PHYSIOTHERAPY IN NEUROLOGICAL SCIENCES

UNIT 1: NEUROANATOMY AND NEUROPHYSIOLOGY

S.N	Question Type	Question	Mapping to TNMGRMU, GPAT, MRB, and AIIMS	Design Thinking Framework
1	2-Marks	Define cerebral hemispheres.	TNMGRMU Dec 2021; GPAT (fundamental neuroanatomy concepts); MRB (basic neurophysiology knowledge); AIIMS (focus on cerebral structures for stroke rehab protocols).	Empathize: Understanding patient deficits in higher cognitive functions.
2	2-Marks	Differentiate between frontal and parietal lobes of the cerebral hemispheres.	TNMGRMU Oct 2021; GPAT (key neuroanatomy terminology); MRB (physio syllabus); AIIMS (applies in motor vs. sensory rehab design).	Define: Identifying specific lobe-related impairments in assessment.
3	2-Marks	What is the rationale behind studying the structure of cerebral hemispheres in physiotherapy?	TNMGRMU Feb 2022; GPAT (neuro principles); MRB (therapeutic rationale); AIIMS (uses for targeted neuro rehab to enhance motor control).	Ideate: Brainstorming interventions for hemispheric lesions.
4	2-Marks	Mention two functions of the temporal lobe in cerebral hemispheres.	TNMGRMU July 2022; GPAT (functions in neuroanatomy); MRB (basic neuro); AIIMS (leverages for auditory and memory rehab in neuro patients).	Prototype: Developing exercises mimicking temporal lobe roles.
5	2-Marks	List any two association areas in the cerebral hemispheres.	TNMGRMU May 2022; GPAT (cortical areas); MRB (formulation of neuro knowledge); AIIMS (uses in cognitive-motor integration therapy).	Test: Evaluating efficacy of association-based rehab tools.

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6	5-Marks	Explain the gross structure of the cerebellum.	TNMGRMU Dec 2021, Feb 2023; GPAT (cerebellar anatomy); MRB (advanced neuroanatomy); AIIMS (considers structure for balance disorder management).	Empathize: Assessing coordination deficits in cerebellar patients.
7	5-Marks	Write a note on the functional divisions of the cerebellum.	TNMGRMU Oct 2022; GPAT (cerebellar functions); MRB (neuro criteria); AIIMS (evaluates divisions for ataxia rehab).	Define: Defining cerebellar dysfunction types for treatment planning.
8	5-Marks	Describe the role of cerebellar nuclei in motor control.	TNMGRMU July 2022, June 2023; GPAT (nuclei in neurophysiology); MRB (specialized neuro delivery); AIIMS (develops nucleus-targeted exercises for dysmetria).	Ideate: Generating ideas for nuclei-specific proprioceptive training.
9	5-Marks	Explain the afferent and efferent pathways to the cerebellum.	TNMGRMU Feb 2024; GPAT (pathway systems); MRB (advanced neuro systems); AIIMS (pioneers pathway rehab like proprioceptive neuromuscular facilitation).	Prototype: Creating pathway simulation devices for therapy.
10	5-Marks	Discuss the vestibular connections of the cerebellum.	TNMGRMU Mar 2025; GPAT (vestibular applications); MRB (balance science); AIIMS (uses connections for vestibular rehab in vertigo).	Test: Testing vestibular-cerebellar integration outcomes.
11	15-Marks	Explain the detailed structure and functions of the spinal cord, including its segments and tracts.	TNMGRMU May 2022, Oct 2022; GPAT (spinal mechanisms); MRB (advanced neuroanatomy); AIIMS (applies in spinal cord injury rehab protocols).	Empathize: Empathizing with sensory-motor losses in spinal injuries.

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12	15-Marks	Describe the ascending and descending tracts in the spinal cord and their clinical significance in physiotherapy.	TNMGRMU Dec 2023; GPAT (tract physiology); MRB (expertise in neuro tracts); AIIMS (focuses on tract preservation in paraplegia management).	Define: Defining tract-specific impairments for goal setting.
13	15-Marks	Discuss the blood supply and meningeal coverings of the spinal cord.	TNMGRMU July 2022; GPAT (vascular neuroanatomy); MRB (neuro syllabus); AIIMS (considers supply for ischemia prevention in rehab).	Ideate: Ideating preventive strategies for cord vascular issues.
14	2-Marks	Define peripheral nerves.	TNMGRMU Feb 2022; GPAT (peripheral concepts); MRB (basic peripheral knowledge); AIIMS (focus on nerve definitions for peripheral neuropathy protocols).	Empathize: Understanding peripheral nerve pain in patients.
15	2-Marks	List two types of peripheral nerves based on function.	TNMGRMU Oct 2021; GPAT (nerve classification); MRB (physio basics); AIIMS (applies in sensory-motor nerve rehab).	Define: Classifying nerve types for assessment.
16	5-Marks	Explain the structure of a typical peripheral nerve.	TNMGRMU Dec 2021; GPAT (nerve structure); MRB (advanced peripheral); AIIMS (considers for nerve conduction studies in therapy).	Prototype: Prototyping nerve gliding exercises.
17	5-Marks	Describe the formation of major nerve plexuses from peripheral nerves.	TNMGRMU May 2022; GPAT (plexus anatomy); MRB (plexus criteria); AIIMS (evaluates plexuses for brachial plexus injury rehab).	Test: Testing plexus mobilization techniques.

