WORKING PRINCIPLE OF TAMPING MACHINES

1. Lining systems are used on ....machines
   - a. CSM & 3X only
   - b. UNO & DUO only
   - c. all tamping machines only
   - d. all track machines

2. .... Lining method/ methods are used on tamping machine
   - a. 3 point lining only
   - b. 4 point lining only
   - c. 3 point & 4 point
   - d. single chord & double chord

3. During lining machine measures deflection w.r.t. .... & rectify it.
   - a. Reference rail
   - b. both rails
   - c. no rail
   - d. canted rail

4. During alignment machine corrects ....
   - a. Slew
   - b. versine
   - c. cant
   - d. cross level

5. Tamping machine can work on the horizontal curve having radius up to--
   - a. 100 mtrs
   - b. 150 mtrs
   - c. 200 mtrs
   - d. 176 mtrs

6. Tamping machine can work on the vertical curve having radius up to ....
   - a. 500 mtrs
   - b. 2500 mtrs
   - c. 3000 mtrs
   - d. 4000 mtrs

7. Tamping machine can normally work on max. gradient as per design
   - a. 1in 1000
   - b. 1in 100
   - c. 1in 150
   - d. 1in 400

8. Versine of curved track depends on ....
   - a. radius of curve
   - b. measuring chord length
   - c. measurement method
   - d. all of a,b & c

9. Double chord lining system is used on .... machine
   - a. UT Only
   - b. Old UNO & DUO only
   - c. CSM & Tamping Express
   - d. only CSM

10. In lining system, smoothing mode may be used in ....
    a. 4 point lining method only
    b. 3 point lining method only
    c. 3 point & 4 point lining method both
    d. None of these

11. Laser mode may be used in ....
    a. 4 point lining method
    b. 3 point lining method
    c. 3 point & 4 point lining method both
    d. None of these

12. Design mode may be used in ....
    a. 4 point lining method
    b. 3 point lining method
    c. 3 point & 4 point lining method both
    d. None of these

13. In 4 point lining method, no. of trollies used...............
    a. 2
    b. 3
    c. 4
    d. 1

14. In 4 point lining method, versines are measured at .... points for comparison to control the lining
    a. 1
    b. 2
    c. 3
    d. 4

15. Standard formula for calculating versine, if chord length is BD & versine is required to be measured at point C in between BD is H=.................
    a. BCxCD/2R
    b. BCxCD/R
    c. BCxCD/4R
    d. BCxCD/8R

16. What is versine ratio in four point lining method if front bogie is at D, lining bogie is at C, measuring bogie at B and rear bogie at A
    a. i=ACxBC/ABxBD
    b. i= AD xBD/ACxBC
    c. i=ACxCD/ABxBD
    d. i= AD xBD/ABxBC

17. Versine ratio in four point lining method for CSM is ....
    a. 1.33
    b. 1.2157
    c. 1.62231
    d. 1.507

18. In four point lining method, what assumption has been taken, if front bogie is at D, lining bogie is at C, measuring is at B and rear is at A
   a. A & B are on corrected track and C & D is on incorrected track
   b. A,B & D are on corrected track & C is on incorrected track
   c. A,B are on corrected track & C&D is on incorrected track
   d. A &D are on corrected track and B&C is on incorrected track

19. Residual Error or left over error in case of four point lining method in smoothing mode is ....
   a. Fd/n
   b. 0
   c. H1/H2
   d. iH2

20. Residual Error or left over error in case of four point lining method in design mode is ....
   a. Fd/n
   b. 0
   c. H1/H2
   d. iH2

21. error reduction ratio in case four point lining method is ....
   a. n=ACxBC/ABxBD
   b. n= AD xBD/ACxBC
   c. n=ACxCD/ABxBD
   d. n= AD xBD/ABxBC

22. error reduction ratio in case of four point lining method for UNIMAT-3S (old)
   a. 6
   b. 6.47
   c. 7.62
   d. 6.276

23. The error reduction ratio is valid under the presumption that the Points .... & .... are on the perfect alignment
   a. A&D
   b. A,B & D
   c. B&D
   d. A &B

24. VERSINE COMPENSATION VALUE (Vm) is fed in ....
   a. 3 point lining only
   b. 4 point lining only
   c. 3 & 4 point lining
   d. None of these

