JEMAS(PG)-2024 **QB No: 4103100001**

Subject: Master of Prosthetics & Orthotics (MPO)

Duration: 90 minutes **No of MCQ: 100** **Full Marks: 100**

INSTRUCTIONS

1. All questions are of objective type having four answer options for each.
2. **Category-1**: Carries **1** mark each and only one option is correct. In case of incorrect answer or any combination of more than one answer, ¼ mark will be deducted.
3. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.
4. Use only **Black/Blue ink ball point pen** to mark the answer by filling up of the respective bubbles completely.
5. Write Question Booklet number and your roll number carefully in the specified locations of the **OMR** sheet. Also fill appropriate bubbles.
6. Write your name (in block letter), name of the examination center and put your signature (as is appeared in Admit Card) in appropriate boxes in the **OMR sheet**.
7. The OMR sheet is liable to become invalid if there is any mistake in filling the correct bubbles for Question Booklet number/roll number or if there is any discrepancy in the name/ signature of the candidate, name of the examination center. The OMR sheet may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
8. Candidates are not allowed to carry any written or printed material, calculator, pen, log-table, wristwatch, any communication device like mobile phones, bluetooth devices etc. inside the examination hall. Any candidate found with such prohibited items will be **reported against** and his/her candidature will be summarily cancelled.
9. Rough work must be done on the Question Booklet itself. Additional blank pages are given in the Question Booklet for rough work.
10. Hand over the OMR sheet to the invigilator before leaving the Examination Hall.
11. Candidates are allowed to take the Question Booklet after examination is over.

Signature of the Candidate: _____

(As in Admit Card)

Signature of the Invigilator: _____

ROUGH WORK ONLY

MPO

1.The state of equilibrium demonstrated whan an object's COG is UNCHANGED when it is disturbed is
(A) Stable equilibrium
(B) Unstable equilibrium
(C) Neutral equilibrium
(D) None of the above

2.You will be working with a patient who had a STROKE. You expect which of the following descriptions to best characterize the TYPICAL gait pattern that you will see?
(A) Excessive ANTERIOR tilt and LUMBAR lordosis with exaggerated arm swing
(B) A shift of the trunk tot the AFFECTED side with WEIGHT-BEARING
(C) Weight shift to the UNINVOLVED side with CIRCUMDUCTION of the INVOLVED leg
(D) A quick shift POSTERIORLY of the trunk at the moment of heel strike.

3.Pressure on the vertebral discs is GREATEST in which of the following positions?
(A) Supine
(B) Side-lying
(C) Seated
(D) Standing upright

4. Which two SPINAL CURVES are considered to be the SECONDARY (antigravity) curves
(A) Cervical and Thoracic
(B) Thoracic and sacral
(C) Cervical and Lumbar
(D)Lumbar and sacral

5. What does STATIC mean
(A) Moveable systems
(B) Manner in which bones move in space
(C) Systems that move then stop
(D) Non-moving or nearly non-moving systems

6.Which segment of the cervical spine does NOT experience lateral rotation?
(A)C1-Occiput
(B)C1-C2
(C)C2-C3
(D)C3-C4

7. Identify the incorrect statement regarding the cervical vertebrae
(A) Oval shaped end plates that curl up at the lateral edges
(B) Paired uncinate processes which guide movement
(C) Triangular shaped vertebral foramen
(D) Foramen transversarium through which passes the vertebral artery at all levels

8. Identify the incorrect statement regarding the cervical disc
(A)Cresent shaped annulus that becomes thinner laterally
(B) Lower water content than the thoracic or lumbar disc
(C) The nucleus is highly vascular and innervated
(D) An uncovertberal cleft can be identified that advances to divded the disc by age 14

9.Which of the following is NOT true of longuscolli?
(A)Innervated by the ventral rami C2-C6
(B) Inserts onto the transverse processes of C3-C5
(C) Inferior fibres originate at vertebral bodies of C5-T3
(D) Superior fibres originate on transverse processes of C3-C6

10.Which of the following is NOT true of the intertransversarii?
(A) Originates on the transverse processes of T1-C2
(B) Line of action produces lateral flexion
(C) All fibres are innervates by the posterior primary rami
(D) Anteriolateralfibres are innervated by the anterior rami

