CENTRAL RAILWAY

**Limited Departmental Competitive Examination – Class II Service**

**Civil Engineering Department on 13 – 10 – 1984**

Time : 2 hrs. Marks : 50

PAPER I - GENERAL KNOWLEDGE

NOTE :- 1. Return the question paper along with the Answer Books.

2. Answers can be given in English or Hindi.

3. All questions must be answered.

Q. 1 - What do the following abbreviations stand for? ( 5 marks )

(a) F.S.I. (b) H.C.F. (c) M.I.S.A. (d) A.I.R.F. (e) A.D.B. (f) P.L.O. (g) I.N.T.U.C. (h) R.A.W. (i) L.C.M. (j) N.D.A.

Q. 2 – The following are the Capitals of: - (5 marks)

(a) SEOUL (b) KOHIMA (c) ITANAGAR (d) ANKARA ( e ) THIMPU ( f ) KUALA LUMPUR ( g ) WARSAW ( h ) BEIRUT ( i ) HAWAT ( j ) OMAN

Q. 3 – Name the Authors of the following books: - ( 5 marks )

( a ) GONE WITH THE WIND ( b ) AS YOU LIKE IT ( c ) MY EXPERIMENTS WITH TRUTH ( d ) GODAN ( e ) GITANJLI

Q. 4 – List, which in your opinion the five most important achievements made by human mankind in the 20 th Century. ( 5 marks )

Q. 5 – Name the following: - ( 10 marks )

1. Five Major ports of India.
2. Five Major rivers of India.
3. Five Mountain peaks of India.
4. Five Musical instruments of India.
5. Five important magazines of India.

Q. 6 - Write short notes on: - ( 10 marks )

1. The Punjab Situation.
2. The official Languages Act.
3. The lunar of eclipse.
4. India’s policy of Non – Alignment.

Q. 7 – What do you know of the following: - ( 10 marks )

* 1. C. Rajagopalachari. 6.) CHERENKOV.
  2. Imelda Poroos. 7.) ADOLF HITLER.
  3. Jarnail Singh Bhindranwale. 8.) JENNIFER KAPOOR.
  4. Walter Mondale. 9.) P. T. USHA.
  5. N. T. Ramarao. 10.) PRESIDENT TITO.

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###### CENTRAL RAILWAY

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 13 – 10 – 1984 Time : 3 Hours.

PAPER – II ( i ) Marks : 100

**Professional Subject**

NOTE : ( a ) All questions carry equal marks.

( b ) Answer any FIVE questions.

( c ) Make suitable assumptions regarding data where necessary.

Q. 1 – ( a ) Draw the bending moment and shear force diagram for a beam carrying a uniformly distributed load the supports are at a distance of L / 4 from each end L being the length of beam ?

( b ) Design a double reinforced RCC roof slab for a room of size 16’ x 16’.

Q. 2 – ( a ) How would you decide the type of bridge and type of foundations for a bridge to cross a nala of 500 feet width. High flood level is 25 feet above average bed level.

( b ) Show with a sketch layout of reinforcement in RCC Box culvert.

Q. 3 – Write short notes on any four of the following: -

1. S.F.Curve.
2. Poison’s ratio.
3. Pert Chart.
4. Controlled concrete.
5. Load test on pile.
6. Neoperene bearings.

Q. 4 – Indicate specification for any four of the following: -

1. Mass c.c. for bridge abutment.
2. Flooring for heavy repair shed.
3. Asphalting of colony roads.
4. Mosaic tile flooring.
5. Wearing course in road surface of a road over bridge.

Q. 5 – Indicate with sketches the method of launching 60 feet Girder spans on a viaduct.

Q. 6 – While carrying out survey for a new railway line, how would you decide the water ways required for a bridge.

Q. 7 – Design a water supply scheme for a station, adopting the following data –

1. Source of water – River flow at a distance of 1 km.
2. Requirement of water – 1 lack gallons per day.
3. Difference in level between water level in river and level to which water is to be pumped – 200 feet.

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – ESTABLISHMENT RULES

Date : 14 – 10 – 1984 Time : 1 hour. Max. Marks : 25

Note :- 1.) Attempt any two questions.

2.) All questions carry equal marks.

Q. 1 – If a Class IV staff slaps a clerk in your office, please give in detail the action you will take and the DAR procedure to be followed.

Q. 2 – Write short notes on the following: -

1. How many types of leave is there describing them briefly.
2. Corporate Enterprise group, its composition and its functions.
3. List out the various allowances railway men are entitled to.
4. Productivity Linked Bonus.

