UG/MBBS/205(AB)

Roll No. SME 2015ME024

First Professional M.B.B.S. (II Semester) Examination, 2021

Physiology

Paper-II

Time: - Three hours

Full Marks: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

Note: - Use separate answer books for each section.

Note: - Attempt all questions.

Section-A

Marks: 50

1. Describe the connections and functions of basal ganglia. Discuss the etiology, clinical features and treatment of Parkinson's disease. 12
2. Short answer questions: (4x5=20)
   (a) Properties of sensory receptors
   (b) Brown-Sequard syndrome
   (c) Phototransduction
   (d) Role of hypothalamus in temperature regulation.
3. Explain differences between two physiological processes: (3x4=12)
   (a) Presynaptic inhibition and post synaptic inhibition
   (b) Stretch reflex and withdrawal reflex
   (c) Broca's aphasia and Wernicke's aphasia.
4. Problem based MCQ: (3x2=6)
   (a) While performing a neurological examination on a 42-year old patient, the clinician asked him to walk across the examination room and noticed unsteady gait. Next, he asked him to stand still with his feet together and eyes closed and noted marked swaying back and forth. When the patient opened his eyes, the swaying persisted. Vibration sense was normal on all four limbs. This clinical picture is likely due to damage to which of the following structures?
      (i) Ventral horn of the spinal cord (ii) Cerebral peduncles
      (iii) Dorsal column (iv) Cerebellum
   (b) An otorhinolaryngologist was examining a patient for hearing loss and noticed that the Rinne test was negative in the left ear and Weber test showed lateralization to the right ear. This clinical picture is consistent with:
      (i) Wax filled in the external auditory meatus
      (ii) Perforation of the tympanic membrane
      (iii) Disruption of the ear ossicles
      (iv) Lesion of the cochlear nerve
   (c) Last week you celebrated college foundation day in which you participated in many events and enjoyed a lot with your friends. One of your friends could not attend the event as he has gone home. When he returned, he asked you about your experience in the event. Enthusiastically you explained him all about your experience in the college foundation day. This form of memory is an example of:
      (i) Implicit memory (ii) Episodic memory
      (iii) Semantic memory (iv) Procedural memory

P.T.O.

Section-B

Marks: 50

5. Describe the process of synthesis of glucocorticoids and discuss the functions of glucocorticoids. Add a brief note on Cushing's syndrome. (3+5+4=12)

6. Write short notes on the following: (4x5=20)
   (a) Aldosterone escape
   (b) Milk ejection reflex
   (c) Action of insulin on glucose metabolism
   (d) Ovarian changes during menstrual cycle.

7. Explain the physiological basis of: (3x4=12)
   (a) Osteoporosis in elderly women
   (b) Use of oral contraceptive pills as an effective contraceptive method
   (c) Control of basal metabolism by Thyroid hormones.

8. Multiple choice questions (Select most appropriate option): (3x2=6)
   (a) A 2 year old child is brought to Pediatrics OPD with yellowish discoloration of skin on entire body. The sclera of his eyes is however not discolored and white in appearance. Which of the following statements best explains the patient's present condition?
      (i) The condition has appeared due to increased breakdown of erythrocytes
      (ii) There is increased accumulation of carotene in this patient
      (iii) The child might be suffering from defective bile metabolism
      (iv) The hepatic conversion of carotene to vitamin A is defective due to hyperthyroidism.

   (b) A 30 year male patient came to medicine OPD with complains of severe fatigue and loss of appetite. He was previously on treatment with glucocorticoids since 6 months. What can be the most probable abnormality associated with prolonged glucocorticoid therapy?
      (i) Adrenal glands become atrophic with prolonged treatment with glucocorticoids
      (ii) ACTH levels are very high in this patient
      (iii) Adrenal glands become hyper responsive to prolonged treatment with glucocorticoids
      (iv) There are increased adrenal medullary secre ions seen in such cases.

   (c) Testosterone is responsible for producing distinguishing characteristics of the masculine body. Which of these defects is produced if testosterone is <u>not</u> produced or inadequately secreted?
      (i) It will increase bone matrix
      (ii) It may cause increase in erythrocyte count
      (iii) It may produce increased skin thickness
      (iv) It may lead to failure in descent of testes.

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UG/MBBS/204(AB)

Roll No. ...2015SME029

First Professional M.B.B.S. (II Semester) Examination, 2021

Physiology

Paper-I

Time: - Three Hours

Full Marks: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

Note: - Use Separate Answer Books for Each Section.

Section-A

Q.1	Define cardiac cycle. Describe the various phases of cardiac cycle.	3+9=12
Q.2	Write short notes on: (a) Inverse stretch reflex (b) Hemostasis (c) Nerve growth factors (d) Hypovolemic shock	4 X 5 = 20
Q.3	Compare and Contrast between: (a) Acquired and innate immunity (b) Active and passive transport (c) First and second heart sound	3 X 4 = 12
Q.4	Multiple choice questions (Select most appropriate option): (a) A person slept with his head over forearm. Next morning, he complains of tingling and numbness in forearm. It is caused by: (i) Sensitivity to hypoxia A>B>C (ii) Sensitivity to pressure A>B>C (iii) Sensitivity to hypoxia C>B>A (iv) Sensitivity to pressure B>A>C (b) A person with 65 Kg weight has haematocrit reading of 40 % and plasma volume of 3 litres. What is his total blood volume? (i) 4.0 litres (ii) 5.0 litres (iii) 6.0 litres (iv) 7.0 litres (c) During heavy exercise, the cardiac output increases up to five-fold while pulmonary arterial pressure rises very little. This physiological ability of the pulmonary circulation is best explained by: (i) Recruitment of more capillary and dilatation of pulmonary capillary (ii) Sympathically mediated greater distensibility of pulmonary vessels (iii) Large amount of smooth muscle in pulmonary arterioles (iv) Smaller surface area of pulmonary circulation	3 X 2=6

P.T.O.

Section-B

Q.1 What is oxygen saturation of hemoglobin? Describe the mechanisms of oxygen transport in blood. Describe in brief regarding oxygen hemoglobin dissociation curve. Write the salient physiological differences between oxygen-hemoglobin and oxygen-myoglobin dissociation curves. 1+4+4+3=12

Q.2 Write short notes on: 4 X 5 = 20

(a) Dietary fibers
(b) Glomerulo-tubular balance
(c) Peptic ulcer disease
(d) Renal clearance

Q.3 Explain the physiological basis of following statements: 3 X 4 = 12

(a) Tubular maximum (Tm) for glucose in practice is actually less than the calculated value
(b) Surgical resection of terminal part of small intestine may cause megaloblastic anemia
(c) Plasma bicarbonate level rises after food

Q.4 Multiple choice questions (Select most appropriate option): 3 X 2=6

(a) This is a radiograph from a patient with bilateral ureteric obstruction leading to hydronephrosis. The GFR was also reduced in this patient. Which one of the following pressure change is responsible for lowering the GFR?

(i) Decreased glomerular hydrostatic pressure
(ii) Increased glomerular oncotic pressure.
(iii) Increased Bowmen's capsule hydrostatic pressure.
(iv) Decreased Bowmen's capsule oncotic pressure.

