

## Preface to Latest (NSQF Level-4) compliant edition

Directorate General of Training (DGT) under the Ministry of Skill Development & Entrepreneurship, undertakes steps from time to time to improve its various aspects in line with changing market and industry requirements. In 2015, DGT initiated the process of incorporating the concept of competency based curricula. In order to do so, the curriculum all CTS trades have been revised and reoriented with appropriate National Skill Qualification Framework (NSQF) level. The curriculum for **Physiotherapy Technician (Sector - Helthcare)** has been fixed at **level 4**.

Like as physical exercise and Yoga have very important role for healthy lifestyle, absolutely same way Physiotherapy plays extremely important role to regain normal healthy lifestyle after illnesses viz. brain-stroke, paralysis ; after recovering from fractures in result of accidents etc. and after major treatments or surgeries. When we talk about use of physiotherapy in the field of medical science, then it is applicable for rehabilitation of brain-stroke, to reduce physiological damage occurred in accidents, for appropriate movement of body after knee and hip replacements, to minimise the effects of illness such as Parkinson, facial paralysis, to correct the changes that occurs in spinal cord (Lordosis, Kyphosis), to correct Gait (defective walk), to treat problem of new-born child that may occur in some delivery process, tennis elbow, heel spur, golfer elbow, wrist drop, foot drop and to minimise damage due to problem in nerve that may occur, physiotherapy is used in one or the other form for such purposes. This is only a model illustration of physiotherapy applications, nevertheless some medical experts prescribe physiotherapy to minimise the effect of deadly diseases such as cancer. Now-a-days, yoga and physical exercises are assumed as a part of physiotherapy. So you can imagine the ever increasing importance of physiotherapy.

### Gratitude

*We express our gratitude for valuable advise, active and positive cooperation of*

**- Dr. Dinesh Kumar Yadav**

*MBBS, MD (Internal Medicine), DM (Nephrology)*

*Consultant: Nephrology, Kidney and Urology Institute, (Medanta, Gurugram, India)*

**- Dr. Dharendra Singh**

*MBBS, MD (Internal Medicine), DM (Cardiology)*

*Consultant: Division of Interventional Cardiology, (Medanta, Gurugram, India)*

**- Dr. Pankaj Kumar**

*MBBS, MD, (PSY, KGMU, LKO) FIPS, FIAPP, FDPS, MIMA*

**Senior Consultant Psychiatrist & Psychotherapist:**

*MAX SUPER SPECIALTY HOSPITAL, NEW DELHI (INDIA)*

*SIR GANGARAM HOSPITAL, NEW DELHI (INDIA)*

*due to which we have become able to present the book in this form.*

We trust that this book is complete in all respects for subject of **Physiotherapy Technician** for it's full duration of 1 Year for the **Theory** as well as **Practical** subjects.

This book will be equally useful to other similar degree and diploma courses.

We would welcome suggestions from our esteemed readers for further improvement of this volume.

**- Authors**

# Contents

<i>NSQF (Level-4) compliant Competency Based Curriculum for Physiotherapy Technician (Theory and Practical) Under C.T.S.</i> .....	xi-xvi
<b>Physiotherapy Terminology</b> .....	<b>i-x</b>
<b>1. Introduction to Physiotherapy</b> .....	<b>1-14</b>
↳ Identification of electrotherapy modalities .....	9
↳ Exercise tools and equipments .....	10-11
↳ Human body and its parts .....	12
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>13-14</b>
<b>2. Introduction to Anatomy and Physiology</b> .....	<b>15-32</b>
↳ Anatomical and Fundamental Positions .....	23
↳ Planes, Axis, Anatomical and Fundamental Positions .....	24
↳ Anatomical regions (Male - Anterior view) .....	25
↳ Anatomical regions (Male - Posterior view) .....	26
↳ Anatomical regions (Female - Anterior view) .....	27
↳ Anatomical regions (Female - Posterior view) .....	28
↳ Human Body Cavities and Organs .....	29-30
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>31-32</b>
<b>3. Osteology</b> .....	<b>33-46</b>
↳ Skeleton system .....	40
↳ Skull, Vertebral Column and Throat (Rib Cage) .....	41
↳ Bones of Skull .....	42
↳ Throat .....	43
↳ Vertebral column .....	44
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>45-46</b>
<b>4. Orthology</b> .....	<b>47-60</b>
↳ Diagrams of major joints of human body .....	56
↳ Joints formation by using bones .....	57
↳ Human bones in X-Ray .....	58
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>59-60</b>
<b>5. Myology</b> .....	<b>61-74</b>
↳ Main muscles of human body .....	69
↳ Skeletal muscles of human body .....	70
↳ Muscles structure .....	71
↳ Major muscles of upper and lower limb .....	72
↳ Major muscles of upper and lower limb .....	72
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>73-74</b>
<b>6. Cell, Tissue and Skin</b> .....	<b>75-88</b>
↳ Microscopic diagram of different tissue, Human cells picture with label .....	85
↳ Postures of skin .....	86
↳ Postures of skin .....	86
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>87-88</b>
<b>7. Neurology</b> .....	<b>89-108</b>
↳ Nervous System .....	103
↳ Spinal cord, Neuron, Human brain, Reflex Arc .....	104
↳ Plexus .....	105
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>106-108</b>
<b>8. Circulatory System</b> .....	<b>109-124</b>
↳ Heart structure, Blood circulation in heart .....	119
↳ Heart location and position, Blood pressure examination .....	120
↳ AV display of blood circulation .....	121
<b>Assignment/Test (Solved) Multiple Choice Questions</b> .....	<b>122-124</b>

