

POWER EXERCISE

16.1: Nutrients

2015

1. Which one of the following vitamins is not fat soluble?
(a) A (b) B
(c) D (d) E (AMU)

2014

2. Which one of the following vitamins is anti-haemorrhagic?
(a) Vitamin B₁₂ (b) Vitamin B₅
(c) Vitamin C (d) Vitamin K (AIIMS)

2013

3. A healthy person eats the following diet-5 gm raw sugar, 4 gm albumin, 10 gm pure buffalo ghee adulterated with 2 gm vegetable ghee (hydrogenated vegetable oil) and 5 gm lignin. How many calories he is likely to get?
(a) 126 (b) 164
(c) 112 (d) 144 (NEET Karnataka)

4. Which of the following elements is a constituent of biotin?
(a) Magnesium (b) Calcium
(c) Phosphorus (d) Sulphur (NEET Karnataka)

2012

5. In a normal adult, ascending order of concentration of following molecules is
(a) K > Na > Fe > Cu (b) Na > K > Cu > Fe
(c) Fe > Na > K > Cu (d) Na > Fe > K > Cu. (AIIMS)

6. Cyanocobalamin is required for the maturation of
(a) RBC (b) platelets
(c) WBC (d) lymph. (AFMC)

7. Which of the following acid is also a vitamin?
(a) Ascorbic acid (b) Formic acid
(c) Malic acid (d) Palmitic acid (AFMC).

8. Which one of the following vitamins is manufactured in human liver?
(a) Vitamin A (b) Vitamin D
(c) Vitamin C (d) Vitamin K (BHU)

2011

9. The purplish red pigment rhodopsin contained in the rods type of photoreceptor cells of the human eye, is a derivative of

- (a) vitamin B₁ (b) vitamin C
(c) vitamin D (d) vitamin A.

(AIPMT Prelim)

10. Sulphur is not a constituent of

- (a) cysteine (b) methionine
(c) ferredoxin (d) pyridoxine. (AMU)

11. A balanced diet does not include

- (a) carbohydrates and fats
(b) nucleic acids and enzymes
(c) proteins and vitamins
(d) minerals and salts. (Karnataka CE)

2010

12. Vitamin B₆ is also called

- (a) thiamine (b) pantothenic acid
(c) pyridoxine (d) retinol. (AIIMS)

13. Vitamin-D is produced in human body in

- (a) muscles (b) nerves
(c) skin (d) bone-marrow. (WB JEE)

2009

14. In human percent of body weight of carbohydrates, lipids and proteins respectively is

- (a) 1, 15, 17 (b) 15, 17, 7
(c) 7, 17, 15 (d) 17, 15, 7. (AMU)

15. The number of essential amino acids in adult human is

- (a) nine (b) eight
(c) four (d) seven. (JEE)

16. Which of the following is used for long term energy storage by animals?

- (a) Amino acids (b) Glucose
(c) Fat (d) Glycogen (JEE)

2008

17. Anti-haemorrhagic vitamin is

- (a) vitamin C (b) vitamin B
(c) vitamin A (d) vitamin K. (BHU)

16.2: Alimentary Canal

2017

18. Which cells of 'crypts of Lieberkuhn' secrete antibacterial lysozyme?

- (a) Paneth cells (b) Zymogen cells
(c) Kupffer cells (d) Argentaffin cells (NEET)

19. A baby boy aged two years is admitted to play school and passes through a dental check-up. The dentist observed that the boy had twenty teeth. Which teeth were absent?

- (a) Canines (b) Pre-molars
(c) Molars (d) Incisors (NEET)

2016

20. Which of the following guards the opening of hepatopancreatic duct into the duodenum?

- (a) Pyloric sphincter (b) Sphincter of Oddi
(c) Semilunar valve (d) Ileocaecal valve (NEET Phase-I)

21. In the stomach, gastric acid is secreted by the

- (a) peptic cells (b) acidic cells
(c) gastrin secreting cells (d) parietal cells. (NEET Phase-I)

22. The main function of the lacteals in the villi of human small intestine is to absorb

- (a) fat globules
(b) water and mineral salts
(c) amino acids
(d) glucose and amino acids
(e) glucose and water. (Kerala PMT)

2015

23. The primary dentition in human differs from permanent dentition in not having one of the following type of teeth.

- (a) Molars (b) Incisors
(c) Canines (d) Premolars (AIPMT)

24. Vermiform appendix arises from

- (a) caecum (b) colon
(c) rectum (d) ileum. (AMU)

25. Brunner's glands are found in

- (a) duodenum (b) jejunum
(c) stomach (d) both (a) and (b). (JIPMER)

26. Choose the correct statement among the following.

- (a) The intestinal mucosal epithelium has oxyntic cells.
(b) Ptyalin converts proteins into proteoses and peptones.
(c) Crypts of Lieberkuhn is seen between the bases of villi in the intestine.
(d) Sphincter of Oddi is present at the junction of oesophagus and cardiac stomach.
(e) Goblet cells secrete hydrochloric acid in stomach. (Kerala PMT)

27. The epithelium found in the inner linings of stomach and intestine is

- (a) columnar (b) squamous
(c) stratified (d) pseudo-stratified. (WB JEE)

2014

28. The middle part of the small intestine is

- (a) duodenum (b) jejunum
(c) ileum (d) pyloric region. (J & K CET)

2013

29. Ileocaecal valve is present in between

- (a) colon and large intestine
(b) colon and small intestine
(c) stomach and small intestine
(d) cardiac stomach and fundus. (Karnataka CET)

2012

30. Argentaffin cells in human beings are found in

- (a) small intestine (b) stomach
(c) large intestine (d) liver. (AMU)

31. In human beings, the three pair of salivary glands and numerous buccal glands produce about

- (a) 1.0 dm³ of saliva per day
(b) 1.5 dm³ of saliva per day
(c) 2.0 dm³ of saliva per day
(d) 2.5 dm³ of saliva per day. (AMU)