(b) A normal healthy subject makes an inspiratory effort against closed airway, you would expect following to occur:
(i) Internal intercostal muscles contract
(ii) Intrapleural pressure becomes more negative
(iii) Pressure inside pulmonary capillaries falls
(iv) Alveolar pressure falls more than intrapleural pressure

(c) Which of the following conditions lead to tissue hypoxia without alteration of oxygen content of blood:
(i) Carbon mono-oxide poisoning
(ii) Methemoglobinemia
(iii) Cyanide poisoning
(iv) All of the above

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Rishab Dev

Sent up (Sessional) MBBS examination

Physiology (Paper-II)

(Total marks=100) Time: 3 hours

Attempt all questions, draw suitable diagrams wherever required

Section A:

Q.1. Describe the characteristics of EEG waves during awake and sleep states. Provide a comparative account of REM and NREM sleep. (6+6=12 marks)

Q.2. Write short notes on: (4×5= 20 marks)

A. Withdrawl reflex
B. Impedance matching mechanism in middle ear
C. Bioenergetics
D. Parameters of growth chart

Q. 3. Explain differences between the following: (3×4= 12 marks)

A. Upper and lower motor neuron lesions
B. Conductive and sensory-neural hearing loss
C. Isotonic and isometric exercise

Section B:

Q. 1. Describe the synthesis, transport and mechanism of action of Growth Hormone. Also *discuss the Physiological* actions of the Growth Hormones (6+6= 12 marks)

Q. 2. Write short notes on: (4×5= 20 marks)

A. Cardiovascular changes in pregnancy
B. Physiology of lactation
C. Pseudohermaphroditism
D. Communication skill of a doctor in clinical practice

Q.3. Explain the physiological basis of given statement (3×4= 12 marks)

A. Amenorrhea is observed in the lactating mother
B. There is an increase in the basal body temperature 1to 2 days after ovulation
C. Hypothalamo-hypophyseal portal system is a physiological need of hypophysiotropins

Roll No: 29
Name: Rishabdev

Sept up (Sessional) MBBS examination

Physiology (Paper-I)

(Total marks=100) Time: 3 hours

Attempt all questions, draw suitable diagrams wherever required

Section A:

Q.1 What is shock? What are different types of shock? Discuss compensatory mechanisms that operate after blood loss of 600 mL. (2+4+6=12 marks)

Q.2. Write short notes on: (4×5= 20 marks)

A. Nernst equation and its application
B. Blood transfusion
C. Heart sounds
D. Properties of mammalian nerve fibres

Q. 3. Explain differences between the following: (3×4= 12 marks)

A. Voltage gated and ligand gated channels
B. T and B-lymphocytes
C. Red and white muscle fibres

Section B:

Q. 1. A 55-year-old man comes to the clinic complaining of fatigue and persistent shortness of breath, which becomes worse during exercise. The patient has a history of respiratory infections and has a chronic cough that is worse in the morning. The patient has smoked cigarettes since he was a teenager. Currently he smokes about one pack of cigarettes a day. On physical examination, patient is in mild respiratory distress with an elevated respiratory rate and shallow breaths. An end-expiratory wheeze is heard on auscultation. Pulmonary function tests: FEV1% = 60%. PEFR= 55 % of predicted. Chest radiograph: Normal, Arterial blood gases: PO_2 75 mm Hg, PCO_2 48 mm Hg, HCO_3^- =36 meq/L, pH 7.32. (1+2+1+4+4= 12 marks)

A. Identify the respiratory disorder depicted in the above mentioned case
B. Justify your diagnosis with physiological explanation
C. Identify the type of acid base disorder in this case
D. Draw one labeled schematic flow volume loop for such kind of disorders
E. Describe the working principle of normal spirometer for recording of dynamic one breath lung volumes and capacities.

Q. 2. Write short notes on: (4×5= 20 marks)

A. Tubuloglomerular feedback
B. Chloride shift
C. Liver function tests
D. Countercurrent system

Q.3. Explain the physiological basis of given statement (3×4= 12 marks)

A. Long term use of proton pump inhibitors may cause anaemia
B. Exercise may cause hyperkalemia
C. Stagnant hypoxia causes increased a-v O_2 difference

UG/MBBS/204(AB)

Roll No. .....

FIRST PROFESSIONAL M.B.B.S. (II SEMESTER) EXAMINATION, 2020

PHYSIOLOGY

PAPER-I

TIME: - THREE HOURS

FULL MARKS: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

NOTE: - USE SEPARATE ANSWER BOOKS FOR EACH SECTION.

Section-A

Marks: 50

Note: - Attempt all questions.

1. Describe the cardiac output and the factors determining it. Explain in brief the regulatory mechanisms which maintain cardiac output during challenging conditions. (7+5=12)

2. Write short notes on: (4x5=20)
   (a) Homeostasis
   (b) Plasma proteins
   (c) Latch bridge phenomenon in smooth muscle
   (d) Pacemaker potential.

3. Compare and contrast between: (3x4=12)
   (a) Action potential and electrotonic potential
   (b) Sharp pain and dull pain
   (c) Tetanus and clonus.

4. *Multiple choice questions* (Select most appropriate option): (2x3=6)

   (a) A 50 years old female had been experiencing tingling in her right fingers. Further, her wrist and hand had become weak. Her physician advised the evaluation of nerve conduction velocity for carpal tunnel syndrome. Which of the following nerve fiber has slowest conduction velocity?

   (i) Aα fibers (ii) Aβ fibers (iii) B fibers (iv) C fibers

   (b) On increasing the radius of resistance vessels, which of the following parameter is increased?

   (i) Systolic BP (ii) Diastolic BP
   (iii) Viscosity of the blood (iv) Capillary blood flow

   (c) Which of the following plasma proteins is not synthesized primarily in the liver?

   (i) Angiotensin II converting enzyme
   (ii) Angiotensinogen
   (iii) IGF-I
   (iv) Fibrinogen

P.T.O.

III[rd] Terminal (Sessional) M.B.B.S. Examination
(January 2021)

PHYSIOLOGY

PAPER-I

Time: 3 hours Full Marks = 100

NOTE: USE SEPARATE ANSWER BOOKS FOR EACH SECTION
Attempt all questions

SECTION-A Marks = 50

1. Define Blood Pressure. Explain in brief regarding short term mechanisms of blood pressure regulation. 2+10=12

2. Write short notes on: 4 X 5= 20
   a). Blood transfusion
   b). Excitation contraction coupling in skeletal muscle
   c). Resting membrane potential
   d). Windkessel effect - Distensible arteries.