Q. 3 – ( a ) Describe briefly the term ‘Casual Labour’ and the benefits that an employee gets when he joins as a casual labour.

( b ) What additional benefits dose he get when he becomes monthly rated casual labour.

Q. 4 – Describe briefly the various Welfare measures available for Railway men on the Railways.

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – FINANCIAL RULES

Date : 14 – 10 – 1984 Time : 1 hour. Max. Marks : 25

Note :- Question No. 1 is compulsory and carries 15 marks. Attempt one more of the remaining questions each of which carry 10 marks.

Q. 1 – write short notes on any five :-

1. MAS.
2. Liability register.
3. Imp rest Cash Accountal.
4. Development Fund.
5. Allocation heads for Revenue Expenditure.
6. Completion Report.
7. Stock Sheets.

Q. 2 – Describe in detail how as an Engineer you would control expenditure on a particular work so that you do not exceed the sanctioned amount.

Q. 3 – How is the budget for revenue demand of Engineering Department prepared? When is it prepared and what stages are there for its review during a financial year?

Q. 4 – what checks would you exercise as an AEN on the Stores kept with ( a ) an I.O.W. ( b ) a P.W.I.

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###### CENTRAL RAILWAY

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 14 – 10 – 1984 Time : 3 Hours.

PAPER – II ( ii ) Marks : 100

**Professional Subject**

NOTE : i )All questions carry equal marks.

ii ) Answer any FIVE questions.

Q. 1 – An existing fish plated track in a busy double line section is to be converted into a 3 rail welded panel track. Describe the procedure to be followed and the organisation required.

Q. 2 – Explain the track monitoring methods adopted on Indian railways.

Q. 3 – Describe the detail the procedure for deep screening in case of CWR track.

Q.4 – Describe the procedure and precautions to be adopted for construction of a high railway embankment in a marshy area.

Q. 5 – Explain how a zonal contract is finalised, involving negotiation, and is operated. How are the disputes arising out of the contract, settled?

Q. 6 – What is the schedule laid down for inspection of service structure and buildings. Explain in detail as to how inspection of a steel high service tank is to be carried out.

Q. 7 – write short notes on –

1. Flash butt welding.
2. Single tender.
3. Security patrolling.

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**CENTRAL RAILWAY**

# Limited Departmental Competitive Examination – Class II Service

# Civil Engineering Department on 25 – 10 – 1986

Time : 2 hrs. Marks : 50

GENERAL KNOWLEDGE

Q. 1 – What do the following abbreviations stand for ? 12

( a ) DDT ( b ) HUDCO ( c ) AIDS ( d ) UNCTAD ( e ) G.N.P. ( f ) PIN Code.

Q. 2 – Write short notes on: - 12

1. Asian Games at Seoul. 2. Forth Pay Commission. 3. RITES.

Q. 3 – Name the following: - 12

1. Governor of Maharashtra.
2. Cabinet Minister for External Affairs.
3. Capital of West Germany.
4. Capital of Assam.
5. Capital of South Korea.
6. Land of Midnight sun.

Q. 4 – Fill in the blanks :- 14

Inventor / Discovery. Inventor / Discovery.

1. Radium ...............................

2. Printing for the blind. ..............................

3. Television. ..............................

4. Fountain Pen. ..............................

5. .................................. A. Einstein.

6. .................................. W. K. Rontgen.

7. .................................. Galileo.

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###### CENTRAL RAILWAY

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 25 – 10 – 1986 ( A. N. ) Time : 3 Hours.

PAPER – II ( i ) Marks : 100

NOTE : All questions carry equal marks.

Answer any FIVE questions.

Make suitable assumptions regarding data where necessary.

Q. 1 – ( a ) If the degree of curve is defined by the angle at the center subtended by an arc (or chord) 20 meters, find the length of the chord in meters so that the versine measured in cms is equal to the degree of curve.

( b ) What is an ideal transition curve and by what name it is generally called. A transition curve is required for a circular curve of 200-meter φ radius, the gauge being 1.5 m. and max super elevation restricted to 15 cm. The transition restricted to 15 cm. The transition is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of radial acceleration is 30 cm / sec3 . Calculate the required length of transition.

Q. 2 – ( a ) Two concentrated loads of 100 & 200 KN advance along a girder of 20 m. span, the distance between the loads being 8 m. Find the position of the section which has to support the greatest bending moment and calculate the value of this bending moment.

