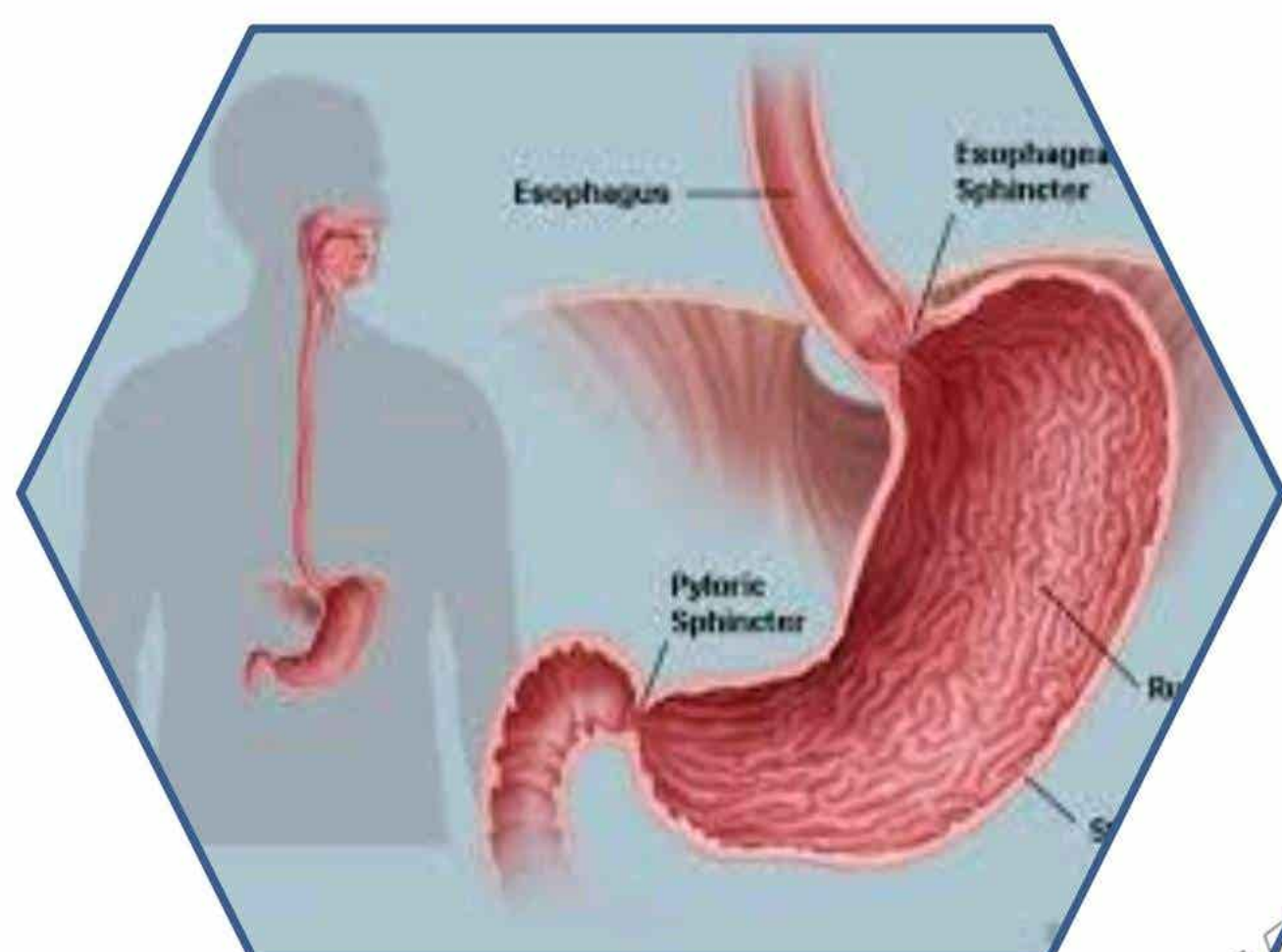


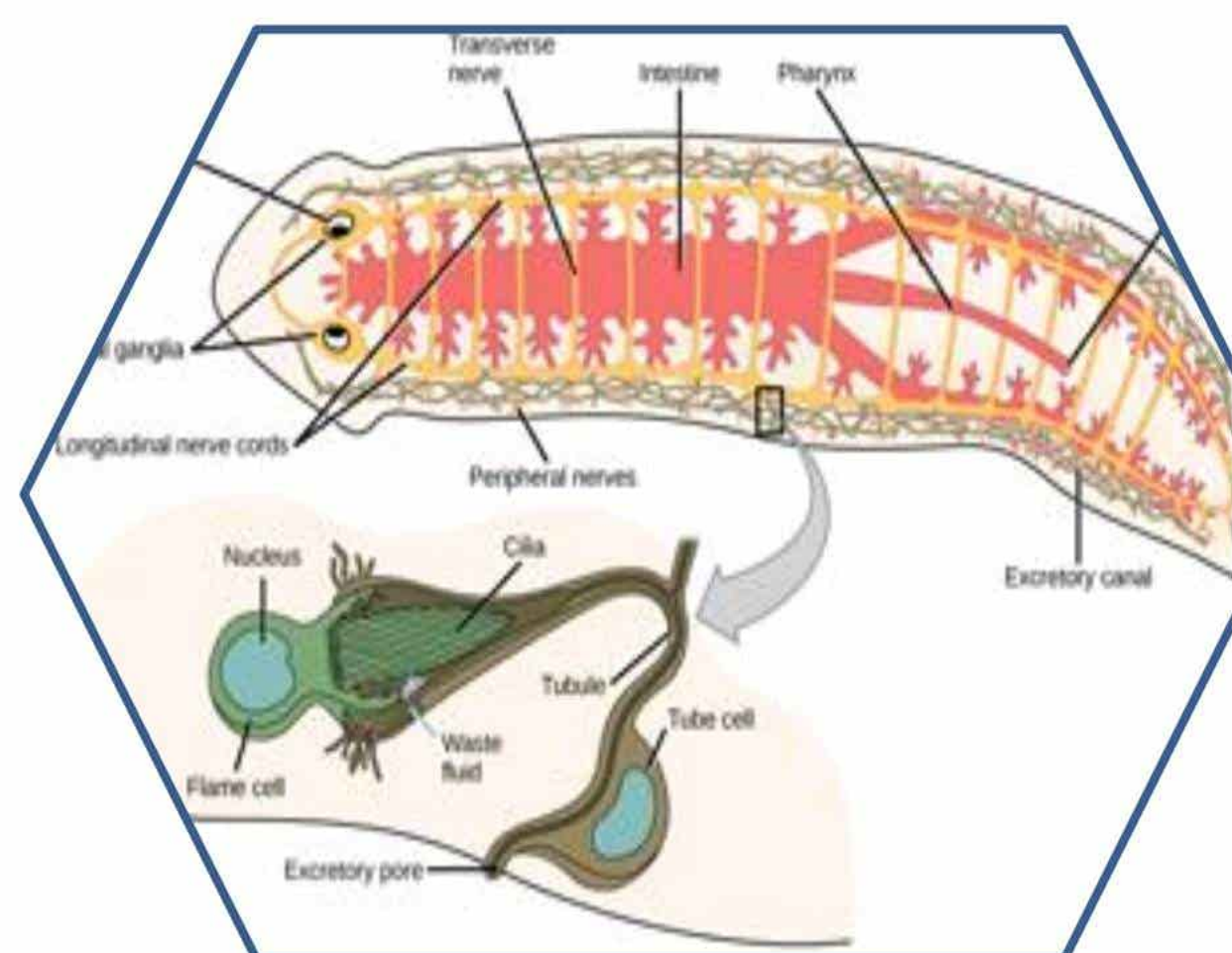
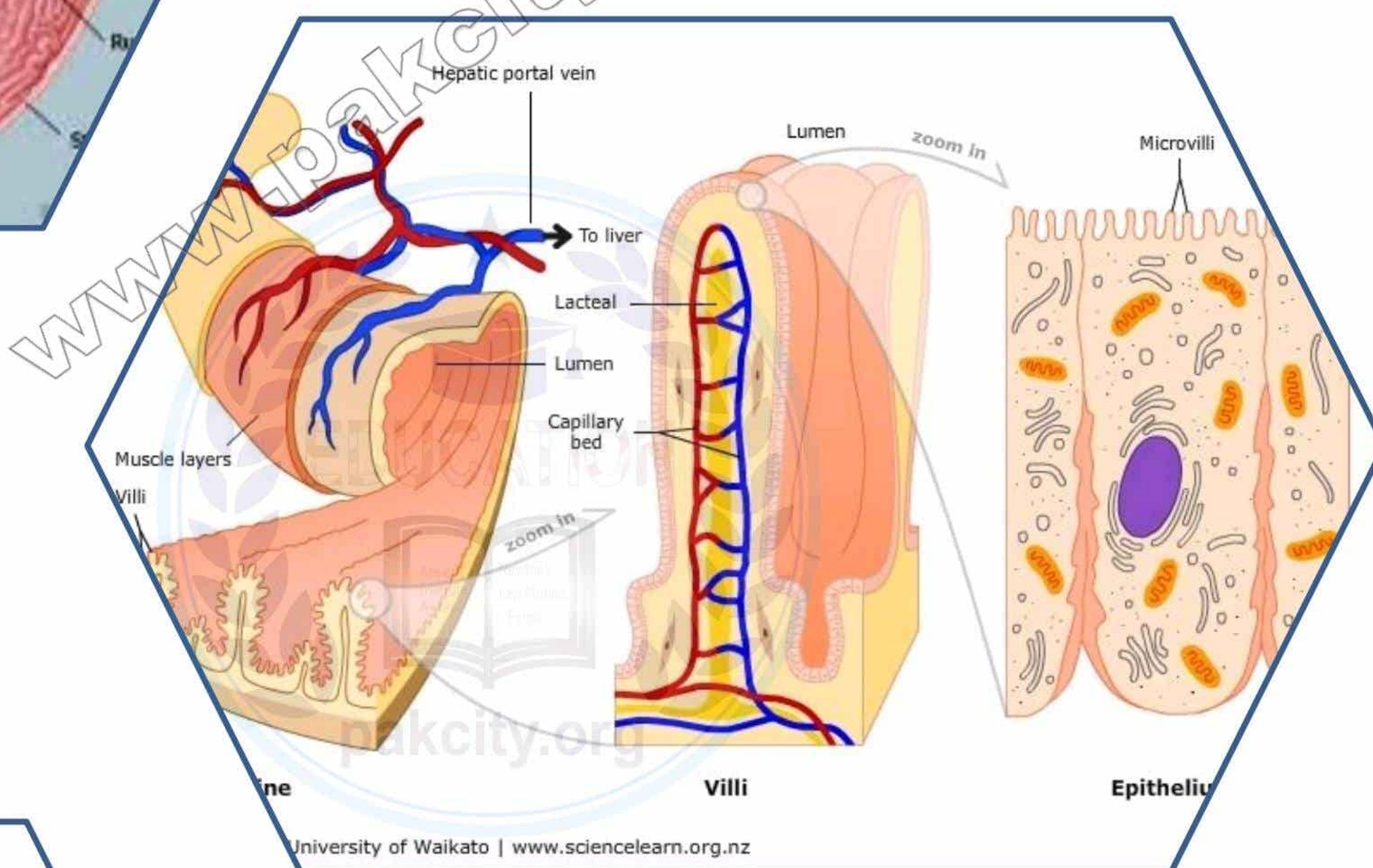


CHAPTER 12

NUTRITION



- **Exercise Short Answers**
- **Important Short Answers**



- **Exercise MCQ's**
- **Important Additional MCQ's**
- **Past MDCAT MCQ's**

Exercise MCQ's

❖ Encircle the correct answer from the multiple choices.

- 1) A plant requires nitrogen and sulfur for its:
a) Cell wall b) Enzymes c) Starch deposits d) DNA replication
- 2) A plant requires potassium for:
a) Synthesizing protein
b) Synthesizing chlorophyll
c) Opening and closing of stomata
d) Synthesizing fats
- 3) Carnivorous plants live in soils that are deficient in:
a) Water b) Oxygen c) Nitrogen d) Iron
- 4) Most vitamins functions as:
a) Catalyst b) High energy compound c) Gastro vascular cavity d) Mouth
- 5) Digestion in hydra and planaria takes place within its:
a) Transport molecules b) Alimentary canal c) Gastro vascular cavity d) Coelom
- 6) Mucus in saliva is made of:
a) Saturated fatty acids b) Glycoproteins c) Phospholipids d) Glycolipids
- 7) The structure in mouth that prevents food from entering the nasal cavities is the:
a) Epiglottis b) Soft palate c) Tongue d) Pharynx
- 8) A mammalian herbivore has:
a) Fewer teeth than carnivore
b) Flatter teeth than a carnivore
c) More teeth than a carnivore
d) More pointed than a carnivore
- 9) Many humans become ill from consuming milk and milk products because they lack:
a) Bacteria in intestine b) Hydrochloric acid c) Lactase d) Renin
- 10) Which of the following animals has no need for a gallbladder?
a) Cat b) Man c) Lion d) Goat

Answer key:

