

**QUESTION PAPER FOR SELECTION CIVIL ENGG AENs (GROUP B)
EAST COAST RAILWAY CIVIL ENGINEERING DEPARTMENT
AGAINST 70% VACANCIES**

(One Paper on Professional subject, Establishment and Financial Rules)

PART-A PROFESSIONAL SUBJECTS

Max Marks : 100

Answer any five questions from Part-A. All the questions in Part-A carry equal marks.

Q.1 Write short notes on any five of the following: [5x4=20]

- a) Annual track maintenance programme for concrete sleeper track
- b) Pre-tamping & post-tamping activities
- c) Toe Load Measurement
- d) Measurement of ballast
- e) Protection of work sites
- f) Monsoon patrolling and patrol charts
- g) Gang strength review
- h) Elastic fastenings

Q.2 a) Answer any five of the following: [5x2=10]

- i) What is the nominal gauge of track ballast?
- ii) On which locations ERC-J clips are used?
- iii) What is maximum percentage of machine-crushed ballast that may pass 20mm square mesh sieve?
- iv) What is the approximate weight of 1 T-km of 60 kg rail?
- v) What is the medical category for Gatekeepers?
- vi) What is the frequency of refresher course for PWIs?
- vii) On what track parameter the TGI value depends most?
- b) Draw the Bending Moment and Shear force diagram of a 6m effective span simply supported beam having a uniformly distributed load of 0.6 t/m and a concentrated load of 5t at the center.

Q.3 a) Explain the procedure of conducting distressing of a LWR track. [10]

b) What are the works that require CRS's sanction?

Q.4 a) Indian Railway's Schedule of Dimensions (BG track) [10]

- i) Maximum clearance of check rails in level crossings
- ii) Maximum radius of curvature of BG track in meter
- iii) Horizontal distance of C/L of track from platform coping
- iv) Minimum clearance of check rails in curve
- v) Steepest gradient at a station yard without provision of a slip siding
- b) What the painting scheme for girders in Bridges on Indian Railways? Describe separately for areas where corrosion is severe as well as for areas where corrosion is not severe.

Q.5 Write the full form of the following abbreviations with a short note against each(not exceeding 10 words) [20x1=20]

- i) GCC ii) RRI iii) SEJ iv) ERC
 - v) TRT vi) USFD vii) SMB viii) GMT
 - ix) SOD x) G&SR xi) TRD xii) DMT
 - xiii) RAT xiv) RAW xv) ZMF xvi) CRS
 - xvii) SI PLAN xviii) DBM xix) HFL xx)
- IRICEN**

Q.6 a) What are the duties and responsibilities of an Assistant Engineer in charge of an open line sub-division? [10]

b) You are the first officer to arrive at the site of serious accident involving casualties. Describe the various actions that will be taken by you, and in what order?

Q.7 A 6m span single line girder bridge is required to be rebuilt as a RCC Box culvert. The height of embankment is 4 meters. Describe with sketch the methodology to be adopted including the temporary arrangements for execution of the work under traffic. [20]

Q.8 a) What do you understand by yielding formation? What are the types of [10] embankment failures? What remedial measures will you suggest for improving a yielding formation?

b) Based upon the track recording car results, the track is classified into A, B, C &

D categories. Bring out the limits of defects for various categories. What measures will you take to improve TRC results on your track? [10]

PART-B-FINANCE

MAX MARKS-15

Q.9 Chose the correct answer to the following questions (attempt all) (5x2=10)

a) Whitewashing of staff quarters gets charged to the following revenue allocation:

- i) J-550
- ii) B-200
- iii) B-700
- iv) None of above

b) As per CVC's recent guidelines negotiations are to be held with

- i) All the valid tenders
- ii) L-1 only
- iii) L-1 & L-2 only
- iv) Not to be held at all

c) Hidden measurements are required to be test checked by AEN upto:

- i) 20%
- ii) 50%
- iii) 100%
- iv) Not required

d) Ballast measurements are required to be test checked by AEN upto:

- i) 20%
- ii) 50%
- iii) 75%
- iv) 100%

e) Repairs and maintenance works can be carried out departmentally or through zonal or other contractual agencies without a sanctioned estimate so long as the value does not exceed.