<b>9. Food, Nutrition and Digestive system .....</b>	<b>125-134</b>
↳ Diet chart for different age groups .....	131
↳ Organs of digestive system .....	132
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>133-134</b>
<b>10. Respiratory system and Endocrinology .....</b>	<b>135-150</b>
↳ Organs of respiratory system .....	146
↳ Respiratory system .....	147
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>148-150</b>
<b>11. Excretory System, Gynaecology and Obstertrics .....</b>	<b>151-168</b>
↳ Excretory system, Excretory system (Kidney), Excretory system (Nephron) .....	164
↳ Micturition reflex .....	165
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>166-168</b>
<b>12. Thermotherapy .....</b>	<b>169-176</b>
↳ Application of hot packs at different regions of body .....	174
↳ Application of wax bath .....	175
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>176</b>
<b>13. Infra-Red Radiation and Cryotherapy .....</b>	<b>177-182</b>
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>182</b>
<b>14. Deep Heating Agents and Stimulators .....</b>	<b>183-194</b>
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>193-194</b>
<b>15. Massage Therapy and Rehabilitation .....</b>	<b>195-208</b>
↳ Hand position illustration in various type of massage .....	205
↳ Therapeutic Trigger points .....	206
<b>Assignment/Test (Solved) Multiple Choice Questions .....</b>	<b>207-208</b>
<b>16. Exercise Therapy and Yoga: Fundamentals of Exercise .....</b>	<b>209-225</b>
☞ <b>Definition of therapeutic exercise .....</b>	<b>210</b>
☞ <b>Benefits of exercises .....</b>	<b>210-213</b>
☞ <b>Classification of exercises .....</b>	<b>214-216</b>
⇒ Active exercise .....	214
⇒ Passive exercise .....	214
⇒ Resistive exercise .....	215
⇒ Isometric exercise .....	215
⇒ Functional exercise .....	215
⇒ Stretching exercise .....	215
⇒ Isokinetic exercise .....	216
⇒ Closed-chain exercise .....	216
⇒ Open-chain exercise .....	216
↳ Positioning of patient and therapist .....	217
↳ Common streaching exercises .....	218-219
↳ Rules for exercises .....	219-223
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>224-225</b>
<b>17. Applied Exercise Therapy .....</b>	<b>226-249</b>
☞ <b>Passive movements .....</b>	<b>227</b>
☞ <b>Goniometry .....</b>	<b>227</b>
☞ <b>Active movements, Activeassisted movements .....</b>	<b>228</b>
☞ <b>Resistive exercise .....</b>	<b>229</b>
☞ <b>Co-ordination and Balance .....</b>	<b>230</b>
☞ <b>Stretching exercise .....</b>	<b>231</b>
☞ <b>Techniques for chest physiotherapy (CPT) .....</b>	<b>232</b>
☞ <b>Manual muscle testing (MMT) .....</b>	<b>237</b>
☞ <b>Techniques of PNF .....</b>	<b>239</b>
☞ <b>Indications and contraindications of breathing exercise .....</b>	<b>240</b>
☞ <b>Grades of MMT .....</b>	<b>242</b>
☞ <b>Precautions while performing these exercises on patient .....</b>	<b>242</b>