1	b	2	c	3	c	4	a	5	c
6	b	7	b	8	b	9	c	10	d

Nutrition and Modes of Nutrition

- ## Nutritional deficiency in plants

- ## Nutrition in plants

- ## Nutrition in Animals

- Please visit for more data at: www.pakcity.org

23. Rodents are:

- a) Herbivores b) Detritivores c) Carnivores d) Omnivores

24. Which one of the following is not a carnivore?

- a) Cat b) Dog c) Lion d) Deer

25. Which one of the following is not a carnivore?

- a) Cat b) Dog c) Bear d) Tiger

26. The animals which feed upon other animals are called:

- a) Carnivores b) Detritivores c) Herbivores d) Omnivores

27. The animals have large canine:

- a) Carnivores b) Detritivores c) Herbivores d) Omnivores

28. Which of the following is not omnivore?

- a) Crow b) Bear c) Pig d) Deer

29. The animals which eat both plant and animals are called:

- a) Herbivores b) Carnivores c) Filter feeder d) Omnivores

30. A common mussel (Filter feeder) has 2 large gills covered with:

- a) Flagella b) Cilia c) Pseudopodia d) Shell



31. Certain types of whales are:

- a) Detritivores b) Fluid feeder c) Omnivores d) Filter feeder

32. Which of the following is fluid feeder?

- a) Aphid b) Earthworm c) Sheep d) Man

33. The animals which ingest food in liquid form are called:

- a) Carnivores b) Filter feeder c) Microphagous feeder d) Fluid feeders

34. Seizing and swallowing type of microphagous feeding is found in:

- a) Aphids b) Hydra c) Mussels d) Spotted dog fish

35. There is a rasping tongue-like stature in mollusks called:

- a) Radula b) Blastula c) Gastrula d) Morula

36. The feeding that occurs in the garden snail is:

- a) Tentacular b) Seizing c) Scraping d) Filter

37. An organism that live upon or within another organisms (parasitism) is called:

- a) Predator b) Pest c) Parasite d) Host

38. Of the following, which one has more variety of nutrition?

- a) Animals b) Bacteria c) Plants d) Fungi

39. Earthworm is an example of _____ feeder:

- a) Detritus b) Fluid c) Macrophages d) Filter

40. Of the following, which one is missing in herbivores?

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

Holozoic Nutrition

41. The process of intake of food:

- a) Absorption b) Ingestion c) Assimilation d) Egestion

42. Utilization of products of digestion for production of energy or synthesis of cellular material is:

- a) Absorption b) Digestion c) Assimilation d) Egestion

Nutrition in Amoeba, Hydra, Planaria, Cockroach

43. In amoeba digestion is:

- a) Intracellular b) Extracellular c) Both a & b d) None of these

44. The one in which only intercellular digestion occur:

- a) Cockroach b) Planaria c) Amoeba d) Hydra

45. Digestion in Hydra takes place in:

- a) Mouth b) Colon c) Enteron d) Stomach

46. In hydra, ectodermal cells got food from endodermal cells by:

- a) Osmosis b) Active transport c) Facilitated diffusing d) Diffusion

47. Tentacles is a characteristics of:

- a) Cockroach b) Planaria c) Amoeba d) Hydra

48. The intestinal caeca are present in digestive system of:

- a) Hydra b) Planaria c) Cockroach d) Earthworm

49. In cockroach food is temporarily stored in:

- a) Gizzard b) Esophagus c) Mesenteron d) Crop

50. In cockroach food (Partially digested food) is temporarily stored in:

- a) Rectum b) Gizzard c) Crop d) Colon

51. In planaria, numerous small branches which end blindly are called as:

- a) Digestive tract b) Intestinal caeca c) Hepatic caeca d) Both b & c

52. Midgut in cockroach is a short narrow tube called:

- a) Hepatic caeca b) Gizzard c) Stomach d) Rectum

Digestion in Man

53. Saliva is secretion of salivary glands. Which of the following are not its components?

- a) Water & Mucus b) Pepsin c) Sodium Bicarbonate d) Amylase

54. Parotid gland is found in:

- a) Stomach b) Mouth c) Intestine d) Esophagus

55. Parotid glands are situated in front of the:

- a) Jaws b) Ears c) Tongue d) Eyes

56. Sub-lingual glands are located below the:

- a) Jaws b) Ear c) Tongue d) All of these

57. pH of fresh saliva is about:

- a) 6.0 b) 7.0 c) 8.0 d) 9.0

58. Carbohydrate digesting enzymes are called:

- a) Ligase b) Amylase c) Protease d) Lipase

59. During swallowing the food travels from oval cavity to the stomach by way of esophagus:

- a) Very quickly b) Pushed down by pharynx c) By antiperistalsis d) Moving due to peristalsis

60. Structure in mouth that prevents food from entering nasal cavities is:

- a) Epiglottis b) Nose c) Soft palate d) Glottis

61. The human stomach is situated below the:

- a) Diaphragm b) Liver c) Kidneys d) Spleen

62. The mucosa of the stomach possesses cells:

- a) Mucous b) Parietal c) Zymogen d) All of these

63. Oxyntic cell secrete:

- a) Mucous b) Bicarbonates c) HCl d) Pepsinogen

64. Which of the following cells secretes hydrochloric acid?

- a) Mucous cells b) Zymogen cells c) Epithelial cells d) Oxyntic cells

65. HCl is secreted by which cell in stomach:

- a) Mucous cell b) Zymogen cells c) Parietal cells d) Chief cell

66. Pepsin is secreted by:

- a) Mucus cell b) Zymogen cell c) Parietal cells d) Oxyntic cells

67. The term chyme is applied to:

- a) Semi digestive food in oral cavity
b) Semi-solid food in stomach
c) Semi digested food in the small intestine
d) Completely digested food in last part of small intestine

68. The muscles of the stomach walls thoroughly mix up the food with gastric juices and the resulting semi-solid / semi-liquid material is called:

- a) Bolus b) Mucus c) Bolus or chyme d) Chyme

69. Which type of cells in human stomach secrete Gastrin:

- a) Mucous cells b) Parietal cells c) Zymogens cells d) Endocrine cells

70. Gastrin is the hormone which is produced by the:

- a) Liver b) Pyloric region of stomach c) Mucosal lining of intestine d) Gland

71. The first part of the small intestine is called:

- a) Rectum b) Ileum c) jejunum d) Duodenum

72. The length of duodenum is about:

- a) 15-20 cm b) 20-25 cm c) 30-35 cm d) 10-15 cm

73. Pancreas is a:

- a) Part of stomach b) Part of large intestine c) Part of small intestine d) Separate gland

74. The carbohydrate digesting enzyme in pancreatic juice is:

- a) Lipase b) Amylase c) Erypsin d) Trypsin

75. Trypsinogen is converted into trypsin by the activity of:

- a) NaHCO_3 b) HCl c) Enterokinase d) Peptidase

76. The enzyme which is not secreted by the pancreas is:

- a) Trypsinogen b) Amylase c) Enterokinase d) Lipase

77. Liver secretes bile into:

- a) Helium b) Stomach c) Tongue d) Jejunum

78. Emulsification is the function of:

- a) Bile b) Lipase c) Amylase d) Protease

79. Which animal has no need of gall bladder?

- a) Cat b) Man c) Lion d) Goat

80. Gastric secretion is inhibited by:

- a) Bile b) Pancreatic juice c) Secretin d) Gastrin

81. Hepatic and pancreatic secretions are stimulated by hormone called:

- a) Gastrin b) Insulin c) Pepsinogen d) Secretion

82. If bile pigments are prevented from having digestive tract causing a condition called (if bile pigments are accumulated in blood the condition is called):

- a) Piles b) Obesity c) Jaundice d) Filler

83. Gall stones are produced in the gall bladder due to precipitation of:

- a) Glucose b) Cholesterol c) Glycerol d) CaCO_3

84. The length of jejunum is about:

- a) 2m b) 2.8m c) 1.4m d) 2.4m

85. Dipeptides are broken down into amino acids by (Enzyme that produce amino acids):

- a) Erypsin b) Pepsin c) Trypsin d) Lipase

86. Sites of digestion in the digestive system of man are:

- a) 1 b) 2 c) 3 d) 4

87. Each villus is richly supplied with blood capillaries and vessel of lymphatic system called:

- a) Arteriole b) Bronchiole c) Lacteal d) Coelom

88. Villi and microvilli are present in:

- a) Pharynx b) Small intestine (Jejunum) c) Esophagus d) Large intestine

89. A sphincter muscle present at the end of ileum that opens and closes time to allow a small amount of residue to enter the large intestine:

- a) Cardiac sphincter b) Pyloric sphincter c) Ileocolic sphincter d) Anal sphincter

90. In large intestine, vitamin K is formed by the activity of:

- a) Symbolic bacteria b) Obligate parasite c) Parasitic bacteria d) Facultative bacteria