- i) Rs.20,000/-
- ii) Rs.50,000/-
- iii) Rs.75,000/-
- iv) Rs.1,00,000/-

Q.10 Answer any one of the following:[1x5=5]

a) What are the various types of tenders? What are the circumstances under which various types of tenders are required to be called?

b) What is imprest cash? Under what circumstances expenditure can be incurred from the imprest cash?

c) What are the responsibilities of an AEN with regard to checking of contractors' bills?

PART-C ESTABLISHMENT & RAJBHASA

Max marks-35

Answer all questions in part-C

Q.11 Write short notes on any three of the following: [3x5=15]

- a) HOER
- b) Muster Sheet
- c) D&A Rule
- d) Section 3(3) of Official language Act
- e) Facilities available in Railway to learn Rajbhasa

Q.12 Write short notes on any three of the following: [3x5=15]

- a) Permanent Negotiation Machinery
- b) PREM
- c) Service sheets
- d) Material-at Site Account
- e) Zonal contract

Q.13 Write short notes on any two of the following: [2x2.5=5]

- a) Organisation of the Railways
- b) Minimum Wages Act]
- c) Wage period

- i) Demand No.3
- ii) Demand No.4
- iii) Demand No.11
- iv) Demand No.15
- d) Track renewal works get charged to:
 - i) DRF
 - ii) DF
 - iii) OLWR
 - iv) CAP
- e) Cambers in girders are provided to:
 - i) Compensate for deflection under load
 - ii) Enable trains to negotiate curved alignment
 - iii) Keep allowance for loss of section due to corrosion
 - iv) None of above.
- f) The shelf life of paint Red lead ready mixed is:
 - i) 2 Months
 - ii) 4 Months
 - iii) 6 Months
 - iv) 9 Months
- g) The Condition Rating Number(CRB) of a bridge component requiring immediate rebuilding/rehabilitation is:
 - i) 0
 - ii) 1
 - iii) 3
 - iv) 5
- h) The percentage of steel work & bearings of all girders having clear span 12.2m and above that is required to be inspected in detail by the BRI every year is:
 - i) 10%
 - ii) 20%
 - iii) 25%
 - iv) 33.3%
- i) A medium to high workability of concrete is indicated by a slump of :
 - i) 0-25mm
 - ii) 25-50mm
 - iii) 50-100mm
 - iv) 100-175mm
- j) A wheel flange has a "Sharp Flange" if the flange tip radius is:
 - i) More than 5mm
 - ii) Less than 5mm
 - iii) More than 10mm
 - iv) Less than 10mm
- k) The speed restriction required to be imposed at a LC when check rails are removed for overhauling/TT Machine working is :
 - i) 75 kmph
 - ii) 50 kmph
 - iii) 30 kmph
 - iv) 15 kmph
- l) The chapter in IRPWM that deals in maintenance of permanent way is:
 - i) Chapter-I
 - ii) Chapter-II
 - iii) Chapter-III
 - iv) Chapter-IX
- m) Minimum radius of curve for BG track is:
 - i) 775 m
 - ii) 575 m
 - iii) 275 m
 - iv) 175 m
- n) For Thermit Welding the maximum lateral misalignment allowed measured on 1.0m straight edge is:

- i) +/- 0.2mm
- ii) +/- 0.3mm
- iii) +/- 0.4mm
- iv) +/- 0.5mm

PART-B FINANCE

Max. Marks-15

16 Answer any three of the following questions (all questions carry equal marks) :

- a) What are the various types of estimates? Write short notes against each indicating the stage at which these are framed.
- b) How is a 'Material at site account' maintained? Mention the daily records that are required to be maintained, and the returns that are required to be submitted.
- c) What is a labour pay sheet? How is it prepared and what the checks that are required to be exercised by the supervisor in charge?
- d) What are the checks required to be exercised by an AEN on a contractor's bill.
- e) What is the difference between Earnest Money and Security Deposit? In what form can security deposit be accepted from a contractor?

