

## [Electric Traction MCQ PDF Download](#)

**1. Main traction systems used in India are those using ..... locomotives.**

- (a) steam engine
- (b) diesel engine
- (c) diesel-electric
- (d) electric
- (e) all of the above

Answer: (e) all of the above

**2. Diesel electric traction has comparatively limited overload capacity because**

- (a) diesel engine is a constant output prime mover.
- (b) diesel engine has shorter life span.
- (c) regenerative braking cannot be employed.
- (d) diesel-electric locomotive is heavier than an ordinary electric locomotive.

**Answer: (a) diesel engine is a constant output prime mover.**

**3. The range of horse power of diesel locomotives is**

- (a) 100 - 500
- (b) 1,500 - 2,500
- (c) 3,000 - 4,500
- (d) 4,500 - 5,000

**Answer: (b) 1,500 - 2,500**

**4. In India, diesel locomotives are manufactured at**

- (a) Varanasi.
- (b) Kolkata.
- (c) Bangalore.
- (d) Ajmer.

**Answer: (a) Varanasi.**

**5. In diesel-electric drive**

- (a) initial investment required is low.
- (b) locomotive and train is a self-contained unit.
- (c) power loss in speed control is low.
- (d) all of the above.

**Answer: (d) all of the above.**

## **6. Battery driven vehicles**

(a) are easy to control and very convenient to use.

(b) have low maintenance cost.

(c) cause no pollution.

(d) all of the above.

**Answer: (d) all of the above.**

## **7. Battery operated trucks are used**

(a) in power stations.

(b) for local delivery of goods in large towns with maximum daily run up to 50 - 60 km.

(c) in narrow gauge traction.

(d) for main line service.

**Answer: (b) for local delivery of goods in large towns with maximum daily run up to 50 - 60 km.**

**8. Electric traction in comparison to other traction systems has the advantage(s) of**

- (a) higher acceleration and braking retardation.
- (b) cleanest system and so ideally suitable for the underground and tube railways.
- (c) better speed control.
- (d) all of the above.

**Answer: (d) all of the above.**

**9. Electric railway can handle the traffic upto double the amount possible with steam railway. It is because of**

- (a) better speed control.
- (b) larger passenger carrying capacity.
- (c) higher schedule speed.
- (d) both (b) and (c).

**Answer: (d) both (b) and (c).**

**10. Electric traction in comparison to other traction systems has the drawback(s) of**

- (a) interference with communication lines running along the track.

(b) heavy initial expenditure in laying out overhead electric supply system.

(c) interruption of traffic-rot hours owing to short time power failure.

(d) all of the above.

**Answer: (d) all of the above.**

### **11. The most vital factor against electric traction is**

(a) its high maintenance cost.

(b) possibility of Power failure.

(c) high initial cost laying out overhead electric supply system.

(d) necessity of providing a negative booster.

**Answer: (c) high initial cost laying out overhead electric supply system.**

### **12. The locomotive that has the best operational availability is**

(a) diesel-electric.

(b) electric.

(c) steam.

(d) steam-electric.

**Answer: (b) electric.**

**13 Unbalanced forces are maximum in case of**

(a) diesel shunters.

(b) diesel locomotives.

(c) steam locomotives.

(d) electric locomotives.

**Answer: (b) electric.**

**14. Maintenance requirements are minimum in case of**

(a) electric locomotives.

(b) steam locomotives.

(c) diesel electric locomotives.

(d) diesel engines.

**Answer: (a) electric locomotives.**

**15. A drive suitable for mines where explosive gases may exist**

- (a) steam engine.
- (b) battery locomotive.
- (c) diesel engine.
- (d) any of the above.

**Answer: (b) battery locomotive.**

**16. A submarine is provided driving power through.(while moving under water)**

- (a) diesel engines.
- (b) steam engines
- (c) batteries.
- (d) gas turbine.

**Answer: (c) batteries.**

**17. Ordinary tramway is the most economical means transport for**

- (a) very dense traffic in large cities.
- (b) rural services.

(c) suburban services.

**Answer: (a) very dense traffic in large cities.**

**18. Unlike a tramway, a trolley bus needs no**

(a) driving axles.

