

QUESTION PAPER No. 1

**WRITTEN EXAMINATION FOR SELECTION FOR PROMOTION FROM GROUP
'C' TO GROUP 'B' SERVICE TO THE POST OF AEN(GR. B) AGAINST 30%
QUOTA IN CIVIL ENGINEERING DEPARTMENT, NORTHERN RAILWAY
(Assessment Period 2014-15)**

DATE OF EXAMINATION: 08.10.2016

MAXIMUM MARKS: 150

TIME ALLOWED : 03 HRS.

1. Answer total **Six** questions. Any extra question attempted after **Six** will not be evaluated.
2. All questions carry marks as indicated against each.
3. All questions should be answered only in the Answer Sheet and no question is to be answered in Question Paper. Answers should be supplemented with illustrated sketches, wherever required.
4. **Candidates having found writing name/leaving any other identification marks in Answer Sheet shall be liable to be disqualified.**
5. Answer of Objective Type questions having cutting, overwriting, erasing, scoring off a ticked answer in multiple choice and ticking another answer will not be evaluated.
6. Answers may be written either in English or in Hindi.
7. In case of any ambiguity in the Hindi version, the English version is to be considered authentic.

Section I		
Q.1	Write the correct option:-	35x1=35 marks
(i)	In which year of First World War Germany declared war on Russia and France? A. 1914 B. 1915 C. 1916 D. 1917	
(ii)	India has largest deposits of ____ in the world. A. gold B. copper C. mica D. None of the above	

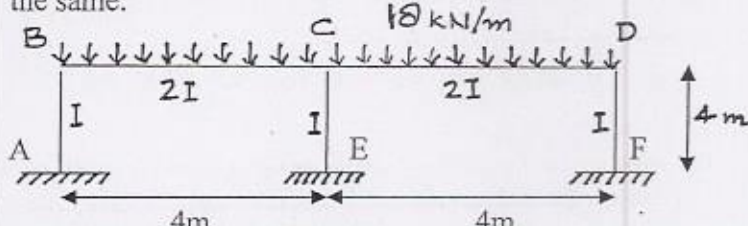
(iii)	India's first Technicolor film _____ in the early 1950s was produced by _____ <u>A.</u> 'Jhansi Ki Rani', Sohrab Modi <u>B.</u> 'Jhansi Ki Rani', Sir Syed Ahmed <u>C.</u> 'Mirza Ghalib', Sohrab Modi <u>D.</u> 'Mirza Ghalib', Munshi Premchand	
(iv)	In which year, terrorists crash two planes into New York's World Trade Centre on September 11 in a sequence of destruction? <u>A.</u> 2000 <u>B.</u> 2001 <u>C.</u> 2002 <u>D.</u> 2003	
(v)	In a normal human body, the total number of red blood cells is <u>A.</u> 15 trillion <u>B.</u> 20 trillion <u>C.</u> 25 trillion <u>D.</u> 30 trillion	
(vi)	India participated in Olympics Hockey in <u>A.</u> 1918 <u>B.</u> 1928 <u>C.</u> 1938 <u>D.</u> 1948	
(vii)	If force is expressed in Newton and the distance in metre, then the work done is expressed in <u>A.</u> Joule <u>B.</u> Kg wt <u>C.</u> Kg wt m <u>D.</u> Watt	
(viii)	Indira Gandhi was assassinated in <u>A.</u> 1974 <u>B.</u> 1984 <u>C.</u> 1994 <u>D.</u> 2004	
(ix)	How many times has Brazil won the World Cup Football Championship? <u>A.</u> Four times <u>B.</u> Twice <u>C.</u> Five times <u>D.</u> Once	

