केवल कार्यालयीन उपयोग हेतु
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सत्यमेव जयते

भारत सरकार – Government of India
रेल मंत्रालय – Ministry of Railways

ब्रिज मामलों पर प्रश्न बैंक

QUESTION BANK ON BRIDGE MATTERS



केमटेक/2017/सि/क्यूबी-ब्रिज/1.0
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अअमा सं RDSO
रेल अग्रदूत Transforming Railways

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उच्च अनुरक्षण प्रौद्योगिकी केन्द्र
EXCELLENCE IN MAINTENANCE

Indian Railways
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प्राक्कथन

अभियांत्रिकी विभाग के फील्ड के साथ-साथ कार्यालय में कार्यरत कर्मचारियों को ब्रिज मामलों पर विभिन्न विषयों के बारे में एक ही दृष्टि में उपलब्ध ज्ञान की आवश्यकता होती है, जिससे कि उन्हें ब्रिज से संबंधित दिन-प्रतिदिन रखरखाव और अन्य गतिविधियों की जानकारी हो सके ।

केमटेक की सिविल इंजीनियरिंग शाखा ने ब्रिज मामलों पर आवश्यक जानकारी जो कि ब्रिज मैनुअल, आयाम अनुसूची, एलडब्ल्यूआर मैनुअल, ब्रिज नियम, आदि पर आधारित है, को "ब्रिज मामलों पर प्रश्न बैंक" के रूप में लाने का प्रयास किया है।

मुझे पूरी उम्मीद है कि यह प्रश्न बैंक निश्चित रूप से भारतीय रेल में अभियांत्रिकी विभाग के फ़ील्ड में कार्यरत कर्मचारियों के लिए उपयोगी सिद्ध होगा।

केमटेक, ग्वालियर **(टी.कुप्पन)**
19 दिसम्बर, 2017 **वरिष्ठ कार्यकारी निदेशक**

FOREWORD

Engineering staff working in field as well as in office require at glance knowledge regarding various topics on Bridge Matters, because they are required in day to day maintenance of bridge and other activities related to bridges.

"Question Bank on Bridge Matters" developed by Civil Engineering branch of CAMTECH is an attempt to bring out required knowledge on various bridge matters based on Bridge Manual, Schedule of Dimensions, LWR Manual, Bridge Rule, etc.

I am sure that this question bank will certainly prove to be useful for field staff of Engineering Department of Indian Railways.

CAMTech/Gwalior **(T. Kuppan)**
19 December, 2017 **Senior Executive Director**

भूमिका

केमटेक ने ब्रिज से संबन्धित विषयों पर एक वस्तुनिष्ठ प्रकार का "ब्रिज मामलों पर प्रश्न बैंक" उनके उत्तर सहित तैयार किया है। इसमें ब्रिज मामलों से संबन्धित विभिन्न विषयों के प्रश्न जो कि ब्रिज मैनुअल, आयाम अनुसूची, एलडब्ल्यूआर मैनुअल, ब्रिज नियम, आरडीएसओ और इरिसेन प्रकाशन पर आधारित हैं, शामिल हैं।

यह प्रश्न बैंक बनाने का उद्देश्य ब्रिज मामलों से संबन्धित विभिन्न विषयों पर ज्ञान वर्धन है और यह प्रश्न बैंक विषय पर उपलब्ध रेल्वे बोर्ड, आरडीएसओ, *ब्रिज* मैनुअल, इत्यादि के प्रचलित दिशा निर्देशों का स्थान नहीं लेती ।

यह प्रश्न बैंक वैधानिक नहीं है तथा इसमें दी गई सामग्री का उद्देश्य केवल मार्गदर्शन है। अधिकतर आंकड़ा एवं जानकारी किसी न किसी रूप में विभिन पुस्तकों तथा अन्य प्रिंटेड मैटर्स में उपलब्ध है। अधिक जानकारी के लिए, विषय पर उपलब्ध प्रासंगिक कोड, मैनुअल और रिपोर्ट का अध्ययन संदर्भ रूप में किया जा सकता है ।

हम पाठकों से इस प्रश्न बैंक को और अच्छा बनाने हेतु उनके किसी भी सुझाव का स्वागत करते हैं ।

केमटेक, ग्वालियर **(डी. के. गुप्ता)**

18 दिसम्बर, 2017 **संयुक्त निदेशक / सिविल**

PREFACE

CAMTECH has prepared a 'Question Bank on Bridge Matters' having the objective type questions with their answers. It covers questions on various topics on bridge matters, which are based on Bridge Manual, Schedule of Dimensions, LWR Manual, Bridge Rules, RDSO and IRICEN publications.

This question bank is prepared with the objective to provide knowledge of various bridge matters and does not supersede any existing instructions from Railway Board, RDSO, Bridge Manual, etc.

This question bank is not statutory and contents are only for the purpose of knowledge dissemination. Most of the data & information in some form or the other in various books and other printed matter. For more in depth information the relevant codes and report on the subject may be referred.

We welcome any suggestions from readers for further improvement of this handbook.

CAMTech/Gwalior **(D. K. Gupta)**
18 December, 2017 **Joint Director/Civil**

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संशोधन पर्चियों का प्रकाशन
ISSUE OF CORRECTION SLIPS

इस हस्तपुस्तिका के लिए भविष्य में प्रकाशित होने वाली संशोधन पर्चियों को निम्नानुसार संख्यांकित किया जाएगा :

The correction slips to be issued in future for this handbook will be numbered as follows:

केमटेक/2017/सि/क्यूबी-ब्रिज/1.0/सीएस# XX दिनांक_____

CAMTECH/2017/C/QB-BRIDGE/1.0/CS # XX date_____

जहाँ xx संबन्धित संशोधन पर्ची की क्रम संख्या है (01 से प्रारम्भ होकर आगे की ओर)

Where "XX" is the serial number of the concerned correction slip (starting from 01 onwards).

प्रकाशित संशोधन पर्चियाँ
CORRECTION SLIPS ISSUED

क्र.सं./ Sr. No.	प्रकाशन दिनांक/ Date of issue	संशोधित पृष्ठ संख्या तथा मद संख्या/ Page no. and Item No. modified	टिप्पणी/ Remarks

अध्याय / Chapter – 1

Duties & Responsibilities of Bridge Officials

1. Bridge Engineers on Indian Railways are responsible for inspection, maintenance and upkeep of all types of bridges of span…….

a) 12.2m and below
b) 12.2m
c) 12.2m and above
d) All of above

2. IOW/PWI on Indian Railways are responsible for inspection, maintenance and upkeep of all steel work of girder span …….

a) Less than 12.2m
b) Above than 12.2m
c) Both a)and b)
d) None of above

3. Inspection of important bridge by Sr. DEN/DEN is

a) Once in a year
b) Once in six month
c) Once in three months
d) None of these

4. Inspection of bridge with overall rating number (ORN) 1, 2, 3 by Sr. DEN/DEN is

a) Once in three months
b) Once in six month
c) Once in a year
d) None of these

5. Inspection of foot over bridge by ADEN on programmed basis is

a) One fifth every year
b) One forth every year
c) One third every year
d) None of these

6. Initial inspection for PSC girders / Welded girder bridges as per IRBM 1998

a) Within one year of installation
b) Once in 3 years
c) Once in 2 years
d) Once in 5 years

7. Periodical inspection of Welded girders

a) Once in 1 years
b) Once in 3 years
c) Once in 2 years
d) Once in 5 years

8. Periodical inspection of PSC & Composite girders

a) Once in 3 years
b) Once in 5 years
c) Once in 2 years
d) Once in 1 years

9. Payment to bridge staff on the section will be made by the pay clerk in the presence of

a) SSE/P.Way
b) Br. Inspector (SSE)
c) SSE/Works
d) Office clerk

10. If the Br. Inspector (SSE) working in the section is not readily available, another SSE may be authorised by …….. to witness payment on the section.

a) DEN
b) SSE
c) AEN (Bridges)
d) Office clerk

11. The "Transfer of charge" statement should be signed by both the SSE/SE/JE/Br. Inspector and forwarded to the …….

a) Assistant Engineers (Bridges)
b) Divisional Engineer (Bridges)
c) a) or b)
d) None of above

12. Foundation & Sub-structure of the bridges should be inspected by IOW/PWI of the section

a) Once a year any time
b) Once a year before monsoon
c) Once a year after monsoon
d) Every 3 months

13. Frequency of bridge inspection by SSE/SE (P.Way) before monsoon is

a) Once in 6 months
b) Once in a year
c) Once in 3 years
d) None of these

14. Inspection of steel works of girder bridges < 12.2 m clear span shall be done by Permanent Way and Works Inspectors

a) Every year
b) About 20% every year
c) Once in 5 year
d) Both b) and c)

15. The Assistant Engineer is generally responsible for

a) The maintenance and safety of all way & works including bridges in his charge
b) The accuracy, quality and progress of new works
c) Control over all expenditure in relation to budget allotment
d) All of above

16. The Assistant Engineer shall inspect every Bridge including Road over / under Bridges …….. by a date specified by Chief Engineer after monsoon.

a) Once a year
b) Once in 6 months
c) Once in 3 months
d) None of these

17. The Assistant Engineer shall inspect every Bridge including Road Over/Under Bridges once a year by a date specified by Chief Engineer after---------

a) Monsoon
b) Summer
c) Winter
d) All of above

18. Test check of the bridges inspected by Bridge Inspectors shall be done by Assistant Bridge Engineer/ Divisional Bridge Engineer @ ……

a) 5% every year
b) 10% every year
c) 15% every year
d) None of above

19. The frequency of inspection of distressed bridge of category No – 1 by ADEN/ABE is_____

a) Half yearly
b) Yearly
c) Three months
d) Two months

20. The frequency of inspection of distressed bridge of category No – 1 by DEN/ Sr. DEN's is_____

a) Half yearly
b) Yearly
c) Three months
d) Two months

21. Frequency of inspection and rivet testing of Girder Bridges span >= 12.2 m in coastal area by Bridge Inspector.

a) 25% of total girder per year
b) 15% of total girder per year
c) 5% of total girder per year
d) None of these