(b) running rail.

(c) hand brakes.

(b) overhead contact wire.

**Answer: (b) running rail.**

**19. The direct current system employed for tramways operates on**

(a) 3000 V

(b) 1500 V

(c) 750 V

(d) 400 V

**Answer: (c) 750 V**

**20. For tramways the return circuit is**

- (a) track rails.
- (b) neutral wire.
- (c) common earthing.
- (d) cables.

**Answer: (a) track rails.**

**21. For 600 V dc line for tramcars, track is connected to the**

- (a) positive of the supply.
- (b) negative of the supply.
- (c) midvoltage of 300 V.
- (d) none of the above.

**Answer: (b) negative of the supply.**

**22. In tramways**

- (a) the power is supplied at 600 V dc from a single overhead conductor of + ve polarity.
- (b) the speed is controlled by field weakening of series parallel control.

(c) rheostatic and mechanical brakings are employed for normal service.

(d) all of the above.

**Answer: (d) all of the above.**

### **23. The main drawback of tramways is that**

(a) the life of tramcar equipment is short.

(b) it has restricted manoeuvrability.

(c) it needs laying overhead supply system and track for its use which is costly to maintain and constitutes a source of danger to other road users.

(d) all of the above.

**Answer: (c) it needs laying overhead supply system and track for its use which is costly to maintain and constitutes a source of danger to other road users.**

### **24. The trolley buses**

(a) do not require laying of track for its use as return conductor.

(b) make use of foot operated master controllers.

(c) make use of stabilized rheostatic braking.

(d) all of the above.

**Answer: (d) all of the above.**

## **25. In diesel electric traction**

(a) the driving motors are dc series type and fed from the dc generators driven by the diesel engine put on the same locomotive.

(b) the starting and speed control is affected by varying the excitation of the generator.

(c) regenerative braking is not possible.

(d) all of the above.

**Answer: (d) all of the above.**

## **26. Suburban railways use**

(a) 1,500 V dc.

(b) 400 V, 3-phase ac.

(c) 3,300 V, 3-phase ac.

(d) 600 V, 3-phase ac.

**Answer: (a) 1,500 V dc.**

## 27. Long distance railways operate on

- (a) 600 V dc.
- (b) 25 kV single-phase ac.
- (c) 25 kV three-phase ac.
- (d) 15 kV three-phase ac.

**Answer: (b) 25 kV single-phase ac.**

## 28. The electric locomotives run faster at curved routes in comparison to steam locomotives because

- (a) its centre of gravity is lower than that of steam locomotive.
- (b) its centre of gravity is higher than that of steam locomotive.
- (c) the speed at curved routes is independent of locations of centre of gravity.
- (d) none of the above.

**Answer: (a) its centre of gravity is lower than that of steam locomotive.**

## 29. Low frequency operation of overhead line in traction system

- (a) increases the spacing between substations.

(b) reduces the spacing between substations.

(c) spacing is independent of frequency of supply.

**Answer: (a) increases the spacing between substations.**

### **30. In Kando system of track electrification**

(a) single-phase ac is converted into dc.

(b) single-phase ac is converted into 3-phase ac.

(c) 3-phase ac is converted into dc.

(d) 3-phase ac is converted into single-phase ac.

**Answer: (b) single-phase ac is converted into 3-phase ac.**

### **31. The composite system (single-phase ac to dc system) has been chosen for all future track electrification in India as**

(a) it needs light overhead catenary.

(b) it needs less number of substations.

(c) it combines the advantages of high-voltage ac distribution at 50 Hz with dc series traction motors.

(d) it provides flexibility in the location of substations.

**Answer: (c) it combines the advantages of high-voltage ac distribution at 50 Hz with dc series traction motors.**

**32. Single-phase ac system is preferred for main line railway service because**

(a) the initial, maintenance and operating costs of ac substations are less as the substation equipment required in single-phase ac system is less, cheap and efficient.

(b) number of substations required is less.

(c) of reduced cost of distribution system.

(d) all of the above.

