



UNIVERSITY OF THE PUNJAB

First Prof. A/2015

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Physiology & Histology / Physiology
PAPER: 4 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q. # 1 Describe mechanism of transport of carbon dioxide by blood from tissues to Alveoli 20
- Q. # 2 (a) Define Cardiac output. Describe the factors that affect cardiac output 12
(b) Draw a label diagram of ECG and write down its significance in diagnosis 08
- Q. # 3 Briefly discuss causes, symptoms and treatment of Anemia. 20
- Q. # 4 Write down in detail various steps of urine formation by renal tubules. 20
- Q. # 5 Discuss the functions of Parasympathetic Nervous System at various organ level 20
- Q. # 6 (a) Describe the movement and functions of Large Intestine. 10
(b) Describe the composition and functions of Saliva and Gastric Juice 10
- Q. # 7 Write a note on
- (a) Composition and functions of Bile 10
(b) The functions of Skin 10



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PAPER: 4 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.No.		Marks
1	What are the subdivisions of autonomic nervous system (ANS)? Describe the effects of sympathetic nervous system on major organs?	20
2	Define GFR? Discuss its mechanism of regulation?	20
3	Define immunity? Discuss in detail different types of immunity?	20
4	A) What is the morphological structure of neuron? Classify it on functional basis? B) Describe the functions of different centres located in the brain stem?	10 10
5	A) Classify blood vessels? Write down their structure and function? B) Define shock? Describe four types of shock?	10 10
6	Define blood pressure? Discuss in detail the mechanisms of regulation of blood pressure?	20
7	Write note on following A) Cerebrospinal fluid B) Deglutition	10 10



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First Prof. 2nd A/2016

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Physiology & Histology / Physiology
PAPER: 4 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q1. Classify nervous system? Describe the functions of cerebrum and cerebellum? 20
- Q2. Define GFR? Discuss its mechanism of regulation? 20
- Q3. Define immunity? Discuss in detail different types of immunity? 20
- Q4. Describe the structure and functions of skin? 20
- Q5. Define blood pressure? Discuss in detail the mechanisms of regulation of blood pressure? 20
- Q6. A) Describe the physiology of pancreas and discuss in detail exocrine secretion of pancreas? 10
- B) Discuss the movements of the small intestine involved in the digestion? 10
- Q7. Write note on following
- A) Dilute and concentrated urine 10
- B) Reflex arch 10



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First Prof. A/2017

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PAPER: 4 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.No.		Marks
1	What are red blood cells (RBCs)? Explain the production, functions and fate of RBCs.	20
2	A) What are neuroglia and their different types?	10
	B) Discuss the composition and functions of Cerebrospinal fluid.	10
3	A) Discuss the secretions from gastric glands and write down the basic mechanism of secretion of hydrochloric acid?	12
	B) Explain the defecation reflexes.	08
4	Describe the divisions of the autonomic nervous system? State the functions of parasympathetic nervous system on different organs.	20
5	A) Discuss the physiological and metabolic functions of insulin and glucagon.	12
	B) Discuss the physiological functions of glucocorticoids.	08
6	A) Discuss the properties of respiratory membrane and diffusion of gases through respiratory membrane.	12
	B) Name pulmonary volumes and discuss the significance of each volume.	08
7	A) How the cardiac muscles are different from skeletal muscles? Discuss in detail the properties of cardiac muscles.	10
	B) Discuss in detail the mechanism of contraction of cardiac muscle.	10



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TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.No.		Marks
1	What is immunity? Explain its various types and discuss in detail the immune response against an antigen.	20
2	A) Discuss different types and functions of plasma proteins.	10
	B) Describe cardiac cycle in detail.	10
3	A) Describe different pairs of spinal nerves.	10
	B) What is a reflex action? Classify reflexes and describe reflex arc.	10
4	A) Discuss in detail transport of oxygen between the lungs and the tissues?	10
	B) What is hypoxia? Explain different types of hypoxia?	10
5	A) Discuss the composition and functions of pancreatic juice and regulation of pancreatic secretions.	12
	B) Discuss the composition and functions of bile?	08
6	A) Enumerate the functions of kidney and draw a labeled diagram of nephron.	10
	B) Discuss the formation of dilute and concentrated urine?	10
7	A) Describe different parts of neuron? Classify on basis of structure and functions?	10
	B) Discuss the functions of cerebrum?	10



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First Prof: Annual – 2018

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Roll No.