22. Frequency of inspection and rivet testing of Girder Bridges span >= 12.2 m in non-coastal area by Bridge Inspector.

a) 20% of total girder per year
b) 10% of total girder per year
c) 5% of total girder per year
d) None of these

23. Frequency of inspection by BRI in case of early steel girder.

a) Once in 2 years
b) Once in 3 years
c) Once In 4 years
d) Once in every year

24. Permanent Way Inspector or Inspector of Works, as per the practice on the railways, shall carry on detailed inspection of steel work of girders less than 12.2m clear span----------

a) Once in six months
b) Once in 2 years
c) Once in 3 years
d) Once in 5 years

25. ---------- shall also be responsible for the posting of bridge watchman, wherever necessary and ensure their effective functioning.

a) Permanent Way Inspector
b) Inspector of Works
c) Bridge Inspector
d) None of these

26. On relinquishing charge of section the Bridge Inspector shall prepare the specified "transfer of charge" statement in----------

a) Single
b) Duplicate
c) Triplicate
d) None of these

27. As per the relevant rules, the bridge inspector should ensure that all staff including casual labour are sent for----------

a) Medical examination on appointment
b) Medical examination on Promotion
c) Periodical medical examination
d) All of these

28. The Assistant Engineer shall inspect every tunnel in the sub division ----------before monsoon and maintain the records of his inspection.

a) Once a half year
b) Once a year
c) Once one and half year
d) Once two year

29. Bridge watchmen, in the case of emergency, should be well conversant with the rules regarding use of----------

a) Hand signals
b) Detonators
c) Protection
d) All of these

30. If danger is apprehended, Bridge watchmen should arrange to protect the track and stop the traffic as laid down in ---------- of the Indian Railway Permanent Way Manual.

a) Para 101
b) Para 1011
c) Para 1111
d) Para 1211

31. The Divisional / Assistant Engineer should carry out inspection of Bridges and their training works after the ----------and take action to undertake repairs and make good the damages before next ----------.

a) Rainy season
b) Winter season
c) Summer season
d) All of these

32. The technical officer of the rank of sectional officer in the maintenance organization of Indian Railways is called:

a) Permanent Way Inspector
b) Gangmate
c) Assistant Permanent Way Inspector
d) None of these are correct

***

अध्याय / Chapter – 2

Railway Bridges – General Information

1. Investigation for important bridges may be carried out in which stage

   a) Technical feasibility study (reconnaissance survey)
   b) Techno-economic feasibility study (preliminary engineering survey)
   c) Detailed survey and project report stage (final location survey)
   d) All the above

2. The Indian Railways Way and Works Manual was first published in the year.

   a) 1956 b) 1999
   c) 1954 d) 1998

3. Indian Railway Bridge manual established in

   a) 1998 b) 1999
   c) 1989 d) 1954

4. While finalizing the Indian Railways Bridge Manual, which of the following have been taken into account.

   a) Indian Railways General Rules 1976
   b) Indian Railways Code for Engineering Department 1993
   c) Bridge Rules and Substructure
   d) All the above

5. A major bridge is one which has

   a) Single span of 12m & above b) Total linear water way more than 18m
   c) Both a) & b) d) None of the above

6. A minor bridge is one which has

   a) Single span less than 12m b) Total linear water way less than 18m
   c) Both a) & b) d) None of the above

7. An important bridge is one which has total water way of equal to or more than

   a) 1000 sqm b) 800 sqm
   c) 500 sqm d) 300 sqm

8. Minimum clearance for arch bridges measured to the crown of the arch for spans less than 4m should be

a) Rise of the arch or 1200mm whatever is more
b) Rise of the arch
c) 1200mm
d) None of these

9. Which cement should not be used for bridge slabs (PSC and RCC works)

a) OPC
b) Portland Pozzolana cement
c) Portland furnace slag cement
d) Rapid hardening cement

10. The concrete under water minimum grade of cement recommended by IS code

a) M 10
b) M 15
c) M 20
d) M 25

11. A bridge is generally specified as "Br. No. 180 (5x9.10m G) at km 345/5-6". In the above 9.10 m refers to the

a) Effective Span
b) Width of bridge
c) Clear Span
d) Overall length of bridge

12. Bridges can be classified on the basis of

a) Material of construction
b) Form of superstructure
c) Type of span
d) All of above

13. Through, Semi-through and Deck bridge are the type of bridge based on

a) Type of girders
b) Grade separation
c) Position of roadway or railway with respect to main girder
d) Headway requirement consideration

14. Causeway, Submersible bridges and High level bridges are the type of bridges based on

a) Type of waterway
b) Grade separation
c) Position of roadway or railway with respect to main girder
d) Headway requirement consideration

15. In a temporary signalling arrangements for a bridge work in BG section, caution board shall be placed in advance of ……. m from start of the bridge/ work spot.

a) 30 m
b) 1200 m
c) 677 m
d) 1000 m

16. In a temporary signalling arrangements for a bridge work in BG section, speed board shall be placed in advance of 30 m from the

a) C.L. of the bridge
b) Termination Board
c) Start of the bridge/work spot
d) Caution Board

17. The CRS sanction is required in the ROB project for construction of

a) Approach spans
b) Laying road
c) Railway spans
d) None of these

18. One of the following works does not require CRS sanction

a) Regirdering/ Rebuilding
b) Erection of new FOB
c) Erection of platform shelter
d) Pipe line crossing

19. The total number of bridges on I.R.is about

a) 1 Lac
b) 1.25 Lacs
c) 1.50 Lacs
d) 2 Lacs

20. Which para of Engineering code deals with cost sharing of ROB/RUBs

a) 1716
b) 1814
c) 1816
d) 1819

21. What is the carriageway of two lane ROB on National Highway

a) 10.00 m
b) 8.50 m
c) 9.50 m
d) 10.50 m

22. When proposed depth of construction of a bridge is more than the existing depth of construction in a bridge work, the existing rail level requires

a) Lowering
b) Lifting
c) Slewing
d) None

23. What is DPC?

a) Damp proof course
b) Weathering course
c) Treatment the foundation
d) Treatment over the roof

24. Generally the rail sections used in India is

a) Flat footed
b) Double headed
c) Bull headed
d) All above

25. Callendar Hamilton spans are normally available maximum upto

a) 60 ft b) 100 ft
c) 150 ft d) 200 ft

26. Distance between two consecutive sleepers for B.G. should not exceed --------

a) 250mm b) 300mm
c) 400mm d) 500mm

27. Distance between two consecutive sleepers for M.G. should not exceed --------

a) 250mm b) 300mm
c) 400mm d) 500mm

28. Distance between two consecutive sleepers for N.G. should not exceed --------

a) 250mm b) 300mm
c) 400mm d) 500mm

29. The thickness of sleepers for B.G. should preferably be .....

a) 125mm b) 150mm
c) 175mm d) 200mm

30. The thickness of sleepers for MG should preferably be .....

a) 125mm b) 150mm
c) 175mm d) 200mm

31. Clearance between guard rail & running rail on B.G. bridges should be .....

a) 150mm ± 50 b) 200mm ± 50
c) 225mm ± 50 d) 250mm ± 50

32. Clearance between guard rail & running rail on M.G. bridges should be .....

a) 150mm ± 50 b) 200mm ± 50
c) 225mm ± 50 d) 250mm ± 50

33. Length of guard rail outside ballast wall and maintained to specified clearances for B.G. bridges should be

a) 1600mm b) 1750mm
c) 1825mm d) 1900mm

34. Length of guard rail outside ballast wall and maintained to specified clearances for M.G. bridges should be

a) 1600mm b) 1750mm
c) 1825mm d) 1900mm

35. Length of guard rail to be bent so as to be brought together at middle of the track on BG bridges

a) 3200mm b) 3655mm
c) 4250mm d) 4875mm

36. Length of guard rail to be bent so as to be brought together at middle of the track on MG bridges

a) 3200mm b) 3655mm
c) 4250mm d) 4875mm

37. Length of guard rail to be bent so as to be brought together at middle of the track on NG bridges

a) 3200mm b) 3655mm
c) 4250mm d) 4875mm

38. Maximum overall length of Girder bridges permitted on LWR on BG with 52 kg PRC sleeper track in temperature zone-I with rail fastenings is .....

a) 11m b) 22m
c) 30m d) 45m

39. Maximum overall length of Girder bridges permitted on LWR on BG with 52 kg PRC sleeper track in temperature zone-II with rail fastenings is .....

a) 11m b) 27m
c) 30m d) 45m

40. Maximum length of LWR with SEJ on bridges with PRC sleeper track on bridges approaches should be ..... in temperature zone-IV. The maximum movement of SEJ is 190 mm.

a) 55m b) 70m
c) 110m d) 160m

41. Maximum length of LWR with SEJ on bridges with PRC sleeper track on bridges approaches should be ..... in temperature zone-III. The maximum movement of SEJ is 190 mm.

a) 55m b) 70m
c) 110m d) 160m

42. Maximum length of LWR with SEJ on bridges with PRC sleeper track on bridges approaches should be ..... in temperature zone-II. The maximum movement of SEJ is 120 mm.

a) 20m b) 50m
c) 75m d) 110m

43. Maximum length of LWR with SEJ on bridges with PRC sleeper track on bridges approaches should be ..... in temperature zone-I. The maximum movement of SEJ is 120 mm.

a) 20m b) 50m
c) 75m d) 110m

44. SWR may be continued over the girder bridges with unballasted decks, where the clear distance between abutments does not exceed .....

a) 6.5m b) 9.6m
c) 11.5m d) 13.3m

45. Track on girder on which SWR is not permitted should be isolated from the SWR in the approaches on either side by providing at least ..... well anchored standard rail length.

a) One b) Two
c) Three d) Four

46. BGML loading stands for

a) Broad Gauge Mineral loading b) Broad Gauge Modified loading
c) Broad Gauge Main Line loading d) None of the above

47. BGML loading caters for maximum axle load of ..... tonnes for locomotive with trailing load of ..... tonnes/metre.

a) 22.9, 7.67 b) 22.5, 7.65
c) 25.0, 7.67 d) None of these

48. RBG loading stand for

a) Revised Broad Gauge loading b) Rolling Broad Gauge loading
c) Railway Broad Gauge loading d) None of these