**Answer: (d) all of the above.**

**33. In underground traction, the supply system is**

(a) 500 V to 1,000 V dc

(b) 25 kV, 50 Hz

(c) 50 kV, 50 Hz

(d) 25 kV, 25 Hz

**Answer: (a) 500 V to 1,000 V dc**

**34. Problem(s) of single-phase traction systems is/are**

- (a) current and voltage unbalance.
- (b) electrostatic and electromagnetic induction.
- (c) generation of harmonics.
- (d) all of the above.

**Answer: (d) all of the above.**

**35. The chief requirements of main line railway services are**

- (a) high maximum speed.
- (b) minimum cost of overhead structure.
- (c) high acceleration and braking retardation.
- (d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**36. The main requirements of suburban railway services are**

- (a) rapid acceleration and braking retardation
- (b) no interference to the communication circuits running along the track.

(c) high maximum speed.

(d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**27. The acceleration rate for urban or suburban services is**

(a) 1.5 - 4 kmphps.

(b) 3 - 4 kinphps.

(c) 5 - 10 kmphps.

(d) 0.5 - 1.5 kmphps.

**Answer: (a) 1.5 - 4 kmphps.**

**28. The braking retardation for urban or suburban services is**

(a) 1.5 - 2.5 kinphps.

(b) 3 - 4 kmphps.

(c) 5 - 10 kmphps.

(d) 0.5 - 1.5 kmphps.

**Answer: (b) 3 - 4 kmphps.**

**29. The coasting retardation for main line railway services is about**

- (a) 10 kmphps.
- (b) 3 kmphps.
- (c) 0.16 kmphps.
- (d) 0.01 kmphps.

**Answer: (c) 0.16 kmphps.**

**30. The maximum speed at which trains run on main line railway service is**

- (a) 160 kmph.
- (b) 120 lapph.
- (c) 100 kmph.
- (d) 200 kmph.

**Answer: (a) 160 kmph.**

**31. In main line services as compared to urban and suburban services**

- (a) distance between the stops is more (exceeding 10 km).

- (b) maximum speed attained is high.
- (c) acceleration and braking retardation rates are low.
- (d) all of the above.

**Answer: (d) all of the above.**

**32. The speed-time curve for urban service has no**

- (a) coasting period.
- (b) free running period.
- (c) braking period.
- (d) acceleration period.

**Answer: (b) free running period.**

**33. Free running and coasting periods are generally long in case of**

- (a) city service.
- (b) suburban service.
- (c) main line service.
- (d) outer suburban service.

**Answer: (c) main line service.**

**34. In suburban services as compared to urban services**

- (a) the coasting period is longer.
- (b) the coasting period is smaller but free running period is longer.
- (c) the coasting and free running periods are smaller.
- (d) none of the above is true.

**Answer: (a) the coasting period is longer.**

**35. Trapezoidal speed-time curve pertains to**

- (a) main line service.
- (b) urban service.
- (c) suburban service.
- (d) urban/suburban service.

**Answer: (a) main line service.**

**36. Quadrilateral speed-time curve is the close approximation for**

- (a) urban service.
- (b) suburban service.

(c) urban/suburban service.

(d) main line service.

**Answer: (c) urban/suburban service.**

### **37. Area under the speed-time curve represents**

(a) total distance travelled.

(b) average speed.

(c) average acceleration.

(d) none of the above.

**Answer: (a) total distance travelled.**

### **38. The speed of train estimated taking into account the stoppage time at a station in addition to the actual running time between stops, is called the speed.**

(a) average

(b) schedule

(c) free running

(d) notching

**Answer: (b) schedule**

**39. The average speed of a train is independent of**

- (a) duration of stops.
- (b) acceleration and braking retardation.
- (c) distance between stops.
- (d) running time.

**Answer: (a) duration of stops.**

**40. The schedule speed of a given train when running on a given service (with given distance between stations) is affected by**

- (a) acceleration and braking retardation.
- (b) maximum or crest speed.
- (c) duration of stop.
- (d) all of the above.

**Answer: (d) all of the above.**

**41. Skidding of a vehicle always occurs when**

- (a) braking effort exceeds its adhesive weight.
- (b) brake is applied suddenly.