91. Bacteria that produce vitamin K are found in:

- a) Small intestine b) Large intestine c) Stomach d) Duodenum

92. Goblet cells secrete:

- a) HCl b) Enzymes c) Mucus d) Amylase

93. If absorption of water & salt does not take place due to infection cause a condition called:

- a) Cholera b) Constipation c) Dyspepsia d) Diarrhea

94. Constipation is caused by the excessive absorption of:

- a) Water b) Oxygen c) Blood d) Food

Diseases related to Nutrition



95. A severe form of food poisoning called Botulism is caused by:

- a) Clostridium b) Campylobacter c) Salmonella d) Vibrio

96. The loss of appetite due to fear of becoming obese is:

- a) Bulimia nervosa b) Anorexia nervosa c) Dyspepsia d) Obesity

97. A neurotic disorder in slightly older girl is:

- a) Anorexia nervosa b) Bulimia nervosa c) Dyspepsia d) Obesity

98. Name the neurotic disorder characterized by bouts of over eating of fattening foods:

- a) Bulimia nervosa b) Anorexia nervosa c) Dyspepsia d) Salmonella

99. Excess gastric secretion is an important factor of:

- a) Obesity b) Piles c) Food poisoning d) Peptic ulcer

Answer key:

1	b	2	b	3	d	4	b	5	c	6	b	7	b	8	c	9	d	10	b
11	d	12	b	13	c	14	c	15	a	16	b	17	b	18	b	19	d	20	c
21	b	22	a	23	a	24	d	25	c	26	a	27	a	28	d	29	d	30	b
31	d	32	a	33	d	34	d	35	a	36	c	37	c	38	a	39	a	40	b
41	b	42	c	43	a	44	c	45	c	46	d	47	d	48	b	49	d	50	c
51	b	52	c	53	b	54	b	55	b	56	c	57	c	58	b	59	d	60	c
61	a	62	d	63	c	64	d	65	c	66	b	67	b	68	d	69	d	70	b
71	d	72	b	73	d	74	b	75	c	76	c	77	d	78	a	79	d	80	c
81	d	82	c	83	b	84	d	85	a	86	c	87	c	88	b	89	c	90	a
91	b	92	c	93	d	94	a	95	a	96	b	97	b	98	a	99	d		

MDCAT MCQ'S

2008

- 1) Name the nutrition resulted by feeding on dead and decaying matter:
- | | | | |
|----------------|--------------|--------------|-----------------|
| a) Saprophytic | b) Symbiotic | c) Parasitic | d) Both b and c |
|----------------|--------------|--------------|-----------------|
- 2) Name the neurotic disorder characterized by bouts of over eating of fattening foods:
- | | | | |
|--------------------|----------------------|--------------|---------------|
| a) Bulimia nervosa | b) Anorexia nervosa. | c) Dyspepsia | d) Salmonella |
|--------------------|----------------------|--------------|---------------|
- 3) Which one of these is an example of tubular excretory system called metanephridia?
- | | | | |
|-------------|--------------|----------|---------------|
| a) Planaria | b) Cockroach | c) Hydra | d) Earthworm. |
|-------------|--------------|----------|---------------|

2009

- 4) Pepsin enzyme is produced in an inactive form and is activated in situation when it is required because:
- | | | | |
|----------------------------------|--|---|----------------------|
| a) Not produced in complete form | b) It does not work efficiently at that time | c) Quite capable of destroying cells internal structure | d) None of the above |
|----------------------------------|--|---|----------------------|
- 5) At the junction between esophagus and the stomach there is a special ring of muscles called:
- | | | | |
|----------------------|-------------------------|------------------------|----------------------|
| a) Cardiac Sphincter | b) Esophageal Sphincter | c) Ileocolic Sphincter | d) Pyloric Sphincter |
|----------------------|-------------------------|------------------------|----------------------|
- 6) Hepatic and pancreatic secretions are also stimulated by a hormone called:
- | | | | |
|------------|------------|-------------|-------------|
| a) Gastrin | b) Insulin | c) Secretin | d) Glucagon |
|------------|------------|-------------|-------------|
- 7) Like pepsin, trypsin is also secreted as inactive trypsinogen, which is activated by:
- | | | | |
|-----------------|----------|-----------|------------|
| a) Enterokinase | b) Chyme | c) Lipase | d) Erypsin |
|-----------------|----------|-----------|------------|

2010

- 8) In human beings, what is the function of amylase in digestion?
- | | | | |
|-------------------------------|-----------------------------------|------------------------|-------------------------------|
| a) Digestion of triglycerides | b) Digestion of all types of food | c) Digestion of lipids | d) Digestion of carbohydrates |
|-------------------------------|-----------------------------------|------------------------|-------------------------------|
- 9) Where is the ileocolic sphincter located in your body?
- | | | | |
|---|---|---|---|
| a) At the junction of esophagus and stomach | b) At the junction of ileum and large intestine | c) At the junction of stomach and small intestine | d) At the junction of small intestine and large intestine |
|---|---|---|---|
- 10) The term which is employed to the loss of appetite due to fear of becoming obese is:
- | | | | |
|------------|--------------|---------------------|--------------------|
| a) Obesity | b) Dyspepsia | c) Anorexia nervosa | d) Bulimia nervosa |
|------------|--------------|---------------------|--------------------|

2011

- 11) Which of the following enzyme is released in an inactive form:
- | | | | |
|------------|-----------------|-----------|-----------|
| a) Amylase | b) Enterokinase | c) Lipase | d) Pepsin |
|------------|-----------------|-----------|-----------|
- 12) Which of the following hormones stimulate the secretion of pancreatic juice from pancreas in liver?
- | | | | |
|-------------|------------|---------------|------------------------------|
| a) Secretin | b) Gastrin | c) Pepsinogen | d) Both Gastrin and Secretin |
|-------------|------------|---------------|------------------------------|
- 13) In large intestine, vitamin k is formed by the activity of:
- | | | | |
|-----------------------|-----------------------|----------------------|-------------------------|
| a) Symbiotic Bacteria | b) Parasitic Bacteria | c) Obligate Bacteria | d) Facultative Bacteria |
|-----------------------|-----------------------|----------------------|-------------------------|
- 14) During swallowing of food which structure close nasal opening?
- | | | | |
|----------------|---------------|----------------|-----------|
| a) Hard Palate | b) Epiglottis | c) Soft Palate | d) Larynx |
|----------------|---------------|----------------|-----------|

2012

- 15) The muscles of the stomach walls thoroughly mix up the food with gastric juices and the resulting semi-solid / semi-liquid material is called:
- | | | | |
|----------|----------|-------------------|----------|
| a) Bolus | b) Mucus | c) Bolus or chime | d) Chyme |
|----------|----------|-------------------|----------|
- 16) Trypsinogen is converted into trypsin by the activity of:
- | | | | |
|-----------------|-----------------|---------------------|--------------|
| a) Goblet cells | b) Enterokinase | c) Absorptive cells | d) Peptidase |
|-----------------|-----------------|---------------------|--------------|
- 17) In large intestines, vitamin K is formed by the activity of:
- | | | | |
|-----------------------|-----------------------|----------------------|-------------------------|
| a) Symbiotic bacteria | b) Parasitic bacteria | c) Obligate parasite | d) Facultative bacteria |
|-----------------------|-----------------------|----------------------|-------------------------|
- 18) Goblet cells secrete:
- | | | | |
|--------|------------|----------|------------|
| a) HCl | b) Enzymes | c) Mucus | d) Amylase |
|--------|------------|----------|------------|