32. In the gastrointestinal tract the Meissner's plexus and the Auerbach's plexus occur respectively in the

- (a) lamina propria and muscularis mucosa
(b) submucosa and muscularis externa
(c) submucosa and mucosa
(d) mucosa and muscularis externa. (AMU)

33. The layer lining the lumen of the human alimentary canal is

- (a) serosa (b) sub-mucosa
(c) muscularis (d) pleura
(e) mucosa. (Kerala PMT)

2011

34. Which one of the following correctly represents the normal adult human dental formula?

- (a) $\frac{3}{3}, \frac{1}{1}, \frac{3}{2}, \frac{1}{1}$ (b) $\frac{2}{2}, \frac{1}{1}, \frac{3}{2}, \frac{3}{3}$
(c) $\frac{2}{2}, \frac{1}{1}, \frac{2}{2}, \frac{3}{3}$ (d) $\frac{3}{3}, \frac{1}{1}, \frac{3}{3}, \frac{3}{3}$ (AIPMT Mains)

35. The mucosal layer in the stomach form irregular folds known as

- (a) villi (b) lumen
(c) rugae (d) crypts of Lieberkuhn
(e) lacteals. (Kerala PMT)

36. Column I contains names of the sphincter muscles of the alimentary canal and Column II contains their locations. Match them properly and choose the correct answer.

Column I	Column II
A. Sphincter of ani internus	1. Opening of hepatopancreatic duct into duodenum
B. Cardiac sphincter	2. Between duodenum and posterior stomach
C. Sphincter of Oddi	3. Guarding the terminal part of alimentary canal
D. Ileocaecal	4. Between oesophagus sphincter and anterior stomach
E. Pyloric sphincter	5. Between small intestine and bowel

- (a) A-3, B-2, C-4, D-1, E-5
 (b) A-2, B-5, C-1, D-4, E-3
 (c) A-3, B-4, C-1, D-5, E-2
 (d) A-4, B-3, C-1, D-2, E-5.

(Karnataka CET)

37. Exclusive holozoic nutrition is seen in

- (a) spider (b) man
 (c) housefly (d) earthworm.

(OJEE)

2010

38. Human dental formula is

- (a) $\frac{2123}{2123}$ (b) $\frac{2123}{1223}$
 (c) $\frac{1223}{2123}$ (d) $\frac{1223}{1223}$
 (e) $\frac{2213}{2213}$

(Kerala PMT)

39. The type of teeth present in humans is

- (a) monophodont and homodont
 (b) diphyodont and heterodont
 (c) diphyodont and homodont
 (d) monophodont and thecodont.

(OJEE)

40. The distal part of the stomach that opens into duodenum is called

- (a) fundus (b) pylorus
 (c) omentum (d) jejunum. (OJEE)

2008

41. The uniform protoplasmic extensions on the intestinal epithelium is known as

- (a) brush border (b) striated border
 (c) cilia (d) villi. (AMU)

42. Part of the stomach which opens into the duodenum is
 (a) cardiac (b) pyloric
 (c) fundus (d) body. (BHU)

16.3: Digestive Glands

2017

43. Wharton's duct is the duct of
 (a) submandibular salivary gland
 (b) parotid gland
 (c) sublingual gland
 (d) all of these. (AIIMS)

44. In man, bile duct joins with pancreatic duct to form _____ which is guarded by sphincter of Oddi.
 (a) choledocus duct (b) cystic duct
 (c) ampulla of Vater (d) Wharton's duct (JIPMER)

2015

45. Identify the correctly matched structure and its secretion.

- (a) Brunner's gland - Salivary amylase
 (b) Intestinal mucosa - Insulin
 (c) Gall bladder - Bile
 (d) Salivary gland - Lysozyme
 (e) Goblet cells - HCl (Kerala PMT)

46. The hormone that stimulates the release of pancreatic juice is

- (a) secretin (b) glucagon
 (c) inhibin (d) insulin. (WB JEE)

47. Zymogenic cells of gastric gland secrete

- (a) pepsinogen (b) trypsin
 (c) pepsin (d) chymotrypsin. (WB JEE)

2014

48. Which of the following organs does not produce any digestive enzymes?

- (a) Salivary gland (b) Pancreas
 (c) Liver (d) Stomach (WB JEE)

2012

49. Brunner's glands are found in

- (a) mucosa of duodenum
 (b) mucosa of ileum
 (c) submucosa of duodenum
 (d) submucosa of ileum. (BHU)

50. In man, Glisson's capsule is associated with the

- (a) digestive system (b) excretory system
 (c) nervous system (d) reproductive system
 (e) endocrine system. (Kerala PMT)

51. Brunner's gland is present in
 (a) duodenum (b) jejunum
 (c) ileum (d) rectum. (WB JEE)

2010

52. Brunner's gland is present in
 (a) liver (b) duodenum
 (c) oesophagus (d) stomach. (AFMC)

53. This is the common passage for bile and pancreatic juices
 (a) ampulla of Vater (b) ductus Choledochus
 (c) duct of Wirsung (d) duct of Santorini. (AMU)

54. Glisson's capsule is the characteristic feature of
 (a) mammals (b) birds
 (c) reptiles (d) arthropods. (BHU)

55. The sphincter of Oddi found in man, guards the
 (a) pancreatic duct
 (b) hepatopancreatic duct
 (c) bile duct
 (d) cystic duct
 (e) duodenum. (Kerala PMT)

2008

56. In humans, sphincter of Oddi is associated with the opening of
 (a) hepatopancreatic ampulla
 (b) pyloric stomach
 (c) oesophagus
 (d) common hepatic duct. (J & K CET)

57. Which of the following is the largest gland in an adult man?
 (a) Thyroid (b) Pancreas
 (c) Thymus (d) Liver (UP CPMT)

16.4: Digestion of Food

2017

58. Which of the following options best represents the enzyme composition of pancreatic juice?
 (a) Amylase, Pepsin, Trypsinogen, Maltase
 (b) Peptidase, Amylase, Pepsin, Rennin
 (c) Lipase, Amylase, Trypsinogen, Procarboxypeptidase
 (d) Amylase, Peptidase, Trypsinogen, Rennin (NEET)

