

National Board of Examinations

Question Paper Name : DNB Physiology Paper1
Subject Name : DNB Physiology Paper1
Duration : 182
Total Marks : 100
Display Marks: No

Maximum Instruction Time : 0
Is Section Default? : No

Question Number : 1 Question Id : 32718744217 Consider As Subjective : Yes

Please write your answers in the answer booklet within the allotted pages as follows:-

Question Number	Answer to be attempted within	Question Number	Answer to be attempted within
Q. 1	Page 1-5	Q. 6	Page 26-30
Q. 2	Page 6-10	Q. 7	Page 31-35
Q. 3	Page 11-15	Q. 8	Page 36-40
Q. 4	Page 16-20	Q. 9	Page 41-45
Q. 5	Page 21-25	Q. 10	Page 46-50

1. Osmolar movement in oedematous and inflammatory disorders:

- Definition of osmolarity, tonicity and effective osmoles. [3]
- Explain the physiological basis of cell swelling and shrinkage. [4]
- Describe clinical applications of concepts of osmolality in intravenous fluid therapy. [3]

Question Number : 2 Question Id : 32718744218 Consider As Subjective : Yes

Ion transport in cellular electrophysiology & pathophysiology:

- a) Explain the Nernst equation and its assumptions. [3]
- b) Describe Goldman–Hodgkin–Katz equation in detail. [4]
- c) Give the limitations of Nernst and Goldman- Hodgkin–Kartz equations. [3]

Question Number : 3 Question Id : 32718744219 Consider As Subjective : Yes

Voltage-gated Na⁺ channel in cardiac & muscular diseases:

- a) Structure of voltage-gated Na⁺ channels. [3]
- b) Activation and inactivation mechanisms of voltage-gated Na⁺ channels. [4]
- c) Discuss Na⁺ channel-related genetic channelopathies. [3]

Question Number : 4 Question Id : 32718744220 Consider As Subjective : Yes

Structural muscle contraction:

- a) Describe structural organization of skeletal muscle fibres. [3]
- b) Explain cross-bridge cycling with ATPase activity. [4]
- c) Genetic disorders affecting contractile proteins. [3]

Question Number : 5 Question Id : 32718744221 Consider As Subjective : Yes

Cellular junction & intercellular transport.

- a) Define cell junctions and their types. [3]
- b) Explain molecular composition and functions of tight junctions. [4]
- c) Discuss diseases related to junctional defects. [3]

Question Number : 6 Question Id : 32718744222 Consider As Subjective : Yes

- a) Define second messengers. [2]
- b) Explain cAMP and IP₃–DAG pathways. [4]
- c) Describe genetic mutations affecting second messenger pathways. [4]

Question Number : 7 Question Id : 32718744223 Consider As Subjective : Yes

- a) Describe the functions of the cytoskeleton. [2]
- b) Explain the structure and functions of microtubules, microfilaments and intermediate filaments. [6]
- c) Discuss the clinical disorders related to cytoskeleton defects. [2]

Question Number : 8 Question Id : 32718744224 Consider As Subjective : Yes

- a) Explain DNA replication initiation. [3]
- b) Describe leading and lagging strand synthesis. [4]
- c) Discuss telomere maintenance. [3]

Question Number : 9 Question Id : 32718744225 Consider As Subjective : Yes

- a) Discuss the historical development of genetics. [3]
- b) Explain the central dogma including exceptions. [4]
- c) Describe role of non-coding RNAs in gene regulation. [3]

Question Number : 10 Question Id : 32718744226 Consider As Subjective : Yes

- a) Describe DNA repair mechanisms. [3]
- b) Explain mismatch repair and its molecular basis. [4]
- c) Give the clinical relevance of defective repair systems. [3]