



Date of issue : Centre :
Sup. Sign. : Seat No. :

ND-2006000101020001-O Seat No. _____

First Year M. B. B. S. Examination

January - 2022

Physiology : Paper - 1

Time : Hours]

[Total Marks : 20

Instruction :

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
First Year M. B. B. S.

Name of the Subject :
Physiology : Paper - 1

Subject Code No. : Section No. (1, 2,.....): Nil

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Seat No. :

Student's Signature

Section A

MCQs

20 marks

- The phospholipid seen mostly on the outer leaflet of cell membrane is
 - Phosphatidylethanolamine
 - Phosphatidylserine
 - Phosphatidylcholine
 - Phosphatidylinositol
- Fluidity of the lipid bilayer cell membrane is decreased by Decreasing the cell membrane concentration of
 - the unsaturated fatty acids
 - transmembrane protein
 - the saturated fatty acids
 - glycoprotein
- Hemostasis refers to the
 - unwavering control of a physiological set point
 - maintaining a stable internal environment
 - maintaining a stable external environment
 - coagulation of blood

4. Blood does not coagulate inside the body due to the presence of-
- a) Fibrin
 - b) Heparin
 - c) Hemoglobin
 - d) Thromboplastin
5. The region of the sarcomere which contains thick filaments is
- a) M Line
 - b) Z Line
 - c) I Band
 - d) A Band
6. In skeletal muscle myosin head binding site on actin is covered by
- a) Troponin I
 - b) Tropomyosin
 - c) Troponin C
 - d) Titin
7. During the contraction of a skeletal muscle fiber, the actin and myosin filaments slide past each other. Which of the following represents expected changes in the widths of I bands and A-bands during the contraction process?
- | I Band Width | A Band Width |
|--------------|--------------|
| a. Increase | No Change |
| b. Decrease | Increase |
| c. No Change | Increase |
| d. Decrease | No Change |
8. Smooth muscle differs from skeletal muscle by
- a) Highly developed sarcoplasmic reticulum
 - b) Lesser duration of contraction
 - c) Role of extracellular calcium in contraction
 - d) More number of mitochondria
9. In rapid repolarization of ventricular muscle fibres
- a) Slow calcium channels close & slow potassium channels open
 - b) Fast sodium channels close & fast potassium channels open
 - c) Slow calcium channels open & fast potassium channels close
 - d) Fast sodium channels close & fast calcium channels open
10. Which of the following pathway begins at the anterior portion of SA node and ends at AV node
- a) Intermodal pathway of Wenkebach
 - b) Intermodal pathway of Bachman
 - c) Internodal pathway of Thorel
 - d) Bundle of Kent
11. Warm and red skin is seen in
- a) Constricted arterioles and capillaries
 - b) Dilated arterioles and capillaries
 - c) Constricted arterioles and capillaries
 - d) Only dilated capillaries

12. During which phase of cardiac action potential, the inward rectifier potassium current is observed
- a) Initial rapid repolarisation
 - b) Plateau
 - c) Final repolarisation
 - d) Depolarisation
13. Which of the following organ disorder is least likely to result in steatorrhoea
- a) Liver
 - b) Small Intestine
 - c) Pancreas
 - d) stomach
14. The mitotically active, undifferentiated cells that replenish Enterocytes, are located in
- a) Brunner's gland
 - b) Crypts of Lieberkuhn
 - c) Payer's patches
 - d) Gut associated lymphoid tissue
15. Intrinsic factor of Castle is secreted by
- a) Chief cells
 - b) Parietal cells
 - c) G cells
 - d) S cells
16. Which of the following can result in gastric ulcer by damaging the mucosal barrier and increasing acid secretion
- a) Gastrin
 - b) H. Pylori
 - c) Bile salts
 - d) Epidermal growth factor
17. Most of the work during tidal inspiration is done by
- a) Diaphragm
 - b) External intercostals muscles
 - c) Internal intercostals muscles
 - d) Sternocleidomastoid muscles
18. Surfactant helps to
- a) Lower the surface tension
 - b) Bring about the closure of the alveoli
 - c) Relax the bronchial wall
 - d) Increase the work of breathing
19. Most of the resistance to the renal blood flow is offered by
- a) Efferent arterioles
 - b) afferent arterioles
 - c) Peritubular capillaries
 - d) renal vein
20. The first micturition reflex is initiated at the urine volume of ___ in urinary bladder
- a) 50 ml
 - b) 150 ml
 - c) 250 ml
 - d) 350 ml

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ND-2006000101020001 Seat No. _____

First Year M. B. B. S. Examination

January - 2022

Physiology : Paper - 1

Time : Hours] _____

[Total Marks : 80

Instruction :

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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Name of the Examination :
First Year M. B. B. S.