( b ) A reinforced concrete pipe is of uniform thickness and 24 inches mean diameter. The loading from above may also be considered of uniformly distributed both loads having a value of 1600 Lbs per sq feet. If the pipe is 2 inches thick what maximum stress is induced. Draw the Bending moment diagram?

Q. 3 – ( a ) What are the material required for reinforced cement concrete structure of a multi - storied building. Describe them in brief with specification.

( b ) Design a concrete mix from the following data: -

Strength desired – 3800 psi,

Slump - 1” ,

Fineness modules of fine and coarse, aggregates available are 2 and 6.2 and max size of particle is ¾”, Weight of fine and coarse aggregates are 110 lbs per cft. And 100 lbs per cft respectively, Weight of cement is 90 lbs per cft. Voids in fine and coarse aggregates are 40 % each. Water cement ratio for a strength of 3800 psi = 0.64, the fineness modulus of combined aggregates may be taken as 4.7, voids in cement 50 %

Q. 4 – ( a ) What are loads and forces taken into account for designing a pile and what is load carrying capacity of a pile.

( b ) Determine the load carrying capacity of an RCC pile. Given the following data Section of the pile = 50 cm x 50 cm

Length of the pile = 15 m.

Weight of concrete = 2.4 t / m3

Weight of falling hammer = 5 tonnes.

Weight of free fall = 1 m.

Average penitration under last ten blows. = 5 mm

Efficiency of hammer = 100 %

Co-efficient of restitution = 0.5

Total elaste compression = 30 mm

Use Hiley formula.

Q. 5 – ( a ) Describe Bernoulli’s ‘ theorem for liquids. Illustrate with equation. How this is applied for the construction of venturimeter.

50 liters per sec of water flow in a horizontal pipeline which is 200m long and the centerline of which is 3 m above the datum line. The pipe tapers from 30 cm diameter to 20 cm dia. If the pressure at the larger end of the pipe is 1kg / Cm2. Calculate the pressure on the other end. Neglect losses.

( b ) A bridge is to be constructed over a stream having a catchment area = 20 miles2 partly in plains and partly in hills. Portion in hills has a length of 1.7 miles and fall of 880 ft. and that in plains has a length of 5.7 miles and a fall of 244 ft. Calculate the flood discharge if co elf of discharge is 80 % and area factor 95 5 and value of constant for calculating time of concentration = 14 for hills and 6 for plains. One hr rain fall intensity may be assumed as 2.5’’.

Q. 6 – A new railway Colony is going to have a population of 60,000. suggest the arrangements of water supply and sewage disposal. There is a river having perennial flow, which can be used, as source of water supply and also for disposal of treated sewage. Draw a neat diagram.

Q. 7 – Write short notes on any five: -

1. Triangulation
2. Proof stresses and working stresses.
3. Bricks.
4. Well foundation.
5. Unit Hydrograph.
6. Activated sludge process.

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CENTRAL RAILWAY

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 26 – 10 – 1986 Time : 3 Hours.

PAPER – II ( ii) Marks : 100

NOTE : i ) All questions carry equal marks.

ii ) Answer any FIVE questions.

iii ) Wherever required the written material should be supplemented by neat explanatory sketches.

Q. 1 – Explain in details the various operations involved in Through Packing – conventional Maintenance by beater Packing.

Q. 2 – Specify all the restrictions on laying of Long Welded Rails on B.G. Track in regard to Alignment, Gradient, Formation, Track- Structure, Bridges, Level Crossings, yards, etc

Q. 3 – A curve is to be laid for a B. G. track with following limitations - ( a ) Radius: 875 m ( b ) Actual Cant : 75 mm ( c ) Cant Deficiency : 75 mm ( d ) Deflection Angle : 200

Determine for the above curve - ( i ) Maximum Permissible Speed. ( ii ) Desirable Length of Transition Curve. ( iii ) Chain ages and Deflection Angles or Tangential Offsets for laying out half of the curve ( with transition ) with normal chord length = 10 m.

Q. 4 - Describe in details the Central Railway Specification for carrying out earth work in Railway Embankment in good soil for heights exceeding 6 meters.

Q. 5 – Describe the various elements of Bridge Inspection specified in the Indian Railways Way and works Manual.

Q. 6 – Describe with sketches one of the procedures that can be adopted for girder erection of 3 x 30 m span triangulated steel girders on tall piers on a new line.

OR

Describe with sketches one of the procedures that can be adopted for replacement under traffic existing 3 x 30 m span triangulated steel girders with new deeper girders.

