

QUESTION PAPER No. 1

FOR WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP 'C' TO GROUP 'B' SERVICE TO THE POST OF AEN (GROUP 'B') AGAINST 30% QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY.

DATE OF EXAMINATION : 02.08.2009

Maximum Marks: 150

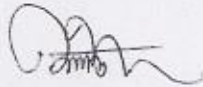
Time Allowed: 03 Hrs.

1. Answer total five questions. There are three sections in this paper. Select at least two questions from section I, at least one question from section II & at least one question from section III.
2. All questions carry equal marks and as per indicated against each.
3. All the questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper. No mobile phone should be in your possession.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

SECTION - I

प्रश्न -1 A

- (क) राजभाषा कार्यान्वय समितियों का गठन किस-किस स्तर पर किया गया है? इन समितियों की बैठक कितने समय बाद होती है? 4
- (ख) हिन्दी शिक्षण योजना के अंतर्गत कर्मचारियों के लिए कौन-कौन सी निर्धारित परीक्षा है और उनका शैक्षिक स्तर क्या है? 4
- (ग) हिन्दी की निर्धारित परीक्षा पास करने पर किसी कर्मचारी को क्या-क्या प्रोत्साहन मिलते हैं? 4
- (घ) राजभाषा नियमों के अंतर्गत क, ख, तथा ग क्षेत्रों से क्या अभिप्राय है। 4
- (ङ) राजभाषा तथा राष्ट्रभाषा में क्या अंतर है? 4



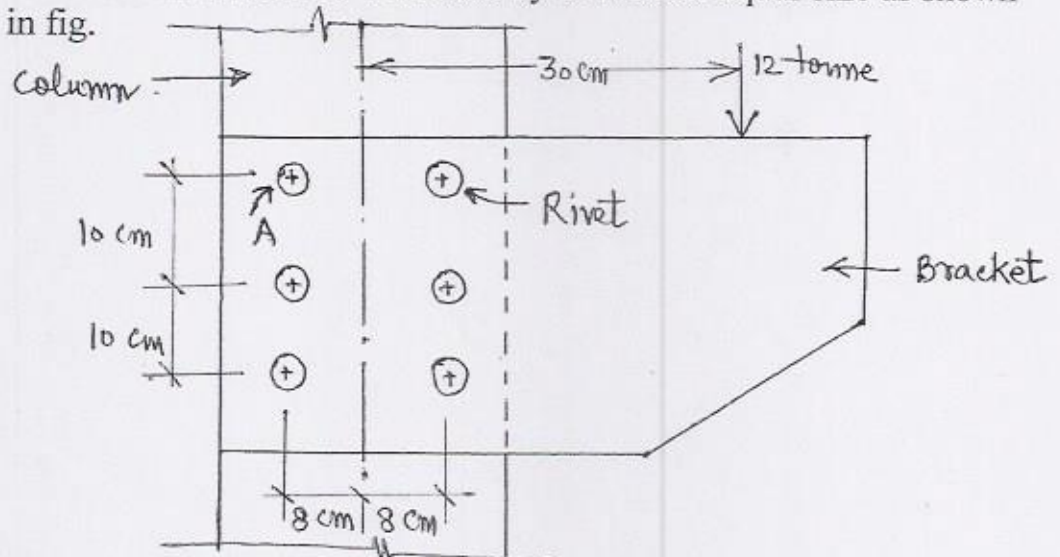
Q. 1B (i) Give the full forms of the following: - (5)

- | | |
|-----------------------|-------------------|
| (a) RSPB | CRIS |
| (b) IPWE | SNCI |
| (c) RDSO | DFCCIL |
| (d) UIC | IRCON |
| (e) ADB | PQRS |
| (f) MRTS | SAARC |
| (g) KRCL | UNO |
| (h) RVNL | COIS |
| (i) FOIS | |
| (j) MAGLEV | |

Q.1B (ii) Name the following:- (5)

- State in which "Rajaji National Park" is located?
- The person who wrote the National Anthem - "Jana Gana Mana"?
- First person in the world to land on the moon
- First Commander in Chief of free India
- Longest river in the world

Q. 2 A bracket is rivetted to a column by 6 rivets of equal size as shown in fig.



It carries a load of 12 tonnes at a distance of 30 cm. from the centre of the column. Calculate the load carried by rivet marked 'A'.