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18	15-Marks	Discuss the cranial nerves derived from peripheral nervous system and their physiotherapy implications.	TNMGRMU Oct 2022; GPAT (cranial mechanisms); MRB (advanced cranial); AIIMS (applies in facial nerve palsy management).	Ideate: Brainstorming cranial nerve stimulation ideas.
19	2-Marks	What is the pyramidal system?	TNMGRMU July 2022; GPAT (pyramidal basics); MRB (motor knowledge); AIIMS (focus on pyramidal for spastic rehab).	Empathize: Sensing pyramidal lesion impacts on voluntary movement.
20	2-Marks	Mention two components of the pyramidal tract.	TNMGRMU Feb 2023; GPAT (tract components); MRB (basic tracts); AIIMS (leverages for upper motor neuron therapy).	Define: Defining pyramidal pathway deficits.
21	5-Marks	Explain the origin and pathway of the corticospinal tract in the pyramidal system.	TNMGRMU June 2023; GPAT (corticospinal physiology); MRB (pyramidal delivery); AIIMS (develops tract-based facilitation techniques).	Prototype: Designing corticospinal activation prototypes.
22	5-Marks	Describe the role of the pyramidal system in fine motor skills.	TNMGRMU Dec 2021; GPAT (motor applications); MRB (skill science); AIIMS (uses for dexterity training in hemiplegia).	Test: Evaluating pyramidal skill improvements.
23	15-Marks	Elaborate on the lesions of the pyramidal system and their effects on posture and movement.	TNMGRMU Mar 2025; GPAT (lesion mechanisms); MRB (advanced lesions); AIIMS (focuses on lesion recovery kinetics).	Ideate: Ideating compensatory strategies for pyramidal lesions.

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24	2-Marks	Define the extrapyramidal system.	TNMGRMU Oct 2021; GPAT (extrapyramidal concepts); MRB (involuntary knowledge); AIIMS (protocols for extrapyramidal disorders like Parkinson's).	Empathize: Understanding involuntary movement challenges.
25	2-Marks	List two structures involved in the extrapyramidal system.	TNMGRMU Feb 2024; GPAT (basal ganglia terms); MRB (system basics); AIIMS (applies in basal ganglia rehab).	Define: Identifying extrapyramidal structure impairments.
26	5-Marks	Explain the basal ganglia's role in the extrapyramidal system.	TNMGRMU July 2022; GPAT (ganglia functions); MRB (extrapyramidal criteria); AIIMS (evaluates for dystonia management).	Prototype: Prototyping basal ganglia modulation exercises.
27	5-Marks	Describe the connections between cerebellum and extrapyramidal system.	TNMGRMU May 2022; GPAT (intersystem pathways); MRB (coordination science); AIIMS (uses in ataxic rehab integration).	Test: Testing extrapyramidal-cerebellar synergy.
28	15-Marks	Discuss the clinical manifestations of extrapyramidal disorders and physiotherapy approaches.	TNMGRMU Dec 2023; GPAT (disorder challenges); MRB (expertise in disorders); AIIMS (considers manifestations like compliance in Parkinson's therapy).	Ideate: Generating holistic approaches for extrapyramidal symptoms.
29	2-Marks	What is a neuron?	TNMGRMU Oct 2022; GPAT (neuron basics); MRB (cellular knowledge); AIIMS (focus on neuron for neurodegenerative rehab).	Empathize: Relating to neuronal damage in chronic conditions.

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30	2-Marks	Mention two types of neurons.	TNMGRMU Feb 2022; GPAT (neuron types); MRB (basic types); AIIMS (leverages for sensory vs. motor neuron therapy).	Define: Classifying neuron types in diagnostics.
31	5-Marks	Explain the structure of a multipolar neuron.	TNMGRMU July 2022; GPAT (multipolar anatomy); MRB (neuron structure); AIIMS (considers for motor neuron disease protocols).	Prototype: Simulating neuronal structure in educational models.
32	5-Marks	Describe the process of action potential propagation in a neuron.	TNMGRMU Dec 2021; GPAT (propagation physiology); MRB (action potential science); AIIMS (uses in nerve stimulation therapy).	Test: Assessing propagation via biofeedback tools.
33	15-Marks	Elaborate on the classification of neurons and their physiological properties relevant to physiotherapy.	TNMGRMU June 2023; GPAT (classification mechanisms); MRB (advanced classification); AIIMS (applies properties in neuro rehab design).	Ideate: Innovating neuron-targeted neuroplasticity exercises.
34	2-Marks	Define synapse.	TNMGRMU May 2022; GPAT (synapse concepts); MRB (synaptic knowledge); AIIMS (focus on synapse for synaptic plasticity in learning).	Empathize: Understanding synaptic failure in fatigue.
35	2-Marks	Differentiate between chemical and electrical synapses.	TNMGRMU Oct 2021; GPAT (synapse types); MRB (basic synapses); AIIMS (applies in fast vs. modulated signal rehab).	Define: Defining synaptic transmission modes.
36	5-Marks	Explain the structure of a chemical synapse.	TNMGRMU Feb 2023; GPAT (chemical structure); MRB (synapse anatomy); AIIMS (develops structure-based neurotransmitter modulation).	Prototype: Creating synapse model for patient education.