2016

59. Which hormones do stimulate the production of pancreatic juice and bicarbonate?
 (a) Angiotensin and epinephrine
 (b) Gastrin and insulin

- (c) Cholecystokinin and secretin
 (d) Insulin and glucagon (NEET Phase-II)

60. Digestion of proteins is incomplete in the absence of enterokinase, because
 (a) trypsinogen is not converted into trypsin
 (b) pepsinogen is not converted into pepsin
 (c) prorennin is not converted into rennin
 (d) chymotrypsinogen is not converted into chymotrypsin. (Karnataka CET)

61. Read the following reactions and choose the correct option.

1. Pepsinogen $\xrightarrow{\text{HCl}}$ Pepsin
 2. Proteins $\xrightarrow{\text{Pepsinogen}}$ Proteoses + peptones
 3. Trypsinogen $\xrightarrow{\text{HCl}}$ Trypsin
 4. Chymotrypsinogen $\xrightarrow{\text{Enterokinase}}$ Chymotrypsin
 5. Peptones $\xrightarrow{\text{Trypsin}}$ Dipeptides
- (a) 1 alone is correct.
 (b) 1 and 5 alone are correct.
 (c) 3 and 5 alone are correct.
 (d) 2, 4 and 5 alone are correct.
 (e) 2 alone is correct. (Kerala PMT)

2015

62. The optimum pH for pepsin is
 (a) 11 (b) 5-6
 (c) 1.6-2.4 (d) 4-7. (AMU)

63. Enzymes not present in pancreatic juice is
 (a) amylase (b) chymotrypsinogen
 (c) lipase (d) enterokinase. (AMU)

64. The enzyme that is not present in succus entericus is
 (a) nucleosidase (b) lipase
 (c) maltase (d) nuclease. (AIPMT)

65. Emulsification of fat occurs by
 (a) bile salts (b) bile pigments
 (c) pancreatic juice (d) succus entericus. (J & K CET)

66. The secretions of the brush border cells of the intestinal mucosa along with the secretion of goblet cells constitute the
 (a) succus entericus (b) chyme
 (c) gastric juice (d) chylomicrons
 (e) bolus. (Kerala PMT)

67. Emulsification of fat takes place through
 (a) bile pigments (b) liver enzymes
 (c) bile salts (d) intestinal enzymes. (UP CPMT)

68. In liver, _____ is converted into _____.
 (a) urea, ammonia (b) ammonia, urea
 (c) nitrate, ammonia (d) ammonia, nitrate (UP CPMT)

106. The wall of the stomach is protected against the action of HCl by
 (a) epidermal layer (b) mesodermal layer
 (c) mucous layer (d) muscular layer.
 (J & K CET)

107. The gastric juice contains
 (a) trypsin, pepsin, lipase
 (b) pepsin, lipase, rennin
 (c) pepsin, amylase, trypsin
 (d) trypsin, pepsin, rennin
 (e) pepsin, rennin, carboxypeptidase.
 (Kerala PMT)

108. Match column I with column II and choose the correct option.

Column I	Column II
A. Goblet cells	1. Antibacterial agent
B. Lysozyme	2. Mucus
C. Saliva	3. HCl
D. Oxyntic cells	4. Sublingual gland
(a) A-3, B-1, C-4, D-2	
(b) A-1, B-3, C-4, D-2	
(c) A-2, B-3, C-1, D-4	
(d) A-4, B-1, C-2, D-3	
(e) A-2, B-1, C-4, D-3	

(Kerala PMT)

109. The sugar present in milk is _____.
 (a) fructose (b) sucrose
 (c) glucose (d) lactose
 (Karnataka CET)

110. Succus entericus is secreted by _____.
 (a) Auerbach's plexus (b) Brunner's glands
 (c) Peyers patches (d) Crypts of Lieberkuhn
 (Karnataka CET)

111. Bile salts in bile help in _____ of fats.
 (a) dehydration (b) deglutition
 (c) emulsification (d) peristalsis (OJEE)

112. Which of the following are proteolytic enzymes?
 (a) Ptyalin, trypsin, pepsin
 (b) Lipase, erepsin, trypsin
 (c) Erepsin, trypsin, pepsin
 (d) Pepsin, nuclease, nucleotidase (OJEE)

113. Which of the following statements is correct?
 (a) Argentaffin cells produce serotonin.
 (b) Villikinin is secreted by large intestine.
 (c) In cheilosis, deficient nutrient is nicotinamide.
 (d) Bleeding diseases occur due to deficiency of vitamin E.
 (UP CPMT)

114. Name the hormone that stimulates the secretion of gastric juice.
 (a) Renin (b) Enterokinase
 (c) Enterogastrone (d) Gastrin (WB JEE)

115. Bile salts act as activator of which enzyme?
 (a) Pepsinogen (b) Trypsinogen
 (c) Lipase (d) Pancreatic amylase
 (WB JEE)

116. Which of the following cells produce HCl?
 (a) β -Cell (b) α -Cell
 (c) Oxyntic cell (d) Chief cell
 (WB JEE)

2009

117. Which one of the following pairs of food components in humans reaches the stomach totally undigested?
 (a) Starch and fat (b) Fat and cellulose
 (c) Starch and cellulose (d) Protein and starch
 (AIPMT)

118. The food that enters intestine from stomach is called
 (a) chyle (b) chyme
 (c) fundus (d) none of these.
 (AFMC)

119. Secretin
 (a) stimulates enzyme secretion by pancreas, inhibits acid secretion in stomach, stimulates gall bladder
 (b) stimulates bicarbonate secretion by pancreas, inhibits acid secretion in stomach, stimulates bicarbonate secretion by liver
 (c) stimulates acid secretion in stomach, potentiates action of CCK, inhibits intestinal movement
 (d) stimulates gall bladder, inhibits acid secretion in stomach, stimulates bicarbonate secretion by pancreas.
 (AMU)