3. Compare and differentiate between 3 X 4=12
   a). Primary and secondary active transport
   b). First and second heart sound
   c). Humoral and cellular immunity

4. Multiple choice questions (Select most appropriate option) 3 X 2=6

   a) Dicumarol is a drug that impairs the utilization of vitamin K by the liver. Dicumarol therapy, therefore, would decrease the plasma concentration of which of the following procoagulants?
      i. Prothrombin
      ii. Fibrinogen
      iii. Antihemopilic factor (factor VIII)
      iv. Ac-globulin (factor V)

   b) Edema could be caused by all of the following except
      i. High arterial blood pressure (hypertension)
      ii. Leakage of plasma proteins into the tissue fluid, as in inflammation and allergy.
      iii. An elevated level of albumin in the blood plasma.
      iv. An obstruction of the lymphatic drainage

   c) Myxedema is a disease caused by hypothyroidism, which causes production of excessive amount of glycoprotein in the interstitial spaces. The effect of this on capillary fluid dynamics would be to cause
      i. Precapillary sphincters to shut off blood flow to affected tissues.
      ii. Vasodilation of the capillaries.
      iii. Reduced osmotic return of fluid and thus accumulation of fluid in the tissues resulting in edema.
      iv. Increased transfer of tissue fluid into the bloodstream, resulting in hypertension.

III[rd] Terminal (Sessional) M.B.B.S. Examination
(January 2021)

PHYSIOLOGY
PAPER-II

Time: 3 hours

Full Marks = 100

NOTE: USE SEPARATE ANSWER BOOKS FOR EACH SECTION
Attempt all questions

Marks = 50

SECTION-A

1. Describe the genesis and characteristics of EEG waves. Briefly explain the clinical use of EEG. 7+5=12

2. Write short notes on: 4 X 5= 20
   a). Inverse stretch reflex.
   b). Hearing defects and hearing tests
   c). Parkinsonism
   d). Apoptosis

3. Compare and differentiate between: 3 X 4=12
   a). Myopia and hypermetropia
   b). Fast and slow pain
   c). Hypoxic and anemic hypoxia

4. Multiple choice questions (Select most appropriate option) 3 X 2=6
   a). Fastest adapting cutaneous receptor is:
      i. Pacinian corpuscle
      ii. Merkel's disc
      iii. Ruffini's end organ
      iv. Free nerve ending
   b). A 22 year male patient was detected a brain tumor in close vicinity to hypothalamus and the same was successfully removed by neurosurgery. However, during the procedure, there was inadvertent damage to a hypothalamic nucleus. After recovery, the patient started eating voraciously and developed obesity. Which one of the following hypothalamic nuclei might have been damaged in this patient?
      i. Ventromedial
      ii. Lateral
      iii. Anterior
      iv. Posterior
   c). A 58 year old male patient was suffering from a severe form of major depression and was refractory to antidepressant medications. He was admitted in the Psychiatry ward and was provided ECT (Electro convulsive therapy). After his recovery he was not able to remember the event immediately preceding ECT but could retrieve remote memory. This short term memory loss was due to inadequate memory processing in
      i. Cingulate gyrus
      ii. Hippocampus
      iii. Mamilary body
      iv. Amygdala

Mayank 52

Sent up (Sessional) MBBS examination

Physiology (Paper-II)

(Total marks=100) Time: 3 hours

Attempt all questions, draw suitable diagrams wherever required

Section A:

Q.1. Describe the characteristics of EEG waves during awake and sleep states. Provide a comparative account of REM and NREM sleep. (6+6=12 marks)

Q.2. Write short notes on: (4×5= 20 marks)

A. Withdrawl reflex
B. Impedance matching mechanism in middle ear
C. Bioenergetics
D. Parameters of growth chart

Q. 3. Explain differences between the following: (3×4= 12 marks)

A. Upper and lower motor neuron lesions
B. Conductive and sensory-neural hearing loss
C. Isotonic and isometric exercise

Section B:

Q. 1. Describe the synthesis, transport and mechanism of action of Growth Hormone. Also discuss the Physiological actions of the Growth Hormones (6+6= 12 marks)

Q. 2. Write short notes on: (4×5= 20 marks)

A. Cardiovascular changes in pregnancy
B. Physiology of lactation
C. Pseudohermaphroditism
D. Communication skill of a doctor in clinical practice

Q.3. Explain the physiological basis of given statement (3×4= 12 marks)

A. Amenorrhea is observed in the lactating mother
B. There is an increase in the basal body temperature 1to 2 days after ovulation
C. Hypothalamo-hypophyseal portal system is a physiological need of hypophysiotropins

UG/MBBS/204(AB)

Roll No. .....

FIRST PROFESSIONAL M.B.B.S. (II SEMESTER) EXAMINATION, 2020

PHYSIOLOGY

PAPER-I

IME: - THREE HOURS FULL MARKS: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

OTE: - USE SEPARATE ANSWER BOOKS FOR EACH SECTION.

Section-A Marks: 50

ote: - Attempt all questions.

Describe the cardiac output and the factors determining it. Explain in brief the regulatory mechanisms which maintain cardiac output during challenging conditions. (7+5=12)

(4x5=20)

. Write short notes on:

(a) Homeostasis

(b) Plasma proteins

(c) Latch bridge phenomenon in smooth muscle

(d) Pacemaker potential.

(3x4=12)

3. Compare and contrast between:

(a) Action potential and electrotonic potential

(b) Sharp pain and dull pain

(c) Tetanus and clonus.

(2x3=6)

4. Multiple choice questions (Select most appropriate option):

(a) A 50 years old female had been experiencing tingling in her right fingers. Further, her wrist and hand had become weak. Her physician advised the evaluation of nerve conduction velocity for carpal tunnel syndrome. Which of the following nerve fiber has slowest conduction velocity?

(i) Aα fibers (ii) Aβ fibers (iii) B fibers (iv) C fibers

(b) On increasing the radius of resistance vessels, which of the following parameter is increased?

(i) Systolic BP (ii) Diastolic BP

(iii) Viscosity of the blood (iv) Capillary blood flow

(c) Which of the following plasma proteins is not synthesized primarily in the liver?

(i) Angiotensin II converting enzyme

(ii) Angiotensinogen

(iii) IGF-I

(iv) Fibrinogen

P.T.O.

III[rd] Terminal (Sessional) M.B.B.S. Examination
(January 2021)

PHYSIOLOGY
PAPER-II

Time: 3 hours Full Marks = 100

NOTE: USE SEPARATE ANSWER BOOKS FOR EACH SECTION
Attempt all questions

SECTION-A Marks = 50

Describe the genesis and characteristics of EEG waves. Briefly explain the clinical use of EEG. 7+5=12

Write short notes on: 4 X 5= 20

a). Inverse stretch reflex.
b). Hearing defects and hearing tests
c). Parkinsonism
d). Apoptosis

Compare and differentiate between: 3 X 4=12

a). Myopia and hypermetropia
b). Fast and slow pain
c). Hypoxic and anemic hypoxia

Multiple choice questions (Select most appropriate option) 3 X 2=6

a). Fastest adapting cutaneous receptor is:
i. Pacinian corpuscle
ii. Merkel's disc
iii. Ruffini's end organ
iv. Free nerve ending

b). A 22 year male patient was detected a brain tumor in close vicinity to hypothalamus and the same was successfully removed by neurosurgery. However, during the procedure, there was inadvertent damage to a hypothalamic nucleus. After recovery, the patient started eating voraciously and developed obesity. Which one of the following hypothalamic nuclei might have been damaged in this patient?
i. Ventromedial
ii. Lateral
iii. Anterior
iv. Posterior

c). A 58 year old male patient was suffering from a severe form of major depression and was refractory to antidepressant medications. He was admitted in the Psychiatry ward and was provided ECT (Electro convulsive therapy). After his recovery he was not able to remember the event immediately preceding ECT but could retrieve remote memory. This short term memory loss was due to inadequate memory processing in
i. Cingulate gyrus
ii. Hippocampus
iii. Mamilary body
iv. Amygdala

UG/MBBS/205(AB)

Roll No. [illegible]

FIRST PROFESSIONAL M.B.B.S. (II SEMESTER) EXAMINATION, 2020

PHYSIOLOGY

PAPER-II

TIME: - THREE HOURS FULL MARKS: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

NOTE: - USE SEPARATE ANSWER BOOKS FOR EACH SECTION.

