Pneumotaxic centre –

- a) Increase duration of inspiration
- b) Increase rate of respiration
- c) Increase depth of respiration
- d) Damage causes slower respiration
- e) Stimulate apneustic centre

F(decrease)TF(decrease)TF(inhibit) [ref:genesis 33]

18. Apneustic centre-

- a) Increase duration of inspiration
- b) Increase rate of respiration
- c) Increase depth of respiration
- d) Continuous stimulation causes apneusis
- e) Stimulate by vagus nerve

TF(decrease)TTF(inhibit) [ref:genesis 33]

19. Respiratory function changes in old age

- a) Loss of chest wall compliance
- b) Increase reserve capacity
- c) Increase ventilation perfusion mismatch
- d) Reduce ventilator responses to hypoxia
- e) Impaired defences against infection

TF(decrease)TTT [ref:Davidson 23rd, 17.1,550]

20. What are causes of acute Type-II Respiratory failure

- a) Acute exacerbation asthma
- b) COPD
- c) Sleep apnoea
- d) Narcotic drugs
- e) Ankylosing spondylitis

TTFTF [ref: Davidson 23rd, 17.16, 565]

21. Surface tension in lung-

- a) Creates a collapsing pressure inversely proportional to radius
- b) Having high collapsing pressure in large alveoli
- c) Causes atelectasis in absence of surfactant
- d) Causes more difficult to keep open small alveoli
- e) Is expressed as dynes/cm².

TF(low)TTT [Ref:BRS physiology 120]

Laplace's Law:collapsing

$$\text{pressure}(P) = \frac{2T(\text{surface tension})}{r(\text{radius})}$$

*large alveoli=low collapsing pressure=easy to keep open

*Small alveoli=high collapsing pressure=difficult to open

*dynes are unit of force acting on a mass of 1gm

22. In breathing cycle-

- a) Lung volume in FRC at rest
- b) Alveolar pressure are positive during inspiration
- c) Intrapleural pressure is negative during expiration
- d) Alveolar pressure equals to atmospheric pressure at rest
- e) Intrapleural pressure become positive during forceful expiration

TF(negative in inspiration)F(negative in expiration)TT [ref: BRS physiology 122,123]

At rest:alveolar pressure zero,intrapleural pressure negative

Inspiration:alveolar pressure negative,intrapleural pressure more negative

Expiration: alveolar pressure positive, intrapleural pressure negative, positive in forceful expiration.

23. Factors shifting O₂-Hb dissociation curve to Right-

- a) ↑ P₅₀
- b) Hypoxia
- c) Myxodema
- d) HbF
- e) Polycythemia

TFTFT [ref: genesis 22]

24. Factors shifting O₂-Hb dissociation curve to Left

- a) When affinity of Hb to O₂ increases
- b) CO poisoning
- c) HbS
- d) Stored blood
- e) Thyrotoxicosis

TFTTF [ref: genesis 22]

25. Changes occur during inspiration-

- a) Blood is squeezed out of the lung
- b) Rise of venous return to the left heart
- c) Fall of intra-thoracic pressure
- d) Increase in the capacitance of the pulmonary vascular bed
- e) Increase in the output of the left heart

FFTTF [ref: genesis 10]

26. Spirometry can measure-

- a) PEFR
- b) FRC
- c) VC
- d) RV
- e) Inspiratory capacity

TFTFT [ref: genesis:13]

27. Chemical factor in the regulation of respiration

- a) PCO₂ indirectly stimulate central chemoreceptor
- b) PCO₂ indirectly stimulate peripheral chemoreceptor
- c) Central chemoreceptor situated in ventral surface of medulla
- d) Peripheral chemoreceptor situated in pons
- e) CO₂ increase alveolar ventilation 4 fold

TFTFF [ref: genesis 35, 36]

28. Non-membranous organelles are?

- a) Microtubule
- b) Golgi apparatus
- c) Endoplasmic reticulum
- d) Centrosome
- e) Ribosome

TFTTT [Ref: genesis 6]

29. Component of cytoskeleton?

- a) Mitochondria
- b) Microtubules
- c) Nucleus
- d) Intermediate filament
- e) Cell wall

FTTTF [Ref: genesis 13]

30. Example of secondary active transport?

- a) Na⁺ -K⁺ + pump
- b) Na⁺ -H⁺ + exchanger
- c) Ca²⁺ + pump
- d) Na⁺ -glucose co transport
- e) H⁺ pump

TFTFT [Ref: genesis 18]

Each question below contains five suggested answers- choose the one best response to each question (31-50)

31. Following inhibits actin-myosin interaction?

- a) Acetylcholine-esterase
- b) Troponin-T
- c) Troponin-C
- d) Troponin-I
- e) Na⁺

D [Ref: vision physiology 7th 24]