120. In the absence of enterokinase, the digestion of _____ would be affected in our intestine.
 (a) albumin (b) starch
 (c) maltose (d) amino acid
 (Karnataka CET)

121. Compare the statements A and B.
Statement A : Blood sugar level falls rapidly after hepatectomy.
Statement B : The glycogen of the liver is the principal source of blood sugar.
 Select the correct description.
 (a) Statement A is wrong and B is correct.
 (b) Both the statements A and B are correct and B is not the reason for A.
 (c) Both the statements A and B are correct and B is the reason for A.
 (d) Statement A is correct and B is wrong.
 (Karnataka CET)

122. Digestion is brought about by
 (a) hormones (b) neurotransmitters
 (c) growth factors (d) enzymes.
 (OJEE)

123. Salivary amylase, a digestive enzyme begins digestion of
 (a) proteins (b) fats
 (c) carbohydrates (d) all of these.
 (OJEE)

124. Gastric enzymes are

- (a) pepsin
(b) rennin
(c) gastric lipase
(d) all of these.

(UP CPMT)

2008

125. Which one of the following is the correct matching of the site of action on the given substrate, the enzyme acting upon it and the end product ?

- (a) Small intestine : proteins $\xrightarrow{\text{Pepsin}}$ amino acids
(b) Stomach : fats $\xrightarrow{\text{Lipase}}$ micelles
(c) Duodenum : triglycerides $\xrightarrow{\text{Trypsin}}$ monoglycerides
(d) Small intestine : starch $\xrightarrow{\alpha\text{-Amylase}}$ disaccharide (maltose)

(AIPMT)

126. What will happen if the secretion of parietal cells of gastric glands is blocked with an inhibitor?

- (a) In the absence of HCl secretion, inactive pepsinogen is not converted into the active enzyme pepsin.
(b) Enterokinase will not be released from the duodenal mucosa and so trypsinogen is not converted to trypsin.
(c) Gastric juice will be deficient in chymosin.
(d) Gastric juice will be deficient in pepsinogen.

(AIPMT)

127. Food that enters into intestine is known as

- (a) bolus
(b) chyme
(c) chyle
(d) none of these.

(AFMC)

128. pH of gastric juice is

- (a) 2
(b) 4
(c) 6
(d) 8.

(OJEE)

16.5: Absorption of Digested Products

2014

129. Fructose is absorbed into the blood through mucosa cells of intestine by the process called

- (a) active transport
(b) facilitated transport
(c) simple diffusion
(d) co-transport mechanism.

(AIPMT)

2013

130. Select the correct match of the digested products in humans given in column I with their absorption site and mechanism in column II.

Column I

- (a) Glycerol, fatty acids
(b) Cholesterol, maltose
(c) Glycine, glucose
(d) Fructose, Na⁺

Column II

Duodenum, move as chylomicrons
Large intestine, active absorption
Small intestine, active absorption
Small intestine, passive absorption

(NEET)

2012

131. During absorption of carbohydrates in the blood the most rapidly transported monosaccharide is

- (a) glucose
(b) galactose
(c) fructose
(d) sucrose.

(BHU)

2010

132. Carrier ions like Na⁺ facilitate the absorption of substances like

- (a) amino acids and glucose
(b) glucose and fatty acids
(c) fatty acids and glycerol
(d) fructose and some amino acids.

(AIPMT Prelims)

133. The food materials in intestine are absorbed through

- (a) cilia
(b) flagella
(c) villi
(d) vibrissae.

(OJEE)

2009

134. Which one of the following statements is true regarding digestion and absorption of food in humans?

- (a) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na⁺.
(b) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.
(c) About 60% of starch is hydrolysed by salivary amylase in our mouth.
(d) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.

(AIPMT)

135. Most digestion and absorption of food takes place in

- (a) stomach
(b) small intestine
(c) large intestine
(d) caecum.

(OJEE)

2008

136. Fats and lipids are absorbed in

- (a) lymph capillaries
(b) blood capillaries
(c) hepatic portal vein
(d) none of these.

(AFMC)

16.6: Disorders of Digestive System

2015

137. The deficiency of which of the following vitamins will cause xerophthalmia?

- (a) A
(b) B
(c) C
(d) K

(AMU)

138. A patient with bleeding gums is advised to take fresh fruits and vegetables in diet specially because he suffers from

- (a) scurvy
(b) night blindness
(c) beri-beri
(d) anaemia.

(COMEDK)

EXERCISES

1. Choose the correct answer among the following :

- (a) Gastric juice contains
- (i) pepsin, lipase and rennin
 - (ii) trypsin, lipase and rennin
 - (iii) trypsin, pepsin and lipase
 - (iv) trypsin, pepsin and renin
- (b) Succus entericus is the name given to
- (i) a junction between ileum and large intestine
 - (ii) intestinal juice
 - (iii) swelling in the gut
 - (iv) appendix

2. Match column I with column II

Column I

- (a) Bilirubin and biliverdin
- (b) Hydrolysis of starch
- (c) Digestion of fat
- (d) Salivary gland

Column II

- (i) Parotid
- (ii) Bile
- (iii) Lipases
- (iv) Amylases

3. Answer briefly:

- (a) Why are villi present in the intestine and not in the stomach?
- (b) How does pepsinogen change into its active form?
- (c) What are the basic layers of the wall of alimentary canal?
- (d) How does bile help in the digestion of fats?

4. State the role of pancreatic juice in digestion of proteins.

5. Describe the process of digestion of protein in stomach.

6. Give the dental formula of human beings.

7. Bile juice contains no digestive enzymes, yet it is important for digestion. Why?

8. Describe the digestive role of chymotrypsin. Which two other digestive enzymes of the same category are secreted by its source gland?

9. How are polysaccharides and disaccharides digested?

10. What would happen if HCl were not secreted in the stomach?

11. How does butter in your food get digested and absorbed in the body?

12. Discuss the main steps in the digestion of proteins as the food passes through different parts of the alimentary canal.

