Roll No. .....

Question Booklet Number

O. M. R. Serial No.

B. Sc. (Biotechnology) (Second Semester)

EXAMINATION, July, 2022

MAMMALIAN PHYSIOLOGY

Paper Code				
BBT	2	0	0	1

Questions Booklet Series
C

Time : 1:30 Hours] [*Maximum Marks : 100*

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 75 questions are attempted by student, then the first attempted 75 questions will be considered for evaluation. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को किन्हीं 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page) (शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. Which of the following terms describes the volume of blood ejected by the heart in one minute ?

(A) End Diastolic Volume (EDV)

(B) Stroke Volume (SV)

(C) Heart Rate (HR)

(D) Cardiac Output (CO)

2. The atrioventricular (AV) node is important for heart function because :

(A) It directs the cardiac impulse from the atria to the ventricles.

(B) It serves as the pacemaker for the heart.

(C) It causes heart sound.

(D) None of the above

3. Serum differs from blood as it lacks :

(A) antibodies

(B) clotting factors

(C) albumins

(D) globulins

4. This plasma protein is responsible for blood coagulation :

(A) Fibrinogen

(B) Globulin

(C) Serum amylase

(D) Albumin

5. Globulins of the blood plasma are responsible for :

(A) defence mechanisms

(B) blood clotting

(C) oxygen transport

(D) osmotic balance

6. Which of the following blood cells play an important role in blood clotting ?

(A) Thrombocytes

(B) Neutrophils

(C) Leucocytes

(D) Erythrocytes

7. Normal Blood Pressure of a healthy human is :

(A) 140/80

(B) 120/90

(C) 130/100

(D) 120/80

8. The tricuspid valve is present between :

(A) Ventricle and pulmonary artery

(B) Ventricle and aorta

(C) Left auricle and left ventricle

(D) Right auricle and right ventricle

9. Pacemaker is ..... .

(A) AV node

(B) SA node

(C) Bundle of HIS

(D) Ventricle muscles

10. Which of the following has the thickest wall ?

(A) Right ventricle

(B) Left ventricle

(C) Right atrium

(D) Left atrium

11. How many chambers does a human heart have ?

(A) 2 chambers

(B) 4 chambers

(C) 6 chambers

(D) 8 chambers

12. The condition of low blood pressure than normal is :

(A) Hypotension

(B) Tachycardia

(C) Bradycardia

(D) Hypertension

13. Where does the heart send the deoxygenated blood for oxygenation ?

(A) Kidneys

(B) Liver

(C) Brain

(D) Lungs

14. The vitamin essential for blood clotting is ..... .

(A) Vitamin A

(B) Vitamin B

(C) Vitamin C

(D) Vitamin K

15. Arrange the following component acts during blood clotting mechanism :

(i) Platelets

(ii) Prothrombin

(iii) Fibrinogen

(iv) Ca^{2+}

(v) Thrombokinase

Codes :

(A) (i), (ii), (iii), (iv), (v)

(B) (i), (iv), (v), (ii), (iii)

(C) (iii), (iv), (v), (i), (ii)

(D) (v), (iv), (iii), (ii), (i)

16. Which occurs last in the clotting process ?

(A) Formation of thrombin

(B) Formation of thromboplastin

(C) Aggregation of platelets

(D) Formation of network

17. What are the two systems that make up the coagulation process ?

(A) Vascular and hemolysis

(B) Extrinsic and intravascular

(C) Intravascular and vascular

(D) Intrinsic and extrinsic

18. Prothrombin is the precursor of :

(A) Fibrin

(B) Fibrinogen

(C) Thrombin

(D) Thromboplastin

19. Hemophilias A and B are hereditary deficiencies of which coagulation factors, respectively ?

(A) VII and IX

(B) VIII and IX

(C) XI and VIII

(D) XI and IX

20. ECG depicts the depolarization and repolarization of processes during the cardiac cycle. In the ECG of a normal healthy individual one of the following waves is not represented. Which one is that ?