↳ Presentation of passive movements (manually) .....	243
↳ Assessment of range of motion of major joints by using goniometer scales .....	244
↳ Assessment of range of motion of major joints .....	245
↳ Assessment of range of motion of major joints .....	245-246
↳ Perform strengthening exercises by utilizing therabands / thera tubes .....	245-246
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>248-249</b>
<b>18. Exercise Physiology .....</b>	<b>250-274</b>
☞ <b>Thermoregulation and exercise organs .....</b>	<b>251-253</b>
⇒ Conduction, convection & evaporation .....	252
⇒ Homeostasis .....	252
⇒ Physiological thermoregulation .....	252
☞ <b>Respiration .....</b>	<b>253-255</b>
⇒ Muscles for inspiration and expiration .....	253
⇒ Static and Dynamic Lung volume .....	254
⇒ Gaseous exchange .....	255
☞ <b>Cardiovascular adaptations .....</b>	<b>255-257</b>
⇒ Sub maximal exercise .....	256
⇒ At maximal exercise .....	257
☞ <b>Fatigue: Types, Symptoms, Recovery .....</b>	<b>257</b>
☞ <b>Endurance: Definition, Training .....</b>	<b>258</b>
☞ <b>Kinesiology &amp; Biomechanics: Basic terminologies .....</b>	<b>259</b>
☞ <b>Relaxation exercises .....</b>	<b>259-261</b>
☞ <b>TRACTION:Contraindications, Therapeutic uses and effects .....</b>	<b>261-262</b>
☞ <b>Activities of daily living .....</b>	<b>262</b>
☞ <b>Gait:Definition, phases, abnormal gait patterns .....</b>	<b>262-266</b>
☞ <b>Walking aids: Types, indications, precautions .....</b>	<b>266-268</b>
↳ Positioning of patient while given traction (spinal decompression) .....	269
↳ Exercise and relaxation positions for spinal decompression, cervical and neck pains .....	270
↳ Walking aids (Parts of a wheel chair) .....	271
↳ Various type of walking aids .....	271
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>272-274</b>
<b>19. Applied Anatomy .....</b>	<b>275-314</b>
☞ <b>Carpal tunnel syndrome. ....</b>	<b>276-279</b>
☞ <b>Erb's and kulmpke palsy .....</b>	<b>279-283</b>
⇒ Kulmpke palsy .....	283-284
☞ <b>De Quervain's disease .....</b>	<b>285-287</b>
☞ <b>Rotator cuff syndrome .....</b>	<b>287-292</b>
☞ <b>Wrist drop .....</b>	<b>293-295</b>
☞ <b>Trendelenburg's sign .....</b>	<b>295-296</b>
☞ <b>Tarsal tunnel syndrome .....</b>	<b>296-299</b>
☞ <b>Genu valgum/varum .....</b>	<b>300-301</b>
☞ <b>Coxa valgus/ varus .....</b>	<b>302-303</b>
☞ <b>Foot drop .....</b>	<b>303-307</b>
↳ Rehabilitation program for patients (Stroke) .....	307-309
↳ Calculate obesity according to BMI .....	310
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>311-314</b>
<b>20. Ortho-Neuro-General .....</b>	<b>315-360</b>
☞ <b>Kyphosis, Lordosis &amp; Scoliosis .....</b>	<b>316-320</b>
⇒ Kyphosis .....	316-317
⇒ Lordosis .....	317-319
⇒ Scoliosis .....	319-320
☞ <b>Cervical &amp; Lumbar Spondylosis .....</b>	<b>320-322</b>

☞ Ankylosing Spondylosis .....	322-323
☞ Tennis Elbow .....	323-326
☞ Golfer's Elbow .....	326-328
☞ Gout .....	328-329
☞ Osteoarthritis .....	329-331
☞ Rheumatoid Arthritis .....	331-333
☞ Frozen Shoulder .....	333-335
☞ Fracture .....	335-338
☞ Dislocation & subluxation .....	338-341
☞ Sprain .....	341-343
☞ Tendonitis .....	344-345
☞ Rickets .....	346-348
☞ Osteomalacia .....	348-349
☞ Osteomyelitis .....	349-350
☞ Calcaneal Spar .....	350-352
☞ Flatfoot .....	352-354
ℙ Develop Ergonomics .....	354-355
ℙ Precautions related to treatment .....	356
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>357-360</b>
<b>21. Neurological Condition .....</b>	<b>361-392</b>
☞ Cerebral palsy .....	362-365
☞ Hemiplegia .....	365-367
☞ Paraplegia .....	367-368
☞ Quadriplegia .....	368-370
☞ Myalgia .....	370-371
☞ Fibromyositis .....	371-373
☞ Polio Myelitis .....	373-375
☞ Parkinsonism .....	375-378
☞ Bell's palsy .....	378-380
☞ C.V.A. ....	380-382
☞ Upper & Lower Motor Neuron diseases .....	382-383
☞ Peripheral Nerve Injury .....	383-384
☞ Spinal Cord Injury .....	384-385
☞ Sciatica .....	385-386
ℙ Hemiplegia and Hemiparesis .....	387-388
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>389-392</b>
<b>22. General Condition .....</b>	<b>393-398</b>
☞ Obesity .....	394-396
☞ Burns .....	396-397
<b>Assignment/Test—Solved (MCQs) .....</b>	<b>397-398</b>