Subject: Physiology & Histology / Physiology

TIME ALLOWED: 30 min.

PAPER: 4 Part – I (Compulsory) (Old & New Course)

MAX. MARKS: 20

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

1. The principle muscle of inspiration is A. External intercostals B. Sclanci C. Pectoralis minor D. None of the above	2. The average GFR in a 70 kg person is A. 180 L/day B. 125 L/day C. 125 mL/min D. Both A & C
3. Which of the following are the parts of neurons? A. Brain, spinal cord & vertebral column B. Dendrite, axon, and cell body C. Sensory and motor D. Cortex, medulla and sheath	4. Acetylcholine and norepinephrine are two well-known _____. A. Postsynaptic receptors B. Enzymes that rapidly inactivate neurotransmitters C. Drugs of abuse D. Neurotransmitters
5. An axon conducts nerve impulses _____ the cell body. A. Away from B. Toward C. Both toward and away from D. Around, bypassing	6. Vasopressin secretion is regulated under control of A. Osmoreceptors B. Baroreceptors C. Both A & B D. None of the above
7. Respiratory unit contains all of the following EXCEPT: A. Terminal bronchioles B. Alveolar ducts C. Atria D. Alveoli	8. Higher thought processes for learning and memory are primarily in the _____. A. Medulla oblongata B. Cerebellum C. Cerebrum D. Pons
9. The closure of the mitral and tricuspid valves at the onset of systole A. S1 Sound B. Systole C. Diastole D. S2 Sound	10. What is the first phase in cardiac cycle A. Passive Filling B. Ventricular Isovolumic Contraction C. Atrial Contraction D. Ventricular Ejection
11. The proper transmission of impulse to the entire cardiac muscles is called A. Excitability B. Automaticity C. Conductivity D. Contractility	12. During exercise (compared with at rest), stroke volume is... A. Increases B. Unchanged C. Decreases D. None of above

<p>13. Secretin is majorly responsible for the increase in the secretion of</p> <p>A. Water and Bicarbonate ions B. Water and bile juice C. Bile salts D. Endocrine secretion of pancreas</p>	<p>14. One of the following enzyme is responsible for the digestion of carbohydrates in mouth</p> <p>A. Pepsin B. Ptyalin C. Trypsin D. Both b and c</p>
<p>15. The combination of macula densa and juxtaglomerular cells is known as the</p> <p>A. Juxtaglomerular apparatus B. Renal pelvis C. Renal cortex D. Renal corpuscle</p>	<p>16. Which of the following is an important mixing mechanism in small intestine</p> <p>A. Haustrations B. Retropulsion C. Villi D. Segmentation movements</p>
<p>17. Which of the following layers of skin does not contain blood vessels</p> <p>A. Cutis B. Dermis C. Epidermis D. Subcutaneous</p>	<p>18. The voltage that enters in T tubule is sensed by</p> <p>A. Calcium channel B. Sodium channel C. Chloride channel D. Potassium channel</p>
<p>19. Complement proteins perform all the functions except</p> <p>A. Opsonization B. Chemoattraction C. Pore formation D. Phagocytosis</p>	<p>20. Primary haemostasis involves</p> <p>A. Fibrin polymerization B. Platelet aggregation C. Factor X activation D. Factor V activation</p>



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Subject: Physiology & Histology / Physiology
PAPER: 4 Part – II (Old & New Course)

TIME ALLOWED: 2 Hrs. & 30 min.
MAX. MARKS: 80

Attempt this Paper on Separate Answer Sheet provided.

Attempt any 4 questions. Each question carry equal marks.

Q.No.		Marks
2	Discuss the fate of organic molecules during absorptive state?	20
3	(a) Describe the Spinal Nerves and their functions. (b) What do you understand from, "Reflex Arch". What are their main types?	10 10
4	(a) Define and explain different types of Pulmonary Volumes and Capacities (b) Describe the Transport Mechanism of CO ₂ from Tissues to alveoli	10 10
5	Write a note on Glomerular Filtration Rate and its Regulation	20
6	(a) What do you understand by ECG? Draw the normal ECG. Explain waves and intervals? (b) What are Autoimmune Diseases? Explain the immune activity of natural killer cells and cytotoxic T cells.	10 10
7	(a) Classify autonomic nervous system. What are the main neurotransmitters and receptors for sympathetic nervous system? (b) Discuss the functions of sympathetic nervous system on major body organs if you start from head to toe.	10 10



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Roll No.