(A) Depolarization of Atria

(B) Repolarization of Atria

(C) Depolarization of Ventricles

(D) Repolarization of Ventricles

21. Which of the following is called the neurotransmitter ?

(A) Acetylcholine

(B) Dopamine

(C) Serotonin

(D) All of the above

22. Which of the following types of leukocytes are charecterised by the presence of kidney-shaped nucleus ?

(A) Eosinophil

(B) Basophil

(C) Monocytes

(D) Neutrophil

23. P wave of ECG indicates :

(A) Depolarization of right ventricle

(B) Depolanzation of left ventricle

(C) Depolarization of both atria

(D) Atria to ventricular conduction time

24. Which of the following is the correct formula for cardiac output ?

(A) stroke volume / heart rate

(B) stroke volume × resistance

(C) heart rate / resistance

(D) None of the above

25. The Myelin sheath is derived from the :

(A) Microglia

(B) Neuroglial cells

(C) Schwann cells

(D) Nerve cells

26. Nissl's granules are found in :

(A) Nerve cells

(B) WBC

(C) RBC

(D) Platelets

27. Parkinson's disease is due to loss of :

(A) Acetyl

(B) 5-HT

(C) Dopamine

(D) None of the above

28. A nerve impulse jumps from one ..... to another during saltatory conduction.

(A) Synapse

(B) Axon

(C) Node of Ranvier

(D) Myelin sheath

29. An adult brain contains roughly how many neurons ?

(A) 10 million

(B) 100 billion

(C) 100 million

(D) 1 million

30. What significant event occurs within the neuron that results in an action potential ?

(A) Calcium released.

(B) Enzymes are activated.

(C) ATP is formed.

(D) Ion channels are opened.

31. Neurotransmitters are often stored in :

(A) synaptic vesicles

(B) microtubules

(C) endoplasmic reticulum

(D) None of the above

32. Neurotransmitter release occurs through the process of :

(A) excitation

(B) exocytosis

(C) pinocytosis

(D) synthesis

33. Synapse is a junction between which of the following ?

(A) Muscles

(B) Neurons

(C) Cells

(D) Filaments

34. Which of the following contains receptors for neurotransmitters ?

(A) Pre-synaptic ending

(B) Post-synapting ending

(C) Synaptic cleft

(D) None of the above

35. What is the most common inhibitory neurotransmitter in the brain ?

(A) Glycine

(B) Glutamate

(C) Gamma-aminobutyric acid

(D) Dopamine

36. A typical neuron has a resting membrane potential of about :

(A) + 70 mV

(B) + 100 mV

(C) – 70 mV

(D) 0 mV

37. Which of the following is involved in the neuronal action potential ?

(A) Sodium (Na^+) channel

(B) Potassium (K^+) channel

(C) Na^+ K^+ ATPase pump

(D) All of the above

38. The mode of communication between the neurons by sending electrical impulses is known as :

(A) Membrane potentials

(B) Neuromodulators

(C) Neurotransmitters

(D) Action potentials

39. What does indicate that a nerve has been excited ?

(A) Production of generator potential

(B) Production of a wave of depolarization

(C) Production of an electronic potential

(D) None of the above

40. This hormone is responsible for "fight-or-flight" response :

(A) Thyroxin and melatonin

(B) Insulin and glucagon

(C) Epinephrine and norepinephrine

(D) Oestrogen and progesterone

41. Difference between endocrine and exocrine glands is that :

(A) endocrine glands release hormones, exocrine glands release waste.

(B) endocrine glands are interconnected, exocrine glands are totally independent.

(C) endocrine glands are formed by epithelial tissue, exocrine glands are connective tissues primarily.

(D) endocrine glands are ductless, exocrine glands release secretions into ducts or at the surface of the body.

42. This is not an endocrine gland :

(A) Adrenal

(B) Pituitary

(C) Lacrimal . .

(D) Thyroid . .

43. Action of parathormone in the human body :

(A) decreases blood sodium level

(B) increases blood sodium level

(C) decreases blood calcium level

(D) increases blood calcium level

44. What gland is located just superior to the kidneys ?

(A) Pituitary
(B) Adrenal
(C) Pancreas
(D) Ovaries

45. The primary target of the releasing and inhibiting hormones of the hypothalamus is the :

(A) Liver and adipose tissue
(B) Gonads
(C) Anterior pituitary
(D) Bone marrow

46. The posterior pituitary stores and releases :

(A) Growth hormone and prolactin
(B) Prolactin and oxytocin
(C) Oxytocin and antidiuretic hormone (ADH)
(D) ADH and growth hormone

47. Most hormones of the endocrine system are regulated by a :

(A) Negative feedback mechanism.
(B) Positive feedback mechanism.
(C) Hormone-receptor complex.
(D) Hormone-gene complex.

48. How does steroid hormone influence the cellular activities ?

(A) Using aquaporin channels as the second messenger
(B) Changing the permeability of the cell membrane
(C) Binding to DNA and forming a gene-hormone complex
(D) Activating cyclic AMP located on the cell membrane

49. What is gigantism ?

(A) When growth hormone is in excess and epiphyseal cartilage is growing.
(B) Renal tubules are unable to respond to ADH.
(C) Low stimulation of target glands.
(D) Excess of prolactin hormone.