2013

- 19) Which one of the following vitamins is produced by microflora of large intestine?
a) Vitamin K b) Vitamin A c) Vitamin C d) Vitamin D
- 20) _____ is activated to _____ by Enterokinase/enteropeptidase enzyme secreted by the lining of duodenum:
a) Pepsinogen, Pepsin
b) Trypsinogen, Trypsin
c) Pepsinogen, Trypsin
d) Chymotrypsinogen, Chymotrypsin
- 21) Which of the following are absorbed in the large intestine?
a) Water and salts b) Salts and glycerol c) Water and peptones d) Amino acids and sugars
- 22) Saliva is basically composed of water, mucus, amylase and:
a) Sodium bicarbonate b) Sodium hydroxide c) Sodium chloride d) Hydrocarbons

2014

- 23) In human, Escherichia coli is involved in the formation of:
a) Calcium b) Vitamin A c) Vitamin D d) Vitamin K
- 24) The function of Goblet cells is to secrete:
a) Gastrin b) Pepsinogen c) Hydrochloric acid d) Mucus
- 25) Gastric glands are composed of _____ types of cells:
a) Two b) Four c) Three d) Five
- 26) HCl in gastric juice is secreted by which one of the following cells?
a) Chief cells b) Mucous cells c) Oxyntic cells d) Kupffer cells

2015

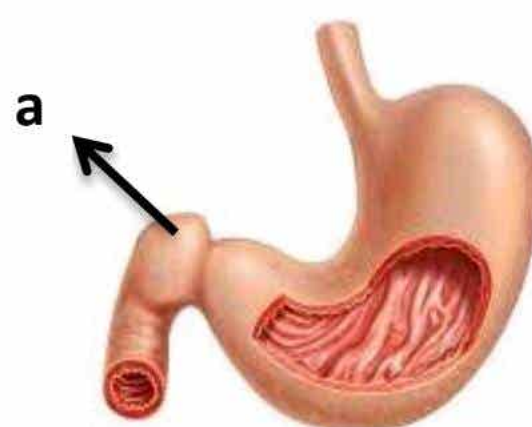
- 27) Oxyntic cells in stomach produces:
a) Pepsin b) Gastrin c) Pepsinogen d) HCl
- 28) The hormone which inhibits the secretion of pancreatic juice is:
a) Secretin b) Thyroxine c) Gastrin d) Parathormone
- 29) Trypsinogen is activated to trypsin by:
a) HCl b) Mucus c) Enterokinase d) Gastrin
- 30) The emulsification of fats is the role of:
a) Saliva b) Gastrin c) Pancreatic juice d) Bile

2016

- 31) Digestion of _____ starts in oral cavity due to the action of enzyme present in saliva:
a) Starch b) Fatty Acids c) Cellulose d) Polypeptides
- 32) Food enters from stomach into small intestine through:
a) Pyloric Sphincter b) Semilunar valve c) Cardiac Sphincter d) Diaphragm
- 33) _____ are the part of a gastric gland which produce hydrochloric acid:
a) Parietal Cells b) Chief Cells c) Goblet Cells d) Zymogen Cells
- 34) Protein components of food are digested by the enzymatic secretion of:
a) Goblet Cells b) Zymogen Cells c) Parietal Cells d) Oxyntic Cells

2017

- 35) Food is diverted in the esophagus by:
a) Glottis b) Cheeks c) Tongue d) Epiglottis
- 36) Label 'a' in the following diagram:
a) Cardiac sphincter
b) Stomach valve
c) Sinoatrial valve
d) Pyloric sphincter

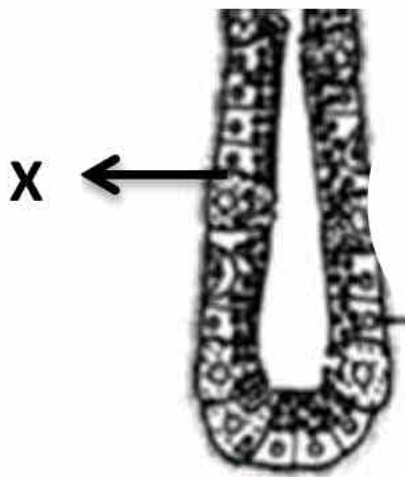


37) Enzyme pepsin acts on:

A	Protein	Polypeptides
B	Polypeptide	Dipeptides
C	Fats	Fatty acids/glycerol
D	Protein	Amino Acids

38) Following is the structure of gastric glands in stomach wall where 'x' is:

- a) Mucosa b) Visceral fat cells c) Mucus cells d) Oxyntic cells



Answer key:

1	a	2	d	3	a	4	c	5	a
6	c	7	a	8	d	9	b	10	c
11	d	12	a	13	a	14	c	15	d
16	b	17	a	18	c	19	a	20	b
21	a	22	a	23	d	24	d	25	c
26	c	27	d	28	a	29	c	30	d
31	a	32	a	33	a	34	b	35	d
36	d	37	a	38	d				



Exercise Short Answers

Q:1 What is the advantage of a digestive tract as compared with digestive cavity?

Ans: Digestive tract is better digestive system as compared to digestive cavity because digestive tract is comparable to tube like and digestive cavity is comparable to sac-like digestive system. Moreover in tube like digestive system food passes through different segments so offering better digestion and absorption in respective section (division of labour) rather than a single cavity performing all functions.

Q:2 What are functions of human liver?

Ans: Functions of human liver:

- It secretes bile which may be temporarily stored in the gall bladder and released into the duodenum through the bile duct.
- Bile contains bile salts, which acts on fats and emulsifies them.
- It converts highly toxic ammonia into less toxic urea to be extracted through kidneys.
- It filters and stores blood.
- It is storage site for vitamins, iron, blood substances used in blood clotting.

Q:3 What measures should be taken to avoid food poisoning?