13. Explain the term thecodont and diphyodont.

14. Name different types of teeth and their number in an adult human.

15. What are the functions of liver?

EXERCISES

1. Define vital capacity. What is its significance?
2. State the volume of air remaining in the lungs after a normal breathing.
3. Diffusion of gases occurs in the alveolar region only and not in the other parts of respiratory system. Why?
4. What are the major transport mechanisms for CO_2 ? Explain.
5. What will be the pO_2 and pCO_2 in the atmospheric air compared to those in the alveolar air ?
 - (i) pO_2 lesser, pCO_2 higher
 - (ii) pO_2 higher, pCO_2 lesser
 - (iii) pO_2 higher, pCO_2 higher
 - (iv) pO_2 lesser, pCO_2 lesser
6. Explain the process of inspiration under normal conditions.
7. How is respiration regulated?
8. What is the effect of pCO_2 on oxygen transport?
9. What happens to the respiratory process in a man going up a hill?
10. What is the site of gaseous exchange in an insect?
11. Define oxygen dissociation curve. Can you suggest any reason for its sigmoidal pattern?
12. Have you heard about hypoxia? Try to gather information about it, and discuss with your friends.
13. Distinguish between
 - (a) IRV and ERV
 - (b) Inspiratory capacity and Expiratory capacity.
 - (c) Vital capacity and Total lung capacity.
14. What is Tidal volume? Find out the Tidal volume (approximate value) for a healthy human in an hour.

POWER EXERCISE

17.1: Human Respiratory System

2015

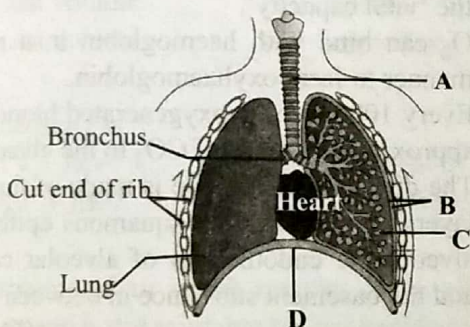
1. Bowman's glands are found in
 - (a) olfactory epithelium
 - (b) external auditory canal
 - (c) cortical nephrons only
 - (d) juxtamedullary nephrons. (JIPMER)
2. The entry of food into the larynx is prevented by
 - (a) mitral valve
 - (b) diaphragm
 - (c) epiglottis
 - (d) hyoid
 - (e) frenulum. (Kerala PMT)

2014

3. The serous membrane which covers the lungs is called
 - (a) pericardium
 - (b) peritoneum
 - (c) perichondrium
 - (d) pleura. (WB JEE)

2013

4. The figure shows a diagrammatic view of human respiratory system with labels A, B, C and D. Select the option which gives correct identification and main function and / or characteristic.



- (a) C - Alveoli - Thin walled vascular bag like structures for exchange of gases
 - (b) D - Lower end of lungs - Diaphragm pulls it down during inspiration
 - (c) A - Trachea - Long tube supported by complete cartilaginous rings for conducting inspired air
 - (d) B - Pleural membrane - Surrounds ribs on both sides to provide cushion against rubbing (NEET)
5. The trachea terminates into
 - (a) bronchial tree
 - (b) atrium
 - (c) bronchi
 - (d) alveoli. (Karnataka CET)

2012

6. Surfactant
 - (a) is a protein produced by type II alveolar cells
 - (b) is excessive in many premature infants resulting in difficulties in breathing

- (c) decreases the surface tension of the fluid lining the alveoli
- (d) is lacking in individuals suffering from acute respiratory distress syndrome. (J & K CET)

7. Alveoli are present in
 - (a) lungs
 - (b) kidney
 - (c) liver
 - (d) brain. (OJEE)

17.2: Mechanism of Breathing

2016

8. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because
 - (a) there is a negative pressure in the lungs
 - (b) there is a negative intrapleural pressure pulling at the lung walls.
 - (c) there is a positive intrapleural pressure.
 - (d) pressure in the lungs is higher than the atmospheric pressure. (NEET Phase-II)

2015

9. Hiccups can be best described as
 - (a) forceful sudden expiration
 - (b) forceful contraction of intercostal muscles during deep breathing
 - (c) vibration of the soft palate during breathing while sleeping
 - (d) jerky incomplete inspiration. (AIIMS)
10. Which of the following is the most appropriate in normal circumstances?
 - (a) During inspiration, the intrapulmonary pressure is less than the atmospheric pressure.
 - (b) During expiration, the intrapulmonary pressure is less than the atmospheric pressure.
 - (c) During inspiration, the intrapulmonary pressure is more than the atmospheric pressure.
 - (d) During expiration, the intrapulmonary pressure is equal to the atmospheric pressure. (AMU)

2014

11. To generate pressure gradients to facilitate expiration and inspiration, the human body uses the intercostal muscles and
 - (a) alveolar sacs
 - (b) bronchi
 - (c) primary, secondary and tertiary bronchioles
 - (d) diaphragm
 - (e) windpipe. (Kerala PMT)

2015

2012

12. In humans, which among these is not a step in respiration?
- Pulmonary ventilation
 - Alveolar diffusion of O_2 and CO_2
 - Transport of gases by blood
 - Diffusion of O_2 and CO_2 between blood and tissues
 - Utilisation of CO_2 by cells for catabolic reactions
- (Kerala PMT)

2011

13. Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?
- One can breathe out air totally without oxygen.
 - One can breathe out air through Eustachian tube by closing both nose and mouth.
 - One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.
 - The lungs can be made fully empty by forcefully breathing out all air from them.
- (AIPMT Mains)

2010

14. Pick the correct statement.
- The contraction of internal intercostal muscles lifts up the ribs and sternum.
 - The RBCs transports oxygen only.
 - The thoracic cavity is anatomically an air tight chamber.
 - Healthy man can inspire approximately 500 mL of air per minute.
 - During expiration, the intrapulmonary pressure is slightly below the surrounding atmospheric pressure.
- (Kerala PMT)
15. Which of the following statements is correct?
- During inspiration external intercostal muscles and diaphragm contract.
 - Cyanosis means collapse of alveoli.
 - Eupnea is slow breathing.
 - Coryza is caused by human corona virus.
- (UP CPMT)

