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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

: 05.09.2008

(Sh. Shankar Lal
for selection of
Mena)
PWT/NWR

Maximum Marks: 150

Time Allowed: 03 Hrs.

1. **Answer total five questions. Question no. 1 is compulsory. In addition, there are three sections in this paper. At least one question must be selected from each section.**
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, calculator 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.**

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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? 5
- (ख) हिन्दी शिक्षण योजना के अंतर्गत कर्मचारियों के लिए कौन-कौन सी निर्धारित परीक्षा है और उनका शैक्षिक स्तर क्या है? 5
- (ग) राजभाषा नियमों के अंतर्गत क, ख, तथा ग से क्या अभिप्राय है। 5

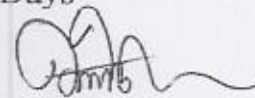
1.B

(i) The Universal Law of Gravitation was propounded by

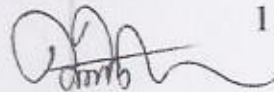
- (a) Kepler (b) Newton
(c) Arya Bhat (d) Galileo

(ii) The period of revolution of a geostationary satellite is

- (a) 24 Hours (b) 12 Hours
(c) 30 Days (e) 365 Days



- (iii) Sound cannot travel through
- (a) Water (b) Steel
(c) Vacuum (d) Hydrogen Gas
- (iv) Cooking Gas is a mixture of
- (a) $\text{CO} + \text{CO}_2$ (b) $\text{C}_4\text{H}_{10} + \text{C}_3\text{H}_8$
(c) $\text{CH}_4 + \text{C}_6\text{H}_6$ (d) $\text{O}_2 + \text{CO}_2$
- (v) Constitution of India came into force on
- (a) 26 January 1950 (b) 26 January 1949
(c) 26 November 1949 (d) 15 August 1947
- (vi) The first Asian Games were held at
- (a) Manila (b) Tokyo
(c) Jakarta (d) New Delhi
- (vii) Gopi Chand plays
- (a) Tennis (b) Badminton
(c) Chess (d) Hockey
- (viii) Rajaji National Park is located in the State of
- (a) Kerala (b) Madhya Pradesh
(c) Uttar Pradesh (e) Jammu & Kashmir
- (ix) National Anthem "Jana Gana Mana" is written by
- (a) Mahatma Gandhi (b) R.N.Tagore
(c) Pandit Nehru (d) B.C.Chatterjee
- (x) Bangalore is the capital of
- (a) Tamil Nadu (b) Karnataka
(c) Rajasthan (d) Kerala



SECTION - I

Q. 2. A rolled steel joist of I section has the following dimensions:-

Flanges	-	300mm wide and 30mm thick
Web	-	10mm thick
Height	-	600 mm

Above RSJ, as a beam carries a uniformly distributed load of 5 tonnes per metre run on a span of 8 meters. Calculate the maximum stress produced due to bending. (30)

Q. 3 (a) Design a simply supported rectangular reinforced concrete beam of span 6 m. The beam has to carry a load of 8000 N/M including self-weight. Show by sketch the reinforcement required. (20)

(b) What is slenderness ratio in a column and describe what is effective length of a column. (10)

Q. 4 (a) Describe controlled concrete and also the procedure of designing concrete mix for a particular strength say M-40. (10)

(b) How is prestressed concrete different from plain reinforced concrete? Give in brief merits & demerits of both and the main usages of prestressed concrete. (10)

(c) How is water cement ratio important in any type of concreting? How can we achieve high workability of concrete with low water cement ratio and under what circumstances is this needed. (10)

SECTION - II

Q.5 A brick pier 600 mm x 600 mm is 4 m high. It has to carry on axial load of 520 KN. The allowable bearing capacity of the soil on which the pier is to rest is 250 KN/m². The weight of brick masonry is 18.84 KN/m³. The angle of repose is 30° and the weight of earth is 16 KN/m³.

Design a suitable foundation for the pier. (30)



Q. 6

Write short notes on any four:-

(7.5 x4=30)

- (i) Atterberg limits
- (ii) Dynamic Testing of soils
- (iii) Portable Nuclear compaction gauge
- (iv) Laser Particle size analyser
- (v) Sub-surface Interface Radar System
- (vi) Geophones.

Q. 7

Answer any four:-

(7.5 x4=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.

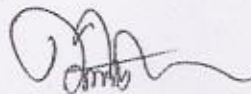
- (iii) Define the following terms used for Theodolite Survey
 - (a) Centering
 - (b) Line of Collimation
 - (c) Double Sighting
- (iv) What are important uses of contours?
- (v) Name the different methods for setting a simple curve.