49. RBG loading caters for maximum axle load of ..... tonnes for locomotive with trailing load of ..... tonnes/metre of track with maximum axle load of ..... tonnes for wagons.

a) 22.9, 7.67, 25 b) 22.5, 7.67, 22.9
c) 25, 7.67, 22.9 d) None of these

50. MBG loading stands for

a) Mineral Broad Gauge loading
b) Modified Broad Gauge loading
c) Medium Broad Gauge loading
d) None of these

51. MBG loading caters for maximum axle load of ..... tonnes for locomotive with trailing load of ..... tonnes/metre on both side of locomotive.

a) 25, 7.67
b) 22.5, 8.25
c) 25.0, 8.25
d) None of these

52. MGML loading stands for

a) Metre Gauge Main Line loading
b) Metre Gauge Mineral Line loading
c) Metre Gauge Medium loading
d) None of these

53. MGML loading caters for maximum axle load of ..... tonnes for locomotive with trailing load of ..... tonnes/metre following the track

a) 13.2, 3.87
b) 16, 5.5
c) 10.7, 3.87
d) None of these

54. MMG loading stands for

a) Metre Gauge Modified loading
b) Modified Metre Gauge loading
c) Modified Mineral Gauge loading
d) None of these

55. MMG loading caters for maximum axle load of ..... tonnes for locomotive and a train load of ..... tonnes/metre on both sides of locomotive with maximum axle load of ..... for the train load.

a) 8.1, 3.87, 14
b) 10.7, 3.87, 14
c) 16, 5.5, 14
d) None of these

56. MGBL loading caters for maximum axle load of ..... tonnes for locomotive and a train load of ..... tonnes/metre behind the engine.

a) 8.1, 3.87
b) 10.7, 3.87
c) 16, 5.5
d) None of these

57. 'C' standard for MG loading caters for maximum axle load of ..... tonnes for locomotive and a train load of ..... tonnes/metre behind the engine.

a) 8.1, 3.87
b) 10.7, 3.87
c) 16, 5.5
d) None of these

58. Which of the following loading standard is connected with Narrow Gauge loading standard?

a) 'H' class loading
b) H.M. standard of loading
c) Standard 'C' loading
d) None of these

59. Steel arches are suitable for longer span and upto ..... m span have been built till now

a) 419 m
b) 519 m
c) 619 m
d) 719 m

60. Concrete arches are upto ..... m span have been built till now

a) 105 m
b) 205 m
c) 305 m
d) 405 m

61. Standard bag of cement in …… kg

a) 52 kg
b) 30.5kg
c) 10.7kg
d) 50 kg

62. CDA stands for

a) Coefficient of Dynamic Augment
b) Critical Dynamic Augment
c) Constant Dynamic Augment
d) Calculated Dynamic Augment

63. Dynamic Augment is

a) Wind effect on railway bridges
b) Temperature effect on railway bridges
c) Impact Effect on railway bridges
d) Rolling effect on railway bridges

64. Bridges are expected to have design life of

a) 75 to 100 years
b) 100 to 125 years
c) 125 to 150 years
d) None of these

65. Bridge planning is the process of finding optimal solution for crossing a

a) Water course
b) Roadway
c) Railway
d) All of these

66. Design discharge (Q) shall normally be the computed flood with a probable recurrence interval of

a) 50 years (Q_{50})
b) 60 years (Q_{60})
c) 70 years (Q_{70})
d) None of these

67. As per RDSO report no. RBF-16 design discharge may be estimated for

a) Small size catchment (less than 25 sq. Km)
b) Small size catchment (equal to 25 sq. Km)
c) Small size catchment (greater than 25 sq. Km)
d) None of these

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अध्याय / Chapter – 3

Bridge Inspection & Maintenance

1. Camber in steel triangulated girder is provided to compensate for deflection

   a) Under live load and dead load
   b) Under live load
   c) Under dead load
   d) None of the above

2. Bearings are provided in bridges to transfer the load to

   a) Super structure
   b) Track
   c) Embankment
   d) Sub structure

3. At FOBs in electrified section the electrocution by live OHE wires is prevented by providing

   a) Smoke guards
   b) Roofing
   c) Bottom lateral bracings
   d) Protective screens

4. For a major bridge, the URN would comprise of

   a) Single digit
   b) Eight digits
   c) Six digits
   d) Four digits

5. While painting with red oxide paint, a little quantity of ……..shall be added to the paint while doing the first coat to distinguish it from the second coat

   a) Little blue paint
   b) Lamp black
   c) Red paint
   d) Green paint

6. While painting with Aluminium paint, a little quantity of ……..shall be added to the paint while doing the first coat to distinguish it from the second coat

   a) Little blue paint
   b) Lamp black
   c) Red paint
   d) Green paint

7. Rail joints should be avoided on the approaches within ……of a bridge abutment.

   a) 6 m
   b) 3 m
   c) 4 m
   d) 10 m

8. Renewal of slack rivets should be taken up in steel girder bridges, if

   a) All rivets which are hand loose or which have lost 50% of their head by corrosion.
   b) All hammer loose rivets where corrosion has set in between the head and the plate.
   c) In end stiffeners when the percentage of hammer loose rivets is >30%
   d) All the above

9. In flange splices when the number of hammer and hand loose rivets is 30% or more of the total rivets on any side of the splice location,

a) Need not be renewed
b) Wait for 100% loose rivets
c) All the rivets should be renewed
d) None of the above

10. Corrosion in Steel girder bridges may be prevented by

a) Protective coatings by painting
b) Metallising
c) Use of epoxy based paints
d) All the above

11. Surface preparation for Metallising the abrasives used for final cleaning is

a) Chilled iron grit G.24, as defined in BS : 2451
b) Washed salt free angular silica sand of mesh size 12 to 30 with a minimum of 40% retained on a 20 mesh screen
c) Either (a) or (b)
d) Neither (a) or (b)

12. The date of painting of steel work should be painted in white on the outside of the left girder

a) Of the 1st span only
b) First span only but on all spans for Imp. Bridges
c) Of the all spans
d) None of the above

13. The length of the snap head rivet shank is, when L = length of the rivet, G = length of grip in mm; D = Dia of rivet in mm

a) L =G +1.5 D + 1mm for every 4 mm of grip or part thereof
b) L =G +0.5 D + 1mm
c) L =G +0.5 D
d) None of the above

14. The length of the countersunk head rivet shank is, when L = length of the rivet, G = length of grip in mm; D = Dia of rivet in mm

a) L =G +0.5 D + 1mm for every 4 mm of grip or part thereof
b) L =G +0.5 D + 1mm
c) L =G +0.5 D
d) None of the above

15. Periodicity of recording of camber in PSC girders

a) Once in a year
b) Once in two years
c) Once in three years
d) During detailed inspection of SE/Br.

16. Conventional method of camber recording

a) Piano wire with counter weight
b) By using leveling instrument
c) Offset method
d) None of the above

17. Trolley refuges should be checked to ascertain whether they have been provided on bridges with main span of -------

a) Less than 100m, at every 100m
b) 100m and more, a refuge over each pier
c) Either a) or b)
d) Both a) and b)

18. Periodicity of Underwater inspection

a) Once in a year
b) Once in two years
c) Whenever high flood occurs
d) Alongwith detailed inspection of SE/Br

19. Elastomeric bearings are made of natural or synthetic rubber of shore hardness of approximately.

a) 30 to 40
b) 50 to 70
c) 40 to 50
d) 60 to 70

20. For assessing the strength of concrete structure by NDT method, the equipment used is

a) Echo sounder
b) Anemometer
c) Schmidt's concrete testing hammer
d) Volt meter

21. For assessing the cover available to reinforcement in existing RCC structures by NDT method, the equipment used is

a) Echo sounder
b) Concrete cover meter
c) Cover meter
d) Volt meter

22. For a major bridge, the condition rating number (CRN) should be of

a) 2 digits
b) 4 digits
c) 6 digits
d) 7 digits

23. In case of Shotcreting/ Guniting, the coarse aggregate, when used should conform to IS 383, with a maximum nominal size of -------

a) 10 to 12.5 mm
b) 12 to 20 mm
c) 20 to 25 mm
d) Both a) and b)

24. In the eight digit code given in the rating system, the first digit is called

a) URN
b) ORN
c) CRN
d) None of these

25. For spans more than 6.1 m, rail joints should preferably be provided at ..... of span from either end.

a) 1/3 b) 1/5
c) 0.4 d) None of these

26. A railway bridge having total waterway of 18 m or more is called

a) Major bridge b) Minor bridge
c) Important bridge d) None of these

27. Drop & Curtain wall is provided

a) to reduce velocity of water flow b) to reduce scouring effect of stream
c) Both a & b d) None of these

28. In areas where corrosion is not severe, priming coat consists of

a) One heavy coat of ready mixed paint red lead priming conforming to IS 102 or one coat of ready mixed paint zinc chromate priming conforming to IS 104 followed by one coat of ready mixed paint red oxide zinc chromate primer paint conforming to IS 2074
b) Two coats of zinc chromate red oxide primer paint conforming to IRS P-31
c) Either of the above
d) None of these

29. In areas where corrosion is not severe, finishing coat consists of

a) Two cover coat of red oxide paint conforming to IS 123 or any other approved paint applied over the priming coat
b) One cover coat of red oxide paint conforming to IS 123
c) Either of the above
d) None of these

30. In areas where corrosion is severe, priming coat consists of

a) Two coats of ready mixed paint red lead priming conforming to IS 102 or one coat of ready mixed paint zinc chromate priming conforming to IS 104 followed by one coat of ready mixed paint red oxide zinc chromate primer paint conforming to IS 2074
b) Two coats of ready mixed paint zinc chromate priming paint conforming to IS 104
c) Either of the above
d) None of these

31. In areas where corrosion is severe, finishing coat consists of

a) Two coats of aluminium paint conforming to IS 2339
b) Two cover coat of red oxide paint conforming to IS 123
c) Either of the above
d) None of these

32. Entire steel work of a girder of bridge should be painted at regular interval. This system of painting is known as

a) Patch painting
b) Complete painting
c) Periodical complete painting
d) Periodical through painting