17.3: Respiratory Volumes and Capacities

2017

16. Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration, because of
- inspiratory reserve volume
 - tidal volume
 - expiratory reserve volume
 - residual volume
- (NEET)

17. Amount of air in the lungs that remains after deep breathing is called
- dead space
 - residual volume
 - vital capacity
 - ventilation rate.
- (J & K CET)

18. The volume of air left in the lungs after forceful expiration and after normal expiration is respectively called
- tidal volume and expiratory capacity
 - residual volume and expiratory capacity
 - residual volume and functional residual capacity
 - vital capacity and functional residual capacity.
- (JIPMER)

19. The volume of air that will remain in the lungs after a normal expiration is called
- vital capacity
 - functional residual capacity
 - residual volume
 - total lung capacity
 - inspiratory capacity.
- (Kerala PMT)

2014

20. Choose the wrong statement.
- Solubility of CO_2 in blood is 20-25 times higher than that of O_2 .
 - The total volume of air accommodated in the lungs at the end of a forced inspiration is called the 'vital capacity'.
 - O_2 can bind with haemoglobin in a reversible manner to form oxyhaemoglobin.
 - Every 100 mL of deoxygenated blood delivers approximately 4 mL of CO_2 to the alveoli.
 - The diffusion membrane is made of three major layers namely the thin squamous epithelium of alveoli, the endothelium of alveolar capillaries and the basement substance in between them.
- (Kerala PMT)

21. Match the items listed under column I with those given under column II. Choose the appropriate option from the given choices.

Column I		Column II		
A. Residual volume (RV)	p.	4000 mL - 4600 mL		
B. Inspiratory Reserve Volume (IRV)	q.	1100 mL - 1200 mL		
C. Vital capacity (VC)	r.	1000 mL - 1100 mL		
D. Expiratory Reserve Volume (ERV)	s.	3000 mL - 3500 mL		
E. Inspiratory capacity (IC)	t.	2500 mL - 3000 mL		
A	B	C	D	E
(a) t	q	s	r	p
(b) q	r	s	t	p
(c) q	t	p	r	s
(d) r	t	p	q	s

(Karnataka CET)

22. The volume of air that can be breathed in by maximum forced inspiration over and above the normal inspiration is called
 (a) expiratory reserved volume
 (b) inspiratory reserved volume
 (c) vital capacity
 (d) inspiratory capacity. (WB JEE)

2013
 23. Tidal air in mammalian lungs is
 (a) air that normally goes in and out of lungs during breathing
 (b) total maximum air that can be drawn into lungs
 (c) air that is left in the lungs after normal expiration
 (d) air that can be expelled out from lungs forcibly after normal expiration. (AIIMS)

24. The inspiratory reserve volume + tidal volume + expiratory reserve volume is the same as
 (a) inspiratory capacity + expiratory reserve volume
 (b) total lung capacity - functional residual capacity
 (c) inspiratory capacity + functional residual capacity
 (d) inspiratory capacity + residual volume. (AMU)

2012
 25. 1200 mL volume of air that always remains in the lungs even after forcible expiration is called
 (a) tidal volume (b) residual volume
 (c) vital volume (d) inspiratory volume. (AFMC)

26. Vital capacity is
 (a) TV + IRV (b) TV + ERV
 (c) RV + ERV (d) TV + IRV + ERV. (BHU)

27. The volume of air which remains in the conducting airways and is not available for gas exchange is called
 (a) vital capacity
 (b) functional residual capacity
 (c) forced expiratory volume
 (d) anatomical dead space. (J & K CET)

28. After forceful inspiration, the amount of air that can be breathed out by maximum forced expiration is equal to
 (a) Inspiratory Reserve Volume (IRV) + Expiratory Reserve Volume (ERV) + Tidal Volume (TV) + Residual Volume (RV)
 (b) IRV + RV + ERV
 (c) IRV + TV + ERV
 (d) TV + RV + ERV. (WB JEE)

29. The volume of 'anatomical dead space' air is normally
 (a) 230 mL (b) 210 mL
 (c) 190 mL (d) 150 mL. (WB JEE)

2011
 30. Dead space air in man is
 (a) 500 mL (b) 150 mL
 (c) 250 mL (d) 1.5 L. (J & K CET)
 31. Large volume of air a person can expire after a forceful inspiration is called
 (a) inspiratory reserve volume
 (b) expiratory reserve volume
 (c) vital capacity
 (d) tidal volume. (OJEE)

2010
 32. Listed below are four respiratory capacities (i-iv) and four jumbled respiratory volumes of a normal human adult.

Respiratory capacities	Respiratory volumes
(i) Residual volume	2500 mL
(ii) Vital capacity	3500 mL
(iii) Inspiratory reserve volume	1200 mL
(iv) Inspiratory capacity	4500 mL

Which one of the following is the correct matching of two capacities and volumes?
 (a) (ii) 2500 mL, (iii) 4500 mL
 (b) (iii) 1200 mL, (iv) 2500 mL
 (c) (iv) 3500 mL, (i) 1200 mL
 (d) (i) 4500 mL, (ii) 3500 mL (AIPMT Prelims)

33. The volume of air inspired or expired during normal respiration is called
 (a) tidal volume
 (b) inspiratory reserve volume
 (c) expiratory reserve volume
 (d) residual volume. (AFMC)

34. Match the columns and select the correct option from the codes given below.

(A) TV + ERV	(i) Expiratory capacity
(B) RV + ERV + TV + IRV	(ii) Total lung capacity
(C) ERV + RV	(iii) Functional residual capacity
(a) A-(i), B-(ii), C-(iii)	(b) A-(iii), B-(i), C-(ii)
(c) A-(iii), B-(ii), C-(i)	(d) A-(ii), B-(iii), C-(i)

(BHU)