(x)	If speed of rotation of the earth increases, weight of the body <u>A.</u> increases <u>B.</u> remains unchanged <u>C.</u> decreases <u>D.</u> may decrease or increase	
(xi)	India's first nuclear blast at Pokhran in Rajasthan took place in <u>A.</u> 1984 <u>B.</u> 1974 <u>C.</u> 1964 <u>D.</u> 1954	
(xii)	How many players are there on each side in the game of Basketball? <u>A.</u> 4 <u>B.</u> 5 <u>C.</u> 6 <u>D.</u> 7	
(xiii)	In a normal human being, how much time does food take to reach the end of the intestine for complete absorption? <u>A.</u> About 8 hours <u>B.</u> About 12 hours <u>C.</u> About 16 hours <u>D.</u> About 18 hours	
(xiv)	In cricket, the two sets of wickets are <u>A.</u> 18 yards apart <u>B.</u> 20 yards apart <u>C.</u> 22 yards apart <u>D.</u> 24 yards apart	
(xv)	Kiran Bedi received Magsaysay Award for government service in <u>A.</u> 1992 <u>B.</u> 1993 <u>C.</u> 1994 <u>D.</u> 1995	
(xvi)	Logarithm tables were invented by <u>A.</u> John Napier <u>B.</u> John Doe <u>C.</u> John Harrison <u>D.</u> John Douglas	
(xvii)	With which sport is the Jules Rimet trophy associated? <u>A.</u> Basketball <u>B.</u> Football <u>C.</u> Hockey <u>D.</u> Golf	

(xviii)	Joule is the unit of <u>A.</u> temperature <u>B.</u> pressure <u>C.</u> energy <u>D.</u> heat	
(xix)	Kemal Atatürk was <u>A.</u> the first President of Independent Turkey <u>B.</u> the founder of modern Turkey <u>C.</u> revolutionary leader of Soviet Union <u>D.</u> None of the above	
(xx)	Ms. Medha Patkar is associated with the <u>A.</u> Tehri project <u>B.</u> Enron project <u>C.</u> Sardar Sarovar project <u>D.</u> Dabhol project	
(xxi)	Kathakali, Mohiniattam and Ottamthullal are the famous dances of <u>A.</u> Kerala <u>B.</u> Karnataka <u>C.</u> Orissa <u>D.</u> Tamil Nadu	
(xxii)	Jaspal Rana is associated with which of the following games? <u>A.</u> Swimming <u>B.</u> Archery <u>C.</u> Shooting <u>D.</u> Weightlifting	
(xxiii)	Modern Indo-Aryan languages are based on an ancient language called <u>A.</u> Hindi <u>B.</u> Sanskrit <u>C.</u> Kannada <u>D.</u> Tamil	
(xxiv)	Lakshmi Bai National College of Physical Education is located at <u>A.</u> Bhopal <u>B.</u> Gwalior <u>C.</u> Karnal <u>D.</u> Patiala	
(xxv)	Malfunctioning of which of the following organs causes jaundice? <u>A.</u> Stomach <u>B.</u> Pancreas <u>C.</u> Liver <u>D.</u> Kidney	

(xxvi)	Brass gets discoloured in air because of the presence of which of the following gases in air? <u>A.</u> Oxygen <u>B.</u> Hydrogen sulphide <u>C.</u> Carbon dioxide <u>D.</u> Nitrogen	
(xxvii)	Which of the following is a non metal that remains liquid at room temperature? <u>A.</u> Phosphorous <u>B.</u> Bromine <u>C.</u> Chlorine <u>D.</u> Helium	
(xxviii)	Which of the following is used in pencils? <u>A.</u> Graphite <u>B.</u> Silicon <u>C.</u> Charcoal <u>D.</u> Phosphorous	
(xxix)	Chemical formula for water is <u>A.</u> NaAlO_2 <u>B.</u> H_2O <u>C.</u> Al_2O_3 <u>D.</u> CaSiO_3	
(xxx)	The gas usually filled in the electric bulb is <u>A.</u> nitrogen <u>B.</u> hydrogen <u>C.</u> carbon dioxide <u>D.</u> oxygen	
(xxxii)	Washing soda is the common name for <u>A.</u> Sodium carbonate <u>B.</u> Calcium bicarbonate <u>C.</u> Sodium bicarbonate <u>D.</u> Calcium carbonate	
(xxxiii)	Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next? <u>A.</u> 22 <u>B.</u> 24 <u>C.</u> 25 <u>D.</u> 26	
(xxxiii)	Look at this series: 53, 53, 40, 40, 27, 27, ... What number should come next? <u>A.</u> 12 <u>B.</u> 14 <u>C.</u> 27 <u>D.</u> 53	