11. The orientation of the zygapophyseal joints on the thoracic spine is approximately
(A) 45 degrees to the sagittal plane
(B) 60 degrees to the transverse plane
(C) 90 degrees to the sagittal plane
(D) degrees to the frontal plane

12.Which tissue of the thoracic spine has the highest elastic component?
(A) Nuscleuspulposis
(B) Annulus fibrosus
(C) Ligamentumflavum
(D) Posteriorlongditudinal ligament

13.Which nerve can be found in the inferior margin of the intervertebral foramen (IVF)
(A) Sypathetic ganglion
(B) Gray ramus communicans
(C) Recurrent meningeal
(D) Ventral ramus

14.Which stucture of the lumbar spine recieves innervation from the sinuvertebral nerve?
(A) Outer 1/3 of the annulus
(B) Periosteum of spinous process
(C) Zygapophyeseal joints
(D) Posterior lumbar musculature

15.The gray rami communicans innverates what structures of the lumbar spine?
(A) Vertebral end plates
(B) Zygapophseal joints
(C) Fibres of multifidus
(D) Outer 1/3 of the disc

16. How many vertabae are there in the cervical section of the spine?
(A) 3
(B) 4
(C) 7
(D) 6

17. Which of the following **IS** an indication for spinal imobalisation?
(A) A fall from greater than 2 meters
(B) Axial Loading
(C) Any signs of a spinal injury with a history of recent trauma
(D) All of the above

18. In the spinal cord, the somas of the lower motor neurons are found in:
(A) The caudaequina
(B) Posterior horns
(C) Anterior horns
(D) Posterior root ganglia

19. All of but which of the following can result in temporary or permanent demenia:
(A) Parkinson's disease
(B) ALS
(C) Meningitis
(D) HIV

20 .Which of the following is not a warning sign of Deep Vein Thrombosis?
(A) Shortness of breath or chest pain
(B) Shooting pain running up and down the body
(C) wollen or red areas that could be warm to touch in the groin, heel or calf
(D) Skin that look pale or blue and is cold to touch

21. While manual muscle testing a patient, the patient is able to partially achieve full range against gravity. What is the muscle grade for this patient?
(A) 3
(B) 3+
(C) 2+
(D) 3-

22. Which of the following is not a consideration when working with Oncology patients who have bone metastases?
(A) Activity should be pain limited in the patients AROM.
(B) Avoid manual muscle testing and resistance exercises on the involved extremity.
(C) Patients are always on strict bedrest
(D) If bone metastasis present in weightbearing bone, make sure there are orders re: weightbearing status in chart.

23. A client demonstrates impaired fine motor function after sustaining a CVA. Which assessment would not be appropriate for the OTR to administer to evaluate the client's coordination?
(A) Visual Analog Scale
(B) Box and Blocks test
(C) 9-Hole Peg Test
(D) Minnesota Rate of Manipulation Test

24. Your client presents with a recent CVA resulting in left hemiparesis. In retraining upper extrmity control, which movement patterns should you elicit first?
(A) Shoulder flexion and shoulder abduction
(B) Elbow flexion and finger flexion
(C) External rotation and elbow extension
(D) Scapular elevation and elbow flexion

25. In patients with complete SCI's, which is NOT an appropriate technique to prevent orthostatic hypotension?
(A) TED hose.
(B) Wrapping legs with Ace wraps
(C) Monitor their blood pressure to make sure their systolic BP is above 100.
(D) (D)Abdominal binder.

26. An infant has been referred to you from the doctor with a prescription that says: "DX Cerebral Palsy: OT
Evaluate and Treat". What occupation is most important to start with?
(A) Feeding
(B) ROM
(C) Play
(D) Self Care
.

27. Which of the following would produce the least amount of muscle atrophy in a patient with a spinal cord injury?
(A) Loaded (against resistance) functional electric stimulation
(B) Do nothing, let the body heal itself
(C) PROM
(D) Non-loaded (against no resistance) functional electrical stimulation

28. Immediate precautions following a total hip replacement procedure include which of the following?
(A) No lifting, no bending, no twisting
(B) No hip flexion beyond 90, no hip rotation, no crossing legs, no adduction and no bending or bringing foot close to hands
(C) No hip flexion beyond 70, no hip rotation, no crossing legs
(D) No hip flexion beyond 120, no twisting, no adduction

29.Range of motion to the hand of a tetraplegia patient is performed in a specific way to facilitate tenodesis grasp. Which is correct?