35. The volume of air that is normally inspired and expired at every breath is called
 (a) residual volume
 (b) inspiratory reserve volume
 (c) vital capacity
 (d) tidal volume. (J & K CET)

36. In which of the following subjects the dead space is highest?
 (a) Old man (b) Old woman
 (c) Young man (d) Young woman (WB JEE)

2009

37. The amount of volume of air that can be inspired/expired normally is called
- (a) tidal volume (b) vital capacity
(c) residual volume (d) normal volume. (AFMC)

17.4: Exchange of Gases

2016

38. The partial pressure of oxygen in the alveoli of the lungs is
- (a) equal to that in the blood
(b) more than that in the blood
(c) less than that in the blood
(d) less than that of carbon dioxide. (NEET Phase-II)

2015

39. Partial pressures of oxygen and carbon dioxide in healthy human lung alveoli are, respectively, nearest to
- (a) 104 and 40 mm Hg (b) 90 and 20 mm Hg
(c) 40 and 45 mm Hg (d) 159 and 0.3 mm Hg. (AMU)

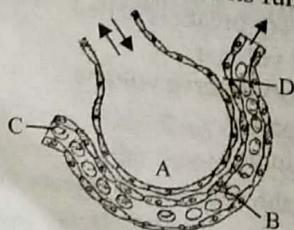
2014

40. The process of exchange of O_2 from the atmosphere with CO_2 produced by the cells is called
- (a) biological respiration
(b) photosynthesis
(c) biological assimilation
(d) gaseous exchange. (J & K CET)

41. What is the pO_2 and pCO_2 in the systemic arteries?
- (a) pO_2 40 mm Hg; pCO_2 45 mm Hg
(b) pO_2 95 mm Hg; pCO_2 104 mm Hg
(c) pO_2 95 mm Hg; pCO_2 40 mm Hg
(d) pO_2 45 mm Hg; pCO_2 40 mm Hg
(e) pO_2 104 mm Hg; pCO_2 159 mm Hg (Kerala PMT)

2013

42. The figure given below shows a small part of human lung where exchange of gases takes place. Select the option which represents labelled part (A, B, C or D) correctly identified along with its function.



- (a) C : arterial capillary - passes oxygen to tissues
(b) A : alveolar cavity - main site of exchange of respiratory gases

- (c) D : capillary wall - exchange of O_2 and CO_2 takes place here
(d) B : red blood cells - transport of CO_2 mainly (AIPMT Prelim)

43. Between breaths the intrapleural pressure is approximately ___ mmHg less than atmospheric pressure.
(a) 1 (b) 4 (c) 8 (d) 10 (AMU, AMU 2010)
44. The factor which does not affect the rate of alveolar diffusion is
(a) solubility of gases
(b) thickness of the membranes
(c) pressure gradient
(d) concentration gradient
(e) reactivity of the gases. (Kerala PMT)

2010

45. The partial pressure of oxygen in the alveolar air is
(a) 45 mm Hg (b) 95 mm Hg
(c) 104 mm Hg (d) 110 mm Hg
(e) 125 mm Hg. (Kerala PMT)
46. The exchange of gases between blood capillaries and alveoli in the lungs is through
(a) simple diffusion (b) active transport
(c) osmosis (d) facilitated diffusion. (OJEE)

17.5: Transport of Gases

2016

47. Reduction in pH of blood will
(a) decrease the affinity of haemoglobin with oxygen
(b) release bicarbonate ions by the liver
(c) reduce the rate of heart beat
(d) reduce the blood supply to the brain. (NEET Phase-I)

2015

48. Which of the following sets of conditions promotes the dissociation of oxygen from haemoglobin?
(a) Low pO_2 , high pCO_2 , high H^+
(b) High pO_2 , high pCO_2 , low H^+
(c) High pO_2 , low pCO_2 , low H^+
(d) Low pO_2 , low pCO_2 , low H^+ (AMU)

2014

49. Approximately seventy percent of carbon dioxide absorbed by the blood will be transported to the lungs
(a) as bicarbonate ions
(b) in the form of dissolved gas molecules
(c) by binding to R.B.C
(d) as carbamino - haemoglobin. (AIPMT)
50. When percentage saturation of haemoglobin with O_2 is plotted against pO_2 , the curve obtained is
(a) J shaped (b) hyperbola
(c) sigmoid (d) U shaped
(e) urn shaped. (Kerala PMT)

breathing

2013

51. Blood carries CO_2 mainly in which form?
 (a) HbCO_2
 (b) Carbonic acid
 (c) NaHCO_3
 (d) HbCO_2 and carbon monoxide (JIPMER)
52. During the transportation of gases, to maintain the ionic balance, chloride ions shift from
 (a) RBCs to plasma (b) plasma to RBCs
 (c) lungs to blood (d) blood to lungs. (Karnataka CET)

2012

53. Increase in body temperature makes oxygen haemoglobin dissociation curve
 (a) shift to left (b) shift to right
 (c) hyperbolic (d) parabolic. (BHU)
54. The amount of O_2 transported in a dissolved state through plasma is approximately
 (a) 97% (b) 20-25% (c) 7% (d) 49% (Kerala PMT)
55. The enzyme essential for the transport of CO_2 as bicarbonate in blood is
 (a) carboxypeptidase
 (b) succinic dehydrogenase
 (c) carbonic anhydrase
 (d) thrombokinas
 (e) lactase. (Kerala PMT)

56. Choose the right sequential phenomena among the following during the delivery of O_2 from blood to tissue.
 P : Absorption of CO_2 by the blood.
 Q : Reaction of absorbed CO_2 with H_2O to form H_2CO_3 within RBC and its conversion into H^+ and HCO_3^- ions.
 R : Reaction of absorbed CO_2 with H_2O in plasma to form H_2CO_3 and its conversion into H^+ and HCO_3^- ions.
 S : Combination of H^+ with heme portion of HbO_2 to release O_2 .
 T : Combination of HCO_3^- with heme portion HbO_2 to form reduced hemoglobin and release of O_2 .
 (a) P, Q, T (b) P, R, S
 (c) P, Q, S (d) P, R, T (WB JEE)