25. VERSINE COMPENSATION VALUE (Vm) is fed by...............

a. Slew potentiometer
b. Versine potentiometer
c. Correctionvalue potentiometer
d. cant potentiometer

26. Costant versine ratio is valid only for track having ....radius
    a. constant
    b. variable
    c. parabolic
    d. Spiral

27. VERSINE COMPENSATION VALUE (Vm) depends on...............
    a. Radius of curve only
    b. Length of transition only
    c. Radius and length of transition both
    d. None of these

28. Direction of toggle switch for feeding vesine compensation value (Vm) when machine enters from Higher radius to lower radius is ....
    a. Outer side
    b. Inner side
    c. Any side
    d. Don't depend

29. Constant for VERSINE COMPENSATION VALUE (Vm) for CSM is ....
    a. 83000
    b. 82485
    c. 88333
    d. 84000

30. V- value for compound curve having radius R1 & R2 (R1 >R2) is ....
    a. V2-V1
    b. V1-V2
    c. V1+V2
    d. None of these

31. Residual error in the 4 point lining method is approximate............of the 3 point lining method
    a. Half
    b. Two times
    c. equal
    d. 1.33 times

32. Why do we not use 4 point lining method in straight track in smoothing mode inspite of half residual error than 3 point lining method
    a. Due to residual error
    b. Due to Vm value
    c. Due to error accumulation
    d. None of these

33. Residual error or left over error in 4 point lining mehod in design mode is--
    a. Fd/n
    b. 1.33 H2
    c. Zero
    d. H1/H2

34. In 3 point lining method, number of trollies used…………
    a. 1
    b. 2
    c. 3
    d. 4

35. In 3 point lining method, versine is measured at ……………point
    a. 1
    b. 2
    c. 3
    d. no need of measurement

36. In 3 point lining method, actual versine measured by lining transducer is compared with ……………………
    a. H2
    b. iH2
    c. Theoretical value fed manually
    d. None of these

37. In 3 point lining method, theoretical versine is being fed by ………………
    a. Slew potentiometer
    b. Versine potentiometer
    c. correctionvalue potentiometer
    d. None of these

38. What is versine formula for CSM in three point lining method
    a. H=25000/R
    b. H=23617/R
    c. H=24000/R
    d. H=29000/R

39. The trolleys in lining system are pneumatically pressed against……………
    a. Datum rail
    b. Opposite of datum rail
    c. Any side
    d. Both rail

40. what is error reduction ratio in 3 point lining method
    a. n=BD/BC
    b. n=BC/BD
    c. n=ACxCD/ABxBD
    d. n= AD xBD/ABxBC

41. Value of residual error in three point lining method for CSM is ………………
    a. 1/3
    b. 1/3.138
    c. 1/3.12
    d. 1/2.91

42. Radius of straight track is …………………
    a. zero
    b. infinite
    c. Depend on length of track
    d. None of these

43. Versine of straight track is ....
    a. zero
    b. infinite
    c. Depend on length of track
    d. None of these

44. In three point lining method, only Versine is measured by lining transducer and same is compared with theoretical Versine, which is fed by Versine potentiometer from front cabin ,but in straight track why do we not feed versine in versine potentiometer.
    a. Does not required
    b. Versine is zero
    c. By default normal setting of Versine potentiometer is zero
    d. None of these

45. In 3 point lining method for circular curve, we can calculate the Versine by the formula
    a. H= AD xBD/ABxBC
    b. H=ACxCD/ABxBD
    c. H=BCxCD/2R
    d. H=BCxCD/4R

46. In 3 point lining method,for curve, radius & length of transition is given by JE/SE(P.Way) are R=250 mtrs & L= 50 mtrs respectively. Hv (versine cumulation value) or CSM will be ....
    a. 94 mm
    b. 140 mm
    c. 0
    d. 100 mm

47. Calculation formula for rate of change of Versine constant throughout transition portion.
    a. VL/R
    b. L/V
    c. VxL
    d. V/L (mm/mtrs)

48. In 3 point lining method, slew is fed from ....potentiometer
    a. versine
    b. slew
    c. General lift
    d. cant

49. In 3 point lining method, in a trasitioned curve having same transition length on both side, costant for versine of two points i.e. A (during straight to tranistion) & C(Circular to transition) is ....
    a. Always different
    b. same
    c. Same but opposite side
    d. None of these