(c) it negotiates a curve.

(d) it passes over points and crossings.

**Answer: (a) braking effort exceeds its adhesive weight.**

#### **42. The adhesive weight is the**

(a) total weight of the locomotive and the train.

(b) weight coming over the driving wheels.

(c) same as the accelerating weight.

(d) none of the above.

**Answer: (b) weight coming over the driving wheels.**

#### **43. Coefficient of adhesion is the ratio of tractive effort to slip the wheels and**

(a) dead weight.

(b) accelerating weight.

(c) adhesive weight.

(d) none of the above.

**Answer: (c) adhesive weight.**

**44. The normal value of coefficient of adhesion is**

- (a) 0.25
- (b) 0.35
- (c) 0.50
- (d) 0.65

**Answer: (a) 0.25**

**45. Coefficient of adhesion reduces due to the presence of**

- (a) dew on rails.
- (b) oil and grease on rails.
- (c) dry sand on rails.
- (d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**46. Coefficient of adhesion improves due to presence of**

- (a) dry sand on rails.
- (b) rust on rails.
- (c) dust on rails.

(d) all of the above.

**Answer: (d) all of the above.**

**47. The value of coefficient of adhesion will be high when rails are**

(a) wet.

(b) cleaned with sand.

(c) greased.

(d) sprayed with oil.

**Answer: (b) cleaned with sand.**

**48. The coefficient of adhesion for wet or greasy rails is**

(a) 0.35

(b) 0.25

(c) 0.08

(d) zero

**Answer: (c) 0.08**

#### 49. The coefficient of adhesion

- (a) same on dc and ac traction.
- (b) high in ac traction and low in dc traction.
- (c) high in dc traction and low in ac traction.
- (d) any of the above.

**Answer: (b) high in ac traction and low in dc traction.**

#### 50. Higher value of tractive effort can be used in electric traction as compared to steam traction because

- (a) of greater adhesive weight (the weight on driving wheels is 70 percent of dead weight in case of electric locomotive whereas in case of steam locomotive it is 50 percent).
- (b) the torque exerted in electric traction is continuous whereas in steam traction it is pulsating one.
- (c) the driving wheels are distributed over a much greater length in electric traction whereas in steam traction they are close to each other.
- (d) all of the above.

**Answer: (d) all of the above.**

**51. When a bogie negotiates a curve, reduction in adhesion occurs resulting in sliding. This sliding is acute when**

- (a) degree of curvature is more.
- (b) wheel base of axles is more.
- (c) none of the above.
- (d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**52. For a given maximum axle load tractive effort with ac locomotive will be**

- (a) less than that of dc locomotive.
- (b) more than that of dc locomotive.
- (c) equal to that of dc locomotive.
- (d) none of the above.

**Answer: (b) more than that of dc locomotive.**

**53. The resistance encountered by a train in motion is on account of**

- (a) resistance offered by air.

- (b) friction at the track.
- (c) friction at various parts of the rolling stock.
- (d) all of the above.

**Answer: (d) all of the above.**

**54. The air resistance to the movement of the train is proportional to**

- (a)  $1/\text{speed}$ .
- (b)  $(\text{speed})$ .
- (c)  $(\text{speed})^2$ .
- (d)  $(\text{speed})^3$ .

**Answer: (c)  $(\text{speed})^2$ .**

**55. The friction at the track is proportional to**

- (a)  $\text{speed}$ .
- (b)  $(\text{speed})^2$ .
- (c)  $(\text{speed})^3$ .
- (d)  $(1/\text{speed})^2$ .

**Answer: (a)  $\text{speed}$ .**

**56. If the resistance to electric train movement is given by  $F_r = a + bv + cv^2$  In the above expression b is likely to cover**

- (a) air resistance.
- (b) track resistance.
- (c) frictional resistance.
- (d) none of the above.

**Answer: (b) track resistance.**

**57. Tractive effort of an electric locomotive can be increased by**

- (a) using high output motors.
- (b) increasing the supply voltage.
- (c) increasing dead weight over the driving axles.
- (d) both (a) and (c).