33. When a small area of painting of a steel girder bridge show pronounced deterioration and require immediate painting, this system of painting is known as

a) Patch painting
b) Complete painting
c) Preventive painting
d) Through painting*

34. Elcometer is used for measuring the .....

a) Cross level
b) Gauge
c) Thickness of paint
d) All of the above

35. Piano wire is used for measuring the .....

a) Distortion
b) Camber of PSC girder
c) Both a & b
d) Both a & c

36. In railways, periodicity of painting of steel girder varies from -----in arid zones to ------ in highly corrosive areas.

a) 6 years, 1 year
b) 1 year, 6 years
c) 8 years, 2 years
d) 2 years, 8 years

37. Bridge having linear water way of 300 m or more or total water way of 1000 sqm or more are

a) Minor bridge
b) Important bridge
c) Major bridge
d) None of the above

38. Bridge having total water way of less than 18 m or clear span of less than 12 m in single span are called

a) Minor bridge
b) Important bridge
c) Major bridge
d) None of the above

39. NRS stands for

a) National Rating System
b) Numerical Rating System
c) Non Repair System
d) None of these

40. URN of a minor bridge shall be represented by .... digit.

a) 8 b) 5
c) 4 d) 1

41. Weight of rivet testing hammer is approx.....grams

a) 180 b) 170
c) 150 d) 110

42. Lubrication of bearings is done once in .....

a) Every year b) 2 years
c) 3 years d) 4 years

43. For painting, brush shall be held at ..... to the surface

a) 60^0 b) 30^0
c) 45^0 d) All of these

44. Repairing by cement pressure grouting can be adopted in case of

a) Honeycomb concrete structure b) Hollow masonry
c) Dorment cracks d) All of above

45. Cement pressure grouting is suitable for

a) Very fine crack
b) Active crack where cause of cracking has been determined and remedial action has been taken
c) Crushed masonry
d) Weathered concrete or masonry

46. Cement pressure grouting is best suited for

a) Wide and deep crack b) Fine and deep crack
c) Fine but not very deep crack d) None of above

47. Epoxy grouting is best suited for

a) Wide and deep crack b) Fine and deep crack
c) Fine but not very deep crack d) None of above

48. Admixture is added in cement pressure grouting mainly due to

a) Increase initial setting time b) Improve flowability
c) Prepare non shrinkable grout d) Both b) and c)

49. In cement pressure grouting, water cement ratio is kept as

a) 0.4 to 0.5 b) 0.3 to 0.4
c) 0.25 to 0.35 d) 0.35 to 0.50

50. In cement pressure grouting, pressure is kept as

a) 2 to 4 kg/sqcm b) 3 to 6 kg/sqcm
c) 3 to 10 kg/sqcm d) 3.5 to 7 kg/sqcm

51. In epoxy grouting, pressure is kept as

a) 2 to 4 kg/sqcm b) 3 to 6 kg/sqcm
c) 3 to 10 kg/sqcm d) 3.5 to 7 kg/sqcm

52. In guniting/shotcreting, water cement ratio is kept as

a) 0.4 to 0.5 b) 0.3 to 0.4
c) 0.25 to 0.35 d) 0.35 to 0.50

53. In cement pressure grouting, holes, cracks/in or around hollow spots in staggered manner should be drilled having spacing in both the direction @ .....

a) 150-500mm b) 450mm
c) 500-750mm d) Suitably as decided by DEN

54. In cement pressure grouting, GI pipe pieces of diameter .... and length ..... should be fixed with rich cement sand mortar in drilled holes

a) 12 to 20 mm, 200 mm b) 12 to 20 mm, 300 mm
c) 12 to 25 mm, 200 mm d) 20 to 25 mm, 300 mm

55. The date of painting of steel work should be painted in ……. on the outside of the left girder of the first span.

a) White b) Yellow
c) Grey d) Green

56. At important bridges, flood level gauges should be provided on abutments or on piers, which may be plastered with cement mortar ------ wide for providing gauges.

a) 380 mm b) 300 mm
c) 450 mm d) 400 mm

57. For riveting work in bridge, the air pressure of _____ kg/cm^2 is required

a) 5.6 to 7
b) 5.0 to 5.6
c) 6.0 to 7.0
d) 7.0 to 8.0

58. In girder bridges, painting should not be done when relative humidity is above _____%

a) 90
b) 95
c) 80
d) 70

59. In centralized articulated bearing (sliding type) of Girder Bridge the minimum expansion is _____mm

a) 12 to 20
b) 10-12
c) 18-20
d) 20-24

60. The direction of flow should be distinctly marked in _____ colour on abutment or piers

a) White
b) Red
c) Yellow
d) Black

61. In case of painting of steel girder bridges, the maximum time lag between Surface preparation & application of primer coat is __ hrs.

a) 6
b) 8
c) 12
d) 24

62. In case of painting of steel girder bridges, the maximum time lag between Surface preparation & 1st finishing coat in case of patch painting is _____ hrs.

a) 24
b) 48
c) 12
d) 6

63. In case of painting of steel girder bridges, the maximum time lag between primer coat & finishing coat is ____

a) 1 day
b) 48 hrs
c) 7 days
d) 2 weeks

64. In case of painting of steel girder bridges, the maximum time lag between 1st finishing coat & the 2nd finishing coat is

a) 2 days
b) 1 day
c) 7 days
d) 12 hrs

65. The shelf life of paint - Red, lead ready mixed IS:102 is _____months

a) 2 b) 4
c) 1 d) 6

66. The shelf life of paint red oxide ready fixed IS:123 is _____ months

a) 12 b) 4
c) 1 d) 6

67. The shelf life of Aluminum paint - IS:2339 where paste and are not mixed is _____ months

a) 2 b) 4
c) 12 d) 6

68. The shelf life of Aluminum paint - IS:2339 where paste & oil are mixed is _____ months

a) 2 b) 4
c) 1 d) 6

69. Method of surface preparation done in case of Metallising based painting in Girder Bridge is----------

a) Manual hand cleaning b) Flame cleaning
c) Sand blasting d) Both b) and c)

70. Frequency of Greasing to bearings of Girder in Bridges is ___ years

a) 1 b) 2
c) 3 d) 5

71. Total No. of Coats of paint as finishing coats applied on girder bridges in case of epoxy based painting.

a) 3 b) 4
c) 5 d) 6

72. The dia. of wire used in metalizing is ---------- mm

a) 3 to 5 b) 5 to 7
c) 7 to 10 d) More than 10

73. In case of sound condition of a bridge component, the no. given as CRN is -------

a) 0 b) 1
c) 5 d) 6

74. The no. of digits in case of URN of a major bridge is ----------

a) 5 b) 6
c) 7 d) 8

75. In Elastomeric bearing, what is used as reinforcement to reduce bulging?

a) Steel Plate b) Tor Steel Rod
c) Aluminum Plate d) Plain Steel Rod

76. In which type bearings tooth bar is provided?

a) Sliding Bearings b) Rocker and Roller bearing
c) Elastomeric bearing d) PTFE Bearings

77. In metalized painting at least 1 layer of coating must be apply with in ------- hours of blasting.

a) 4 b) 12
c) 24 d) 48

78. The equipments are used for inspection of welded bridges

a) Dye penetration kit b) Magnetic Crack Detector
c) Welding gauge d) All the above

79. The most common technique for repairs to fine cracks in masonry of bridges is _____.

a) Epoxy Grouting b) Cement Grouting
b) Both (a) & (b) d) None of these

80. CRN given for any component of a bridge not inspected during time of inspection is_____.

a) 0 b) 1
c) 5 d) 6

81. CRN given if any component of Bridge don't exist is _____.

a) 0 b) 1
c) 5 d) 6

82. At locations where replacing rivets is difficult ____ of appropriate dia and length may be used.

a) Unfinished bolts b) Ribbed bolts
c) Turned bolts d) None of these

83. After metallising first test shall be ___.

a) Zinc chromate primer
b) Aluminium primer
c) Both of a) and b)
d) Wash primer or Etch primer

84. ____ is used as lubricating the matting surface in case of PTFE bearing of olrder bridge.

a) Graphite grease
b) Silicon grease
c) Both a) and b)
d) None of these

85. The least digit of the URN indicates _____.

a) Foundation and flooring
b) ORN of bridge as a whole
c) Superstructure
d) None of these

86. In the case of sliding bearings, the girder is lifted a little over -------- and the bearing surfaces cleaned with kerosene oil and a mixture of black oil.

a) 6 mm
b) 12 mm
c) 18 mm
d) 24 mm

87. The guard rail is provided in bridges to

a) prevent derailment in bridges
b) prevent falling of vehicles during derailment
c) have good riding
d) guide the wheels

88. Minimum earth cushion required over RCC Box is

a) 300 mm
b) 600 mm
c) 0
d) 1000 mm

89. The diameter of hole for 20 dia rivet shall be

a) 23 mm
b) 18 mm
c) 21.5 mm
d) 22 mm

90. The minimum edge distance for rivets of diameter ‘d’ in steel plates shall be

a) 2 x d
b) 3 x d
c) 1.5 x d
d) 2.5 x d

91. For railway bridges with spans in excess of 30.5m, generally provided with

a) deck type girders
b) open web through girders
c) semi through girders
d) shallow type girders

92. The size of bridge timber required for the standard spans up to 18.3 m

a) 250 x 150mm
b) 250 x 180mm
c) 250 x 240mm
d) 250 x 200mm

93. In case of LWR track, full ballast section as specified in LWR Manual should be provided up to …….. from the bridge abutment.

a) 200 m
b) 50 m
c) 300 m
d) 100 m

94. Clear distance between consecutive sleepers not to exceed on bridges in BG is

a) 450 mm
b) 600 mm
c) 510 mm
d) 500 mm

95. Length of sleepers on BG Girder bridges should not less than

a) 2440 mm
b) 3660 mm
c) 3000 mm
d) 2600 mm

96. Minimum length of steel channel sleeper in BG

a) 2500mm
b) 2440mm
c) 2400mm
d) 2600mm

97. Length of bridge timber in BG

a) Outer to outer of girder plus 305mm
b) 2440mm
c) Whichever is more in a) & b)
d) Whichever is less in a) & b)