50. In 3 point lining method, versine for section A can be calculated by the formula
    a. System constant for A/R
    b. System constant B/R
    c. operation constant value for A/(RxL)
    d. None of these

51. What is full form of LASER in the lining system of tamping machine
    a. Lavelling & Alignment by Service Engineer
    b. Long alignment by surveying of existing rail
    c. Light Amplification by Stimulated Emission of Radiation
    d. None of these

52. Which machines are equipped with Automatic Guiding Computer (ALC) for track geometry measurement and LASER Sighting System (LSS) for lining besides other features for design tamping
    a. Tamping express
    b. UNO & old DUO
    c. UNI-3S
    d. BCM

53. During survey by chord system,the lining errors are to be determined by measuring offsets at every .... intervals on ...... chord on straight track
    a. 10 m & 20 m
    b. 5 m & 20 m
    c. 5 m & 40 m
    d. 10 m & 40 m

54. During survey by chord system,the lining errors are to be determined by measuring offsets at every ...... intervals on .... chord on a curved track
    a. 10 m & 20 m
    b. 5 m & 20 m
    c. 5 m & 10 m
    d. None of these

55. The long-wave track geometry faults become significant with the .... in speed of trains.
    a. increase
    b. decrease
    c. constant
    d. None of these

56. LASER lining is used on straight track in 3-point mode to remove ....
    a. Long misalignment or false curve
    b. Short misalignment curve
    c. Both a & b
    d. None of these

57. In ALC, measuring method is used when track data is ....

a. Known   b. Not known

c. Not depend on track data d. None of these

58. During ALC measuring mode,track can measured by the tamping machine in

 a. Reverse direction only b. Working direction only

 c. Both direction   d. None of these

59. While working in ALC measuring mode, checking of working order of .... is necessary before the start of the measuring run to avoid errors at the start of the measuring run, due to poor bogie alignment or incorrect pre-loading.

 a. The lining system only b. The lifting system only

 c. Both a & b   d. None of these

60. In ALC working, the lining system has to be set to ....

 a. 4- point only   b. 3-point only

 c. 3-point or 4- point   d. None of these

61. Versine potentiometer converts versine value to electrical signal at the rate of ....(-ve for RH side and +ve for LH side).

 a. 25mv/mm   b. 50 mv/mm

 c. 2 mv/mm   d. 10 mv/mm

62. Before starting calibration of versine potentiometer, +10V & -10V to this potentiometer should be checked and adjusted by potentiometer P1 & P2 in ....PCB of front cabin

 a. EK 813SV   b. EK 345

 c. EK 290   d. EK 348

63. Slew potentiometer is provided in front cabin on panel ....

 a. B4   b. B2

 c. B3   d. B1

64. Slew potentiometer converts slew value to electrical signal at the rate of ....

 a. 50 mv/mm   b. 25 mv/mm

 c. 2 mv/mm   d. 10 mv/mm

65. Tamping Machine corrects the leveling error in .... mode/modes.

a. one   b. two
c. three   d. Four

66. In smoothening mode, general lift over the Base rail is generally ....
   a. fixed
   b. varies
   c. Fixed or varies
   d. None of these

67. In smoothening mode, Longitudinal level and Cross-level are corrected
   ....
   a. completely
   b. Not completly
   c. Cannot say
   d. None of these

68. In Design or Precision mode, ... is fed by general lift potentiometer
   over base rail.
   a. General lift
   b. Target height
   c. slew
   d. Versine

69. In Design or Precision mode, ... is/are removed
   a. Short waves defect only
   b. Long waves defect only
   c. Both a&b
   d. None of these

70. General Lift should always be .... than the largest dip which shall be
   ascertained by P.Way supervisor in advance
   a. less
   b. more
   c. equal
   d. None of these

71. for single insertion, normal general lift value should be ....in PSC sleeper
   track
   a. 50 mm
   b. 100 mm
   c. 20 mm
   d. 30 mm

72. For double Insertion, general Lift value in PSC sleeper should exceed
   ....
   a. 50 mm
   b. 100 mm
   c. 20 mm
   d. 30 mm

73. While tamping, ramp in & ramp out of .... should be given to the
   track .
   a. 1 in 1000
   b. 1 in 100

c. 1 in 360   d. 1 in 720

74. If leveling offset is LR, distance between front tower to measuring tower is "b" & measuring tower to rear tower is "a", then level error is ....
   a. LRxa/(a+b)
   b. LR/ab
   c. LRxa/b
   d. LRxb/a