Subject: Physiology & Histology / Physiology
PAPER: 4 Part – II (Old & New Course)

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 80

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

NOTE: ATTEMPT ANY FOUR QUESTIONS. EACH QUESTION CARRIES EQUAL MARKS.

- Q. 2 (a) Classify Neurons on the basis of their function. (5)
b) What are Neuroglia and their different types? (5)
c) Discuss the physiological functions of Cerebrum and Cerebellum. (10)
- Q. 3 a) Classify the Brain Meninges and discuss their functions. (5)
b) What structures are included in Brain Stem. Describe their functions. (15)
- Q. 4 (a) Give Functions of Kidneys. (5)
b) Describe reabsorption in proximal convoluted tubule of nephron. (15)
- Q. 5 a) Explain Oxygen Carriage in the blood (10)
b) Describe Oxygen-Hemoglobin Dissociation Curve. Write down the factors affecting this curve (10)
- Q. 6 a) Define Cardiac Cycles. Explain various phases of systole & diastole (10)
b) What do you understand by Heart Sounds? Explain the normal heart sounds & Murmurs (10)
- Q. 7 a) Explain in detail the process of Deglutition. (10)
b) What is Neuromuscular Junction? Explain the mechanism of contraction of skeletal muscles (10)



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Roll No. in Fig.

Roll No. in Words.

Subject: Physiology & Histology / Physiology

MAX. TIME: 30 Min.

PAPER: 4 Part – I (Compulsory) (Old & New Course)

MAX. MARKS: 20

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

1. Schwann cells are one of several types of _____ cells in the nervous system. A) Sensory B) Motor C) Association D) Neuroglia	2. Build up of CO ₂ in the Extra Cellular Fluid is called A. Respiratory alkalosis B. Respiratory acidosis C. Metabolic acidosis D. Metabolic alkalosis
3. _____ is a disease of the myelin sheath. A) Leprosy B) Alzheimer disease C) Multiple sclerosis D) Polio	4. ADH is released from which gland A. Posterior pituitary B. Anterior pituitary C. Adrenal cortex D. Adrenal medulla
5. The _____ contains centers for heartbeat, breathing, and blood pressure. A) Cerebellum B) Cerebrum C) Spinal cord D) Medulla oblongata	6. Macula densa cells release renin due to A. Na ions B. Ca ions C. H ions D. K ions
7. The average GFR in a 70 kg person is A. 180 L/day B. 125 L/day C. 125 mL/min D. Both A & C	8. Na ⁺ / H ⁺ Anti porters are present in which part of nephron A. Proximal convoluted tubule B. Loop of Henle C. Distal convoluted tubule D. Collecting Duct
9. Acetylcholine and norepinephrine act because of their affect on receptors at the _____ membrane. A) Axonal B) Cell body C) Presynaptic D) Postsynaptic	10. Pancreas is responsible for the secretion of which of the following hormones for the regulation of blood glucose after meal intake A. Enterokinase B. Trypsin C. Lipase D. Insulin
11. The first sound we heard using stethoscope is most likely because of... A. Open of AV valve B. Open of aortic valve C. Closure of AV valve D. Closure of aortic valve	12. Gastrin is secreted in stomach and is responsible for secretion of A. Cholecystokinin B. Intrinsic factor C. Hydrochloric acid D. Carboxypolypeptidase

P.T.O.

<p>13. Enterochromaffin cells are responsible for secretion of</p> <ul style="list-style-type: none"> A. Serotonin B. Gastrin C. Histamine D. Prostaglandins 	<p>14. The composition of blood is made constant by its</p> <ul style="list-style-type: none"> A. Circulation B. Viscosity C. Specific gravity D. Gases
<p>15. Gaps in the myelin sheath are called _____</p> <ul style="list-style-type: none"> A. Nodes of Ranvier B. The synapse C. Axonal interstices D. Myelinoids 	<p>16. Which of the following is/are type(s) of neurons?</p> <ul style="list-style-type: none"> A. Sensory B. Motor C. Interneuron D. All of the above
<p>17. Systemic vascular resistance (or Total peripheral resistance as it used to be called...) is most directly modified by:</p> <ul style="list-style-type: none"> A. change in lumen vessel diameter B. Change in capillary end volume C. Change in pre load D. Change in after load 	<p>18. Which is the flat, isoelectric section of the ECG between the end of the S wave (the J point) and the beginning of the T wave</p> <ul style="list-style-type: none"> A. PR segment B. QRS Interval C. ST segment D. QT interval
<p>19. The first Immunoglobulin that is made in fetus is</p> <ul style="list-style-type: none"> A. IgM B. IgA C. IgD D. IgG 	<p>20. "Missing self" is the characteristic feature of</p> <ul style="list-style-type: none"> A. Cytotoxic T cells B. Natural killer cells C. B cells D. Dendritic cells



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Time: 30 Min. Marks: 20

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the correct option.