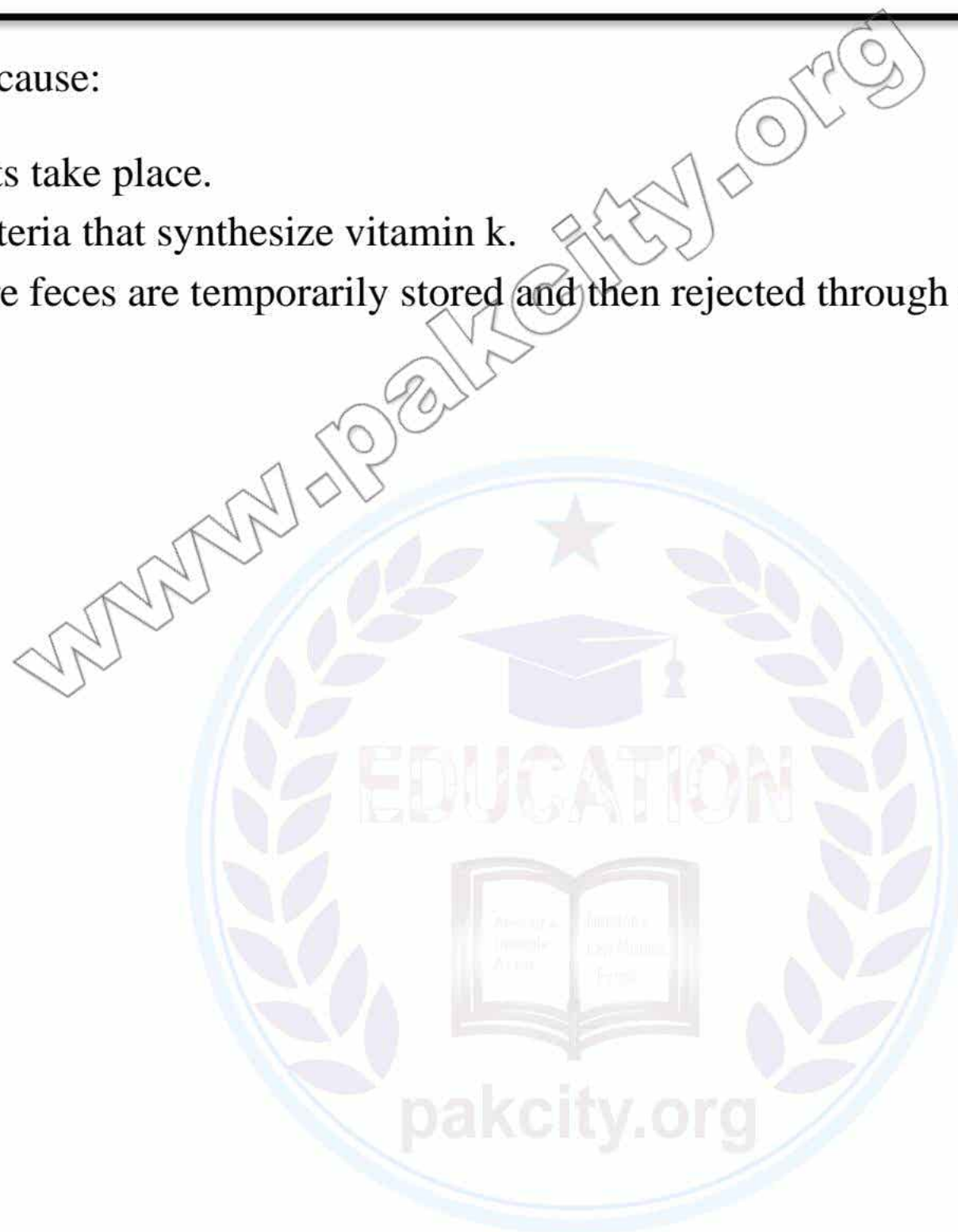
Ans: Preventive measures to avoid food poisoning:

- The liquid that escape during defrosting frozen meat contains *Salmonella* bacteria.
- The dishes and utensils while the meat is defrosting must not be allowed to come in contact with any other food.

Q:4 Can we get along without large intestine?

Ans: We cannot get along without large intestine because:

- In large intestine absorption of water and salts take place.
- Large intestine also harbors many useful bacteria that synthesize vitamin k.
- Rectum is the part of the large intestine where feces are temporarily stored and then rejected through anus,



Important Short Answers



Q:1 Define nutrition.

Ans: Nutrition: The process of acquiring nutrients and energy for cell metabolism is called nutrition.

OR

The sum total of all the processes involved in taking and utilization of elements by which growth, repair and maintenance of activities in the organisms are accomplished is called nutrition.

- It includes all the processes by which we take in food and utilize it, including ingestion, digestion, absorption and assimilation.
- The food or any substance that supplies the body with elements, necessary for metabolism is called nutrient.
- Certain nutrients (Carbohydrates, fats and proteins) provide energy while other nutrients (water, electrolytes, minerals and vitamins) are essential to the metabolic processes.

Q:2 Differentiate between autotrophy and heterotrophy.

Autotrophy	Heterotrophy
<ul style="list-style-type: none">• Mechanism in which organisms prepare their own organic food by themselves using simple inorganic substances/molecule and such organisms are called autotrophs.	<ul style="list-style-type: none">• Mechanism in which organism depends upon on other organisms for their food and such organism are called heterotrophs.
<ul style="list-style-type: none">• Raw materials are accumulated from the environment for making food.	<ul style="list-style-type: none">• Ready food is taken and used as source of nutrition.
<ul style="list-style-type: none">• Autotrophs are either photoautotrophs or chemoautotrophs.	<ul style="list-style-type: none">• Heterotrophs are either photoheterotrophs or chemoheterotrophs.
<ul style="list-style-type: none">• Plants and algae etc.	<ul style="list-style-type: none">• Animals, fungi etc.

Q:3 What is holozoic nutrition? Name steps in holozoic nutrition.

Ans: Holozoic Nutrition: (Greek; Holo=whole and Zoikos=of animals)

It is a type of heterotrophic nutrition that is characterized by the internalization (Ingestion) and internal processing of liquids or solid organic food particles to get energy.

Steps of holozoic nutrition:

- 1) Ingestion
- 2) Digestion
- 3) Absorption
- 4) Assimilation
- 5) Egestion

Q:4 Differentiate between sac like digestive system and tube-like digestive system

Sac like digestive system	Tube like digestive system
<ul style="list-style-type: none">• Digestive tract which is sac like and has single opening only.	<ul style="list-style-type: none">• Digestive tract which is tube like and has two separate opening.
<ul style="list-style-type: none">• Single opening serves as both mouth and anus.	<ul style="list-style-type: none">• Separate openings serve separately as mouth and anus.
<ul style="list-style-type: none">• No proper demarcations in digestive tract.	<ul style="list-style-type: none">• Proper demarcation in digestive tract is seen.
<ul style="list-style-type: none">• So important steps of nutrition like digestion and absorption occurs in sac like body.	<ul style="list-style-type: none">• So important steps of nutrition like digestion and absorption occurs in a tube like body in different regions.
<ul style="list-style-type: none">• Such digestive tract is not so efficient.	<ul style="list-style-type: none">• Such digestive tract is highly efficient.
<ul style="list-style-type: none">• Examples: Hydra, planaria etc.	<ul style="list-style-type: none">• Examples: Earthworm, Cockroach, man etc.

Q:5 Differentiate between herbivore and carnivore.

Herbivore	Carnivore
<ul style="list-style-type: none">• The animals that feed on plants are called herbivores.	<ul style="list-style-type: none">• The animals which feed on another animal are called carnivore.
<ul style="list-style-type: none">• Canine are absent in them.	<ul style="list-style-type: none">• The carnivores have large canine teeth. These canine are used for catching and tearing the prey.

Prof. Ijaz Ahmad Khan Abbasi (Lecturer Biology PGC)

<ul style="list-style-type: none">The upper incisors are absent in grazing and browsing herbivores like deer and sheep. The premolar and molar teeth of the herbivores have large grinding surface.	<ul style="list-style-type: none">The incisors, premolars and molars are all adapted for cutting flesh, cracking bone. They break the chunks to size suitable for swallowing.
<ul style="list-style-type: none">There is large gap between incisors and premolars.	<ul style="list-style-type: none">The gap is absent.
<ul style="list-style-type: none">The typical herbivores are insects, reptiles, birds and mammals. Two important groups of herbivore mammals are rodents and ungulates.	<ul style="list-style-type: none">Examples of carnivores are cat, dog, tiger etc.

Q: 6 How does jaundice develop?

Ans: Jaundice:

If bile pigments are prevented from leaving digestive tract they many accumulate in blood and cause a condition called jaundice.

Q:7: Differentiate between nutrition and nutrient.