SECTION-III

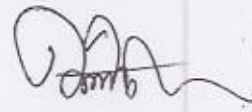
Q. 8 Write short notes on any four:-

7.5 x 4 = 30

- (i) Water Borne Disease
- (ii) Infiltration Galleries
- (iii) Advantages and Disadvantages of Centrifugal pumps
- (iv) Standard Plate Count Test
- (v) Chlorination of Water



- 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 quarters at Railway station dealing passengers per day upto 10000. Assume that quarters have a flushing system. Colony has a central garden of 4 hectares. Assume other datas. (30)



- 1 -

QUESTION PAPER No. II

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 : 05.09.2008


Maximum Marks: 150

Time Allowed: 03 Hrs.

1. Answer total six questions. Question Nos. 1 to 3 of Part A are compulsory. Attempt any 3 questions from Part B.
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.
4. Do not write your name in Answer Sheet or any other identification marks, which if found shall disqualify you.

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Part - A (Compulsory)

- Q.1 (a) What procedure is required to be followed under D&AR Rules to remove a Group 'D' employee from the Railway services? 10
- (b) What are the amounts and conditions under which the advances for the purchase of (i) Motor Car (ii) Motor Cycle/Scooter are granted? 7 ½
- (c) Write short notes on:-
- (i) Staff Benefit Fund (ii) Leave on Medical Certificate
(iii) Productivity Linked Bonus 7 ½



Q.2 Write short notes on the following:-

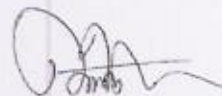
- (i) Urgency Certificate
- (ii) Railway affecting works
- (iii) Distressed bridges and the schedule of inspection thereof by various officials.
- (iv) Comparative merits and demerits of AT Welding and flash butt welding for rails.
- (v) Frequency of USFD testing of weld flange and rails over girder bridges.

5 x 5 = 25

- Q.3 (a) What are the main duties of Assistant Engineer? 7 ½
- (b) What are the inspections to be carried out by an Assistant Engineer on Open Line and their frequency? 7 ½
- (c) 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. 10

Part - B (Non compulsory)

- Question No.1 (a) What are A, B, C, D, E, D Spl. & E Spl. Categories of Track? (4)
- (b) What are criteria for sanctioning a track renewal in an existing running line? (4)
- (c) Describe TSR, TRR, CTR, TWR, TBTR, TFR in brief and also describe which of these can be done with second hand serviceable material? (4)
- (d) What are mechanical methods of carrying out TSR, CTR, Pts. & Xings renewals? What are the machines in use on IR at present? (4)

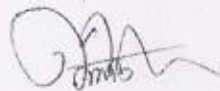


- (e) Describe with sketch the layout & working of PQRS Depot. (4)
- (f) Describe with sketch the various speed restrictions imposed to carry out CTR (P) work with PQRS in a double line section which is being attended with machine tampers. (5)

Question 2

Attempt any five of the following:- (5 x 5 = 25)

- (a) What are the various Indicator Boards of temporary restrictions required?
- (b) What is the procedure for blocking the track for carrying out normal & emergency repairs to track?
- (c) 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?
- (d) Briefly describe the string line method of curve realignment.
- (e) What are General & Subsidiary Rules of a railway and what are the issues concerning Engg.Deptt. mentioned in the same?
- (f) How is the good running on level crossing, points & crossings to be ensured?
- (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?



- Question 3 An open web turnout steel bridge of 250 ft. (76m) span is to be launched from abutment to abutment. There is no intermediate support possible. Describe with sketches the method of launching the same & the main item of checks and cautions to be observed. (25)
- Question 4 (a) What are the main hydraulic, mechanical and electrical systems in a Unimat points & crossing tamper? Give purpose of each in brief. (5)
- (b) Describe working of track machines in track circuited and in electrified areas. (5)
- (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? (5)
- (d) What are the main differences between ballast cleaning machine, shoulder ballast cleaning machine and points & crossings ballast cleaning machine? (5)
- (e) Describe the working of T-28 (points & crossings renewals) machines with example of a renewal of one point in single line electrified sections. (5)
- Question 5 (a) List out various river training and protection measures adopted on a bridge site. (10)
- (b) What is the purpose of guide bund system adopted for a bridge? Explain its design and construction features with the help of a neat sketch. (15)



Question 6

Write short notes on any five of the following:-

- (i) Leaky roof treatment
- (ii) PH value of water
- (iii) Bacteriological impurities in the water
- (iv) Vulncrable locations
- (v) Monsoon precautions
- (vi) Completion report

5 x 5 = 25



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