(A) Passive opening of the fingers when the wrist is flexed and closing of the fingers when the wrist is extended.

(B) Passive closing of the fingers when the wrist is flexed AND closing of the fingers then the wrist is extended

(C) Passive closing of the fingers when the wrist is flexed and opening of the fingers when the wrist is extended.

(D) None of the above

30.Maintaining ROM may be indicated for those individuals who are unable to actively move or who are not permitted to move through full, partial, or any amount of motion. This may include a client on extended bed rest or may be with a client with the potential for scar development due to surgery. Below are benefits of PROM except

(A) Help maintain an awareness of movement

(B) Prevent muscle atrophy

(C) Maintain joint and soft tissue integrity

(D) Assist circulatory and vascular functions

31. What is the contraindication of 4 bar linkage knee joint:

(A) Patient using variable friction

(B) Short stump

(C) Knee disarticulation

(D) Patient having good extensor muscle

32. Which type of knee joint controls both stance phase and swing phase?

(A) Constant friction

(B) Variable friction

(C) Hydraulic

(D) Pneumatic

33. In computer aided fabrication procedure following sequences is followed:

(A) Carving, digitizing, software system

(B) Software system, digitizing, carving

(C) Digitizing, software system , carving

(D) All process are carried out at same time

34. Characteristic of PFFD type A is

(A) Femoral head is present, the acetabulum is adequate but defective, capital fragment is within the acetabulum,

(B) Femoral head is reprented by ossicle, , the acetabulum is not present, short femoral segment, no articular relation between femur and acetabulum

(C) Femoral head is present, the acetabulum is normal, head of the femur is within acetabulum, a short femoral segment with subtrochanteric varus angulation is present,

(D) Femoral head is present, the acetabulum is adequate, no relationship between femur and the acetabulum

35. Long's line is
(A) A straight line from the head of the femur through the distal Femur,
(B) A straight line from the head of the femur through the distal femur, and down to the center of the heel
(C) A straight line from the head of the femur to the centre of the knee joint
(D) A straight line from the head of the femur to the knee joint and down to the center of the heel

36. EMS socket design features includes
(A) Accommodates the physiological shape changes that take place during flexion and extension of the knee.
(B) Increases the surface area of the flexible inner socket by 100% due to the multi-surfacing.
(C) The multi-surfacing also increases the linkage or connection between the residual limb and socket by 400%.
(D) All of the above

37. MAS socket contained
(A) Ischio-Pubic-Ramus.
(B) The Ischial Tuberosity (IT) and the ascending posterior Ischium.
(C) Aggressive containment of proximal ischial and anterior ramal
(D) Anterior ramal

38. IPOP in case of transtibial prosthesis can be
(A) Rigid dressing
(B) Soft dressing
(C) Semirigid dressing
(D) b & c.

39. Contraindication of swash orthosis is
(A) Children with dislocated hips
(B) With hips having greater than 20 degree flexion contractures.
(C) When lower extremity alignment results in excessive external foot progression angles
(D)All of the above

40. Indication of RGO includes all except:
(A) Hip and knee flexion contractures less then 30 degrees,
(B) Active hip flexor strength,
(C) Obesity,
(D) No significant spinal deformity

41. Standing frame is best suitable for
(A) Child with 12 to 24 month with thoracic/high lumbar lesion myelomeningocele ,
(B) Child with 12 to 24 month with low lumbar lesion myelomeningocele
(C) Child with 36 month with high sacral lesion myelomeningocele ,
(D) Child with 12 to 24 month with low sacral lesion myelomeningocele

42. David hart walker is
(A) Standing frame attached with two pedals
(B) A modular THKAFO with wheeled carrier
(C) Lightweight frame attached with two swiveling foot pedals
(D) 4 wheeled base connected with vertical and horizontal uprights in 3 sides

43. Orthosis for Inadequate dorsiflexion in the absence of increased tone
(A) Rigid AFO
(B) Flexible plastic AFO
(C) Rigid AFO with double action ankle joint
(D) Tone reducing AFO

44. Subtalar instability can be addressed by
(A) SMO
(B) AFO
(C) FO
(D) UCBL

45. The parts of the shoe absent in CTEB boot is:
(A) Lace stay
(B) Ball
(C) Heel
(D) Throat

46. Advantages of EPP
(A) Natural feedback to the central nervous system
(B) Mechanical appearance
(C) Less force and excursion
(D) Single digit control of hand prosthesis

.