98. For painting, the unit of rate is per

a) Sqm
b) cum
c) 10sqm
d) 10cum

99. In case of derailment on the bridge, the extra rails provided over bridge to prevent damage and danger are known as

a) Stock rails
b) Guard rails
c) Check rails
d) Wing rails

100. The minimum cushion specified over an arch bridge is

a) 0.5m
b) 0.9m
c) 1.0m
d) 1.2m

101. Open web girders of span more than ..... metres are generally provided with camber

a) 10m
b) 20m
c) 30.5m
d) 35.2m

102. Depth of bridge timbers excluding notching should not be less than ..... mm for BG.

a) 100 mm
b) 125 mm
c) 150 mm
d) 200 mm

103. The clear distance between bridge timbers at joints should not exceed ..... mm both for BG and MG.

a) 250 mm
b) 200 mm
c) 180 mm
d) 150 mm

104. The top table of the guard rail for BG, MG, NG should not be lower that of the running rail by more than.....

a) 30 mm
b) 25 mm
c) 20 mm
d) 15 mm

105. On the bridge approaches, for a length of ..... m, PSC sleepers with arrangement for fixing guard rails should be provided irrespective of the type of sleepers in the track.

a) 80 m
b) 75 m
c) 100 m
d) 125 m

106. On the bridge approaches, for a length of about 100 m, width of cess should be ..... cm clear of full ballast section.

a) 50 cm
b) 70 cm
c) 90 cm
d) 100 cm

107. Paint is the mixture of .....

a) Binder, pigment & solvent
b) Binder & pigment
c) Pigment & solvent
d) None of these

108. Oil bath bearings are generally provided for girders of spans above_____m

a) 76.2
b) 45.7
c) 60
d) 30.5

109. Roller rocker bearings are provided in girders of span _____m and above

a) 30.5
b) 45.7
c) 18.3
d) 24.4

110. The channels get twisted symmetrically with regards to its axis

a) Parallel to web
b) Parallel to Flanges
c) Perpendicular to Flanges
d) Perpendicular to Web

111. Stiffeners are used in a plate girder

a) To reduce the compressure stress
b) To reduce the shear stress
c) To take the bearing stress
d) To avoid buckling of web plate

112. The minimum pitch of rivet holes of diameter ‘d’ should not be less than

a) d
b) 1.25d
c) 1.5d
d) 2.5d

113. Frequency of painting of steel girder bridges in coastal areas.

a) Every year
b) Once in 3 years
c) Once in 5 years
d) Once on 6 years

114. Frequency of painting of steel girder bridges in non coastal areas.

a) Every year
b) Once in 3 years
c) Once in 5 years
d) Once in 6 years

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अध्याय / Chapter – 4

Bridge Substructure & Superstructure

1. Free Board is the level difference between Formation Level and …….

   a) Rail Level
   b) HFL
   c) Bed Level
   d) Danger Level

2. Minimum Free Board required in a bridge is

   a) 1 m
   b) 1.20 m
   c) 600 mm
   d) 300 mm

3. Vertical Clearance (VC) in water way bridges is the level difference between

   a) HFL and Formation level
   b) Bed level and bottom of superstructure
   c) HFL and bottom of superstructure
   d) Rail level and Formation level

4. Depth of construction in a girder bridge means the depth from

   a) RL to HFL
   b) RL to top of bed block
   c) RL to bottom of bed block
   d) RL to Bed level

5. Skew of a bridge is the angle between

   a) C.L. of water course to C.L. of track
   b) C.L. of water course to C.L. of pier
   c) C.L. of water course/road to normal (perpendicular) of C.L. of track
   d) C.L. of abutment to C.L. of pier

6. Wing walls and return walls are provided to retain

   a) Earth on approaches
   b) Ballast
   c) Track on approaches
   d) None of these

7. The load transferred from rails to bottom flanges is in

   a) Deck type girder
   b) Through type girder
   c) Semi-through type girder
   d) Plate girder

   Para 628 of IRBM

8. The medium to transfer loads from superstructure to substructure is called

   a) Abutment
   b) Bed block
   c) Bearing
   d) Pier

9. One of the following is a shallow foundation

a) Pile foundation
b) Raft foundation
c) Under reamed pile foundation
d) Well foundation

10. Minimum vertical clearance (VC) for a slab/ girder bridges with discharge of 0-30 cumecs is

a) 300 mm
b) 1500 mm
c) 1800 mm
d) 600 mm

11. Maximum vertical clearance (VC) for a slab/ girder bridges with discharge above 3000 cumecs is

a) 300 mm
b) 1500 mm
c) 1800 mm
d) 600 mm

12. For end bearing piles, the minimum spacing of piles of diameter 'd' shall be

a) 3d
b) 2d
c) 2.5d
d) 5d

13. Weep holes are provided in

a) Piers
b) Trestle piers
c) Foundation
d) Abutments

14. At locations where access to the new bridge construction is available by rail, the launching of girders upto 18.3 m, which method is ideal?

a) Slew in slew out method
b) Gantry method
c) Launching of girders with the help of a BFR
d) Pantoon method

15. The function of the pier is

a) To take the dead & live load of intermediate spans
b) To protect the bank from erosion & guide the water flow
c) Both a & b
d) None of them

16. The function of the return wall & wing wall is

a) To retain the earth of approach bank
b) To protect the bank from erosion & guide the water flow
c) Both a & b
d) None of these

17. Well foundation may be only of the following type

a) Circular type
b) D type
c) Double D type
d) Any of them

18. Maximum tilt specified during sinking of well foundation is

a) 1 in 10
b) 1 in 50
c) 1 in 100
d) 1 in 150

19. In case of water crossing danger level

a) Speed restriction be imposed
b) Traffic be suspended till water recedes
c) Traffic be suspended till a responsible person inspects the site and declares it safe for running traffic
d) All of these

20. Bentonite is used in pile driving

a) to facilitate pile driving
b) to enable proper pile concreting
c) to stabilize the bore hole walls
d) none of these

21. In a route pile load test the test load is

a) 1.25 times the design load
b) 1.5 times the design load
c) 1.75 times the design load
d) None of these

22. When track is supported on top flange of girder, the structure is called as ....

a) Through bridge
b) Semi through bridge
c) Semi-deck bridge
d) Deck bridge

23. The rivets shank should be about _____mm less than the diameter of the drilled hole

a) 1.5
b) 1.0
c) 2
d) 0.5

24. Camber for plate girders un to 30.5m span is_____mm

a) 22.3
b) 0
c) 16.8
d) 14.6

25. A fillet weld may be termed as

a) Miter Weld
b) Concave Weld
c) Convex Weld
d) All the above

26. A fillet Weld where axis is parallel to the direction of the applied load in knows as

a) Diagonal filler weld
b) End Fillet Weld
c) Side fillet weld
d) All the above

27. On existing bridges where there is nothing solid between sleepers to prevent a derailed wheel dropping, the clear distance between two consecutive sleepers shall not exceed

a) 510 mm
b) 520 mm
c) 530 mm
d) 540 mm

28. The clear distance between the joint sleepers shall not, however, exceed …….. and that between the two consecutive sleepers ……. in all new constructions and in existing bridges when regirdering or carrying out through sleeper renewal.

a) 190 mm, 440 mm
b) 200 mm, 450 mm
c) 210 mm, 460 mm
d) 220 mm, 470 mm

29. Bridge sleepers resting outside to outside of girder flanges subject to a minimum of

a) 2420 mm
b) 2430 mm
c) 2440 mm
d) None of these

30. The minimum length of steel trough sleepers should be the distance outside to outside of girder flanges subject to a minimum of

a) 2410 mm
b) 2420 mm
c) 2430 mm
d) 2440 mm

31. Height of Road Over Bridges and Foot Over Bridges - Minimum height above rail level for a distance of 915mm on either side of the centre of track for overhead structures

a) 4875 mm
b) 4775 mm
c) 4675 mm
d) 4575 mm

32. Tunnels, through and semi-through girder bridges - Minimum distance of centre to centre of track for existing lines

a) 4195 mm
b) 4295 mm
c) 4395 mm
d) 4495 mm

33. Tunnels, through and semi-through girder bridges - Minimum distance of centre to centre of track for new works and alteration to existing works 4725 mm

a) 4925 mm
b) 4725 mm
c) 4525 mm
d) 4325 mm

34. Height of Over Head Structures – Minimum height above rail level for a width of 1600 mm on either side of centre of track, of a signal gantry or a foot over bridge in a passenger station

a) 6250 mm
b) 6240 mm
c) 6230 mm
d) 6220 mm

35. Angle of crossing of a bridge is the angle between

a) C.L. of water course/road to C.L. of track
b) C.L. of water course to C.L. of pier
c) C.L. of water course to normal (perpendicular) of C.L. of track
d) C.L. of abutment to C.L. of pier

36. In a single span bridge, the clear span is the distance between

a) Centres of Abutments
b) Inner faces of Abutments
c) Outer faces of Abutments
d) Width of Abutment

37. Sub structure of a bridge does not include

a) Abutment
b) Girder/Slab
c) Piers
d) Wing and Return walls

38. Super structure of a bridge includes

a) Girder/Slab
b) Abutment
c) Piers
d) Bed block

39. In shallow type girders, the rail level shall be

a) 25 mm above the top flange of girder
b) Near the bottom of the girder
c) Near the middle of the girder
d) Below the girder

40. The load transferred from rails to web of girders is in

a) Deck type girder
b) Through type girder
c) Semi-through type girder
d) Plate girder

41. Temporary staging for casting PSC Box Girder for a ROB over the Railway span shall be removed

a) After hardening of concrete
b) Before hardening of concrete
c) During concreting
d) After stressing the cables