Section-A Marks: 50

Note: - Attempt all questions.

1. Describe the organization, circuitry and functions of the cerebellum. Add a note on the signs and symptoms of cerebullar disorders. 12

(4x5=20)

2. Write short notes on:
   (a) Color vision
   (b) EEG
   (c) Effect of exercise on cardio-respiratory functions
   (d) Stretch reflex.

(3x4=12)

3. Explain differences between two physiological processes:
   (a) Fluent aphasia and nonfluent aphasia
   (b) Conductive deafness and sensorineural deafness
   (c) Upper motor neuron lesion and lower motor neuron lesion.

4. Select the most appropriate answer for the following multiple choice questions: (2x3=6)

(a) During examination, when a painful stimulus was applied to the hand and foot of a patient, withdrawal of limbs occurred. It is:

(i) Extensor reflex (ii) Flexor reflex (iii) Stretch reflex (iv) Golgi tendon reflex

(b) Most of the living cells in plants and animals have rhythmic fluctuations in their function with a circadian cycle. This circadian rhythms according to the light dark cycle is maintained by one of the following:

(i) Thalamus
(ii) Ventrolateral nucleus
(iii) Suprachiasmatic nucleus
(iv) Supraoptic nucleus

(c) Wallerian degeneration occurred in a person after an injury. It is:

(i) Muscle degeneration
(ii) Nerve degeneration
(iii) Muscle regeneration
(iv) Brain degeneration

P.T.O.

Marks: 50

Section-B

5. Describe the process of synthesis of glucocorticoids and discuss the functions of glucocorticoids. Add a brief note on Cushing's syndrome. (3+5+4=12)

6. Write short notes on the following: (4x5=20)
   (a) Aldosterone escape
   (b) Milk ejection reflex
   (c) Action of insulin on glucose metabolism
   (d) Ovarian changes during menstrual cycle.

7. Explain the physiological basis of: (3x4=12)
   (a) Osteoporosis in elderly women
   (b) Use of oral contraceptive pills as an effective contraceptive method
   (c) Control of basal metabolism by Thyroid hormones.

8. Multiple choice questions (Select most appropriate option): (3x2=6)

   (a) A 2 year old child is brought to Pediatrics OPD with yellowish discoloration of skin on entire body. The sclera of his eyes is however not discolored and white in appearance. Which of the following statements best explains the patient's present condition?
      (i) The condition has appeared due to increased breakdown of erythrocytes
      (ii) There is increased accumulation of carotene in this patient
      (iii) The child might be suffering from defective bile metabolism
      (iv) The hepatic conversion of carotene to vitamin A is defective due to hyperthyroidism.

   (b) A 30 year male patient came to medicine OPD with complains of severe fatigue and loss of appetite. He was previously on treatment with glucocorticoids since 6 months. What can be the most probable abnormality associated with prolonged glucocorticoid therapy?
      (i) Adrenal glands become atrophic with prolonged treatment with glucocorticoids
      (ii) ACTH levels are very high in this patient
      (iii) Adrenal glands become hyper responsive to prolonged treatment with glucocorticoids
      (iv) There are increased adrenal medullary secretions seen in such cases.

   (c) Testosterone is responsible for producing distinguishing characteristics of the masculine body. Which of these defects is produced if testosterone is not produced or inadequately secreted?
      (i) It will increase bone matrix
      (ii) It may cause increase in erythrocyte count
      (iii) It may produce increased skin thickness
      (iv) It may lead to failure in descent of testes.

XXXXXX

UG/MBBS/205(AB)

Roll No. 52.....

First Professional M.B.B.S. (II Semester) Examination, 2021

Physiology

Paper-II

Time: - Three hours Full Marks: 100

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

Note: - Use separate answer books for each section.

Note: - Attempt all questions.

Section-A Marks: 50

1. Describe the connections and functions of basal ganglia. Discuss the etiology, clinical features and treatment of Parkinson's disease. 12
2. Short answer questions: (4x5=20)
   (a) Properties of sensory receptors
   (b) Brown-Sequard syndrome
   (c) Phototransduction
   (d) Role of hypothalamus in temperature regulation.
3. Explain differences between two physiological processes: (3x4=12)
   (a) Presynaptic inhibition and post synaptic inhibition
   (b) Stretch reflex and withdrawal reflex
   (c) Broca's aphasia and Wernicke's aphasia.
4. Problem based MCQ: (3x2=6)
   (a) While performing a neurological examination on a 42-year old patient, the clinician asked him to walk across the examination room and noticed unsteady gait. Next, he asked him to stand still with his feet together and eyes closed and noted marked swaying back and forth. When the patient opened his eyes, the swaying persisted. Vibration sense was normal in all four limbs. This clinical picture is likely due to damage to which of the following structures?
      (i) Ventral horn of the spinal cord (ii) Cerebral peduncles
      (iii) Dorsal column (iv) Cerebellum

   (b) An otorhinolaryngologist was examining a patient for hearing loss and noticed that the Rinne test was negative in the left ear and Weber test showed lateralization to the right ear. This clinical picture is consistent with:
      (i) Wax filled in the external auditory meatus
      (ii) Perforation of the tympanic membrane
      (iii) Disruption of the ear ossicles
      (iv) Lesion of the cochlear nerve

   (c) Last week you celebrated college foundation day in which you participated in many events and enjoyed a lot with your friends. One of your friends could not attend the event as he has gone home. When he returned, he asked you about your experience in the event. Enthusiastically you explained him all about your experience in the college foundation day. This form of memory is an example of:
      (i) Implicit memory (ii) Episodic memory
      (iii) Semantic memory (iv) Procedural memory

P.T.O.