50. Which of the following hormones regulates basic metabolic rates ?

(A) ADH
(B) Oxytocin
(C) Thyroxin
(D) ACTH

51. What is the name of the molecule formed when oxygen binds to hemoglobin ?

(A) Oxyhaemoglobin

(B) Oxygen-haemoglobin

(C) Carbaminohaemoglobin

(D) Oxyglobin

52. The Bohr effect/shift moves the oxygen saturation curve in what direction ?

(A) Left

(B) Right

(C) No effect

(D) None of the above

53. Chloride shift is essential for :

(A) CO_2 Transport

(B) O_2 Transport

(C) N_2 Transport

(D) None of the above

54. Haldane effect is associated with :

(A) CO_2 Transport

(B) O_2 Transport

(C) N_2 Transport

(D) None of the above

55. Carbonic anhydrase is present in :

(A) Blood plasma

(B) RBC

(C) WBC

(D) Platelets

56. Carbon dioxide is transported in the blood from the tissue to the lungs in this way :

(A) Dissolved in blood

(B) Buffered with water as carbonic acid

(C) Bound to haemoglobin

(D) All of the above

57. Which of the following gases is released out during the process of respiration ?

(A) Oxygen

(B) Hydrogen

(C) Carbon dioxide

(D) None of the above

58. High temperature moves the oxygen saturation curve in what direction ?

(A) Left

(B) Right

(C) No effect

(D) None of the above

59. On high mountains, difficulty in breathing is due to ..... .

(A) Decrease in partial pressure of O

(B) Decrease in amount of N_2

(C) Increase in CO_2 concentration

(D) All of the above

60. The functional unit of a contractile system in striated system is :

(A) Myofibril

(B) Cross bridge

(C) Z band

(D) Sarcomere

61. Which of the following also shortens when a muscle fibre shortens ?

(A) Sarcomere

(B) Actin filament

(C) Myosin filament

(D) Z-line

62. What is the role of tropomyosin in muscle contraction ?

(A) To release troponin from tropomyosin, allowing myosin to bind to the actin filament

(B) To release calcium from the sarcoplasmic reticulum

(C) To prevent myosin from continuing to slide up the actin filament

(D) To aid in myosin sliding on the actin filament

63. Which of the following proteins are not found in muscle fibres ?

(A) Keratin

(B) Actin

(C) Troponin

(D) Tropomyosin

64. Calcium, during muscle contraction binds with :

(A) Tropomyosin

(B) Troponin

(C) Myosin

(D) Actin

65. Which of the following molecules is important for muscle contraction ?

(A) ATP

(B) Calcium

(C) Magnesium

(D) Both (A) and (B)

66. Muscle fatigue is due to the accumulation of :

(A) carbon dioxide

(B) lactic acid

(C) creatine phosphate

(D) None of the above

67. Which of the following shows ATPase activity during muscle contraction ?

(A) Actin

(B) Tropomyosin

(C) Troponin

(D) Myosin

68. Sliding theory states that :

(A) actin and myosin filaments shorten and slide past each other

(B) when myofilaments slide past each other, shortening of actin filaments occur

(C) when myofilaments slide past each other, shortening of myosin filaments occur

(D) actin and myosin filaments do not shorten, they only slide past each other

69. Muscle contractions are classified into two major categories :

(A) isotonic and isometric

(B) isometric and isokinetic

(C) isokinetic and plyometric

(D) isometric and plyometric

70. Which of the following is the functional unit of the kidney ?

(A) Helium

(B) Neurons

(C) Nephrons

(D) Medulla

71. Animal which secretes urea is called :

(A) Aminotelism

(B) Ureotelism

(C) Uricotelism

(D) Ammonotelism

72. Uricotelism is found in which of the following ?

(A) Birds

(B) Protozoa

(C) Fishes

(D) None of the above

73. Ornithine cycle is also known as :

(A) Kreb's cycle

(B) Urea cycle

(C) Hatch-Slack cycle

(D) None of the above

74. Urea cycle converts ..... .

(A) Keto acids into amino acids

(B) Amino acids into keto acids

(C) Ammonia into a less toxic form

(D) Ammonia into a more toxic form

75. Urea production occurs almost exclusively in which of the following organs ?

(A) Kidneys

(B) Liver

(C) Blood

(D) Urine

76. Simultaneous movement of two molecules across a membrane in the same direction is known as ..... .

(A) Antiport

(B) Symport

(C) Uniport

(D) Biport

77. Which of the following steps are important in urine formation ?

(A) Filtration

(B) Selective reabsorption

(C) Tubular secretion

(D) All of the above

78. The maximum amount of electrolyte and water from glomerular filtrate is reabsorbed in which of the following ?

(A) PCT

(B) Loop of Henle

(C) DCT

(D) Collecting duct

79. Which of the following statements is true ?

(A) Thin descending segment of loop of Henle is highly permeable to water.