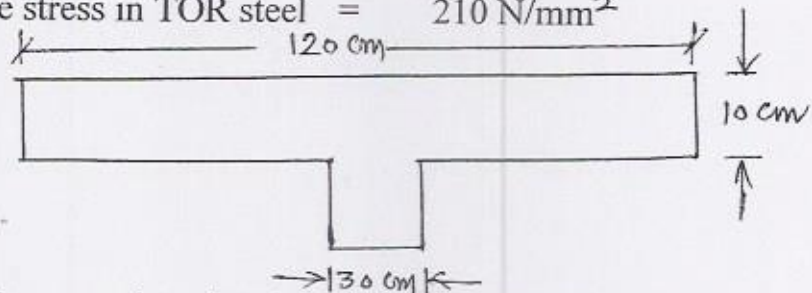
(30)

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Q. 3

Calculate the requirement of reinforcement bars (20mm ϕ) in numbers and the depth of the T-beam for the following section, if it is subjected to a combined live load as well as dead load of 20000 N/m and if the span of the beam is 4m. Assume that Neutral axis lies in the slab portion itself. M-20 grade of concrete and TOR steel is used.

Allowable stress in conc. = 7 N/mm^2
Allowable stress in TOR steel = 210 N/mm^2



Redraw above section showing depth of the beam and bars. (30)

Q. 4

- For water supply arrangements what is chlorination of water and super chlorination of water. (8)
- Describe with sketches the difference between a tube well and a Ranney well (infiltration galleries). (8)
- Describe with sketch the most commonly adopted type of bio-latrines & also a bio-gas plant (unit). (7)
- Show with sketches the differences between P.trap & S trap in a European type water closet (WC). (7)

SECTION – II

Q. 5

A brick pier 600 mm x 600 mm is 4 m high. It has to carry one axial load of 520 KN. The allowable bearing capacity of the soil on which the pier is to rest is 250 KN/m^2 . The weight of brick masonry is 18.84 KN/m^3 . The angle of repose is 30° and the weight of earth is 16 KN/m^3 .

Design a suitable foundation for the pier. (30)

Q. 6

Write short notes on the following: -

(6 x5=30)

- (i) Requirement of good form work
- (ii) Water proofing of flat roofs
- (iii) Active and Passive earth pressure
- (iv) Atterberg Limits
- (v) Optimum Moisture Content
- (vi) Safe Bearing Capacity and Allowable Bearing Pressure

Q. 7

Answer the following: -

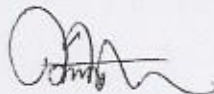
(6 x5=30)

- (i) Advantages and Limitation of Plane Table Survey
- (ii) An angle A was measured by different persons and following are the values:

Angle	No.of measurements
70° 30'	2
70°29'	3
70°28'	4
70°27'	1

Find the most probable value of the angle.

- (iii) Define the following terms used for Theodolite Survey
 - (a) Centering
 - (b) Line of Collimation
 - (c) Double Sighting
- (iv) What are important uses of contours?
- (v) Name the different methods for setting a simple curve.
- (vi) Digital Terrain Modeling



SECTION-III

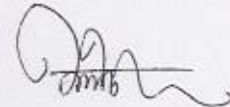
Q. 8 Write short notes on the following: - (6 x 5 = 30)

- (i) Maximum dry density
- (ii) Norms for providing passenger amenities - Minimum essential amenities, recommended level amenities and desirable amenities at Railway Stations
- (iii) Standard Penetration Test (SPT)
- (iv) Advantages and Disadvantages of Centrifugal pumps
- (v) Chlorination and chlorinators
- (vi) Water Cement Ratio

Q. 9 (i) What is a Septic Tank? Draw a neat sectional elevation of a septic Tank. (15)

(ii) Design a septic tank for a small colony of 100 persons with daily sewage flow of 135 litres per head per day. (15)

✓ Q.10 Design a water supply scheme for a railway colony of 400 houses in 50 four storey blocks with population of 2000. Draw sketch showing storage location, capacity & height and pipe line grid with sizes of pipes. Colony is laid in five parallel rows of 10 blocks each. Assume other datas. (30)



QUESTION PAPER No. II

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Time Allowed: 03 Hrs.