Name of the Subject :
Physiology : Paper - 1

Section No. (1, 2,.....): Nil

Subject Code No. :
2 0 0 6 0 0 0 1 0 1 0 2 0 0 0 1

Seat No. :
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Student's Signature

Section B (40 marks)

1. A 46 year old Obese male patient is brought to emergency medical room with perspiration, chest pain (radiating to left shoulder) which is relieved on rest. (1+ 6+3 =10)
 - a. Identify the underlying clinical condition
 - b. Describe the blood supply to heart
 - c. Enumerate the investigations likely to be advised to this patient
2. Answer in Short (any 5 out of 6) (5 x 3 = 15)
 - a. Na⁺.K⁺ pump
 - b. Functions of platelets
 - c. Pernicious anaemia
 - d. Anatomical dead space
 - e. Neat, labeled diagram of a nephron
 - f. myosin filament
3. Short notes (any 3 out of 4) (3 x 5 = 15)
 - a. Oxygen transport
 - b. Functions of blie
 - c. Countercurrent mechanism
 - d. Negative feedback mechanism

Section C (40 marks)

4. Draw a well labelled diagram of oxygen dissociation curve. Describe in detail about oxygen uptake, delivery and transport in blood. Add a note on Haldane's effect. (3+5+2 = 10)

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[Contd..

5. Answer in Short (any 5 out of 6) (5 x 3 = 15)

- a. A V nodal delay
- b. Herring Breuer reflex
- c. Mitochondria
- d. Latch phenomenon
- e. Respiratory membrane
- f. Plateau potential

6. Short notes (any 3 out of 4) 3 x 5 = 15

- a. Neuromuscular transmission
- b. GFR
- c. Erythroblastosis foetalis
- d. Cell mediated immunity

INSTRUCTIONS :

1. The candidate must write the answers in the answer sheet provided.

2. The candidate must write the answers in the answer sheet provided.

3. The candidate must write the answers in the answer sheet provided.

4. The candidate must write the answers in the answer sheet provided.

5. The candidate must write the answers in the answer sheet provided.

6. The candidate must write the answers in the answer sheet provided.

7. The candidate must write the answers in the answer sheet provided.

8. The candidate must write the answers in the answer sheet provided.

9. The candidate must write the answers in the answer sheet provided.

10. The candidate must write the answers in the answer sheet provided.

Section B (40 marks)

1. A 40 year old male patient is brought to emergency with respiratory distress (radiating to left shoulder) which is relieved on rest. Identify the underlying clinical condition. Describe the blood supply to heart. Suggest the investigations likely to be advised to the patient.

2. Answer in short (any 5 out of 6) (5 x 3 = 15)

- a. My X-ray
- b. Functions of platelets
- c. Functions of plasma
- d. Anatomical dead space
- e. Most labelled diagram of a nephron
- f. Myofibrils

3. Short notes (any 3 out of 4) (3 x 5 = 15)

- a. Oxygen transport
- b. Functions of bile
- c. Coagulation mechanism
- d. Negative feedback mechanism

Section C (40 marks)

1. Draw a well labelled diagram of oxygen dissociation curve. Describe the Bohr effect and explain its role in tissue oxygen delivery and transport in blood. Add a note on fetal hemoglobin. (5+2+5 = 12)



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Date of issue : Centre :

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ND-2006000101020002-O Seat No. _____
First Year M. B. B. S. Examination
January - 2022
Physiology : Paper - 2

Time : Hours] [Total Marks : 20

Instruction :

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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Name of the Examination :

First Year M. B. B. S.

Name of the Subject :

Physiology : Paper - 2

Section No. (1, 2,.....):

Subject Code No. :

Seat No. :

Student's Signature

Section A MCQs 20 marks

- Which taste sensation is the most sensitive (has the lowest stimulation threshold)?
 a. Acid b. Bitter c. Salty d. Sour
- Which of the following best describes the "blind spot" of the eye?
 a. Located 5 degrees lateral to the central point of vision
 b. The exit point of the optic nerve
 c. Contains only rods and thus has monochromatic vision
 d. Contains no blood vessels
- After olfactory receptor cells bind odor molecules, a sequence of intracellular events occurs that culminates in the entrance of specific ions that depolarize the olfactory receptor cell. Which ions are involved?
 a. Calcium b. Chloride c. Hydrogen d. Sodium
- Which of the following middle ear ossicle is attached to the tympanic membrane?
 a. Columella b. Incus c. Malleus d. Modiolus