47. Following which electrical hand is used for partial hand amputation?
(A) Sensor hand
(B) Transcarpal hand
(C) Centrielectric hand
(D) Motion control hand

48. Which type of electric elbow has a forearm section that can be cut as well as lengethened?
(A) Ottobock Ergoarm electric plus
(B) Ottobock Ergoarm hybrid plus
(C) Motion control Utah arm2
(D) Boston elbow

49. Which of the following hand has a built in wrist flexion unit?
(A) Motion Control hand
(B) APRL hand
(C) Sensor hand
(D) Robin aid hand

50. In myoelectric control prosthesis, how electricity is produced by muscle?
(A) Involuntary muscle action
(B) Voluntary muscle action
(C) Can be created by both way
(D) None of the way

51. What is myoprehension principle?
(A) Direct muscle action control
(B) Artificial prehensor in space
(C) Natural relationship between muscular contractions and prehension
(D) Voluntary control of prehensor by muscle

52. Following which is not example of indirect control of byproduct of muscle contraction?
(A) Myoacoustic
(B) Muscle bulge
(C) Changes is electrical impedances
(D) Neuroelectric control

53. What is the function of rectifier in electric circuit of myoelectric prosthesis?
(A) Convert AC signal to DC signal
(B) Smoothened the DC signal
(C) Increase the range of electric signal
(D) Reduces the external noices

54. Crisp threshold strategy of proportional system is
(A) Largest amplitude EMG signal relative to an “on” threshold is the signal used to control the motor.
(B) The first signal to cross a preset “on” threshold the signal that is used to control motor and all other signals are ignored or locked out even if they cross the threshold voltage until the first “on” signal has crossed back below a second “off” threshold.
(C) Any signal with amplitude greater than a given threshold value is determined to be “on” until it drops below this threshold.
(D) Any signal with amplitude less than a given threshold value is determined to be “on” until it drops below this threshold

55. Where are flexion creases of hand present in the hand?
(A) Digital,
(B) Palmar,
(C) Wrist
(D) Proximal transverse arch

56. Kienbock's disease is
(A) Avascular necrosis of Triquetrum
(B) Avascular necrosis of lunate
(C) Avascular necrosis of scaphoid
(D) Avascular necrosis of hammate

57. Most commonly fractured bone is:
(A) Hamate
(B) Triquetrum
(C) Capitate
(D) Scaphoid.

58. A 31 yr female presents with a L1 burst fracture. Before taking the impression and aintaining optimal sagittal alignment, you would first want to know the status of what ligament?
(A) Anterior longitudinal ligament
(B) Posterior longitudinal ligament
(C) Ligamentum nuche
(D) Ligamentum flava

59. In order to increase the challenge of a person working on balance instability, you could do which of the following?
(A) Raise the center of gravity and INCREASE the base of support
(B) Raise the center of gravity and DECREASE the base of support
(C) Lower the center of gravity and INCREASE the base of support
(D) Lower the center of gravity and DECREASE the base of support

60. For optimal lateral view standing posture, a plumb line should be aligned with all of the following landmarks except:
(A) Through the earlobe
(B) Through the acromion process of the shoulder
(C) Through the great toe
(D) Lateral view of the hip knee and ankle

61. A person with a facet joint problem in the spine is generally most comfortable in which of the following positions?
(A) Lying prone
(B) Lying supine with legs extended
(C) Side-lying with top leg extended behind the body
(D) Side-lying with both legs flexed toward the chest

62. Cause of poor posture can be which of the following?
(A) Habit
(B) Congenital malformation
(C) Paralysis of key postural muscles
(D) Any of the above