**Answer: (d) both (a) and (c).**

**58. A locomotive with a mass of 50,000 kg on a track whose coefficient of adhesion is 20 per cent will produce a tractive effort of (approximately)**

- (a) 1 kN
- (b) 100 kN
- (c) 25 kN
- (d) 250 kN

**Answer: (b) 100 kN**

**59. Energy consumption in propelling the train is required for**

- (a) accelerating of train mass.
- (b) overcoming the gradient while moving up the gradient.
- (c) overcoming the train resistance.
- (d) all of the above.

**Answer: (d) all of the above.**

**60. Longer coasting period for a train results in**

- (a) higher schedule speed .
- (b) lower specific energy consumption.

(c) higher retardation.

(d) higher acceleration.

**Answer: (b) lower specific energy consumption.**

**61. Specific energy consumption is affected by**

(a) acceleration and retardation values.

(b) the crest speed and nature of route.

(c) distance between stops.

(d) all of the above.

**Answer: (d) all of the above.**

**62. Specific energy consumption is minimum in.....services.**

(a) main line

(b) urban

(c) suburban

(d) equal for all type of

**Answer: (a) main line**

### 63. Specific energy consumption

- (a) increases with the increase in maximum speed.
- (b) decreases with the increase in maximum speed.
- (c) is independent of maximum speed.
- (d) none of the above.

**Answer: (a) increases with the increase in maximum speed.**

**64. If the speed-time curves are similar (not identical), the specific energy consumption of the curve having higher maximum speed is ..... than that of lower maximum speed.**

- (a) lower
- (b) equal
- (c) higher
- (d) none

**Answer: (b) equal**

**65. Specific energy consumption becomes**

- (a) more when distance between stops is more.
- (b) more with the higher values of acceleration (or retardation).

(c) more with high train resistance.

(d) less with the increase in crest speed.

**Answer: (c) more with high train resistance.**

**66. The specific energy consumption for suburban services is usually ..... watt-hours per tonne-km.**

(a) 20 - 30

(b) 30 - 45

(c) 50 - 75

(d) 100 - 150

**Answer: (c) 50 - 75**

**67. The specific energy consumption for main line services is around ..... watt hours per tonne-km.**

(a) 20 - 30

(b) 30 - 45

(c) 50 - 75

(d) 100 - 150

**Answer: (a) 20 - 30**

**68. Specific energy consumption is maximum in ..... services.**

- (a) urban
- (b) suburban
- (c) main line
- (d) equal for all types of

**Answer: (a) urban**

**69. The electric motor used for traction work should be mechanically**

- (a) small in overall dimensions (especially in its overall diameter).
- (b) light in weight and robust in construction.
- (c) capable to withstand continuous vibrations.
- (d) all of the above.

**Answer: (d) all of the above.**

**70. The electric motor used for traction work, electrically should be**

(a) capable of developing high starting torque and withstanding voltage fluctuations, and temporary supply interruptions.

(b) amenable to simple speed control methods, self protective against excessive overloading and amenable to easy and simple methods of rheostatic and/or regenerative braking.

(c) of such characteristics that when they are operated in parallel and coupled mechanically, they share the load almost equal.

(d) all of the above.

**Answer: (d) all of the above.**

**71. In suburban trains, the traction motors are installed on**

(a) locomotive only.

(b) locomotive and coaches.

(c) coaches only.

**Answer: (a) locomotive only.**

**72. The type of dc motor used in electric traction is**

- (a) series.
- (b) shunt.
- (c) separately-excited.
- (d) none of the above.

**Answer: (a) series.**

**73. The dc series motor is most suitable for traction services but more particularly for urban/suburban services because**

- (a) dc series motors are suitable for regenerative braking.
- (b) dc series motors are capable of withstanding rapid fluctuations in supply voltage.
- (c) dc series motors are capable of developing high torque at start.
- (d) dc series motors are capable of withstanding temporary interruption of supply without undue rush of current.