32. Na⁺ -K⁺ + pump is inhibited by?

- a) Frusemide
- b) Bisoprolol
- c) Digitalis
- d) Disopyramide
- e) Flecainide

C [Ref: ganong 20th, 32]

33. A patient with carbon dioxide retention is likely to have

- a) Metabolic acidosis
- b) Alkaline urine
- c) Cool extremities
- d) Raised cerebral blood flow
- e) Low plasma bicarbonate

C (Roddie-Q-179)

34. Tight gap junction is present in-

- a) Epithelium of human lung
- b) Cardiac muscle
- c) Skin
- d) Urinary bladder
- e) Thyroid & Adrenal glands

A (other are gap junction)[Ref: Ganong 25th page-41]

35. Substance which on is not partially from the blood

- a) Prostaglandins
- b) Bradykinin
- c) Adenine nucleotide
- d) Serotonin
- e) Histamine

E (It is synthesized, stored & released in blood) Ref: Ganong 25th page-637)

36. Which of the following is responsible for the movement of O₂ from the alveoli into the blood in the pulmonary capillaries?

- a) Active transport
- b) Filtration
- c) Secondary active transport
- d) Facilitated diffusion
- e) Passive diffusion

E (Ref: Ganong 25th Page-638)

37. Chemical substance which passes through the CSF to brain for stimulating the respiratory center

- a) O₂
- b) H⁺
- c) CO₂
- d) OH⁻
- e) HCO₃⁻

C (Ref: Ganong 25th Page-657)

38. The main respiratory control neurons

- a) Send out regular bursts of impulse to expiratory muscles during quiet respiration
- b) Are unaffected by stimulation of pain receptors
- c) Are located in pons
- d) Send out regular bursts of impulse to inspiratory muscles during quiet respiration
- e) Are unaffected by impulses from cerebral cortex

D (Ref: Ganong 25th P-667)

39. Bronchial cartilage disappears in

- a) Lobar bronchus
- b) Segmental bronchus
- c) Alveolar sac
- d) Bronchioles
- e) Principal bronchus

D (Ref: Grays anatomy 41st Page-968)

40. Tetany occurs in hyperventilation due to

- a) Respiratory acidosis
- b) Metabolic alkalosis
- c) Metabolic acidosis
- d) ↑ H⁺ concentration in blood
- e) Increase neuronal excitability

E [Ref-Ganong-25th ,Page-645]

41. Voluntary respiratory control center is present in

- a) Dorsal portion of medulla oblongata
- b) Ant. lateral part of medulla oblongata
- c) Upper portion of pons
- d) Cerebral cortex
- e) Lower portion of pons

D (Ref: Guyton 13th, page-539)

42. Oxygen debt is

- a) The amount of O₂ consumed after cessation of exercise.
- b) Incurred because the pulmonary capillary walls limit O₂ uptake during exercise.
- c) Possible since skeletal muscle can function temporarily without oxygen.
- d) Associated with a fall in blood lactate.
- e) Associated with respiratory acidosis.

C

43. An arterial blood gas sample from a 36 years old man shows low P(O₂). If the P(O₂) in the blood is low the most likely course is-

- a) Anaemic hypoxia
- b) Histotoxic hypoxia
- c) Hypaemic hypoxia
- d) Hypoxic hypoxia
- e) Stagnant hypoxia

D

44. Spirometry measures all of the following except

- a) Tidal Volume
- b) Residual Volume
- c) Vital capacity
- d) FEV₁
- e) Inspiratory capacity

B

45. Regarding Hypoventilation which one is not correct-

- a) Influx of CO₂ into RBC
- b) Influx of Cl⁻ into RBC
- c) Efflux of HCO₃⁻ from RBC
- d) Decrease P^H
- e) Metabolic acidosis occurs

E

46. Which one is more important to confirm the diagnosis in obstructive lung disease-

- a) FVC
- b) FEV₁
- c) Tidal volume
- d) Inspiratory capacity
- e) PEF

B

47. Respiratory center is directly stimulated by

- a) PCO_2
- b) PO_2
- c) H^+ ion
- d) Na^+ ion
- e) K^+ ion

B

48. You are asked to assess a patient on an ICU who is ventilated at a frequency of 12 per minute and a tidal volume of 0.6L. His arterial PH is > 7.6. To correct his respiratory alkalosis, you should :

- a) Decreased dead space
- b) Decreased tidal volume
- c) Increase oxygen function
- d) Increase minute ventilation
- e) Use positive end expiratory pressure (PEEP)

B

49. The oxygen-haemoglobin dissociation curve is usually a sigmoid plot. The curve will shift to the right with:

- a) Acute alkalosis
- b) Decrease PCO_2
- c) Decrease in temperature
- d) Decrease in 2,3-DPG
- e) Exercise

E

50. Pulmonary vascular resistance increases –

- a) At high altitude
- b) During space flight
- c) On exercise
- d) With anaemia
- e) On inspiring 100% oxygen

A