Institute of Medical Sciences, Banaras Hindu University

MBBS, First Sessional Examination

Total marks 50 **Time 3 hrs**

Attempt all questions

Draw suitable diagrams wherever required

1. Describe hormonal mechanisms that regulate Systemic Arterial Blood Pressure. **(8 Marks)**

2. Write short notes on **(3x5=15)**

   A. Jugular Venous Waves

   B. Compliance of lung

   C. Tissue macrophage system

   D. Classification and characteristic of nerve fiber in human

   E. Nernst equation and its application

3. Explain Why/ Explain Physiological basis of: **(3x5= 15)**

   A. Digitalis increases force of contraction in cardiac muscles

   B. Cardiac muscles cannot be tetanized.

   C. Hyperventilation leads to respiratory alkalosis.

   D. Hypocapnic individuals develop carpopedal spasms.

   E. Exercise causes hyperkalemia.

Department of Physiology

Institute of Medical Sciences, Banaras Hindu University

MBBS, Third Sessional Examination

Physiology Paper -I

Time 3 hrs

Total marks 100

Attempt all questions

Draw suitable diagrams wherever required

Section A

Q 1. Discuss various events that occur during cardiac cycle. (12 marks)

Q 2. Write short notes on: (4X5=20 marks)

a. Hazards of blood transfusion

b. Genesis of pacemaker action potential

c. Skeletal muscle length-tension relationship

d. Transport across cell membrane

Q 3. Explain the difference between the following: (3X 4=12 marks)

a. Type I and Type II muscle fibres

b. Cell mediated immunity and humoral immunity

c. Feedback and feed forward control

Section B

Q 1. Describe the neural and non-neural control of respiration. (12 marks)

Q 2. Write short notes on: (4X5=20 marks)

a. Physiological changes at high altitude

b. Composition and function of bile

c. Tubuloglomerular feedback

d. Transport Maximum

Q 3. Explain the physiological basis of given statements: (3X 4=12 marks)

a. GFR and renal blood flow increase 20 to 30% with in 1or 2 hrs after a person eats a high protein meal.

b. The natives who live in Andes and Himalayas are barrel- chested and markedly polycythemic.

c. Unconjugated hyperbilirubinemia is seen in Crigler Najjar syndrome.

Department of Physiology

Institute of Medical Sciences, Banaras Hindu University

MBBS, Third Sessional Examination

Physiology Paper -II

Time 3 hrs

Total marks 100

Attempt all questions

Draw suitable diagrams wherever required

Section A

Q 1. Describe pathways for fast pain and slow pain with suitable diagrams. Discuss gait control theory of pain. (12 marks) **(4X5=20 marks)**

Q 2. Write short notes on:

a. Basal Ganglia

b. Phantom limb

c. Papez circuit

d. Visual Pathway

Q 3. Explain the difference between the following: **(3X 4=12 marks)**

a. Decorticate and decerebrate rigidity

b. Conductive deafness and sensorineural deafness

c. NREM and REM sleep

Section B

Q 1. Describe the synthesis, transport and mechanism of action of Cortisol. Also discuss the Physiological actions of it. **(12 marks)**

Q 2. Write short notes on: **(4X5=20 marks)**

a. Remodeling of Bone

b. Circadian rhythm

c. Functions of testosterone

d. Role of human chorionic gonadotropin hormone in male fetus.

Q 3. Explain the physiological basis of the given statement : **(3X 4=12 marks)**

a. Amenorrhea is observed in the lactating mother

b. Bradycardia is observed in Pheochromocytoma

c. If the corpus luteum is removed before 6th week of pregnancy, spontaneous abortion almost always occurs

Paper-I

Full Marks: 100

Time: - Three Hours

(Write your Roll No. at the top immediately on the receipt of this Question Paper)

Note: - Use Separate Answer Books for Each Section.

Note: - Attempt all questions.

Marks: 50

Section-A

1. Define the circulatory shock and describe in brief the various types of circulatory shock. Also describe the physiological basis of Refractory Shock. (8+4=12)

2. Write short notes on: (4x5=20)
   (a) Primary Active Transport
   (b) Hemostasis
   (c) Length and tension relation in skeletal muscle
   (d) Myethenia gravis.

3. Compare and differentiate between: (3x4=12)
   (a) Negative feedback and positive feedback mechanisms
   (b) Sharp pain and dull pain
   (c) Synchronous and Asynchronous recruitment of motor unit.

4. Multiple choice questions (select most appropriate options): (3x2=6)
   (a) Each cell benefits from homeostasis and provides it share in the maintenance of homeostatic condition in the ECF which is called as *Milieu Interieur*. All of the following contributes its share maximally in the maintenance of homeostasis except-
      (i) Lungs (ii) Liver
      (iii) Gonads (iv) Gastrointestinal Tract
   (b) Which one of the following is a site where propagated action potentials are generated in the cutaneous sensory neurons?
      (i) Axon hillock (ii) Initial segment of neuron
      (iii) Initial node of Ranvier (iv) Within the receptors
   (c) Which of the following statement is true regarding Lambert-Eaton syndrome-
      (i) The cause for this disease is formation of antibodies against nicotinic receptor present at nerve terminal
      (ii) The cause for this disease is formation of antibodies against nicotinic receptor present at motor end plate
      (iii) The cause for this disease is formation of antibodies against Ca^{2+} channel present on the muscle end plate
      (iv) The cause for this disease is formation of antibodies against Ca^{2+} channel present on the nerve terminal

P.T.O.

Section-B Marks: 50

5. Define GFR. Enumerate the factors determining the GFR of an individual. Discuss in brief how countercurrent mechanism creates and maintains medullary osmotic gradient? (2+3+7=12)

(4x5=20)

6. Write short notes on the following:
   (a) Ventilation-Perfusion ratio
   (b) Migrating motor complex
   (c) Hypoxia at high altitude
   (d) Tubuloglomerular feedback.

(3x4=12)

7. Explain the physiological basis of following facts:
   (a) Just after meal the urine becomes alkaline
   (b) In chronic hypoxia oxygen therapy may be harmful
   (c) In glomerular inflammation albumin appears in urine.

(3x2=6)

8. Multiple choice questions (Select most appropriate option):
   (a) A person has normal lung compliance and increased airway resistance. The most economical way of breathing is-
      (i) Rapid and deep
      (ii) Slow and deep
      (iii) Rapid and shallow
      (iv) Slow and shallow.

   (b) If the glomerular capillary hydrostatic pressure, osmotic pressure of plasma proteins, hydrostatic pressure in the Bowman's space and oncotic pressure in the interstitium are respectively 40, 25, 5, and 0 mm Hg respectively. What is the net pressure driving filtration of fluid into the Bowman's space?
      (i) 10 mm HG
      (ii) 15 mm HG
      (iii) 20 mm HG
      (iv) 25 mm HG

   (c) Surgical resection of 90% of ileum and jejunum causes all except:
      (i) Increase in the fat content of the stool
      (ii) Fall in the circulating ECF volume
      (iii) Demineralization of bone
      (iv) Anaemia.

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Paper-I

Three Hours

Full Marks: 100

rite your Roll No. at the top immediately on the receipt of this Question Paper)

Note: - Use Separate Answer Books for Each Section.

Section-A

1 Define cardiac cycle. Describe the various phases of cardiac cycle. 3+9=12

2 Write short notes on: 4 X 5 =

(a) Inverse stretch reflex
(b) Hemostasis
(c) Nerve growth factors
(d) Hypovolemic shock

3 Compare and Contrast between: 3 X 4

(a) Acquired and innate immunity
(b) Active and passive transport
(c) First and second heart sound

4 Multiple choice questions (Select most appropriate option): 3 X

(a) A person slept with his head over forearm. Next morning, he complains of tingling and numbness in forearm. It is caused by:
(i) Sensitivity to hypoxia A>B>C
(ii) Sensitivity to pressure A>B>C
(iii) Sensitivity to hypoxia C>B>A
(iv) Sensitivity to pressure B>A>C

(b) A person with 65 Kg weight has haematocrit reading of 40 % and plasma volume of 3 litres. What is his total blood volume?
(i) 4.0 litres
(ii) 5.0 litres
(iii) 6.0 litres
(iv) 7.0 litres

(c) During heavy exercise, the cardiac output increases up to five-fold while pulmonary arterial pressure rises very little. This physiological ability of the pulmonary circulation is best explained by:
(i) Recruitment of more capillary and dilatation of pulmonary capillary
(ii) Sympathically mediated greater distensibility of pulmonary vessels
(iii) Large amount of smooth muscle in pulmonary arterioles
(iv) Smaller surface area of pulmonary circulation

P.T.O.