**Answer: (c) dc series motors are capable of developing high torque at start.**

**74. The three-phase induction motors have the advantages of simple and robust in construction, trouble free operation, high voltage operation consequently requiring reduced amount of current and automatic regeneration but are not suitable for traction work. This is because of their**

- (a) flat speed-torque characteristics, constant speed operation and low starting torque.
- (b) complicated speed control system and complicated overhead feeding systems.
- (c) higher initial as well maintenance cost.
- (d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**76. DC shunt motors are not suitable for traction services because of their**

- (a) hard characteristics.
- (b) large time constant.
- (c) power varying directly with developed torque.
- (d) wide variation in torque and flux due to variation in voltage in electric traction.
- (e) all of the above.

**Answer: (e) all of the above.**

**77. Two dc shunt motors having identical characteristics are used drive a train car with unequal wheel diameters. The two motors will share load equally if they are connected in**

- (a) series.
- (b) parallel.
- (c) the loading will always be unequal.

**Answer: (a) series.**

**78. Two locomotives having identical tractive effort-slip characteristics haul a heavy train. The loco with larger diameter shares ..... tractive effort.**

- (a) larger
- (b) smaller
- (c) equal

**Answer: (a) larger**

**79. For single-phase ac system of track electrification, low frequency is desirable as**

- (a) it improves commutation properties of ac motors.
- (b) it increases efficiency of ac motors.
- (c) it improves power factor of ac motors.
- (d) all of the above.

**Answer: (d) all of the above.**

**80. At low frequency of the order of 1/2 Hz to 10 Hz, the induction motor develops**

- (a) high starting torque with excessive starting current.
- (b) high starting torque without excessive starting current.
- (c) low starting torque with excessive starting current.
- (d) low starting torque without excessive starting current.

**Answer: (b) high starting torque without excessive starting current.**

**81. A locomotive exerts a tractive effort of 40,000 N in pulling a train at 60 kmph on a level track. If the same train is to be halted at the same speed but on gradient, the tractive effort required will be at 60,000 N. The output delivered by the motor will be more if it is driven by**

- (a) a 3-phase induction motor.
- (b) a dc series motor.
- (c) an ac series motor.
- (d) equal in all the three cases.

**Answer: (a) a 3-phase induction motor.**

**82. When two or more motors are used for traction service, the method of speed control used will be**

- (a) rheostatic control.
- (c) field control.
- (b) series-parallel control.
- (d) motor generator control.

**Answer: (b) series-parallel control.**

**83. The advantage(s) of series-parallel starting is/are**

- (a) small energy loss and higher efficiency.
- (b) economical speed control.
- (c) higher reliability of operation.
- (d) all of the above.

**Answer: (d) all of the above.**

**84. Parallel operation of traction motors is easier with**

- (a) dc shunt motors.
- (b) dc series motors.
- (c) induction motors.
- (d) none of these.

**Answer: (b) dc series motors.**

**85. In motor-generator locomotive control**

- (a) rheostatic control is used.
- (b) series parallel control is used.
- (c) the output voltage of generator is regulated by means of field control from exciter.

(d) any one of the above method is used.

**Answer: (c) the output voltage of generator is regulated by means of field control from exciter.**

### **86. In metadyne control.**

(a) current throughout the accelerating period remains constant.

(b) tractive effort developed is uniform.

(c) there is no wastage of energy in starting rheostat.

(d) all of the above.

**Answer: (d) all of the above.**

### **87. The method of speed control adopted in 25 kV, single-phase, 50 Hz traction is**

(a) tap changing control of transformer.

(b) reduced current method.

(c) series-parallel control.

(d) rheostatic control.

**Answer: (a) tap changing control of transformer.**

**88. The preferable method of speed control of linear induction motor is**

- (a) variable flux control.
- (b) PAM control.
- (c) variable frequency and constant voltage control.
- (d) variable frequency and variable voltage control.

**Answer: (c) variable frequency and constant voltage control.**

**89. Which of the following braking systems on the locomotives is costly ?**

- (a) Vacuum braking on steam locomotives.
- (b) Vacuum braking on diesel locomotives.
- (c) Regenerative braking on electric locomotives.
- (d) All braking systems are equally costly.

**Answer: (c) Regenerative braking on electric locomotives.**

**90. Braking system employed in diesel electric traction is**

- (a) hydraulic type.
- (b) vacuum type.