63. Spinomed is a
(A) TLSO–sagittal plane control spinal brace
(B) TLSO–sagittal plane-coronal plane control spinal brace
(C) LSO- sagittal plane control spinal brace
(D) LSO- sagittal plane control spinal brace

64. Biomechanical principles of spinal orthosis includes
(A) Distraction force
(B) Ground reaction force application
(C) Indirect effecst of ground reaction force
(D) None of the above

65. What is the ideal amount of displacement that is acceptable in lateral displacement test of transfemoral socket?
(A) 0.2 inch
(B) 0.3 inch
(C) 0.4 inch
(D) 0.5 inch

.

66. Which type of actuator being used in Rheo knee?
(A) Hydraulic
(B) ESR & Electromechanical
(C) Hydraulic, Pneumatic and stepper motor
(D) Magnetorheological

67. System Electric Greifer DMC VariPlus is a:
(A) Single Degree of Freedom: Non-anthropomorphic Prehensors
(B) Multiple degrees of freedom: Non-anthropomorphic Prehensors
(C) Single Degree of Freedom: anthropomorphic Prehensors
(D) Multiple degrees of freedom: Anthropomorphic Prehensors

68. Trans calcaneal amputation is called:
(A) Lisfranc amputation
(B) Boyd Amputation
(C) Pirogroff Amputation
(D) Cho part Amputation

.

69. Which material is best suitable for Flexible socket (ISNY) for Transfemoral prosthesis :
(A) Surlyn
(B) ABS
(C) PVA
(D) Polypropelene

70. Proprio foot:
(A) Active Apropulsive MPC Prosthetic FootAnkle Mechanisms
(B) Passive MPC Prosthetic Foot-Ankle Mechanisms
(C) Active Propulsive MPC Prosthetic FootAnkle Mechanisms
(D) Active Propulsive MPC Prosthetic Knee Mechanisms

71. Linx prosthetics limb is best suitable for:
(A) Activity level 2
(B) Activity level 3
(C) Activity level 4
(D) Activity level 5

72. Placement of prosthetics hip joint in socket should be:
(A) 5 to 10 degree external rotation
(B) 10-15 degree external roattion
(C) Neutral position
(D)5-10 degree internal rotation

73. Medial whip in transfemoral amputation can be best viwed during :
(A) Midstance phase
(B) Terminal stance phase
(C) Preswing phase
(D) D)Swing phase

.

74. Volunatray closing terminal device:
(A) Sierra hand
(B) Hosmer and dorrance hand
(C) APRL hand
(D) Lock grip hand

75. Postural Sway can be calculated through:
(A) AD instrument Power lab
(B) K4b2 Machine
(C) Force Plate
(D) DG gait analyser

76. What should be the rivet size for joining any components in orthosis?
(A) Should not be less than the thickest part through which rivet is driven.
(B) Should be one times of material thickness
(C) Should be one and half times of material thickness
(D) Should be equal to

77. Following which is not included in Windswept deformity:
(A) Sublaxated hip on adducted side
(B) Pelvic obliquity
(C) Scoliosis
(D) Fixed flexion deformity of knee

78. Example of positional lever arm dysfunction in Cerebral Palsy patient:
(A) CoxaValga
(B) Pes Valgus
(C) Hip sublaxation/dislocation
(D) Erect vs crouch gait

79. Ambulatory abduction Orthosis for Legg calve perthes disease:
(A) Illfeldorthosis
(B) Toronto Orthosis
(C) Von rosenOrthosis
(D) Hip abduction Orthoses

80. Ape thumb deformity is seen in :
(A) High median nerve lesion
(B) Low median nerve lesion
(C) Median and ulnar both nerve lesion
(D) High radial nerve lesion

81. Tenodesis Splint is given in:
(A) Individuals with a C6 complete spinal cord injury with no finger flexion or extension.
(B) Individuals with a C6 incomplete spinal cord injury with full finger flexion or extension.
(C) Individuals with a C8 complete spinal cord injury with no finger flexion or extension.
(D) Individuals with a C8 complete spinal cord injury with no finger flexion and full extension.