Nutrition	Nutrrient
<ul style="list-style-type: none">The sum total of all the processes involved in taking and utilization of elements by which growth, repair and maintenance of activities in the organisms are accomplished is called nutrition. ORThe process of acquiring nutrients and energy foe cell metabolism is called nutrition.	<ul style="list-style-type: none">The food or any substance that supplies the body with elements, necessary for metabolism is called nutrient.
<ul style="list-style-type: none">It includes all the processes by which we take in food and utilize it, including ingestion, digestion, absorption and assimilation.	<ul style="list-style-type: none">It is food or any substance that is utilized in different steps of nutrition.
<ul style="list-style-type: none">Examples: Autotrohic mode of nutrition found in green plants while hetrotrophic mode of nutrition found in animals.	<ul style="list-style-type: none">Examples: Certain nutrients (Carbohydrates, fats and proteins) provide energy while other nutrients (water, electrolytes, minerals and vitamins) are essential to the metabolic processes.

Q:8: Differentiate between intracellular and extracellular digestion.

Intracellular digestion	Extracellular digestion
<ul style="list-style-type: none">In intracellular digestion, breakdown of food occurs within cells.	<ul style="list-style-type: none">In extracellular digestion, enzymes are secreted outside the cell into the gut cavity or lumen where then digestion takes place.
<ul style="list-style-type: none">Digestion occurs in food vacuole.	<ul style="list-style-type: none">Digestion occurs in cavity.
<ul style="list-style-type: none">Absorption takes place by final canal.	<ul style="list-style-type: none">Absorption takes place by epithelial cells.
<ul style="list-style-type: none">Undigested food removed by exocytosis.	<ul style="list-style-type: none">Undigested food removed by anus or cloaca.
<ul style="list-style-type: none">Example: Protozoan i.e. amoeba.	<ul style="list-style-type: none">Example: Cockroach, human etc.

Q:9 Differentiate between saprophytic and parasitic mode of nutrition.

Saprophytic mode of nutrition	Parasitic mode of nutrition
<ul style="list-style-type: none">These organisms grow on dead and obtain nutrients from decaying organic material.	<ul style="list-style-type: none">These organisms depend upon other living organisms to obtain nutrients.
<ul style="list-style-type: none">The use extracellular mode of digestion.	<ul style="list-style-type: none">They use intracellular mode of digestion.
<ul style="list-style-type: none">They absorb nutrients through cell wall.	<ul style="list-style-type: none">They absorb nutrients through haustoria.
<ul style="list-style-type: none">They are dependent on decaying organic matter.	<ul style="list-style-type: none">They may be completely dependent or free living as well.
<ul style="list-style-type: none">Examples: Bacteria and Fungi.	<ul style="list-style-type: none">Examples: Plasmodium, tick and mites, Cuscuta etc.

Q:10 What are salivary glands? What are the types of salivary glands in man?

Ans: Saliva is secreted by 3 pairs of salivary glands:

- Sublingual glands:** These are situated below the tongue.
- Submaxillary/Submandibular glands:** These are situated behind the jaws.
- Parotid glands:** These are situated in front of internal ears.

Composition and functions of saliva:

- The components present in saliva are:

Prof. Ijaz Ahmad Khan Abbasi (Lecturer Biology PGC)

- Water and mucus (It lubricates the food).
- Sodium bicarbonate and some other salts (It acts as an antiseptic).
- Amylase or Ptyalin for digestion of carbohydrates (Starch into maltose).

Q:11 What are insectivorous/carnivorous

Ans: Insectivorous plants are truly autotrophs but they grow in marshy area where they cannot fulfil their need of nitrogen. So they catch and digest insects so as to fulfil their need of nitrogen. This phenomenon of eating insects is called insectivory.

Examples of insectivory plants are as follow:

- **Pitcher plant:** *Saracenia pupurea*
- **Venus fly trap:** *Dionaea muscipula*
- **Sun dew:** *Drosera intermedia*



Q:12 What is heart burn or pyrosis?

Ans: Heart burn or pyrosis:

Heart burn or pyrosis is a painful burning sensation in the chest usually associated with the back flush of acidic chyme into the esophagus. This is due to overeating, eating fatty food, lying down immediately after a meal, consuming too much alcohol, caffeine or smoking.

Q:13 Differentiate between Peristalsis and antiperistalsis.

Peristalsis	Antiperistalsis
<ul style="list-style-type: none">• Peristalsis is the downward wave-like movements of smooth muscles along digestive tract.	<ul style="list-style-type: none">• Antiperistalsis is the upward or backward wave-like movements of smooth muscle along digestive tract.
<ul style="list-style-type: none">• It propels food from mouth to stomach and whole cavity canal.	<ul style="list-style-type: none">• It propels food from the intestine back into stomach and even into the mouth.
<ul style="list-style-type: none">• Peristalsis is a normal process.	<ul style="list-style-type: none">• Antiperistalsis leading to vomiting.
<ul style="list-style-type: none">• Peristalsis occurs as an involuntary action for the effective digestion of ingested food.	<ul style="list-style-type: none">• Antiperistalsis occurs due to undigested foods, vomiting due to metabolic disorders etc.

Q:14 What do you know about hunger pang in human?

Ans: Hunger contractions are peristaltic contractions which are increased by low blood glucose level and are sufficiently strong to create an uncomfortable sensation often called hunger pangs. Hunger pangs occur usually 12-24 hour after previous meal or in less time for some people.

Q:15 What is dyspepsia?

Ans: Dyspepsia: Incomplete or imperfect digestion is called dyspepsia. Dyspepsia is not a disease itself. Actually it is symptomatic of other diseases.

Symptoms: This is characterized by:

- Abdominal discomfort
- Flatulence
- Heartburn
- Nausea
- Vomiting

These symptoms may occur irregularly and in different patterns from time to time.

Reasons:

- Excessive acidity in stomach
- Faulty function of stomach and intestine
- Insufficient quality or quantity of bile secretion

Q:16 Give the features of sporophytes. What is saprophytic nutrition?

Ans: If food is obtained from non-living/dead organic matter is called saprophytic nutrition.

- Saprophyte feed on dead matter like dead leaves in the soil rotting tree trunks.
- Extracellular enzymes are produced by plants which digest the decaying matter and absorb the soluble product back into their cells.
- Some bacteria break the protein of dead plants and animals and release nutrients which are taken up by the plant roots and thus help in nitrogen cycle i.e. nitrogen fixation in root nodules. Examples: Mushrooms and Rhizopus etc.

Prof. Ijaz Ahmad Khan Abbasi (Lecturer Biology PGC)

Q:1 Give two ways by which pepsinogen is activated. How pepsinogen is converted into pepsin.

Ans: These cells secrete pepsinogen.

Pepsin:

- Pepsin is an enzyme.
- It is secreted in an inactive form called pepsinogen.
- Pepsinogen is activated to pepsin, when exposed to the acidic medium.
- Pepsin hydrolyses the proteins to yield peptones and peptidoglycan.

Q:18 Define macrophages feeding with example.

Ans: Macrophages feeding:

The animals which take food in the form of large pieces are called microphagous feeders.

The common methods of microphagous feeding are:

- I. Tentacular feeding e.g. Hydra
- II. Scraping e.g. Snail with Radula
- III. Seizing prey and swallowing e.g. spotted dog fish.

Q:19 Differentiate between Gastrin and Secretin.

Gastrin	Secretin
<ul style="list-style-type: none">• It is released from endocrine lining of stomach.	<ul style="list-style-type: none">• It is a hormone released from endocrine lining of duodenum.
<ul style="list-style-type: none">• Specific proteins in food stimulate the gastrin to release.	<ul style="list-style-type: none">• It is secreted by stimulation of acidic chyme touching walls of duodenum.
<ul style="list-style-type: none">• It causes the release of gastric juice from gastric glands.	<ul style="list-style-type: none">• It inhibits the secretion of gastric juice and stimulates the release of hepatic and pancreatic secretion.