75. Residual error ratio in lifting for UNO/DUO machine is ....
   a. 1.33
   b. 3
   c. 2.775
   d. 3.326

76. For carrying out attention to longitudinal profile of railway track, one rail is kept as ....
   a. Base or datum rail
   b. Cant rail
   c. Cess rail
   d. Non cess rail

77. While selecting base rail on straight track in single line and middle track in multiple lines, ... is kept as Base Rail
   a. Non cess rail
   b. Lower/more disturbed track
   c. Higher/less disturbed rail
   d. None of these

78. Generally while selecting base rail on curved track.............................is kept as base rail.
   a. Non cess rail
   b. Lower rail
   c. Higher rail
   d. Any one

79. In Plasser Tampers, direction of Cant Selector Switch is to be always kept
   a. Same side
   b. Opposite to base rail
   c. Does not say
   d. None of these

80. In Russian Tamper, ...is provided for selecting Base Rail.
   a. Cant selecter switch
   b. Slew selecter switch
   c. Base selector switch
   d. None of these

81. In DUOMATIC/UNOMATIC, superelevation is fed from ....
   a. Working cabin
   b. Front cabin
   c. Both cabin
   d. Any cabin

82. In levelling system, there are .... height transducers
    a. Two   b. Three
    c. Four   d. One

83. Longitudinal levels are measured by ....in levelling system
    a. pendulum   b. General lift potentiometer
    c. Height transducer   d. Cant potentiometer

84. In levelling system, front pendulam is used for correction of ....automatically
    a. Longitudinal level   b. Cross level
    c. versine   d. Twist

85. In levelling system, middle pendulam is used for ....
    a. Cross level correction   b. Indication of cross level
    c. Cannot say   d. Twist

86. The output of the rear pendulum serves ....functions in CSM
    a. 1   b. 2
    c. 3   d. 4

87. Most important function of rear pendulam in Tamping Express is ....
    a. Cross level correction   b. Longitudinal level correction
    c. Versine correction   d. Twist correction

88. Recording of cross level is being done with the help of ....
    a. Front pendulum   b. Measuring pendulum
    c. Rear pendulum   d. None of these

89. In which machine, we can fed super elevation/cant in both the cabins
    a. UNO/DUO   b. CSM
    c. Tamping Express   d. UNIMAT

90. In CSM, superelevation potentiometer is provided in .... Cabin
    a. front   b. working
    c. both   d. none of these

91. Correction value can be calculated by the formula
   a. K= 100 x SE/R
   b. K=50 x SE/R
   c. K= 50 x SE/(R*L)
   d. None of these

92. Front pendulam used for sending signals in tamping machine for
   a. versine
   b. Cross level
   c. Cannot say
   d. Both a&b

93. ....machines are used for twist correction.
   a. UNO & DUO
   b. UNI-2S & 3S
   c. CSM & Tamping Express
   d. None of these

94. What is full form of GVA
   a. General versine addition
   b. Geometry value assesment
   c. Geo value access
   d. None of these

95. What is full form of ALC
   a. Automatic logic control
   b. Automatic guiding computer
   c. Automatic lining control
   d. Automatic LASER Control

96. In ALC, there is .... mode for correction.
   a. one
   b. two
   c. three
   d. None of these

ANSWERS

1. c	2. c	3. a	4. b	5. d	6. a	7. b	8. d	9. a	10. c
11. b	12. c	13. c	14. b	15. a	16. c	17. b	18. b	19. a	20. b
21. b	22. c	23. d	24. b	25. b	26. a	27. c	28. a	29. b	30. a
31. a	32. c	33. c	34. c	35. a	36. c	37. b	38. b	39. a	40. a
41. b	42. b	43. a	44. c	45. c	46. a	47. d	48. b	49. c	50. c
51. c	52. a	53. c	54. a	55. a	56. c	57. b	58. c	59. c	60. b
61. b	62. a	63. a	64. a	65. b	66. a	67. b	68. b	69. c	70. b
71. d	72. d	73. a	74. a	75. d	76. a	77. c	78. b	79. b	80. c
81. b	82. a	83. c	84. b	85. b	86. c	87. d	88. c	89. c	90. b
91. b	92. b	93. c	94. b	95. b	96. c				