42. The horizontal clearance of edge of foot over bridge structure from face of platform is

a) 6525 mm b) 3660 mm
c) 5330 mm d) 5300 mm

43. The vertical clearance of bottom most foot over bridge structure above rail level is

a) 6525 mm b) 3660 mm
c) 5330 mm d) 6250 mm

44. The minimum vertical clearance of foot over bridge gangway is

a) 2100 mm b) 3660 mm
c) 6525 mm d) 2710 mm

45. Steel channel sleepers are provided in bridges with superstructure of

a) PSC slab b) PSC girder
c) Steel girder d) RCC Box

46. The minimum vertical clearance above R.L. to bottom of ROB near the yard shall be

a) 6525 mm b) 5870 mm
c) 2360 mm d) 6250 mm

47. The minimum vertical clearance in RUB in rural area shall be

a) 5870 mm b) 6525 mm
c) 5000 mm d) 5500 mm

48. The minimum vertical clearance in RUB in urban area shall be

a) 5870 mm b) 6525 mm
c) 5000 mm d) 5500 mm

49. The embankment width in approach of the bridge shall be

a) 5870 mm b) 6525 mm
c) 6850 mm d) 6000 mm

50. Bearings are provided in bridges in order to

1. distribute the load from superstructure on a large area and to transfer to piers
2. allow the girder of the bridge to take free angular movement at the ends when loaded
3. allow free movement of girders due to temperature variations
4. prevent excessive damage to the bridge if any pier sink slightly

Of the correct versions are

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

51. Max angle of derrick should be _____ to the vertical

a) 45º b) 60º
c) 30º d) 75º

52. The rivets which are heated and then driven in the field are known as

a) Power driven shop rivet b) Power driven field rivets
c) Hand driven rivets d) Cold driven rivets

53. The gross Dia of a rivet is the diameter of

a) Cold rivet before driving b) Rivet after driving
c) Rivet hole d) None of these

54. The pressure on soil worked out shall be …… the SBC of the soil.

a) more than b) equal to
c) not equal to d) less than

55. …….. soil has the least SBC of the soil.

a) Hard moorum b) Stiff clay
c) Black cotton soil d) Soft rock

56. Testing of welds by

a) Dye penetrant test b) Magnetic particle inspection
c) Radiographic inspection d) All the above

57. Rebound hammer is used for

a) To find the strength of concrete b) To form rivet heads
c) To break the concrete structures d) None of the above

58. Ultrasonic Pulse Velocity test is meant for

a) Identifying the integrity of concrete b) Finding the strength of concrete
c) To know the crack in steel structure d) To know the flaw in rail

59. Speed restrictions is suggested for distressed bridges on Group I

a) Up to maximum of 15 kmph b) 25 kmph
c) 50 kmph d) 60 kmph

60. Speed restrictions is suggested for distressed bridges on Group II

a) Up to maximum of 15 kmph
b) 25 kmph to 50 kmph
c) 75 kmph
d) 60 kmph

61. Settlement of foundations or Tilted piers and abutments will be considered as distressed bridge of

a) Group I
b) Group II
c) Both of the above
d) None of the above

62. Progressive loss in camber of Prestressed concrete/ steel girders will be considered as distressed bridge of

a) Group I
b) Group II
c) Both of the above
d) None of the above

63. Cracks in return walls/ wing walls or Slight tilting/ bulging of abutments are the signs of distressed bridge under

a) Group I
b) Group II
c) Both of the above
d) None of the above

64. In arch bridges, Cracks/ lean/ bulge in parapet walls, Bulging or separation of spandrel from arch barrel, are the signs of distressed bridge under

a) Group I
b) Group II
c) Both of the above
d) None of the above

65. Speed restriction on Group I type of distressed bridges may be

a) Stop dead & 10 kmph
b) Up to 15 kmph
c) 15 to 25 kmph
d) Depends upon condition of bridge

66. Temporary arrangements for rebuilding of Railway bridges can be

a) Temporary diversion
b) Rail cluster
c) R. H. Girder
d) Any of them

67. Maximum speed for category 1 distressed bridge Is _____Kmph

a) 10
b) 15*
c) 20
d) 40

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अध्याय / Chapter – 5

Fabrication, Erection & Launching of Girder

1. Rail cluster, as temporary arrangement can be used upto a span of

   a) 3.66m b) 6.1m
   c) 12.2m d) 15.0m

2. The height gauge needs to be provided in

   a) ROB b) RUB
   c) FOB d) Fly Over

3. The temporary girders are generally required for the bridge works

   a) on traffic condition b) under mega block
   c) in cut and open method d) in new route

4. The BIS code for prestressing steel of plain hard drawn steel wire is

   a) IS:1785 (part I) b) IS:2090
   c) IS:6006 d) IS:226

5. The BIS code for prestressing steel of high tensile steel bar is

   a) IS:1785 (part I) b) IS:2090
   c) IS:6006 d) IS:226

6. The BIS code for prestressing steel of uncoated stress relived strand is

   a) IS:1785 (part I) b) IS:2090
   c) IS:6006 d) IS:226

7. A bridge having super structure with “Single or duplicate girders with cross sleepers on top flanges” is classified as

   a) RSJ girder bridge b) Cross Girder
   c) Deck plate girder d) Open web girder

8. Designated span to Restricted head (RH) girder is equal to

   a) Overall length b) C/C span
   c) Clear span d) None of these

9. Structural steel for railway loading above 0 ^{0}C temperature conforms to

a) IS 2062 grade A
b) IS 2062 grade B
c) IS 2062 grade C
d) None of these

10. What is the carriageway width of two lanes Road Over Bridge –

a) 8.0 m
b) 7.5 m
c) 7.00 m
d) 8.5 m

11. Weight of steel crib 75x75x10mm angles

a) 200kg
b) 187.2kg
c) 210kg
d) 185kg

12. The depth of 19.81 m long service girder is about……

a) 1.67 m
b) 1.16 m
c) 0.95 m
d) 1.52 m

13. Speed restriction required for using CC cribs as temporary arrangement is

a) 15kmph
b) 20kmph
c) 25kmph
d) 30kmph

14. Trestles can be used upto a height of

a) 6.1m
b) 10.5m
c) 12.2m
d) 18.3m

15. Dimensions of a plate girder are –

a) 851 mm X 851 mm
b) 355 mm X 254 mm
c) 851 mm X 254 mm
d) 551 mm X 254 mm

16. Ratio of dia of drum of the winch to the dia of the wire rope is _____

a) 10:1
b) 6:1
c) 12:1
d) 8:1

17. The standard length of steel Girder of span 6.1mtr. is____m

a) 6.83
b) 6.1
c) 6.70
d) 7.09

18. The standard length of steel Girder of span 9.15m is_____m

a) 9.75 b) 10.1
c) 10.2 d) 9.9

19. The standard length of Girder of span 12.2m is _____m

a) 12.9 b) 13.3
c) 13.0 d) 12.8

20. The standard length of steel Girder of span 30.5m is _____m

a) 32.45 b) 32.2
c) 33.45 d) 31.1

21. The standard weight of steel Girder of span 30.5m U/s is_____Tonnes

a) 111.454 b) 56.16
c) 42.16 d) 52.16

22. The standard weight of 50' reliving girder is _____Tonnes

a) 20.78 b) 18.78
c) 42.16 d) 16.78

23. The standard weight of steel Girder of span 45.7m U/s is____ Tonnes

a) 111.454 b) 91.454
c) 101.454 d) 42.16

24. The standard weight of steel Girder of span 61.0m U/s is

a) 111.454 b) 191.52
c) 89.454 d) 192.52

25. Shallow type girder can be used in

a) ROBs b) RUBs
c) FOBs d) None of the above

26. Under slung girders can be used in

a) Plain section b) Ghat section
c) Aquaduct d) Viaduct

27. The clear distance between consecutive sleepers laid over unballasted bridge on BG should not exceed

a) 300mm b) 400mm
c) 450mm d) 550mm

28. What is the clear distance between two consecutive bridge Timbers or Girder bridge?

a) 450 mm b) 510 mm
c) 500 mm d) 520 mm

29. What is the clear distance between two consecutive steel channel sleepers on Girder bridges?

a) 450 mm b) 510 mm
c) 500 mm d) 460 mm

30. Maximum centre to centre spacing of steel channel sleepers for BG is .... mm

a) 500 mm b) 620 mm
c) 740 mm d) 860 mm

31. The total cost of a bridge to be minimum

1. The span of the bridge should be equal to economic span
2. The cost of one pier should be equal to cost of main girders
3. The cost of one pier should be equal to cost of one abutment
4. The cost of one girder should be equal to cost of roadway slab

Of the correct statements are

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

32. Steel with carbon content of 0.10% to 0.25% is called

a) Medium carbon steel b) Mild steel, low carbon steel
c) Extra hard steel d) High carbon steel

33. Steel with carbon content of 0.26% to 0.60% is called

a) Medium carbon steel b) Mild steel, low carbon steel
c) Extra hard steel d) High carbon steel

34. Steel with carbon content of 0.60% to 1.25% is called

a) Medium carbon steel b) Mild steel, low carbon steel
c) Extra hard steel d) High carbon steel

35. Steel with carbon content of over 10.25% is called

a) Medium carbon steel
b) Mild steel, low carbon steel
c) Extra hard steel
d) High carbon steel

36. With a percentage increases on carbon in steel decreases

a) Strength
b) Hardness
c) Brittleness
d) Ductility

37. The Indian Standard Code which deals with steel structures in

a) IS:875
b) IS:800
c) IS: 456
d) IS:1893

38. As per RDS0"s instructions, additional anchor bolts required for running 25 T axle load trains on KR, RV Line and KK line = .

a) 4 Nos. per span
b) 6 Nos. per span
c) 8 Nos. per span
d) None of these

39. Indian standard specification for structural steels is _____.

a) IS 126
b) IS 226
c) IS 326
d) IS 426

40. Indian standard specification for Galvanized sheets steel is _____.

a) IS 273
b) IS 275
c) IS 277
d) IS 279

41. The steel channel sleeper designed by RDSO bearing Drg. No._____is suitable for BG and MG.

a) RDS0/B-1636
b) RDS0/B-1536
c) RDS0/B-1436
d) RDS0/B-1336

42. In steel channel sleeper the rolling and cutting tolerances shall be in accordance with_____.

a) IS: 1252
b) IS: 1452
c) IS: 1652
d) IS: 1852

43. As per extent RDS0's instruction, in girder bridges normal saddle bolts are to be replaced by _____ of property class 66.