(c) regenerative type.

(d) any of these.

**Answer: (b) vacuum type.**

**91. The type of braking used in electric traction is**

(a) mechanical braking.

(b) vacuum brake system.

(c) electropneumatic braking.

(d) both (a) and (c).

**Answer: (c) electropneumatic braking.**

**92. Vacuum is created by**

(a) vacuum pumps.

(b) ejector.

(c) vacuum pump or ejector.

(d) none of the above.

**Answer: (c) vacuum pump or ejector.**

**93. Bearings employed for supporting axles of rolling stock are**

- (a) bush bearings.
- (b) roller bearings.
- (c) ball bearings.
- (d) journal bearings.

**Answer: (b) roller bearings.**

**94. The wheels of a train, engine as well as bogies, are slightly tapered so as to**

- (a) reduce friction.
- (b) increase friction.
- (c) facilitate in taking turns.
- (d) facilitate braking.

**Answer: (c) facilitate in taking turns.**

**95. Bo-Bo locomotives have two bogies with**

- (a) two driving axles with individual drive motors.
- (b) two driving axles with group drives.
- (c) four driving axles with individual drive motors.

(d) four driving axles with group drives.

**Answer: (a) two driving axles with individual drive motors.**

**96. A locomotive for Indian Railways has been designated as WAM. In this W indicates that**

(a) the locomotive is to run on metre gauge track.

(b) the locomotive is to operate on broad gauge track.

(c) the locomotive is for goods trains only.

(d) the locomotive is only for shunting duty.

**Answer: (b) the locomotive is to operate on broad gauge track.**

**97. Locomotives with manometer bogies**

(a) are suited both for passengers as well as freight service.

(b) have better coefficient of adhesion.

(c) have better riding qualities owing to reduction of lateral forces.

(d) all of the above.

**Answer: (d) all of the above.**

**98. Factor(s) affecting the design of rolling stock is/are**

- (a) environmental condition.
- (b) vibrations and shocks.
- (c) unbalanced and fluctuating supply voltages for auxiliaries.
- (d) all of the above.

**Answer: (d) all of the above.**

**99. In electric traction if contact voltage exceeds 1,500 V, current collection is invariably by**

- (a) a contact rail.
- (b) a conductor rail.
- (c) overhead wire.
- (d) third rail.

**Answer: (c) overhead wire.**

**100. Conductor rail system of supply is**

- (a) cheap and easy to repair and inspection.
- (b) suitable for heavy current collection at voltages up to 1,200 V.
- (c) universally used for all ac railways.

(d) both (a) and (b).

**Answer: (d) both (a) and (b).**

**101. Overhead lines for power supply to tram cars are at a minimum height of a**

(a) 10 m

(b) 8 m

(c) 5 m

(d) 15 m

**Answer: (a) 10 m**

**102. The current collector that can be employed with different speeds under all wind conditions and stiffness of OHE is known as the**

(a) messenger collector.

(b) pantograph collector.

(c) trolley collector.

(d) bow collector.

**Answer: (b) pantograph collector.**

### 103. DC track circuit consists of

- (a) amplitude modulation equipment.
- (b) a negative booster, feeding points and signals.
- (c) insulated joint and track, track bonding, regulating resistance, track battery to track relay.
- (d) all of the above.

**Answer: (c) insulated joint and track, track bonding, regulating resistance, track battery to track relay.**

### 104. In case of bow and pantograph current collectors

- (a) the pantograph current collector is employed for large currents at higher speeds.
- (b) the pantograph current collector is employed for large currents at lower speeds.
- (c) the bow current collector is employed for large currents at higher speeds.
- (d) the bow current collector is employed for large currents at lower speeds.

**Answer: (a) the pantograph current collector is employed for large currents at higher speeds.**

### **105. Contact with wire is maintained by**

- (a) air pressure in both bow and pantograph current collectors.
- (b) springs in both bow and pantograph current collectors.
- (c) spring in case of bow and air pressure in case of pantograph.
- (d) spring in case of pantograph and air pressure in case of bow collectors.