PART-C (ESTABLISHMENT & RAJBHASA)

Answer all questions in Part-c

Q.17 Write short notes on any three of the following:

- a) Payment of wages Act
- b) Workmen's Compensation Act
- c) Distinctions between Substitute and Casual Labour
- d) Section 3(3) of Official Language Act
- e) Facilities available in Railway to learn Rajbhasa

Q.18 Answer any three of the following:

- a) What is the meaning of 'Family' and 'Dependent relatives' for the purpose of Pass Rules? What is the period of availability of privilege pass?
- b) What is meant by suspension? When and under what circumstances a Railway servant may be placed under suspension?
- c) What are the rules for grant of commuted leave?
- d) When an employee of a railway is classified as an Intensive Worker and when as an Essentially Intermittent Worker?
- e) What are the rules for appointments on compassionate ground?

Q.19 Write short notes on any two of the following

- a) Muster sheet
- b) Service Sheet
- c) Wage Period
- d) Master Craftsman

Q.20 a) What do you understand by distressing of LWR? When does it become necessary to distress a LWR panel and how is the operation carried out?

b) Define "Mean temperature" and "Destressing temperature" in the context of LWER track. Indicate the approximate values for the same in the area you are working.

Q.21 a) You are the first officer to arrive at the site of a passenger train accident involving casualties. List the various actions you would be taking in order of priorities.

b) At what GMT carried 60kg 90 UTS and 52kg 90UTS rails are planned for renewal? What are the GMT prescribed for planning rail renewals on bridge proper and on 100m approaches of important bridges?

Q.22 a) What do you understand "Catch Siding" and "Slip Siding"? Comment as to why and when are they considered necessary?

b) what is a transition curve and why is it necessary? What are the various factors based on which transition curves are designed for BG Railway track?

Q.23 a) What do you understand by (a) Thin Flange, (b) sharp Flange and (c) Deep Flange? Differentiate with sketches of each type of three defects.

b) What is buckling of track? What are the precautions required to be taken to avoid buckling of track? What action would you take to restore traffic once a buckling has taken place?

Q.24 a) What is Need Based concept for USFD testing of rails? What are the stipulated frequencies for A, B & D routes of BG for various traffic densities?

b) List the various actions you would consider necessary to reduce rail fractures

and weld failures.

Q.25 a) What do you understand by TGI value? What would you consider an excellent TGI value? List the attentions that are required to be rendered to improve TGI value of a track.

b) A curve of 600m radius has a limited transition of 40m length. Calculate the maximum permissible speed and super elevation.

Q.26 Answer any 5 of the following questions.

a) Minimum radius for LWR at curve is

i) 175m

ii) 350m

iii) 440m

iv) 500m

b) A satisfactory Ride Index for a long distance express train is

i) 2.5

ii) 4.0

iii) 5.0

iv) 6.0

c) Laid down frequency for track Recording on 'B' route is

i) 2 months

ii) 3 months

iii) 4 months

iv) 6 months

d) Unevenness is measured on a chord of

i) 2.5m

ii) 3.6m

iii) 7.2m

iv) 7.5m

e) For category-I level crossings, the TVU and the Road Vehicles are both more than

i) 6000 & 180 respectively

ii) 6000 & 120 respectively

iii) 3000 & 180 respectively

iv) 3000 & 120 respectively

f) For category-I level crossings, the TVU and the Road Vehicles are both more than

i) 2 years

ii) 3 years

iii) 4 years

iv) 5 years

g) The stipulated frequency for Refresher Course of a PWM is

i) 2 years

ii) 3 years

iii) 4 years

iv) 5 years

h) The future maximum speed of 'B' routes is

i) 160 kmph

ii) 130 kmph

iii) 110 kmph

iv) 105 kmph

Q.27 a) What is camber in steel girders and why it is provided? What factors are attributed to loss of camber?

b) List a few important points that are to be kept in mind while erecting a sleeper crib. Upto what clear spans rail clusters may be used?

Q.28 a) Make out a scheme for relieving a 10 ft clear span Arch Bridge having a surcharge of 2m. The bank height is 6m.

b) What are the approved painting schemes for steel girders? What are the laid down painting schedules for coastal and non-coastal areas? List a few checks that you would exercise to ensure proper quality of painting.

