CHAPTER 2

Rails

Q.1 If the absolute levels of rails at the consecutive axles A, B, C separated by 1.8 metres are 100.505 m, 100.503 m and 100.525 m respectively, then the unevenness of rails is
(a) 0.065 (b) 0.045
(c) 0.055 (d) 0.035

Q.2 Weight of the rail depends on
(a) gauge of the tracks.
(b) speed of trains.
(c) spacing of sleepers.
(d) All of these

Q.3 Distance between inner rail and check rail on a sharp curve is
(a) 40 mm (b) 42 mm
(c) 44 mm (d) 46 mm

Q.4 Rail section first designed in the Indian railways, was
(a) double headed
(b) bull headed
(c) flat footed
(d) (a) and (b) simultaneously

Q.5 A welded rail joint is generally
(a) supported on sleeper
(b) supported on a metal plate
(c) suspended
(d) None of these

Q.6 The gradient on which an additional locomotive is required to negotiate the gradient is called
(a) momentum gradient
(b) pusher gradient
(c) ruling grading
(d) steep gradient

Q.7 On either side of the centre line of rails, a cant of 1 in 20 in the sleeper is provided for a distance of
(a) 150 mm (b) 165 mm
(c) 175 mm (d) 185 mm

Q.8 Check rails are provided on inner side of inner rails if sharpness of the BG curve is more than
(a) 3° (b) 5°
(c) 6° (d) 8°

Q.9 On Indian Railways, the approximate weight of a rail section is determined from the formula
(a) $\frac{\text{Weight of the rail}}{\text{Axial load of locomotive}} = \frac{1}{310}$
(b) $\frac{\text{Weight of the rail}}{\text{Axial load of locomotive}} = \frac{1}{10}$
(c) $\frac{\text{Weight of the rail}}{\text{Axial load of locomotive}} = \frac{1}{510}$
(d) $\frac{\text{Weight of the rail}}{\text{Axial load of locomotive}} = \frac{1}{610}$

Q.10 Indian Railways detects the rail flow by
(a) Mitsubishi Rail flow detector
(b) Soni Rail flow detector
(c) Audi-gauge Rail flow detector
(d) Kraut Kramer Rail flow detector

Q.11 Two important constituents in the composition of steel used for rail are
(a) carbon and silicon
(b) manganese and phosphorus
(c) carbon and manganese
(d) carbon and sulphur

Q.12 Due to battering action of wheels over the end of the rails, the rails get bent down and are deflected at ends. These rails are called
(a) roaring rails (b) hogged rails
(c) corrugated rails (d) buckled rails

Q.13 Maximum value of 'throw of switch' for Broad Gauge track is
(a) 89 mm (b) 95 mm
(c) 100 mm (d) 115 mm

Q.14 Stretcher bar is provided
(a) to permit lateral movement of the tongue rail
(b) to maintain the two tongue rails at the exact distance
(c) to ensure exact gauge at the toe of the switch as well as the nose of crossing
(d) to prevent any vertical movement between the wing rail & nose of crossing

Q.15 Consider the following statements
1. Slide chairs are provided under tongue rails to allow lateral movement
2. Stretcher bars are provided to maintain the two tongue rails at correct distance
3. Grade off chairs are provided behind the heel of the switches to give a ramp to tongue rail.

Of the above statements,
(a) 1 and 2 are correct
(b) 2 and 3 are correct
(c) 1 and 3 are correct
(d) 1, 2 and 3 are correct

Q.16 Match List-I (Formation width) with List-II (M.G.) and select the correct answer using the codes given below the lists:

List-I	List-II
A. Single line track on embankment	1. 488 cm
B. Double line track on embankment	2. 827 cm
C. Single line track in cutting	3. 884 cm
D. Double line track in cutting	4. 427 cm

Codes:

	A	B	C	D
(a)	1	3	2	4
(b)	2	3	4	1
(c)	1	3	4	2
(d)	1	2	3	4

Q.17 Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I
A Corrugated rails
B Burrs
C Wear of rails
D Flange bitten rails

List-II
1. The top surface gets worn out
2. The projection of rail on gauge side
3. The top surface develops alternate ridges and hollows
4. Inner side of outer rail on the curve.

Codes:

	A	B	C	D
(a)	4	1	2	3
(b)	3	1	2	4
(c)	1	2	4	3
(d)	3	2	1	4

Q.18 Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I
A. Chairs
B. Check rails
C. Guard rails
D. Bearing

List-II
1. Used on inner side of lower rail on sharp curves
2. Used for holding double headed and bull headed rails
3. Used on long span bridges
4. Used in between sleeper plates and flat footed rails

Codes:

	A	B	C	D
(a)	1	2	3	4
(b)	3	2	1	4
(c)	2	1	3	4
(d)	1	4	2	3

Q.19 Which of the following pairs are correctly matched?

1. Distance between adjoining face of running rail and check rail
   .....Flangeway clearance
2. Distance through which the tongue rail moves laterally at the toe of switch for the movement of trains
   .....Heal divergence
3. Distance between the gauge faces of the stock rail and tongue rail at the heel
   .....Throw of switch
4. Angle between the gauge face of stock rail and tongue rail
   .....Switch angle

Select the correct answer using the codes given below:

(a) 1 and 4 (b) 2 and 4
(c) 3 and 4 (d) 1, 2, 3 and 4

Q.20 The maximum formation pressure in railway track depends on which of the following factors:

(*i*) Live wheel load
(*ii*) Sleeper spacing
(*iii*) Modulus of elasticity
(*iv*) Track modulus
(*v*) Depth of ballast

(a) (*i*), (*ii*) and (*iii*) only
(b) (*i*), (*ii*), (*iii*) and (*iv*) only
(c) (*i*) and (*ii*) only
(d) All of the above

Q.21 The maximum damage to railway track is caused by:

(a) Accelerating trains
(b) Slow moving heavy trains
(c) Fast-moving light weight trains
(d) Heavy axle load unevenly distributed

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Answers Rails

1. (a) 2. (d) 3. (c) 4. (a) 5. (c) 6. (b) 7. (c) 8. (d) 9. (c) 10. (d)
11. (c) 12. (b) 13. (d) 14. (b) 15. (d) 16. (c) 17. (d) 18. (c) 19. (a) 20. (d)
21. (d)

Explanations Rails

13. (d)
For Broad Gauge
Min value of throw of switch = 95 mm
Max value of throw of switch = 115 mm
For Metre Gauge
Max value of throw of switch = 100 mm
Min value of throw of switch = 89 mm

14. (b)
To permit lateral of movement of the tongue rail - slide Chair
To ensure exact gauge at the toe of the switch as well as the nose of the crossing - The plates

19. (a)
Distance through which tongue rail moves laterally at the toe of switch for movement of trains is throw of switch.
Distance between gauge face of stock rail and tongue rail at the heel of switch is called heel divergence.

20. (d)

$$f_{max} = \frac{2WS}{\pi DL} \times \left(\frac{\mu}{64EI}\right)^{1/4}$$ where

All above factors are included in the formulae.

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