II[nd] Terminal (Sessional) M.B.B.S. Examination
(June-July 2019)
PHYSIOLOGY

Time: 3 hours **PAPER-I** **Full Marks = 50**

NOTE: USE SEPARATE ANSWER BOOKS FOR EACH SECTION
Attempt all questions

SECTION-A **Marks = 25**

(General and cell physiology, Blood, Cardiovascular system &Nerve- muscle Physiology)

1. Define cardiac ejection fraction. Explain the regulatory mechanisms involved in determining in ejection fraction at resting condition, during exercise and heart failure. 1+3+2+1=7

Write short notes on: 3 X 3= 9
a). Platelets.
b). Coronary circulation.
c). Molecular basis of muscle contraction.

Compare and differentiate between 2 X 3=6
a). T- lymphocytes and B- lymphocytes.
b). Renal hypertension and Essential hypertension.
c). Windkessel vessels and resistance vessels.

MCQ: Mark the single best answer 1X3=3

i) The terminal part of ileum was surgically removed in a patient with small bowel obstruction. The patient developed anemia after a few months. The type of anemia in this patient is most likely to be of
A. Hemolytic
B. Megaloblastic
C. Aplastic
D. Hemorrhagic

ii) Na^+-K^+-ATPae activity is enhanced by all of the following hormones, EXCEPT
A. Thyroid
B. Aldosterone
C. Dopamine
D. Insulin

iii) Botulinum toxin injection is used for cosmetic purpose (e.g. reducing the facial wrinkles), because it can paralyse the muscle by
A. Blocking Na^+ channels in the motor nerve
B. Degrading Ach molecule at neuromuscular junction
C. Causing persistent depolirasation of muscle membrane
D. Interfering presynaptic Ach release in neuromuscular junction.

PTO

SECTION-B

(Respiratory system, Excretory system, sports and exercise physiology) Marks = 25

Describe the mechanisms of sodium reabsorption process at various segments of nephron and mention the diuretics affecting the process. 5+2=7

Write short notes on: 3 X 3= 9

a). Oxygen-hemoglobin dissociation curve.
b). Acid-base disturbances.
c). Tests for determining ventilatory functions of lung.

Explain the physiological mechanisms for the following statements: 2 X 3=6

a). Deficiency of lung surfactant may lead to acute respiratory distress syndrome in infants.
b). In a programmed exercise test, respiratory rate changes before the change in blood gas level.
c). PAH clearance test is used to determine renal blood flow.

MCQ: Mark the single best answer 1X3=3

i) Which one of the following pressures will remain sub-atmospheric during both inspiratory and expiratory phases of quiet breathing?

A. Intra alveolar pressure.
B. Intra abdominal pressure.
C. Intra thoracic pressure.
D. Intra pleural pressure.

ii) The type of hypoxia in carbon monoxide poisoning is

A. Anemic hypoxia.
B. Hypoxic hypoxia.
C. Stagnant hypoxia.
D. Histotoxic hypoxia.

iii) A person is having renal blood flow 1200ml/min, serum urea concentration 20 mg/dl, urine urea concentration 10 mg/ml and urine flow rate 2ml/min. His renal plasma clearance of urea is

A. 20 ml/min
B. 40 ml/min
C. 100 ml/min
D. 120 ml/min

$\left(1 - \frac{0.2}{10}\right) \times 120$

$\left(1 - \frac{20}{1000}\\right) \times 120$

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Section-B

1. Describe chemical regulation of respiration. Marks: 25

2. Write short notes on: 7
   (a) Structure of respiratory membrane. (3x3=9)
   (b) Renin angiotensin mechanism.
   (c) Oxygen deficit and oxygen dept.

3. Explain the physiological basis of the following statements: (2x3=6)
   (a) Proximal convoluted tubule (PCT) has a high rate of oxygen consumption.
   (b) High V/P (ventilation perfusion) ratio in the apex of lung.
   (c) Physiological basis of different type of hypoxia.

4. Multiple choice questions (Select most appropriate options): (1x3=
   (a) A major process involved in transport of substance in kidney.
   (i) Transepithelial
   (ii) Transcellular
   (iii) Paracellular
   (iv) Intercellular

   (b) Which of the following volume is expected to be equal in both men and wom
   (i) Inspiratory reserve volume
   (ii) Tidal volume
   (iii) Residual volume
   (iv) Vital capacity

   (c) Which type of diet is having maximum RQ?
   (i) Carbohydrate diet
   (ii) Fat diet
   (iii) Mixed diet
   (iv) Protein diet.

XXXXXX

PHYSIOLOGY
PAPER-I

TIME: - THREE HOURS (Write your Roll No. at the top immediately on the receipt of this Question Paper) FULL MARKS: 50

NOTE: - USE SEPARATE ANSWER BOOKS FOR EACH SECTION.

Section-A

Note: - Attempt all questions. Marks: 25

1. Define cardiac output. Explain in brief the various factors that affect cardiac output.

2. Write short notes on the following: (1×6=7)
   (a) Factors affecting erythropoiesis – (3×3=9)
   (b) Events that take place at neuromuscular junction during impulse transmission –
   (c) Secondary Active Transport Mechanism.–

3. Compare and contrast between: (2x3=6)
   (a) Chronaxie and Rheobase
   (b) Helper T-cells and Cytotoxic T-cells
   (c) Pacemaker potential and cardiac action potential.

4. Multiple choice questions (Select most appropriate option): (1x3=3)
   (a) A person sleeps with his right arm under the head. After sometime, he is awakened due to tingling sensation and pain in his right arm. The type of nerve fiber likely to be involved in this situation is:
   (i) A (ii) C (Dorsal Root) (iii) B (iv) C (Sympathetic)

   (b) A 50 year old man came to medicine OPD with complain of dyspnoea on doing some activity. His blood pressure was measured to be 130/92 mmHg. As a student posted in the OPD, the consultant asked you to calculate his mean arterial pressure (MAP) and pulse pressure (PP). What is your result?
   (i) MAP -100 mmHg; PP-40 mmHg
   (ii) MAP -102 mmHg; PP-40 mmHg
   (iii) MAP -104.7 mmHg; PP-38 mmHg
   (iv) MAP -110 mmHg; PP-38 mmHg

   (c) A 40 year old man came to medicine OPD with complain of weakness and dyspnoea with day to day activity. His blood examination report revealed Hemoglobin 9gm/dl. Reduced function of which of the following is the reason for low hemoglobin levels in this man?
   (i) Spleen (ii) Cartilages (iii) Flat bones (iv) Long bones

Section-B

1. What is oxygen saturation of hemoglobin? Describe the mechanisms of oxygen transport in blood. Describe in brief regarding oxygen hemoglobin dissociation curve. Write the salient physiological differences between oxygen-hemoglobin and oxygen-myoglobin dissociation curves. 1+4+4+3=12

2. Write short notes on: 4 X 5 = 20
   (a) Dietary fibers
   (b) Glomerulo-tubular balance
   (c) Peptic ulcer disease
   (d) Renal clearance

3. Explain the physiological basis of following statements: 3 X 4 = 1
   (a) Tubular maximum (Tm) for glucose in practice is actually less than the calculated value
   (b) Surgical resection of terminal part of small intestine may cause megaloblastic anemia
   (c) Plasma bicarbonate level rises after food

Multiple choice questions (Select most appropriate option): 3 X 2=

(a) This is a radiograph from a patient with bilateral ureteric obstruction leading to hydronephrosis. The GFR was also reduced in this patient. Which one of the following pressure change is responsible for lowering the GFR?