Q.29 Give the full form any 10 of the following abbreviations:

a) PQRS b) ARM c) PNM d) BCm

- e) ECORSC f) PCDO g) SMB h) ART
- i) BOD j) PSC k) UTS l) RLT

Q.30 a) List the names of all the Railway Zones with their Zonal headquarters

b) Name the present incumbents of the following posts in East Coast Railway.

- a) General Manager
- b) Chief Operations Manager
- c) Chief Engineer
- d) Chief Track Engineer
- e) Chief Bridge Engineer

Q.31 Write short notes on any three of the following:

- a) Section 3(3) of Official Language Act
- b) Facilities available in Railway to learn Rajbhasa
- c) Rajbhasa Karyanyan Samiti
- d) Duties of an Assistant Divisional Engineer
- e) Inspector schedule of ADEN

Q.32 a) What do you understand by a weak formation? Describe in brief the various methods available for rehabilitation of a weak formation.

b) How would you assess the requirement of water supply in a Railway settlement following provisions of the IRWM?

Q.33 a) What are the various types of filters commonly used in water supply of a Railway colony? Mention the salient features of each type in a tabular form.

b) What are the various Basic Passenger Amenities required to be provided in different categories of stations?

Q.34 a) List out a few tips to achieve economy of building construction without sacrificing quality.

b) What are Preliminary and Final Works Programme?

Q.35 a) What are the different types of surveys and at what stage each is carried out?

b) What is 'Critical Path Method' and how is it helpful in planning and monitoring progress of a project?

Q.36 a) Mention the laid down frequency for periodic inspections of structural steel works by AEN and IOW for buildings and structures others than bridges? What points are to be noted during these detailed inspections?

b) What is the theory of a septic tank? What are its design aspects? Draw a neat sketch of a septic tank and indicate its component parts.

Q.37 a) Name the different types of foundations you recommend under different site conditions and type of soil. Describe briefly with sketch of each type.

b) Draw neat sketches showing minimum/recommended formation width for banks and cuttings for concrete sleeper track on BG as per latest guidelines of Railway Board for new lines.

Q.38 Answer any six of the following questions

a) Earnest Money is deposited –

- i) While submitting tender
 - ii) At tender opening time
 - iii) On receipt of LAR
 - iv) At the time of execution of Agreement
- b) Chlorination in water supply is done to remove i)

Microorganisms

- ii) Suspended particles
- iii) Iron & Manganese compounds
- iv) Odour

c) The assessed requirement of water for hospitals per patient is i)

115 litres

ii) 140 litres

iii) 180 litres

iv) 250 litres

d) M200 Grade concrete is approximately equivalent to i)

1:3:6

ii) 1:2:4

iii) 1:1 ½ :3

iv) 1:1:2

e) Unit weight of RCC in kg/cum may be taken as)

1200

ii) 2000

iii) 2400

iv) 3600

f) Formwork at the side of columns may be removed after)

2 days

ii) 7 days

iii) 14 days

iv) 21 days

g) The weight of a cement bag may be taken as)

25 kg

ii) 40 kg

iii) 50 kg

iv) 75 kg

h) The number of Elastic Rail Clips at Keyman is required to lubricate each day after completion of his daily round is)

10

ii) 20

iii) 30

iv) 40

Q.39 What is a Muster Sheet and how is it prepared? What are the various points to be examined in its internal check?

Q.40 Describe the main provisions of Hours of Employment Regulations. Briefly describe the various classifications governed by it.

Q.41 What are the procedures for imposing of a minor penalty on a railway servant?

Q.42 At what rate overtime(OT) is allowed to a continuous worker employed as a gatekeeper?

Q.43 What are the various purposes for which permanent withdrawals are admissible from Provident Fund?

Q.44 What are the various kinds of estimates? Mention briefly at what stage each is framed.

Q.45 List the circumstances in which station earnings could be utilized to meet railway expenditure.

Q.46 What are the various types of tenders, and at what stage each is resorted to?

Q.47 What is a zonal contract? What are the nature of works that can be got executed through the agency of the zonal contract?

Q.48 What are the surplus stores? What steps would you take to prevent such accumulations on the Railways? How are they disposed of?