(B) ADH hormone maintains water balance in nephron.

(C) Thick ascending segment of loop of Henle is not permeable to water.

(D) All of the above

80. A cap-shaped structure that encloses glomerulus :

(A) Bowman's capsule

(B) Glomerulus

(C) Collecting duct

(D) Papillary duct

81. A major excretory product in human being is :

(A) Ammonia

(B) Urea

(C) Uric acid

(D) Ammonium chloride

82. Oxygen dissociation curve is a relation between :

(A) Oxygen saturation and partial pressure of oxygen

(B) CO_2 saturation and partial pressure of oxygen

(C) Respiration and breathing

(D) None of the above

83. Pancreatic juice is stimulated by the release of :

(A) Secretin

(B) Cholecystokinin

(C) Enterokinase

(D) Both (A) and (B)

84. Which of the following hormones decreases blood glucose and increases the uptake of glucose in various tissues like skeletal muscle, adipose tissues ?

(A) Insulin

(B) Cortisol

(C) Glucagon

(D) Epinephrine

85. Salivary amylase is active in which of the following parts of the digestive system ?

(A) Mouth
(B) Stomach
(C) Small intestine
(D) Liver

86. Amylase enzyme acts on the :

(A) Starch
(B) Protein
(C) Fat
(D) None of the above

87. Trypsin is secreted by :

(A) Pancreas
(B) Stomach
(C) Liver
(D) Ileum

88. Proteins are completely broken down in amino acid in :

(A) Buccal cavity
(B) Stomach
(C) Intestine
(D) Rectum

89. What is important function of Bile ?

(A) For digestion by emulsification of fat
(B) Digestion by enzyme
(C) Elimination of excretory product
(D) None of the above

90. Bacteria in food entering in the stomach is killed by :

(A) Pepsin
(B) Trypsin
(C) HCl
(D) Sodium bicarbonate

91. Secretin hormone is produced by :

(A) Stomach and stimulate gastric gland
(B) Intestine and stimulate pancreatic gland
(C) Liver and stimulate gall bladder
(D) Intestine and stimulate liver

92. Pancreatic juice takes part in digestion of :

(A) Protein, carbohydrates and fats
(B) Protein and fats
(C) Protein and carbohydrates
(D) Protein only

93. The enzyme tripsinogen is secreted by :

(A) Duodenum
(B) Pancreas
(C) Stomach
(D) Liver

94. The end product of digestion of starch which is absorbed into the blood stream is :

(A) amino acid

(B) fatty add

(C) glucose

(D) None of the above

95. Which of the following glands produces saliva ?

(A) Pancreas

(B) Thyroid

(C) Pituitary

(D) Parotid

96. An important function of the intestinal villi is to :

(A) increase the surface area for absorption of nutrients

(B) move chyme along the alimentary canal

(C) form a protective covering for the alimentary canal

(D) synthesise amino acids

97. Arteries are blood vessels that :

(A) carry blood away from the heart

(B) carry deoxygenated blood

(C) carry blood towards the heart

(D) None of the above

98. The expression 'cardiac cycle' refers to :

(A) the sequence of events in the heart that take place every minute

(B) the volume of blood pumped by the ventricles every minute

(C) the sequence of events that take place between one heartbeat and the next

(D) the sequence of events that create heart sounds

99. Which of the following includes the electrical conducting system of the heart ?

(A) Atrioventricular node

(B) Bundle of HIS

(C) Sinoatrial node

(D) All of the above

100. The rhythm and electrical activity of the heart can be detected with electrodes on the skin and displayed in the form of an :

(A) electrooculogram

(B) electroencephalogram

(C) electrocardiogram

(D) echocardiogram

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the most correct/appropriate answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.

6. All answers are to be given on OMR Answer sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.

7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.

9. There will be no negative marking.

10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.

11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.

12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is ny discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर— A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से एक सबसे सही अथवा सबसे उपयुक्त उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।

6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।

7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।

8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।

9. निगेटिव मार्किंग नहीं है।

10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।

11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।

12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।