(xxxiv)	To design a cross-over between parallel tracks, the required components are : A. two switch, points, two acute angle crossings and two check rails B. two switch points, two acute angle crossings and four check rails C. two switch points, two acute angle crossings and six check rails D. none of these	
(xxxv)	The first Indian railway was laid in A. 1775 B. 1804 C. 1825 D. 1853	
प्र.2.(i) ✓	क, ख, और ग क्षेत्र में आने वाले चार-चार राज्यों के नाम बताएं। जम्मू एवं कश्मीर किस क्षेत्र में आता है।	3x5=15 अंक
(ii)	राजभाषा के अधिनियम 1963 की धारा 3 (3) के अंतर्गत आने वाले सभी दस्तावेजों के नाम लिखें।	
(iii)	राजभाषा और राष्ट्रभाषा के बीच क्या अंतर है। 14 सितम्बर का क्या महत्व है।	
Or		
Q.2	Give the full form of : (i) IRCEP (ii) TMS (iii) LRSBB (iv) PMIS (v) RORACS (vi) KRCL (vii) UNESCO (viii) PSAMS (ix) CRIS (x) IRPSM (xi) DFCCIL (xii) PQRS (xiii) SAARC (xiv) UNO (xv) COIS	15x1=15 marks
Section II Attempt any two questions:-		
Q.3 ✓	Design a R-C column of size 450 mm x 600 mm subject to axial load of 2000 kN under service load condition. Unsupported length of column is 3 m, use M 25 concrete and Fe 415 steel. Assume $l_{eff} = l$	25marks

Q.4 ✓	Analyse the single storey two bay portal frame shown in Figure below and draw the bending moment diagram for the same: 	25marks									
Q.5 ✓	A straight tunnel is to run between two points A & B whose coordinates are as under: <table border="1" data-bbox="563 656 1002 768"> <thead> <tr> <th>Point</th><th>Northing</th><th>Easting</th></tr> </thead> <tbody> <tr> <td>A</td><td>0.0</td><td>0.0</td></tr> <tr> <td>B</td><td>3000m</td><td>250m</td></tr> </tbody> </table> A shaft is to be sunk at a point D which is at the middle of AB. As it is impossible to measure along AB directly, the point D is to be fixed from another point C whose coordinates are 1760m northing and 1395 m easting. Calculate: - The coordinates of D, - the length and bearing of CD, and - the angle ACD, if the bearing of AC is $38^{\circ}30'$ east of north	Point	Northing	Easting	A	0.0	0.0	B	3000m	250m	25marks
Point	Northing	Easting									
A	0.0	0.0									
B	3000m	250m									
Section III: Attempt any two questions:											
Q.6 ✓	A vertical pipe carrying oil of specific gravity 0.8 tapers uniformly from 20cm diameter at the lower section to 10cm diameter at the upper sections. The vertical distance between the sections is 1m. The pressure gauges installed at the lower and upper section read 6N/cm^2 and 5N/cm^2 respectively when the discharge of oil is 30 litre/sec. Calculate the loss of head between the two sections. Determine the direction of flow also.	25marks									
Q.7 (i)	Write short notes on Pot bearings and Elastomeric bearings. Under what situations should Engineers use Pot bearings instead of Elastomeric bearings?	12marks									
(ii)	Write brief notes on the tests prescribed for testing shear strength of soil. In determining the effective stress parameters of a soil sample, which test is preferable, consolidated un-drained test or consolidated drained test?	13marks									

Q.8(i)	Are there any differences in the methods of compaction between clayey soil material and sandy material? Please write brief on different compaction methods for different kinds of soil.	13marks
(ii)	Write short notes on any three of the following: a) Ready mixed concrete (RMC) b) Steps involved in mix design of concrete c) Difference between RCC & PSC with merits and demerits of both and their usage in actual structures. d) Safe bearing capacity e) Optimum moisture content	12marks