**Answer: (b) springs in both bow and pantograph current collectors.**

### **106. Factors affecting quality of current collection in pantograph is/are**

- (a) contact pressure.
- (b) effective mass of frame and span.
- (c) adequate damping in the frame.
- (d) all of the above.

**Answer: (d) all of the above.**

### **107. Advantages of two-stage pantograph is/are**

- (a) inertia forces are reduced.

(b) takes care of variation in contact height and displacement of contact wire between supports.

(c) takes care of low amplitude displacement of contact wire between droppers.

(d) all of the above.

**Answer: (d) all of the above.**

### **108. Span length between supports in electric traction is determined by**

(a) weight of wire per unit length.

(b) maximum wind pressure.

(c) permissible tension in the wire and speed of train.

(d) all of the above.

**Answer: (d) all of the above.**

### **109. Electrical circuit breaker is**

(a) connected between the current collector and the main wiring.

(b) provided on the electric locomotive to protect the electrical equipment against excessive overloads automatically.

(c) provided with a handle to trip it when it is moved to the OFF position by hand.

(d) all of the above.

**Answer: (b) provided on the electric locomotive to protect the electrical equipment against excessive overloads automatically.**

### **110. The characteristics of OHE depend on**

(a) loss of contact and its duration.

(b) temperature and wear of contact wire.

(c) quality of current collection and pantograph pressure on contact wire.

(d) height, stagger, push up of an gradient of contact wire.

(e) all of the above.

**Answer: (e) all of the above.**

### **111. Insulated overlaps are employed in electric traction to provide**

(a) protection of transmission equipment in electric locomotives.

(b) isolating facilities required for the maintenance and operation of OHE.

(c) protection of signals in EMU trains.

(d) gap between adjacent terminal sections of railways.

**Answer: (b) isolating facilities required for the maintenance and operation of OHE.**

### **112. Neutral sections are provided in single-phase ac traction as**

(a) to protect the system from lightning strokes.

(b) supply cannot be maintained from adjacent substations at reduced voltage drops.

(c) adjacent substations tap different phases of three-phase system to achieve balancing.

(d) to provide return section for the communication purpose.

**Answer: (c) adjacent substations tap different phases of three-phase system to achieve balancing.**

### **113. Use of booster transformers is restricted to urban areas because**

(a) there are no earth and water currents.

(b) they are subjected to densely populated areas and so need protection.

(c) they complicate the OHE and cause more faults in the system and thus reduce the system reliability.

(d) they increase the impedance and need feeding posts to be located at close intervals.

(e) both (c) and (d).

(f) all of the above.

**Answer: (e) both (c) and (d).**

### **114. Negative booster**

(a) is a separately-excited generator whose armature is connected to negative busbar and far end of the track through negative feeder.

(b) creates low voltage level in the track to allow all currents to flow through it.

(c) provides protection against earth fault currents.

(d) causes additional voltage drop necessary smooth operation.

(e) both (a) and (b).

**Answer: (e) both (a) and (b).**

**115. In long distance electric trains power for lighting in passenger coaches is provided**

- (a) through rails.
- (b) through locomotive.
- (c) through individual generator of bogie and batteries.
- (d) directly from overhead electric lines.

**Answer: (c) through individual generator of bogie and batteries.**

**116. Power requirements of a train lighting and air-conditioning is met by**

- (a) servo generators.
- (b) chargeable batteries in each compartment.
- (c) axle driven generators in conjunction with batteries.
- (d) either of (b) or (c).

**Answer: (c) axle driven generators in conjunction with batteries.**

### **118. Coach air-conditioning equipment includes**

- (a) standard refrigeration equipment.
- (b) mechanical power generating equipment.
- (c) electrical equipment for control with accessories.
- (d) an air-conditioner with its standard accessories.
- (e) all of the above except (d).

**Answer: (e) all of the above except (d).**

### **119. Requirement(s) of a railway coach air-conditioning is/are**

- (a) to provide heating/cooling.
- (b) to supply clean, fresh air at a controlled uniform temperature.
- (c) sufficient power requirement.
- (d) to account for charging passenger traffic.
- (e) all of the above.

**Answer: (e) all of the above.**

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