Q:20 Differentiate between food poisoning and botulism.

Food poisoning	Botulism
<ul style="list-style-type: none">• It is an illness of food containing toxic substances.	<ul style="list-style-type: none">• It is a severe form of food poisoning.
<ul style="list-style-type: none">• It is caused by toxins produced by bacteria <i>Salmonella</i> and <i>Comphylobacter</i>.	<ul style="list-style-type: none">• It is caused by toxins produced by bacteria known as <i>Clostridium botulinum</i>.
<ul style="list-style-type: none">• Its symptoms are diarrhea, vomiting and abdominal pain.	<ul style="list-style-type: none">• Its symptoms are fatigue, dizziness, double vision, head ache,, vomiting, diarrhea and abdominal pain. Cardiac and respiratory paralysis may occur.
<ul style="list-style-type: none">• It develops by the use of unpasteurized milk and improperly cooked meat.	<ul style="list-style-type: none">• It develops by the use of improperly canned or otherwise preserved food especially meat.

Q:21 Write down the role and deficiency symptoms of K, N and MG in plants.

Elements	Role	Effect of deficiency
N	It is an important part of proteins, lipids, nucleic acids etc.	<ul style="list-style-type: none">• Stunned growth• Premature death of plant
K	Helps in photosynthesis and growth.	<ul style="list-style-type: none">• Stunned growth• Margins of old leaves become yellow
Mg	A central atom of chlorophyll.	Chlorosis

Q:22 What is Diarrhea:

Ans: Diarrhea:

- Diarrhea is the rapid movement of watery fecal matter through the large intestine due to less absorption of water and electrolytes.
- Any pathology that irritates and increase the motility of intestinal wall especially colon can cause diarrhea.
- Diarrhea may lead to dehydration that always proves to be fatal especially in children.

Prof. Ijaz Ahmad Khan Abbasi (Lecturer Biology PGC)

Q:23 Differentiate between Constipation and Diarrhea.

Constipation	Diarrhea
<ul style="list-style-type: none">It is slow movement of feces through the large intestine.	<ul style="list-style-type: none">It is the rapid movement of fecal matter through the large intestine.
<ul style="list-style-type: none">It is associated with large quantities of dry and hard feces due to excessive absorption of water.	<ul style="list-style-type: none">It is associated with watery feces due to less absorption of water and electrolytes.
<ul style="list-style-type: none">It may lead to piles or hemorrhoids.	<ul style="list-style-type: none">It may lead to dehydration that always proves to be fatal especially in children.

Q:24 What is Obesity?

Ans: Obesity: Obesity means excessive fat in the body.

- Obese is a person who has abnormal amount of fat on the body.
- Obesity occurs when a person eats too much than body requirement and the surplus food is stored in body as fat.
- Fat is stored in the cytoplasm of cells in the form of droplets that later become large globules. These cells are called fat cells or adipose cells.
- Groups of fat cells or adipose cells form adipose tissue around the kidney, in the abdomen and under the skin.

Q:25 How adipose tissue is formed?

Ans: If one eat too much food than body requirement, surplus food is stored in the cells as fat called adipose cells or fat cells. These fats are stored in the cytoplasm of the cells are droplets. As these droplets increase in number, they join together to form one large globule of fat in the middle of the cell pushing the cytoplasm into thin layer and nucleus to one side. Groups of fat cells or adipose cells form adipose tissue in the abdomen, around the kidneys and under the skin.

Q:26 What are the symptoms shown in plants of nitrogen deficiency and potassium deficiency in the soil.

Ans: Symptoms shown in plants of nitrogen deficiency:

- Leaves particularly older turn pale yellow due to strong chlorosis.
- Plant growth remains stunted and lateral buds remain dormant.
- Processes of cell division and cell enlargement are inhibited.

Symptoms shown in plants of Potassium deficiency:

- Leaf margin turn yellow and brown in color.
- Premature death of the plants occurs.
- Irregular chlorosis occurs.
- Plant is stunted in growth.

Q:27 How Sundew (*Drosera*) show its insectivorous activity?

Ans: Sundew plant shows its insectivorous activity by modification of its leaves into two halves that bear numerous hairs like tentacles, each with a gland at its tip. When the insect, attracted by plant odor, triggers the hair, the two halves of the leaf are enclosed trapping the insect.

Q:28 What is holozoic nutrition?

Ans: Holozoic nutrition: The nutrition in which complete, non-diffusible food is taken in and digested into smaller diffusible molecules which can be absorbed and assimilated is called holozoic nutrition.

- It is found in free living animals which have specialized digestive tract in which various process occur.
- Holozoic nutrition is achieved by ingestion, digestion, absorption, assimilation and egestion.

Q:29 What are nematocysts? What is their role in ingestion of prey?

Ans: Nematocysts: Nematocysts are numerous stinging cells embedded in the tentacles of coelenterates.

- Each nematocyst consists of a hollow thread coiled within a capsule and a tiny hair like trigger projecting outside.

Role of nematocyst in ingestion of prey:

When a prey such as *Daphnia* or *Cyclops* comes in contact with the trigger of nematocyst, the hollow thread of nematocyst turns out ejects poison and prey is paralyzed or sometimes killed. Coelenterate such as *Hydra* then grasps its prey with its tentacles and pushes it into the digestive cavity through open mouth.

Q:30 Write down causes and treatment of anorexia nervosa?

Ans: Causes of anorexia nervosa:

- An anorexia girl over estimates the size of her body and so insists that she is over-weight when in reality her weight has dropped to dangerous level.
- An anorexic girl is often immature psychologically and unable to cope with challenges of puberty and her emerging sexuality.

Treatment of anorexia Nervosa:

- Psychiatric therapy is usually required when anorexic girl refuses to eat.
- Anorexic girl is usually fed through any route other than alimentary canal that is intramuscularly or intravenously.

Q:31 How is food swallowed by you?

Ans: Swallowing of food: Following steps take place in swallowing the food;

- The tongue moves upwards and backwards against the roof of the mouth cavity forcing the bolus to the back of the mouth cavity.
- The backward movement of the tongue elevates the soft palate. Elevation of soft palate:
 1. Closes nasal cavity and prevents food from entering it.
 2. Exerts pressure against the back wall of the pharynx that triggers an automatic involuntary response which include;
 - a) Contraction of a ring of muscle of glottis closing it partly.
 - b) Rise of larynx.
 - c) Taking of epiglottis in the elevated position keeping food out of the respiratory tract, directing it instead into esophagus.
- The food is forced down the esophagus by peristalsis.

Q:32 What is ulcer?

Ans: Ulcer:

- Ulcer is a lesion or sore on the skin or a mucous membrane, that erodes away the skin or mucous membrane.
- Peptic ulcer is a break in mucus layer of the stomach or first part of small intestine, duodenum.
- Occasionally, peptic ulcer is so severe that a hole develops in the wall of digestive tract and the contents of the tract spill into the abdominal cavity, leading to severe infection which may prove to be fatal.

Q:33 How the secretion of gastric juice is regulated?

Ans: Regulation of secretion of gastric juice:

The secretion of gastric juice is regulated by smell, sight and quality of food (protein). But all these secrete a very small amount of gastric juice. The enzyme present in the gastric juice partially digests protein molecules. When partially digested protein particles touch the mucosal surface of stomach they stimulate the production of gastrin hormone that is carried by the blood to the gastric glands and stimulates them to produce a large quantity of gastric juice.