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Section I

Attempt any two:-

Q.1(i)	Describe AEN's power for imposing major penalty and suspension	12½ marks
(ii)	Describe different Major Penalties as per D & AR Rules.	12½ marks
Q.2	Write short notes on any five : (a) New Pension Scheme (b) Difference between Selection, Suitability and Trade Test. (c) Productivity Linked Bonus (d) House Building Advance (e) Minor Penalties under D&AR Rules. (f) Fabrication of insitu glued joints. (g) Variation of contracts and its sanctioning powers	5x5=25 marks
Q.3	Make out a complete dimensional sketch for 1 in 12 RH turn out 60Kg on PRC sleepers and write down the complete set of fittings required to assemble it.	25marks

Section II**Attempt any two:-**

Q.4	Write short notes on any five : (a) Causes of rail fractures and measures required to prevent them. (b) Increasing the speed of the section from 80 kmph to 110 kmph. (c) Measures to improve the running of the section i.e. reduction in acceleration peaks and increase in TGI values. (d) Numerical ratings of condition of bridges (e) Comparative merits and demerits of AT welding vis a vis Flash Butt Welding of Rails. (f) Supervision and Inspection of welds for quality. (g) What are A,B,C,D,E & D Spl. Categories of Track?	5x5=25 marks
Q.5	USFD testing of rails and welds, types of probes used and their applicability, classification of defects, criteria for imposing speed restrictions, fish plating and removal of such rails/welds. What percentage of rail section is tested by USFD machines? Its present day limitations, can scabbed rails be tested by USFD?	25marks
Q.6(i)	Draw the General Arrangement Drawing (GAD) for a ROB of four lanes on electrified territory over two railway lines with two future tracks. Railway tracks are at 5.3 m track centre.	5 marks
(ii)	Please state the provisions of Works Manual Para No. etc. and Railway Board's guidelines for NOC required for building any structure adjacent to Railway Boundary in private land.	5 marks
(iii)	Rules for licensing/leasing of Railway land for different purposes to private parties and PSUs.	5 marks
(iv)	State any 10 provisions of CE circular 629 on standard dimensions for Buildings.	5 marks
(v)	GR/NR's instructions on action to be taken by SSE/P.Way on reporting of jerks by train drivers during night.	5 marks

Section III**Attempt any two:-**

Q.7	Write short notes on any five: (a) CE Circular No. 315(R-I) (b) CE Circular No. 268 (R-II) (c) CE Circular No. 269	5x5= 25 marks
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	(d) Criteria for sanctioning a Rail Renewal (P) in existing running line. (e) Describe with sketch the layout of a PQRS depot. Also describe the PQRS working at site including QAP for depot/site. (f) What is desirable output for PQRS work at site per month and minimum track length under restriction? (g) GR provisions related to Monsoon Patrolling.	
Q.8 (i)	Elaborate the difference between three point and four point lining system of a tamping machine. Also detail the advantages & disadvantages.	13marks
(ii)	Write short notes on any three: (a) What is the prescribed schedule of inspection of track machines by Open Line officials? (b) What are the equipments which should be available on track machines during block working to meet the exigencies? (c) Describe the duties of track machine operators. (d) Route learning of track machine operators. (e) Information brief to be kept during trailing window inspection (CE Circular No. 316)	3x4=12 marks
Q.9(i)	Design a water supply scheme for a railway colony of 500 houses in 50 five storey blocks with population of 2500. Draw sketch showing storage location, capacity and height and pipe line grid with sizes of pipes. Colony is laid in five parallel rows of 10 blocks each. Assume other data.	10marks
(ii)	What is the effect of excess SE, Excess Cant deficiency and inadequate transition length on curves?	5 marks
(iii)	Elaborate precautions to be taken in fabrication and fixing of channel sleepers and its fittings for ensuring proper alignment of track over bridges.	10marks