5. Olfactory receptor cells belong to which group of cells?
 - a. Bipolar neurons
 - b. Fibroblasts
 - c. Modified epithelial cells
 - d. Multipolar neurons
6. Interneurons that utilize the neurotransmitter enkephalin to inhibit afferent pain signals are most likely to be found in which region of the central nervous system?
 - a. Dorsal horn of spinal cord
 - b. Postcentral gyrus
 - c. Precentral gyrus
 - d. Ventral horn of spinal cord
7. Which type of papillae is located in the posterior part of the tongue?
 - a. Circumvallate
 - b. Foliate
 - c. Fungiform
 - d. Fungiform and circumvallate
8. The processing of short term memory to long term memory is done in :
 - a. Prefrontal cortex
 - b. Hippocampus
 - c. Neocortex
 - d. Amygdala
9. Which of the following thalamic nuclei acts as a relay for transmission of Auditory information
 - a. Dorsomedial
 - b. Lateral geniculate
 - c. Medial geniculate
 - d. Ventral posterolateral
10. A 17-year-old boy sustains serious head and neck trauma during a football game. Physical examination shows a positive Babinski sign. Which of the following is most likely to be damaged in this boy?
 - a. Anterior motor neurons
 - b. Cerebellum
 - c. Corticospinal tract
 - d. Premotor cortex
11. Within minutes after a normal delivery, flow through the foramen ovale decreases dramatically. What is the cause of this change?
 - a. Increased formation of prostaglandin E2 (PGE2) in the endocardium
 - b. Increased rate of flow through the pulmonary artery
 - c. Increased left atrial pressure
 - d. Increased right atrial pressure
12. For male differentiation to occur during embryonic development, testosterone must be secreted from the testes. What stimulates the secretion of testosterone during embryonic development?
 - a. LH from the maternal pituitary gland
 - b. HCG
 - c. Inhibin from the corpus luteum
 - d. GnRH from the embryonic hypothalamus
13. Why do infants of mothers who had adequate nutrition during pregnancy not require iron supplements or a diet rich in iron until about 3 months of age?
 - a. Growth of the infant does not require iron until after the third month
 - b. The fetal liver stores enough iron to meet the infant's needs until the third month
 - c. Synthesis of new red blood cells begins after 3 months
 - d. Muscle cells that develop before the third month do not contain myoglobin

14. What accompanies sloughing of the endometrium during the endometrial cycle in a normal woman?

- a. An increase in progesterone
- b. The LH "surge"
- c. A decrease in both progesterone and estrogen
- d. An increase in estradiol

15. Which of the following increases secretion of GH?

- a. Senescence
- b. Insulin-like growth factor-1
- c. Somatostatin
- d. Hypoglycemia

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16. Which hormone is largely unbound / least bound to plasma proteins?

- a. Cortisol
- b. T4
- c. ADH
- d. Estradiol

17. A 24-year-old student goes hiking in the Thar Desert during summer break. The environmental temperature is 105°F and the relative humidity is 20 percent. Which option best describes the major mechanism of heat loss in this student?

- a. Conduction to air
- b. Conduction to objects
- c. Convection
- d. Evaporation

18. Most of the energy for strenuous exercise that lasts for more than 5 to 10 seconds but less than 1 to 2 minutes comes from what source?

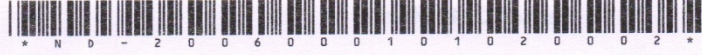
- a. ATP
- b. Anaerobic glycolysis
- c. Oxidation of carbohydrates
- d. Oxidation of lactic acid

19. Parasympathetic neurons

- a. Originate in the brain stem and then run via the vagus to the paravertebral ganglia
- b. Release noradrenaline at their terminals which in turn activates adrenergic receptors
- c. Cause vasodilatation in the blood vessels of the external genitalia
- d. Coordinate the so-called 'flight or fight' response

20. The neurotransmitter released by axon terminals of preganglionic sympathetic fibre is

- a. Acetylcholine
- b. Noradrenaline
- c. Epinephrine
- d. Dopamine



ND-2006000101020002 Seat No. _____

First Year M. B. B. S. Examination

January - 2022

Physiology : Paper - 2

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Time : Hours]

[Total Marks : 80

Instruction :

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Name of the Examination :	<input type="text"/>
First Year M. B. B. S.	<input type="text"/>
Name of the Subject :	<input type="text"/>
Physiology : Paper - 2	<input type="text"/>
Subject Code No. :	Section No. (1, 2,.....) : Nil
2 0 0 6 0 0 0 1 0 1 0 2 0 0 0 2	Student's Signature

Section B 40 Marks

1. A neurologist in his clinic observes a patient entering with waddling gait. On examination he finds intentional tremor and dysmetria. (1+8+1 = 10)
 - a. State the neural organ likely to be involved in the case.
 - b. Describe the various neural circuits involved in the functioning of the concerned organ.
 - c. What is ataxia.
2. Answer in short (any 5 out of 6) (5x3 = 15 marks)
 - a. Autonomic neurotransmitters and their receptors
 - b. Compare and contrast between sympathetic & parasympathetic neurons
 - c. EPSP
 - d. Composition and functions of CSF
 - e. Referred pain
 - f. Myopia
3. Short notes (any 3 out of 4) (3x5 = 15 marks)
 - a. Taste buds
 - b. Draw and label optic pathway
 - c. Functions of middle ear
 - d. Mechanism of body temperature regulation

Section C (40 Marks)

4. Write in detail about biosynthesis, actions, regulation of secretion of insulin. Write about the insulin deficiency and their complications. (2+3+3+2=10)
5. Answer in short (any 5 out of 6) (5x3 = 15 marks)
- a. Second messenger
 - b. Myxedoema
 - c. ADH
 - d. Functions of placenta
 - e. Phases of lactation
 - f. Basal metabolic rate
6. Short notes (any 3 out of 4) (3x5 = 15 marks)
- a. Calcitriol
 - b. Ovulation
 - c. Suckling reflex
 - d. Cushing disease