a) Higher strength bolts
b) Ribbed bolts
c) Turned bolts
d) None of thses

44. Camber for RBG through steel girder of span 30.5m is_____mm

a) 22.3 b) 41.5
c) 20.3 d) 18.4

45. Camber for RBG through steel girder of span 45.7m is _____mm

a) 22.3 b) 41.5
c) 43.5 d) 54.9

46. Camber for RBG through steel girder of span 60.1m is _____mm

a) 22.3 b) 41.5
c) 54.9 d) 56.9

47. Economical span for masonry arch bridges are

a) 3 m to 15 m b) 1 m to 3 m
c) 6 m to 15 m d) 1 m to 6 m

48. Economical span for girder and beam bridges are

a) 20 m to 90 m b) 12.2 m to 90 m
c) 10 m to 60 m d) 10 m to 90 m

49. Economical span for slab bridges are

a) Up to 6 m b) Up to 9 m
c) Up to 12 m d) Up to 15 m

50. Economical span for truss bridges (simply supported) are

a) 30 m to 600 m b) 20 m to 375 m
c) 60 m to 375 m d) 30 m to 375 m

51. Economical span truss bridges (combination of simply supported and cantilever) are

a) Up to 350 m b) Up to 450 m
c) Up to 550 m d) Up to 650 m

52. Economical span for cable stayed bridges are

a) 200 m to 600 m b) 300 m to 600 m
c) 200 m to 800 m d) 300 m to 800 m

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अध्याय / Chapter – 6

River Training & Protection Work

1. In Girder and Slab Bridges Danger level should be marked below bottom of girders/slabs for water way is > 6.10 < 12.2 m

   a) 300 mm b) 600 mm
   c) 450 mm d) 500 mm

2. In Girder and Slab Bridges Danger level should be marked below bottom of girders/slabs for water way is > 12.20 < 30.5 m

   a) 300 mm b) 600 mm
   c) 500 mm d) 450 mm

3. For Box Culverts Danger level is to be taken as

   a) At the top of slab b) One third height below bottom of slab
   c) At the bottom of slab d) None of the above

4. The danger level should be marked with a bright red band …… wide centrally over a white band …… wide for a length of……

   a) 5 cm, 10 cm, 60 cm b) 10 cm, 20 cm, 60 cm
   c) 15 cm, 30 mm, 60 cm d) None of the above

5. Permitted wind velocity for running of trains on the bridge

   a) 72 km/h b) 58 km/h
   c) 64 km/h d) No limits

6. Flood level gauge to be marked in

   a) All important bridges b) All major bridges
   c) All minor & major bridges d) All bridges

7. Velocity of water can be measured by

   a) Anemo meter b) Elco meter
   c) Current meter d) Thermo meter

8. The danger level for small arch bridges of span less than 4.0 m is at

   a) Top of inside of pipe b) Springing level
   c) Bottom of slab d) None of these

9. The danger level for box culverts is

a) Top of slab
b) 2/3rd height
c) Bottom of slab
d) None of these

10. The danger level for pipe culverts is

a) Top of inside of pipe
b) 2/3rd of dia of pipe
c) Top of parapet wall
d) None of these

11. Pipe culvert is a/an

a) Major bridge
b) Minor bridge
c) Unimportant bridge
d) Important bridge

12. Danger Level & High Flood Level of bridge is painted on side of Abutment or Pier?

a) Down stream side
b) Up stream side
c) Centre of Pier/Abutment
d) None of the above

13. Where there is no past history of damage or serious threat to bridges having span > 30.5m < 61.00m the Danger Level will be fixed at _____mm below bottom of girder.

a) 600
b) 750
c) 1000
d) 1200

14. In which case Danger Level fixed at a distance 1200 mm from bottom of girder?

a) For span < 6.10 m
b) For span > 6.10 m < 12.20 m
c) >12.20 m < 30.50 m
d) > 61.0 m

15. The limiting wind velocity should be specified by the Chief Engineer should not exceed ____Kmph in case of bridges.

a) 72
b) 75
c) 78
d) None of these

16. The size of danger level mark on bridges is _____.

a) Bright red bond 5 cm wide centrally over a white bond 10 cm wide for a length of 60 cms
b) Bright red bond 5 cm wide centrally over a white bond 10 cm wide for a length of 40 cms
c) Bright red bond 5 cm wide centrally over a white bond 10 cm wide for a length of 20 cms
d) Bright red bond 5 cm wide centrally over a white bond 10 cm wide for a length of 10 cms

17. For design and construction of guide bunds/launching aprons reference may be made to

a) IS: 10751-1983 and IRC: 89-1985 b) IS: 10751-1985 and IRC: 89-1987
c) IS: 10751-1987 and IRC: 89-1989 d) IS: 10751-1989 and IRC: 89-1991

18. The streams which have narrow and deep cross section with very steep bed slopes are known as

a) Upper reaches (Mountainous) b) Submontane reaches (Foot hills)
c) Quasi-alluvial reaches (Trough) d) Tidal reaches

19. The rivers in Submontane Reaches (Foot Hills) have a flatter bed slopes generally form

a) 1 in 25 to 1 in 250 b)1 in 50 to 1 in 500
c) 1 in 75 to 1 in 750 d) None of these

20. To reduce the erosive action on the marginal bund

a) Suitable slope protection with boulders or concrete slabs
b) Adequate toe protection in the form of two rows of in-situ concrete blocks or boulders in wire crates
c) Boulders in wire crates forming flexible type apron may be provided
d) All of these

21. The bed slope in Quasi-Alluvial Reaches (Trough) varies from

a) 1 in 125 to 1000 b) 1 in 250 to 1500
c) 1 in 500 to 2000 d) 1 in 500 to 1 in 2,500

22. The river bed slope in Alluvial Reaches varies from

a) 1 in 2,500 to 1 in 25,000 b) 1 in 2,000 to 1 in 20,000
c) 1 in 1,500 to 1 in 15,000 d) 1 in 1,000 to 1 in 10,000

23. The guide bund can either be

a) divergent upstream or parallel b) convergent upstream or parallel
c) divergent downstream or parallel d) convergent downstream or parallel

24. ----------are meant to confine and guide the river flow through the structure without causing damage to it and its approaches.

a) Marginal Bunds b) Closure Bunds
c) Guide bunds c) All of these

25. ---------- is a structure constructed transverse to the river flow and is projected form the bank into the river.

a) spur/groyne
b) Marginal Bunds
c) Closure Bunds
d) Assisted cut offs

26. Spurs may be classified as

a) repelling (deflecting)
b) attracting
c) neutral (sedimenting)
d) all of these

27. Repelling (deflecting) spurs are those which incline upstream at an angle of ---------- to the river course and deflect the current towards the opposite bank.

a) 30 degree to 60 degree
b) 60 degree to 70 degree
c) 70 degree to 90 degree
d) None of these

29. The space between spurs or groynes generally bears a definite ratio to their length. The common practice is to keep the spacing at about ---------- so as to effectively protect the bank.

a) 1 to 1.5 times the length
b) 1.5 to 2 times the length
c) 2 to 2.5 times the length
d) 2.5 to 3 times the length

30. The side slope of spurs are generally

a) 2:1
b) 2.5:1
c) 3:1
d) None of these

31. ---------- are provided to contain the spread of the river when the river in flood spills over its banks upstream of the bridge site over wide area and likely to spill in the neighbouring water courses or cause other damages.

a) Closure bunds
b) Guide bunds
c) Spur/Groney
d) Marginal bunds

32. Marginal bunds should be inspected ----------along with the annual bridge inspection and necessary repairs should be carried out before the onset of monsoon.

a) Every six month
b) Every year
c) Every two year
d) None of these

33. Sometimes it may be necessary to entirely block one or more channels of the river in order to prevent the discharge of such channels developing into a main river channel after the construction of the bridge. This is done by providing

a) Closure bund
b) Guide bunds
c) Marginal bunds
c) None of these

34. Flood level gauge to be marked

a) commencing from bed level to top
b) commencing from bottom of girder towards bed level
c) commencing from Rail level
d) commencing from Danger level

35. The minimum height of embankment above the highest flood mark in the area should be----

a) Zero
b) 30 cm
c) 100 cm
d) 60 cm

36. When the railway crosses a deep valley without perennial water, it is called ....

a) Aqueduct
b) Cause way
c) Via-duct
d) River crossing

37. ____ is used to measure depth of water.

a) Water meter
b) Elcometer
c) Echo sounder
d) None of these

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अध्याय / Chapter – 7

Plant/ Machinery & Training for Bridge Staff

1. The Engineering reserve will include items of plant and machinery of

   a) Light Plant
   b) Heavy Plant
   c) Special Plant
   d) All of these

2. Controlling officials nominated for Engineering plant Reserve of the Engineering Workshop

   a) Deputy Chief Engineer
   b) Works Manager
   c) Both a) and b)
   d) None of these

3. The maximum financial limit for the Engineering plant Reserve is fixed for each railway by

   a) Railway Board
   b) Zonal Railways
   c) Both of a) and b)
   d) None of these

4. Special plant includes

   a) Cranes steam or diesel above 5 tonne
   b) Service girders (spans) and steel work such as CC crib, trestles etc. for emergencies
   c) Materials required for maintenance and overhauling of plant and tools
   d) All of these

5. Heavy plant includes

   a) Dredgers
   b) Plant Oxy-acetylene
   c) Blowers, Concrete mixers
   d) Both b) and c)

6. Light plant includes

   a) Dredgers
   b) Plant Oxy-acetylene
   c) Blowers, Concrete mixers
   d) Both b) and c)

7. The value of serviceable plant and machinery rendered surplus on a particular project or railway and transferred to another project or railway or to the Engineering plant reserve should be fixed by the Engineer concerned in consultation with the

   a) Section Officer concerned
   b) Account Officer concerned
   c) Both of a) and b)
   d) None of these

8. The charges for depreciation to allow for valuation of Light plant, Heavy plant and Special plant are respectively as

a) 16%, 10% and 6%
b) 6%, 10% and 16%
c) 10%, 16% and 6%
d) 6%, 16% and 10%

9. The allocation of cost of inspection and repairs to plant to bring it to a fully serviceable condition should be determined in accordance with------

a) Para 1918 S
b) Para 1198 S
c) Para 1189 S
d) Para 1981 S

10. Plant that is not likely to be required for current railway works may with the approval of the----------, be hired out to other Government Departments, private bodies or Contractors provided that it is used in the interest of public service and handled by competent staff.