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37	5-Marks	Describe the role of neurotransmitters at the synapse.	TNMGRMU July 2022; GPAT (neurotransmitter functions); MRB (transmitter criteria); AIIMS (evaluates for excitatory-inhibitory balance in therapy).	Test: Testing neurotransmitter effects via response tracking.
38	15-Marks	Discuss the synaptic transmission process and its implications for neurorehabilitation techniques.	TNMGRMU Dec 2021; GPAT (transmission mechanisms); MRB (advanced transmission); AIIMS (focuses on transmission for PNF and neurofacilitation).	Ideate: Brainstorming synaptic enhancement strategies.
39	2-Marks	List two functions of the occipital lobe in cerebral hemispheres.	TNMGRMU Mar 2025; GPAT (occipital roles); MRB (visual basics); AIIMS (uses in visual-motor rehab).	Empathize: Addressing visual neglect in stroke patients.
40	2-Marks	What are the three lobes of the cerebellum?	TNMGRMU Oct 2022; GPAT (cerebellar lobes); MRB (lobe knowledge); AIIMS (applies in lobar ataxia protocols).	Define: Mapping cerebellar lobe functions to symptoms.
41	5-Marks	Explain the spinocerebellar tract's role in spinal cord function.	TNMGRMU Feb 2024; GPAT (spinocerebellar physiology); MRB (tract science); AIIMS (considers for proprioceptive rehab).	Prototype: Prototyping tract-specific balance boards.
42	5-Marks	Describe the autonomic fibers in peripheral nerves.	TNMGRMU June 2023; GPAT (autonomic nerves); MRB (peripheral autonomic); AIIMS (develops for dysautonomia management).	Test: Evaluating autonomic responses in therapy.
43	15-Marks	Compare and contrast pyramidal and extrapyramidal systems in terms of structure and function.	TNMGRMU May 2022; GPAT (system comparisons); MRB (comparative neuro); AIIMS (applies in mixed lesion rehab).	Ideate: Integrating dual-system approaches.

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44	2-Marks	Name the neurotransmitter primarily used in most synapses.	TNMGRMU Dec 2023; GPAT (neurotransmitter basics); MRB (synaptic chemicals); AIIMS (focus on acetylcholine for neuromuscular rehab).	Empathize: Linking transmitter imbalance to symptoms.
45	2-Marks	What is the role of myelin in peripheral nerves?	TNMGRMU July 2022; GPAT (myelin functions); MRB (nerve insulation); AIIMS (uses in demyelination protocols).	Define: Identifying myelin-related conduction delays.
46	5-Marks	Explain dendritic and axonal transport in neurons.	TNMGRMU Oct 2021; GPAT (transport physiology); MRB (neuron dynamics); AIIMS (considers for axonal injury recovery).	Prototype: Simulating transport in rehab animations.
47	5-Marks	Describe synaptic plasticity and its types.	TNMGRMU Feb 2022; GPAT (plasticity concepts); MRB (synaptic adaptation); AIIMS (evaluates for long-term potentiation in therapy).	Test: Measuring plasticity changes post-intervention.
48	15-Marks	Elaborate on the integrated function of cerebral hemispheres and cerebellum in coordinated movement.	TNMGRMU Dec 2021; GPAT (integration mechanisms); MRB (coordination expertise); AIIMS (focuses on integration for ataxic-spastic rehab).	Ideate: Designing integrated neuro-motor programs.
49	15-Marks	Discuss the neurophysiological basis of reflexes involving the spinal cord and peripheral nerves.	TNMGRMU July 2022; GPAT (reflex physiology); MRB (reflex challenges); AIIMS (applies basis in reflex modulation techniques).	Empathize: Understanding reflex hyperactivity in patients.
50	15-Marks	Explain the neuron-synapse-neuron circuit in the context of pyramidal and extrapyramidal modulation.	TNMGRMU May 2022; GPAT (circuit design); MRB (modulation syllabus); AIIMS (uses circuits for advanced neurofacilitation).	Prototype: Prototyping circuit-based VR therapy tools.