1. **Answer total five questions. There are two parts in the Question Paper – Part-A & Part-B. Attempt minimum two questions from each Part.**
2. **All questions carry equal marks and as per indicated against each.**
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Part – A

- Q.1 (a) Describe in detail the procedure for imposing a major penalty on a Group 'D' railway employee under Discipline & Appeal Rules for long unauthorized absence. 15
- (b) Describe AEN's powers for imposing major penalties and suspension. 7½
- (c) Describe the opportunities available to an employee for appeal and review of the penalty imposed on him. 7½
- Q.2 Write short notes on the following:-
- (i) Completion Report of Work
 - (ii) Project Report on Track Work
 - (iii) Distressed bridges and the schedule of inspection thereof by various officials.
 - (iv) Realignment of curves
 - (v) Frequency of USFD testing of weld flange and rails over girder bridges. 5 x 6 = 30



N.R.V.

Q.3 (a) As AEN, you have been asked to submit a proposal for inclusion in Works Programme 2010-11 for construction of 50 Type-II and 50 Type-III quarters at your Hd.Qrs. station. Write justification abstract cost as per prescribed format indicating chargeable Plan Head with a covering letter addressed to your DEN/Sr.DEN. 15

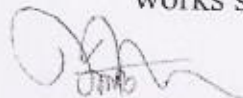
(b) Explain the duties of an Assistant Engineer as the first officer at the site of major accident of a passenger train. Give the sequence of various duties to be performed. 15

- Q.4 (a) Minimum height of a heavy overhead structure (say ROB) above rail level in electrified territory. (5)
- (b) What are minimum and maximum clearances between check rails and running rails on a BG level crossing? (5)
- (c) Height above rail level for a BG high level and medium level passenger platform. (5)
- (d) Horizontal distance between the centre of a track and edge of coping of high level platform on BG. (5)
- (e) What is the slope at the end of a high level passenger platform given to taper of the platform? (5)
- (f) What is the minimum distance between centre of BG track and the nearest pier or abutment of a ROB in a running track? (5)

Part -B

Q.5 Attempt any six of the following:- (6 x5 =30)

- (a) What is the difference between Engineering & Traffic Level Xings?
- (b) How are the categories C, B, A & A 'Spl' given to a level crossing? What is the criteria?
- (c) Explain various Indicator Boards for temporary restrictions with the help of sketch & distance from works site at which these are fixed in case of BG.



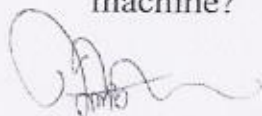
- (d) What action is a SSE (P.Way) (PWI Incharge) required to take in case of a derailment on the section where sabotage or miscreant activity is the prima facie cause of accident?
- (e) Briefly describe the string line method of curve realignment.
- (f) What are General & Subsidiary Rules of a railway and what are the issues concerning Engg.Deptt. mentioned in the same?
- (g) What is the difference between push trolley, motor trolley and material lorry? How is the material lorry loaded with rails to be worked out and how is push trolley to be worked in section with limited visibility?

Q.6

Describe in detail, relaying of track with PQRS relaying system. Give the complete schematic planning to kccp restrictions on minimum length. What steps you will take for quality control? (30)

Q.7

- (a) What are the main hydraulic, mechanical and electrical systems in a Unimat points & crossing tamper? Give purpose of each in brief. (6)
- (b) Describe working of track machines in track circuited and in electrified areas. (6)
- (c) What are the daily, weekly and other periodic inspection & maintenance schedules of a CSM 09-32 TT machines? How these are done and who is responsible for the same? (6)
- (d) What are the main differences between ballast cleaning machine, shoulder ballast cleaning machine and points & crossings ballast cleaning machine? (6)



- (e) Describe the working of T-28 (points & crossings renewals) machines with example of a renewal of one point in single line electrified sections. (6)

Q.8

Write short notes on any six of the following:- (6x5=30)

- (a) Types of bearings on bridges
- (b) Camber in Girder Bridges
- (c) Duties of SE Bridges
- (d) Oiling and greasing of bridge bearings
- (e) Painting of steel structures and girders
- (f) Major, Minor and Important Bridges
- (g) Distressed Bridge

Q.9

Write short notes on any six of the following:- (6X5=30)

- (a) New building materials now available in the market
- (b) Horticulture cadre in the Railways
- (c) Damp-proofing Course
- (d) Schedule of white-washing of railway houses and service buildings
- (e) Non-scheduled items
- (f) Analysis of Rates
- (g) Maintenance and operation of Water Supply Installations



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