82. Appropriate positioning of shoulder joint in Burn rehabilitation:
(A) 180 degrees adduction with 15-20 degrees horizontal adduction and slight external rotation.
(B) 90 degrees adduction with 15-20 degrees horizontal abduction and slight external rotation.
(C) 90 degrees abduction with 15-20 degrees horizontal adduction and slight external rotation.
(D) 90 degrees abduction with 15-20 degrees horizontal adduction and slight internal rotation.

83. Tubingen orthosis is indicated for:
(A) DDH
(B) CDH
(C) Perthes disease
(D) Fixed deformity of hip

84. Specific gravity is highest in :
(A) Polyethelene
(B) Nylon
(C) PVC
(D) Polypropelene

85. Examples of amorphous thermoplastics:
(A) Polystyrene
(B) Polyethylene
(C) Polypropylene
(D) Polyetheretherketone

86. Following which material is used for fabrication of TLSO, cervical orthosis:
    (A) Surlyn
    (B) Kydex or thermoplastic
    (C) Polycarbonate
    (D) Polyethelene

87. Stereolithography process involves:
    (A) Metal filaments are extruded and melted directly by a local electron beam. Material is initially deposited. On to a height-adjustable bed that progressively lowers, and subsequent layers are printed onto the previous layer
    (B) Material is deposited in an even layer on a platform. A laser then "prints" the layer, melting/ welding the powdered material to form the desired layer. Another layer is deposited on top of the current layer and the process is repeated for the full height of the component.
    (C) Small drops of UV-curable material are deposited using inkjet printer heads. UV lights are integrated into the printer to cure the material as it is deposited.
    (D) A height-adjustable platform rests in a bath of liquid UV-curable plastic. The platform begins one layer thickness from the top of the bath. A UV laser "prints" the first layer, which cures upon exposure. The platform then lowers by the layer thickness and the process is repeated.

88. Custom Contour Measuring Instrument is used to measure :
    (A) Foot length
    (B) Knee joint width
    (C) Ankle joint width
    (D) Hip joint width

89. Mechanism of Whiplash injury :
    (A) Shear plus compression
    (B) Hyperflexion
    (C) Hyperextension plus distraction
    (D) Hyperextension

90. Orthosis for Type I Dence fracture:
    (A) Semirigid collar
    (B) Rigid collar
    (C) Halo vest
    (D) SOMI brace

91. Posture training support is:
    (A) Spinal Orthosis for thorasic fracture
    (B) Spinal orthosis for lumbur fracture
    (C) Spinal orthosis for osteoporosis
    (D) Spinal orthosis for potts paraplegia

.

92. Split ring orthoses is best suitable for :
(A) Repositioning of thumb
(B) Positioning of proximal interphalangeal joint
(C) Allowing active flexion of interphalangeal joint
(D) Correction of flexion deformity of thumb.

93. What is the most common color matching technique in silicone prosthesis:
(A) Digital color matching-
(B) Spectromtry
(C) Computer aided color
(D) Color swatches

94. Two point gait :
(A) With two canes or crutches, the patient should advance the right aid, then the left foot, then the left aid,
followed by the right foot
(B) With two aids, usually crutches, the patient should advance both aids simultaneously with the affected
lower limb, then step forward with the unaffected limb.
(C) With two aids patient should advance the right aid and left foot at the same time
(D) Patient move one foot at a time alternating with walking aid in reciprocal manner.

95. Which type lever is most effective in sports movements:
(A) First class
(B) Second class
(C) Third class
(D) No lever system works

96. Lattisimusdorsi is:
(A) Back muscle
(B) Thigh muscle
(C) Leg muscle
(D) Abdomen muscle

97. Hunch back is also known as:
(A) Back pain
(B) Scoliosis
(C) Lordosis
(D) Kyphosis

98. Trapezius muscle helps in:
(A) Punching
(B) Pushing the neck backward
(C) Raising the leg forward
(D) Lateral trunk bending
.

99. Which muscle effected in DQ syndrome:

(A) APL & EPB
(B) FPL & FDS
(C) FDS & FPL
(D) APL & FCU

100. Smallest muscle in human body:

(A) Sartorius
(B) Palmaris longus
(C) Stapedius
(D) Gluteus minimus