(20x1=20)

1. Nervous system consists of: A. Brain B. Spinal Cord C. Nerves D. All of the above	2. Which of the following statement is correct about cerebellum? A. It regulates the muscular movement for locomotion. B. It is part of brain C. Both A & B D. Neither A nor B
3. Which nerves are attached to the brain and emerge from the skull? A. Cranial Nerves B. Spinal Nerves C. Thoracic Nerves D. Sacral Nerves	4. Name the system that controls every activity that you do? A. Nervous System B. Exocrine System C. Endocrine System D. Respiratory System
5. What is the unit of Nervous System? A. Brain B. Spinal Cord C. Neuron D. Nerves	6. A microscopic gap between a pair of adjacent neurons over which nerve impulses pass when going from one neuron to the next is called: A. Neurotransmitter B. Synapse C. Axon D. None of the above
7. Which of the following anatomical structure is NOT part of the conducting zone? A. Pharynx B. Nasal cavity C. Alveoli D. Bronchi	8. A low partial pressure of oxygen promotes the hemoglobin binding to CO ₂ . This is an example of the _____. A. Haldane effect B. Bohr effect C. Dalton's effect D. Henry's effect
9. Which of the following has thickest wall: A. Right ventricle B. Left ventricle C. Right atrium D. Left atrium	10. Mitral valves are present between: A. Left atria & right atria B. Right atria & right ventricle C. Left ventricle & left atria D. Left atria & right atria

P.T.O.

11. Chronotropy refers to: A. Rhythmicity B. Conductivity C. Excitability D. Contractility	12. The ventricular systole duration is: A. 0.1 sec B. 0.2 sec C. 0.3 sec D. 0.4 sec
13. What is the normal duration of QRS complex? A. 0.12 sec B. 0.16 sec C. 0.08 sec D. 0.04 sec	14. Normally, the rate of heart beat in human is determined by: A. Bundle of HIS B. All the cardiac Muscles C. The SA Node D. The cervical ganglion
15. Stroke output of each ventricle in normal adult is: A. 30 ml B. 130 ml C. 70 ml D. 5 liters	16. Large intestinal secretion is stimulated by: A. Direct stimulation B. Local myentric reflex C. Para sympathetic stimulation D. All of the above
17. Oxyntic or parietal cells secrete: A. HCl B. Trypsin C. Zymogen granules D. Pepsinogen	18. Which of the following is the major factor that protects the duodenal mucosa from the damage by gastric acid? A. Pancreatic bicarbonate secretion B. The endogenous mucosal barrier of the duodenum C. Duodenal bicarbonates secretion D. Hepatic bicarbonate secretion
19. Chemotrypsinogen in pancreatic juice is activated by: A. Enterokinase B. Alkaline pH C. Trypsin D. Bile Salts	20. Which of the following has highest pH? A. Gastric Juice B. Pancreatic Juice C. Hepatic Bile D. Succus entericus



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Paper: 4 Part - II (Old & New Course)

Time: 2 Hrs. 30 Min. Marks: 80

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

Q. No. 2		Classify the nervous system. Describe the functions of cerebrum and cerebellum	20
Q. No. 3	(a)	Explain how does sympathetic and parasympathetic nervous system modulate the activity of enteric nervous system.	10
	(b)	Classify WBCs and give their functions	10
Q. No. 4		What do you understand by cardiac muscles? Discuss the properties of cardiac muscles in detail.	20
Q. No. 5		Write in detail CO ₂ transport in blood.	20
Q. No. 6	(a)	Describe the chemical digestion in duodenum and mechanism of endocrine regulation of pancreas, liver and gall bladder.	10
	(b)	Illustrate diagrammatically and explain direct and indirect action of three secretagogues (Ach, Gastrin, and Histamine), their receptors and signal transduction pathways in process of HCl production by parietal cells.	10
Q. No. 7	(a)	What do you understand by heart sounds? Explain the various types of heart sounds.	10
	(b)	Define and briefly explain the followings: i. Cardiac output ii. Stroke volume iii. Heart rate iv. Blood pressure v. GFR	10