57. Amount of oxygen supplied by 100 mL arterial blood while passing through the tissues is
 (a) 0.4-0.6 mL (b) 4-6 mL
 (c) 14-15 mL (d) 19-20 mL. (WB JEE)

2011

58. Bulk of carbon dioxide (CO_2) released from body tissues into the blood is present as
 (a) bicarbonate in blood plasma and RBCs
 (b) free CO_2 in blood plasma
 (c) 70% carbamino-haemoglobin and 30% as bicarbonate
 (d) carbamino-haemoglobin in RBCs. (AIPMT Mains)

59. A large proportion of oxygen remains unused in the human blood even after its uptake by the body tissues. This O_2
 (a) acts as a reserve during muscular exercise
 (b) raises the pCO_2 of blood to 75 mm of Hg
 (c) is enough to keep oxyhaemoglobin saturation at 96%
 (d) helps in releasing more O_2 to the epithelial tissues. (AIPMT Prelims)

60. Which one of the following can bind several hundred times more strongly to the haemoglobin than oxygen?
 (a) CO (b) CO_2
 (c) SO_2 (d) H_2CO_3 (AMU)

61. Amount of CO_2 in expired air is about
 (a) 0.04% (b) 0.03%
 (c) 4.5% (d) 21%. (J & K CET)

2010

62. What is true about RBCs in humans?
 (a) They carry about 20-25 per cent of CO_2 .
 (b) They transport 99.5 per cent of O_2 .
 (c) They transport about 80 per cent oxygen only and the rest 20 per cent of it is transported in dissolved state in blood plasma.
 (d) They do not carry CO_2 at all. (AIPMT Prelims)

63. CO_2 is transported in blood mostly by means of
 (a) plasma
 (b) bicarbonate ion
 (c) carbamino haemoglobin
 (d) none of these. (AFMC)

64. In the resting person, saturation of haemoglobin as blood leaves the tissue capillaries is approximately
 (a) 75% (b) 40%
 (c) 3% (d) 46%. (AMU)

65. According to Boyle's law, the product of pressure and volume is a constant. Hence,
 (a) if volume of lungs is increased, the pressure decreases proportionately
 (b) if volume of lungs is increased, the pressure also increases proportionately
 (c) if volume of lungs is increased, the pressure decreases disproportionately
 (d) if volume of lungs is increased, the pressure remains the same. (Karnataka CET)

66. About 70% of CO_2 in blood is transported in the form of
 (a) dissolved CO_2
 (b) bicarbonates
 (c) carbaminohaemoglobin
 (d) carboxyhaemoglobin. (OJEE)

17.6: Regulation of Respiration

2011

67. Pneumotaxic centre which can moderate the functions of the respiratory rhythm centre is present at
- pons region of brain
 - thalamus
 - spinal cord
 - right cerebral hemisphere
 - left cerebral hemisphere.
- (Kerala PMT)

2010

68. Chemosensitive area of respiratory centre in medulla is affected by
- less CO_2 and H^+ ions
 - less O_2 and H^+ ions
 - excess CO_2 and H^+ ions
 - excess O_2 and H^+ ions.
- (AIIMS)
69. The respiratory rhythm centre is present in the
- cerebrum
 - cerebellum
 - hypothalamus
 - corpora quadrigemina
 - medulla oblongata.
- (Kerala PMT)

17.7: Disorders of Respiratory System

2016

70. Name the chronic respiratory disorder caused mainly by cigarette smoking.
- Respiratory acidosis
 - Respiratory alkalosis
 - Emphysema
 - Asthma
- (NEET Phase-I)
71. Asthma may be attributed to
- inflammation of the trachea
 - accumulation of fluid in the lungs
 - bacterial infection of the lungs
 - allergic reaction of the mast cells in the lungs.
- (NEET Phase-I)

2015

72. Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls.
- Pneumonia
 - Asthma
 - Pleurisy
 - Emphysema (AIPMT)

2012

73. Which one of the following is the correct statement for respiration in humans?
- Cigarette smoking may lead to inflammation of bronchi.
 - Neural signals from pneumotoxic centre in pons region of brain can increase the duration of inspiration.
 - Workers in grinding and stone-breaking industries may suffer, from lung fibrosis.
 - About 90% of carbon dioxide (CO_2) is carried by haemoglobin as carbaminohaemoglobin.
- (AIPMT Prelims)

74. Following are few characters of a disorder in human body.

- Inflammation of the mucous membrane of nasal passage
- Watery secretions by mucous glands
- Continuous sneezing
- Eye watering
- Rise in body temperature

Identify the disorder from the choices given below

- Bronchial asthma
- Rhinitis
- Bronchial carcinoma
- Emphysema

(Karnataka CET)

75. Hypoxia corresponds to

- any change in the relative rates of development of different cell lines in body
- hardening and loss of elasticity of arteries
- deficiency of oxygen in body tissues
- sudden interruption of blood flow to a portion of brain due to blockage of cerebral blood vessel.

(OJEE)

2011

76. Emphysema is a

- cardiovascular disease
- pulmonary disease
- neural disease
- renal disease.

(J & K CET)

77. When the blood contains a high percentage of CO_2 and a very low percentage of O_2 the breathing stops and the person becomes unconscious. This condition is known as

- suffocation
- asphyxia
- emphysema
- eupnea.

(Karnataka CET)

78. Asthma is characterised by

- spasm in bronchial muscle
- alveolar wall degradation
- pain in lungs
- damage in diaphragm.

(OJEE)

79. Cigarette smoking causes

- lung cancer
- baldness
- colour blindness
- none of these. (OJEE)

80. When the oxygen supply to the tissue is inadequate, the condition is

- dyspnea
- hypoxia
- asphyxia
- apnea. (WB JEE)

2009

81. Lack of pulmonary surfactant produces

- asthma
- emphysema
- cystic fibrosis
- respiratory distress syndrome.

(AMU)