(i) Decreased glomerular hydrostatic pressure
(ii) Increased glomerular oncotic pressure.
(iii) Increased Bowmen's capsule hydrostatic pressure.
(iv) Decreased Bowmen's capsule oncotic pressure.

(b) A normal healthy subject makes an inspiratory effort against closed airway, you would expect following to occur:
(i) Internal intercostal muscles contract
(ii) Intrapleural pressure becomes more negative
(iii) Pressure inside pulmonary capillaries falls
(iv) Alveolar pressure falls more than intrapleural pressure

(c) Which of the following conditions lead to tissue hypoxia without alteration of oxygen content of blood:
(i) Carbon mono-oxide poisoning
(ii) Methemoglobinemia
(iii) Cyanide poisoning
(iv) All of the above

Physiology (Paper-I)

Attempt all questions, draw suitable diagrams wherever required

Section A:

Q.1. What is shock? What are different types of shock? Discuss compensatory mechanisms that operate after blood loss of 600 ml. (2+4+6=12 marks)

Q.2. Write short notes on: (4×5= 20 marks)

A. Nernst equation and its application
B. Blood transfusion
C. Heart sounds
D. Properties of mammalian nerve fibres

Q. 3. Explain differences between the following: (3×4= 12 marks)

A. Voltage gated and ligand gated channels
B. T and B-lymphocytes
C. Red and white muscle fibres

Section B:

Q. 1. A 55-year-old man comes to the clinic complaining of fatigue and persistent shortness of breath, which becomes worse during exercise. The patient has a history of respiratory infections and has a chronic cough that is worse in the morning. The patient has smoked cigarettes since he was a teenager. Currently he smokes about one pack of cigarettes a day. On physical examination, patient is in mild respiratory distress with an elevated respiratory rate and shallow breaths. An end-expiratory wheeze is heard on auscultation. Pulmonary function tests: FEV1% = 60%. PEFR= 55 % of predicted. Chest radiograph: Normal, Arterial blood gases: PO_2 75 mm Hg, PCO_2 48 mm Hg, HCO_3^- =36 meq/L, pH 7.32. (1+2+1+4+4= 12 marks)

A. Identify the respiratory disorder depicted in the above mentioned case
B. Justify your diagnosis with physiological explanation
C. Identify the type of acid base disorder in this case
D. Draw one labeled schematic flow volume loop for such kind of disorders
E. Describe the working principle of normal spirometer for recording of dynamic one breath lung volumes and capacities. (4×5= 20 marks)

Q. 2. Write short notes on:

A. Tubuloglomerular feedback
B. Chloride shift
C. Liver function tests
D. Countercurrent system

Q.3. Explain the physiological basis of given statement (3×4= 12 marks)

A. Long term use of proton pump inhibitors may cause anaemia
B. Exercise may cause hyperkalemia
C. Stagnant hypoxia causes increased a-v O_2 difference

IInd Sessional M.B.B.S. (2002-2003) July Examination 2003

Physiology

Paper No. II

Time : 3 hours Full Marks : 50

Note: Answer all the questions.

Q.1 : Discuss the hormonal regulation of (5+5=10)

a) Menstrual cycle
b) Ovulatory cycle

Q.2. Describe the physiological functions of: (4+4=8)

a) Hypothalamohypophysial Tract
b) Growth hormone

Q.3 : Comment on : (4+4=8)

a) Neurodegenerative diseases
b) Spinal shock

Q.4 Give an account of the following; draw diagrams if necessary (4+4=8)

a) Lesions associated with the visual pathway.
b) Frequency and intensity discrimination of sound.

Q.5 Write short notes on : (4×4=16)

a) Contraception
b) synapse
c) Taste Buds
d) Proprioception

FIRST PROFESSIONAL M.B.B.S.(IInd SEM.)SUPPLEMENTARY EXAMINATION, 2006

PHYSIOLOGY

Paper No.II

Time:Three hours Full Marks:50

1. With the help of a labeled diagram outline the origin, course and termination of the corticospinal tract. What are the functions of the tract? Write the effect of lesion at the level of the internal capsule. (5+3+3=11)

2. Enumerate the hormone secreted by the anterior pituitary. Describe the functions and regulation of secretion of growth hormone. What is acromegaly? (4+3+2=9)

(3X3=9)

3. Write the mechanism of the following:
   a) Ovulation
   b) Spermatogenesis
   c) Localization of the direction of sound

(4X3=12)

4. Explain the following:
   a) Why knee jerk is exaggerated in upper motor neuron lesion?
   b) Why osteoporosis is more common in old women?
   c) How the mid-brain areas are responsible for consensual light reflex?
   d) Why the chances of pregnancy are less in nursing mothers?

5. Write short notes on the following:
   a) Relaxin
   b) Renshaw cell neuron
   c) Trace elements in diet

[illegible] Full Marks:50

NOTE: USE SEPARATE ANSWERBOOKS FOR EACH SECTION.

SECTION-A: Physiology Marks-35

1. Write briefly blood clotting and anticlotting systems. What are the clinical importance of each systems. 6+3=9

2. Define Blood-pressure. What are the different pressures you know. Describe briefly short term regulation of Bloodpressure. 2+2+5=9

3. Write in brief- 3x3=9
   a) Excitation contraction coupling
   b) Functions of Loop of Henle
   c) Periodic breathing

4. Give the physiological explanation for any two of the following: 4x4=8
   a) There is increased Respiration rate during exercise.
   b) Bile salts help absorption of Fat.
   c) When the skin is stroked firmly with pointed object, there is TRIPLE RESPONSE.

SECTION-B: Biophysics Marks-15

1. With the help of Donnan's principle of membrane equilibrium explain how total electrolyte content of body varies with [illegible]

2. Write in brief on the following:
   a) Lung compliance in RDS.
   b) Reynold's number and measurement of blood pressure.
   c) Voltage gated channels

UG/MBBS/B5(AB)

FIRST PROFESSIONAL M.B.B.S.(II SEM.)JULY EXAMINATION, 2006

Physiology and Biophysics

Paper No.I

Time:Three hours Full Marks:50

USE SEPARATE ANSWERBOOKS FOR EACH SECTION.