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Doctor of Pharmacy (Pharm.D.) 1st Prof: Annual – 2021

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Subject: Physiology & Histology / Physiology (Old & New Course)

Time: 2 Hrs. 30 Min. Marks: 80

Paper: 4

Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

- | | | |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Q. No. 2 | How brain communicate with rest of the body, discuss important function of cerebrum and various Lobes of brain | 20 |
| Q.NO. 3 a) | Explain Oxygen Carriage in the blood | 10 |
| b) | Describe Oxygen-Hemoglobin Dissociation Curve. Write down the factors affecting this curve | 10 |
| Q. No. 4 | What do you understand by cardiac muscles? Discuss the properties of cardiac muscles in detail | 20 |
| Q. No. 5 a) | Classify salivary glands. Describe composition and functions of saliva | 10 |
| b) | Describe steps involved in saliva secretion and autonomic regulation of salivary secretion. Also describe signal transduction pathways of receptors involved in secretion of saliva | 10 |
| Q.No.6 | Describe mechanisms of HCl production and its regulation | 20 |
| Q. No. 7 a) | Explain Stroke volume and factors affecting the stroke volume | 10 |
| b) | Define Blood pressure and its normal regulation | 10 |



UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) 1st Prof: Annual – 2021

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Paper: 4

Part – I (Compulsory)

Time: 30 Min. Marks: 20

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

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Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

1. Renin is released in response to
 - A. Increased blood pressure
 - B. Decreased blood pressure
 - C. Diuretics
 - D. Angiotensin converting enzyme
2. Most absorption and secretion occurs in this part of the Nephron
 - A. Proximal convoluted tubule
 - B. Descending loop of Henle
 - C. Distal convoluted tubule
 - D. Collecting ducts
3. Which explanation best describes why plasma proteins can function as buffers
 - A. Plasma proteins make a stronger buffer
 - B. Plasma proteins immune to damage from acids.
 - C. Proteins have both positive and negative charges on their surface
 - D. Proteins are alkaline
4. Calcium and Phosphate balance are controlled primarily by
 - A. Parathyroid Hormone
 - B. 1,25(OH)₂D
 - C. Aldosterone
 - D. None of the above
5. The renal pyramids are separated from each other by extensions of the renal cortex called
 - A. Renal medulla
 - B. Minor calyces
 - C. Medullary cortices
 - D. Renal columns
6. Which of following digestive organs does not show peristalsis
 - A. Esophagus
 - B. Stomach
 - C. Small intestine
 - D. Caecum
7. Amount of intestinal secretion daily
 - A. 500ml
 - B. 1000ml
 - C. 1500ml
 - D. 2000ml
8. pH of stomach is
 - A. 1-2
 - B. 4-5
 - C. C. 7.4
 - D. D. 8-10
9. CCK does NOT
 - A. Stimulates gall bladder contraction
 - B. Inhibits gastric emptying
 - C. Stimulate secretion of pancreatic juice rich in enzymes
 - D. Stimulates insulin secretion
10. Which of the following has thickest wall
 - A. Right ventricle
 - B. Left ventricle
 - C. Right atrium
 - D. Left atrium

11. Mitral valves are present between
A. Left atria & right atria
B. Right atria & right ventricle
C. Left ventricle & left atria
D. Left atria & right atria
12. Chronotropy refers to
A. Rhythmicity
B. Conductivity
C. Excitability
D. Contractility
13. The ventricular systole duration is
A. 0.1 sec
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14. What is the normal duration of QRS complex?
A. 0.12 sec
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15. Normally, the rate of heart beat in human is determined by
A. Bundle of HIS
B. All the cardiac Muscles
C. The SA Node
D. The cervical ganglion
16. Stroke output of each ventricle in normal adult is
A. 30 ml
B. 130 ml
C. 70 ml
D. 5 liters
17. Nervous system consists of
A. Brain
B. Spinal Cord
C. Nerves
D. All of the above
18. Which of the following statement is correct about cerebellum?
A. It regulates the muscular movement for locomotion.
B. It is part of brain
C. Both A & B
D. Neither A nor B
19. Which nerves are attached to the brain and emerge from the skull?
A. Cranial Nerves
B. Spinal Nerves
C. Thoracic Nerves
D. Sacral Nerves
20. Name the system that controls every activity that you do?
A. Nervous System
B. Exocrine System
C. Endocrine System
D. Respiratory System