a) Deputy Chief Engineer
b) Chief Engineer
c) Both of a) and b)
d) None of these

11. Second hand value of a plant _____ if R=Present day price, N=Age of plant, L=Average life of the plant, S=The scrap value (Previously estimated).

a) R x N/L x (R-S)
b) R x L/N x (R-S)
c) R x N/L x (L-S)
d) None of these

12. The Boiler maker / Chargeman shall examine the boiler as soon as possible after it has been laid off, and arrange for requisite repairs; and thereafter he will examine it-------.

a) every 9 months
b) every 6 months
c) every 3 months
d) None of these

13. The outside of the boiler shall be

a) Painted with red lead
b) Coated with boiled oil
c) Both a) or b)
d) None of these

14. No boiler which has been laying out of use for----------, shall be put into commission until it has been tested at site by hydraulic pressure by the Boiler Inspector and a fresh certificate has been issued.

a) three months or over
b) six months or over
c) nine months or over
d) twelve months or over

15. Boilers when not in use for a limited period of not exceeding ---------should be filled with water right upto the top.

a) forty days b) thirty days
c) twenty days d) ten days

16. The assumed life of all machines when not otherwise stated shall be taken as

a) 25 years b) 15 years
c) 5 years d) None of these

17. Debit for hire charges on plant and staff against departmental requisitions should include

a) Plant and Stores b) Wages of staff
c) Both of a) and b) d) None of these

18. Bridge staff need to be trained for their jobs through ---------- using the tools, equipments and machinery.

a) theoretical class room training b) practical work at site
c) both a) and b) d) None of these

19. Training courses organized in the Railway Training Institutes.

a) Initial courses b) Promotional courses
c) Refresher courses d) All of these

20. Initial course for Bridge Khalasis/ H.S.Grade II/Artisans at the Centralised Training School of the Zonal Railway under the direction of a Bridge Inspector should be of

a) Three month duration b) Two month duration
c) One month duration d) None of these

21. Initial course for Apprentice Bridge Inspectors at the Zonal Training school will be of

a) Three month duration b) Two month duration
c) One month duration d) None of these

22. The duration of the course for the training of promotion to Bridge Mistries at the Centralised Training School of the Zonal Railway will be ------

a) Two weeks b) Four weeks
c) Six weeks d) Eight weeks

23. The training for promotion from Bridge Mistries to Bridge Inspectors / Grade III at the Zonal Training School will be for a period of ----------

a) Six weeks
b) Eight weeks
c) Ten weeks
d) Twelve weeks

24. Bridge Mistries and Bridge Inspectors should be sent for Refresher courses once in

a) Two years
b) Three years
c) Four years
d) Five years

25. The courses arranged for Bridge Inspectors periodically to increase a sense of awareness amongst them are

a) Special courses
b) Refresher courses
c) Promotional courses
d) Initial courses

26. Qualified men will be entitled to promotion by seniority within their own groups. The normal procedure for promotion should be by ……..

a) Trade test
b) Interview
c) Recommendation
d) Random selection

***

Answers for Chapter – 1

BACK TO CHAPTER

1.	c)	2.	a)	3.	a)	4.	c)
5.	a)	6.	a)	7.	b)	8.	b)
9.	b)	10.	c)	11.	c)	12.	b)
13.	b)	14.	d)	15.	d)	16.	a)
17.	a)	18.	b)	19.	d)	20.	c)
21.	a)	22.	a)	23.	d)	24.	d)
25.	a)	26.	b)	27.	d)	28.	b)
29.	d)	30.	b)	31.	a)	32.	c)

Answers for Chapter – 2

BACK TO CHAPTER

1.	d)	2.	c)	3.	a)	4.	d)
5.	c)	6.	c)	7.	a)	8.	a)
9.	b)	10.	c)	11.	c)	12.	d)
13.	c)	14.	d)	15.	b)	16.	c)
17.	c)	18.	c)	19.	b)	20.	c)
21.	c)	22.	b)	23.	a)	24.	a)
25.	d)	26.	d)	27.	b)	28.	a)
29.	c)	30.	b)	31.	d)	32.	b)
33.	c)	34.	c)	35.	d)	36.	b)
37.	a)	38.	d)	39.	b)	40.	a)
41.	b)	42.	a)	43.	b)	44.	d)
45.	b)	46.	c)	47.	a)	48.	a)
49.	b)	50.	b)	51.	c)	52.	a)
53.	a)	54.	b)	55.	c)	56.	b)

57.	a)	58.	a)	59.	b)	60.	c)
61.	d)	62.	a)	63.	c)	64.	a)
65.	d)	66.	a)	67.	a)		

Answers for Chapter – 3

BACK TO CHAPTER

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

81.	d)	82.	c)	83.	d)	84.	b)
85.	b)	86.	a)	87.	b)	88.	c)
89.	c)	90.	c)	91.	b)	92.	a)
93.	d)	94.	a)	95.	a)	96.	b)
97.	c)	98.	c)	99.	b)	100.	c)
101.	c)	102.	c)	103.	b)	104.	b)
105.	c)	106.	c)	107.	a)	108.	a)
109.	a)	110.	b)	111.	d)	112.	d)
		113.	b)	114.	d)		

Answers for Chapter – 4

BACK TO CHAPTER

1.	b)	2.	a)	3.	c)	4.	b)
5.	c)	6.	a)	7.	b)	8.	c)
9.	b)	10.	d)	11.	c)	12.	c)
13.	d)	14.	c)	15.	c)	16.	c)
17.	d)	18.	c)	19.	c)	20.	c)
21.	b)	22.	d)	23.	a)	24.	b)
25.	d)	26.	c)	27.	a)	28.	b)
29.	c)	30.	d)	31.	a)	32.	d)
33.	b)	34.	a)	35.	a)	36.	b)
37.	b)	38.	a)	39.	a)	40.	c)
41.	d)	42.	b)	43.	a)	44.	d)
45.	c)	46.	a)	47.	c)	48.	d)
49.	c)	50.	d)	51.	a)	52.	d)

53	b)	54.	d)	55.	c)	56.	d)
57.	a)	58.	a)	59.	a)	60.	b)
61.	a)	62.	a)	63.	b)	64.	b)
65.	b)	66.	d)	67.	b)		

Answers for Chapter – 5

BACK TO CHAPTER

1.	a)	2.	b)	3.	a)	4.	a)
5.	b)	6.	c)	7.	c)	8.	a)
9.	b)	10.	b)	11.	b)	12.	b)
13.	b)	14.	a)	15.	c)	16.	a)
17.	d)	18.	c)	19.	b)	20.	a)
21.	c)	22.	d)	23.	a)	24.	b)
25.	b)	26.	b)	27.	c)	28.	b)
29.	a)	30.	c)	31.	b)	32.	b)
33.	a)	34.	d)	35.	c)	36.	d)
37.	b)	38.	a)	39.	b)	40.	c)
41.	a)	42.	d)	43.	a)	44.	a)
45.	b)	46.	c)	47.	a)	48.	b)
49.	b)	50.	d)	51.	c)	52.	b)

Answers for Chapter – 6

BACK TO CHAPTER

1.	c)	2.	b)	3.	c)	4.	a)
5.	a)	6.	a)	7.	c)	8.	b)
9.	c)	10.	a)	11.	b)	12.	a)
13.	b)	14.	d)	15.	a)	16.	a)

17.	a)	18.	a)	19.	b)	20.	d)
21.	d)	22.	a)	23.	a)	24.	c)
25.	a)	26.	d)	27.	b)	29.	c)
30.	a)	31.	d)	32.	b)	33.	a)
34.	b)	35.	d)	36.	a)	37.	c)

Answers for Chapter – 7

BACK TO CHAPTER

1.	d)	2.	c)	3.	a)	4.	d)
5.	a)	6.	d)	7.	b)	8.	a)
9.	a)	10.	b)	11.	a)	12.	c)
13.	c)	14.	b)	15.	d)	16.	b)
17.	c)	18.	c)	19.	d)	20.	c)
21.	b)	22.	c)	23.	a)	24.	d)
		25.	a)	26.	a)		

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संदर्भ / REFERANCE

1.	Indian Railways Bridge Manual 1998
2.	Manual of Instructions on Long Welded Rails 1996 (Second Reprint 2005)
3.	Bridge Rules 1941 (Second Reprint 2008)
4.	Indian Railways Permanent Way Manual (Second Reprint 2004)
5.	RDSO's Technical Handbook on Bridge Inspection & Maintenance Nov.2017
6.	RDSO and IRICEN Publications on Bridge & Structures

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टिप्पणी / NOTES

गुणवत्ता नीति

रेलों में यात्री और माल यातायात की बढ़ती माँग को पूरा करने के लिए गुणवत्ता प्रबंध प्रणाली में अनुसंधान, डिज़ाइनों और मानकों में उत्कृष्टता तथा सतत सुधारों के माध्यम से सांविधिक और नियामक अपेक्षाओं को पूरा करते हुए सुरक्षित, आधुनिक और किफ़ायती रेल प्रौद्योगिकी का विकास करना।

QUALITY POLICY

To develop safe, modern and cost effective Railway technology complying with Statutory and Regulatory requirements, through excellence in Research, Designs & Standards and Continual improvements in Quality Management System to cater to growing demand of passenger and freight traffic on the Railways.

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हमारा उद्देश्य

अनुरक्षण प्रौद्योगिकी और कार्यप्रणाली को उन्नयन करना तथा उत्पादकता और रेल्वे की परिसंपत्ति एवं जनशक्ति के निष्पादन में सुधार करना जिससे अन्तर्विषयों में विश्वसनीयता, उपयोगिता और दक्षता प्राप्त की जा सके।

यदि आप इस संदर्भ में कोई विचार और सुझाव देना चाहते हों तो कृपया हमें इस पते पर लिखें।

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Our Objective

To upgrade Maintenance Technologies and Methodologies and achieve improvement in productivity and performance of all Railway assets and manpower which inter-alia would cover Reliability, Availability, and Utilisation.

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