SECTION-A:Physiology Marks-35

1. Describe the Lead II of Electrocardiogram. What is complete and incomplete heart block? 6+3
2. Discuss the physiology of micturition. What is Automatic bladder? 7+2
3. Describe the cardio respiratory changes during moderate exercise. What is oxygen Debt and "second wind"? 7+2
4. Give physiological explanation for the following(any FOUR) 2x4=8
   (a) Oxygen administration is of little value in histotoxic hypoxia.
   (b) Decreased surfactant concentration in lungs leads to collapse of alveoli.
   (c) Pyloric gastric antrectomy can lead to hypochlorohydria.
   (d) Skeletal muscle becomes rigid after death.
   (e) Energy expenditure during smooth muscle contraction is less than during skeletal muscle contraction.

SECTION-B:Biophysics Marks-15

1. Discuss Donman's principle of membrane equilibrium. With the help of this principle, explain how total electrolyte content of the body varies with pH. 2+4=6
2. Write short notes on: 3x3=9
   (a) Work of breathing in emphysema.
   (b) Tonicity and Osmolarity
   (c) Function of membrane proteins.

1st PROFESSIONAL M.B.B.S. (II - SEM.) SUPPLEMENTARY EXAMINATION, 2008

PHYSIOLOGY AND BIOPHYSICS

Paper - I

Time: Three hours Marks: 50

Use separate answer book for each section.

Section – A: Physiology

Marks – 35

1. List and describe the various factors influencing erythropoisis. Classify anemia on morphological basis 6+3=9
2. Describe how cardiac impulse is generated and spread to all cardiac muscles. List the various heart blocks. 6+3=9
3. Write short notes on: 3x3=9
   (a) Gastric mucosal barrier
   (b) Cyanosis
   (c) Neuromuscular transmission
4. Give physiological explanation for any two of the following. 4x2=
   (a) Hematocrit value of venous blood is more than that of arterial blood.
   (b) Filtrate inside the Loop of Henle is most concentrated at the tip.
   (c) Cardiac muscle can not be tetanised.

Section – B: Biophysics

Marks – 15

Write in brief on the following Biophysical principles:

(a) Action Potential and its physiological significance.

(b) Role of pressure, flow and resistance in a circulatory system.

(c) Lung compliance in pulmonary emphysema.

(d) Structure and functions of Biological Membranes.

UG/MBBS/91(AB)

1st PROFESSIONAL M.B.B.S.(IInd SEM.) JUNE EXAMINATION, 2002

Physiology and Biophysics

Paper No.I

Time: Three hours Full Marks: 50

Note: USE SEPARATE ANSWERBOOKS FOR EACH SECTION.

SECTION-A: Physiology Marks-35

1. Describe the neural and chemical control of Respiration. 5+4

2. Describe the factors regulating GFR. What is Tubuloglomerular feed back mechanism and Glomerulo-Tubular balance.

3. Write the difference between the following: (any THREE): 3×

a) Innate immunity and acquired immunity
b) Obstructive jaundice and Haemolytic jaundice
c) Receptor potential and action potential
d) Primary active transport and secondary active transpo

4. Write short notes on: 3×

a) Functions of Platelets
b) Insensible Perspiration
c) Hyperbaric oxygen therapy

SECTION-B: Biophysics Marks-15

Describe in brief on the following biophysical processes:

1. Role of pressure, flow and resistance in a circulatory syst 4

2. Lung compliance in pulmonary emphysema. 4

3. Action potential and its physiological significance. 4

4. Significance of Donnan's membrane equilibrium. 3

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1st Semester M.B.B.S Sessional Examination
(December, 2008)
Physiology including Biophysics

Time: Three hours Full Marks = 100

Note: Use separate Answer books for each section

Section A- PHYSIOLOGY

Maximum Marks = 85

1. Describe various events of cardiac cycle in reference to parameters that are related to the ventricular functions. Illustrate with suitable diagrams [12]

2. Define motor unit. Describe the properties of motor units and explain the phenomenon of recruitment. [16]

3. Describe the stages of erythropoiesis. Mention the factors affecting erythropoiesis at different stages. Name the indicators of bone marrow functioning. [17]

4. Explain the following statements giving reasons: [2 X 10 = 20]
   a. Application of external Ca^{2+} increases the contraction of cardiac muscle but not the skeletal muscle.
   b. Hyperpolarization-activated cyclic nucleotide gated (HCN) channels are essential for the initiation of SA node activity.
   c. During exercise, ventricular systolic time can not be reduced lesser than 0.17 sec.
   d. MCV is lesser in arterial blood than venous blood.
   e. Hypoproteinemia increases glomerular filtration rate.
   f. Albumin is not present in the urine of healthy individuals.
   g. In obstructive jaundice clotting time is prolonged.
   h. Voluntary hyperventilation leads to Cheyne-Stokes type of breathing.
   i. Urine becomes alkaline after meals.
   j. Apnea is observed when PCO_2 decreases below a critical level.

5. Write short notes on [5 X 4 =20]
   a. Transport maximum for glucose
   b. Neural regulation of Respiration
   c. Platelets
   d. Gastric HCl secretion

Section B- BIOPHYSICS

Maximum Marks = 1

Discuss how resting membrane potential is generated and maintained. [6

Write Short notes on [3 X

a. Role of membrane proteins in membrane transport
b. Membrane fluidity and factors affecting it
c. Membrane excitability

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Section-B

Marks: 50

5. Describe the steps of synthesis of Thyroid hormones. Discuss the functions of thyroid hormones. Add a note on hyperthyroidism. (4+4+4=12)

6. Write short notes on the following: (4x5=20)
   (a) Acromegaly
   (b) Diabetic ketoacidosis
   (c) Feto-placental unit
   (d) Phases of menstrual cycle.

7. Explain the physiological basis of: (3x4=12)
   (a) Non-clotting of menstrual fluid
   (b) Sufficient oxygen utilization by fetus at PO_2 of 30 mm Hg in fetal blood
   (c) Hypokalemia associated with insulin administration.

8. Problem based multiple choice questions: (3x2=6)
   (a) A child of 4 years is brought to Pediatrics OPD with history of decreased body growth. On examination, there was disproportionate growth of body with protruded abdomen, large tongue and decreased mental performance. Which of the following statement is correct regarding the above condition?
      (i) There is decreased secretion of insulin like growth factor-I
      (ii) Administration of insulin and growth hormone will improve patient's condition
      (iii) Formation of thyroid stimulating antibodies against TSH receptors might have led to this condition
      (iv) Administration of thyroxine might be helpful in treating physical defects in this patient but not mental retardation.

   (b) Blood-testis barrier prevents many large molecules from passing from the interstitial tissue to the tubular lumen in seminiferous tubules. Which of the following statement is correct regarding this barrier?
      (i) Tight junctions between adjacent Leydig cells forms this barrier
      (ii) The maturing germ cells cannot pass through this barrier
      (iii) Steroids can enter this barrier easily
      (iv) Composition of fluid of seminiferous tubules is dependent on this barrier.

   (c) A surge of FSH and LH is induced in the adenohypophysis 24-hours before ovulation and the first meiotic division of the primary oocyte resumes. At what stage does the oocyte become arrested until it becomes fertilized?
      (i) First meiotic division, prophase
      (ii) First meiotic division, metaphase
      (iii) Second meiotic division, prophase
      (iv) Second meiotic division, metaphase.

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