Q. 7 – A crossover is to be laid between two parallel B. G. tracks at 4.725 m centers by using 52 kg, 1 in 8½ and 1 in 12 turnouts. For this layout,

1. Determine the main geometrical parameters for setting out the layout.
2. Draw a neat single line dimensioned sketch (not to scale) showing the locations of the salient points of the layout.

Q. 8 – Design an RCC lintel across an opening of 3 m clear span in brick wall 35 cms. Thick, 6 m high above the lintel level. Assume reasonable values for permissible stresses in concrete and steel.

Draw neat sketches (not to scale) showing the construction details of the above lintel adequate for field execution.

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – ESTABLISHMENT RULES

Date : 26 – 10 – 1986 Time : 1 hour. Max. Marks : 25

Q. 1 – Write salient features of family pension scheme. ( 8 )

Q. 2 – What are the power of Sr. Supervisors under D & A Rules? (8)

OR

What are the penalties that can be imposed on a Railway servant under DAR?

Q. 3 – Write short notes on: - (9)

( a ) Casual labour ( b ) Suspension ( c ) Productivity linked bonus.

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – FINANCIAL RULES

Date : 26 – 10 – 1986 Time : 1 hour. Max. Marks : 25

Q. 1 - Write short notes on Any Three: - (15)

( a ) MAS Account ( b ) Unsanctioned Expenditure. ( c ) Accounts Inspection Reports.

( d ) Allocation Registers. ( e ) Charge off Stores.

Q.2 – What is the grant that mainly affects the working expenses of Open Line Railway? How and when is the budget for this grant prepared and revised? (10)

OR

Why is there always excess over expenditure while carrying out works? What are the main causes of such excess and what are suggestions to see that such excesses do not recur in future? (10)

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**CENTRAL RAILWAY**

# Limited Departmental Competitive Examination – Class II Service

# Civil Engineering Department on 07 – 11 – 1987

Time: 2 hrs. Marks : 50

GENERAL KNOWLEDGE

NOTE:- 1. Give your question paper along with your answer sheets.

1. Answer your questions either in English or in Hindi.
2. All the questions are compulsory.

Q. 1 – For each of the following questions tick mark the choice that best answers the question.

1.) According to Revised Bonus Payment Act a worker receiving more than \_\_\_\_\_\_\_\_\_\_\_ /- per month will not be entitle for the bonus.

( a ) 2500/- ( b ) 4500/- ( c ) 800/- ( d ) 2000/- ( e ) 1600/-

2.) In which of the following generally we call FORTH ESTATE to –

( a ) Parliament ( b ) Judiciary ( c ) Public Sector. ( d ) Executive ( e ) Press.

3.) Amritsar was founded by –

(a) Ram das (b) Ravi das (c) Teg Bahadur (d) Gobind Singh (e) None of these.

4.) Salim Ali is famous for –

( a ) Singer ( b ) Painter ( c ) Writer ( d ) Ornithologist.

5.) Between which two countries the 1986 World cup hockey Match was played?

( a ) India – Pakistan. ( b ) Australia – England

( c ) U.S.S.R – Australia ( d ) West Germany – England.

6.) Who is the Chairman of Rajya Sabha (X – Officio chairman)?

( a ) President ( b ) Prime Minister ( c ) Vice President. ( d ) President of ruling party.

( e ) Chief of opposition party.

7.) To which Indian President the Bharat- Ratna Award was not awarded?

( a ) Rajendra Prasad ( b ) Fakruddin Ali Ahmad. ( c ) Dr. S. Radhakrishnan

( d ) V .V. Giri ( e ) Jakhir Hussain.

8.) Triple Antigen doesn’t protect from the following:-

( a ) Tetanus ( b ) Deptharea ( c ) Typhoid ( d ) Whopping Cough ( e ) None.

9.) The new education policy was presented by \_\_\_\_\_\_ mantralay.

( a ) Planning ( b ) Social Work ( c ) Education ( d ) Human Source of development.

10.) The year 1986 was internationally celebrated as: -

( a ) Shelters for unsheltered people ( b ) Human Rights ( c ) Peace ( d ) Young

( e ) None.

Q. 2 – What do the following abbreviations stand for? 5

( a ) LTTE ( b ) SAARC ( c ) GNLF ( d ) INTUC ( e ) UNESCO.

Q. 3 – Name the following: - 5

1. Governor of Jammu & Kashmir.
2. Vice President of India.
3. Chief of Indian air Staff.
4. Chairman of Railway Board.
5. Chief justice of supreme court.

Q. 4 – What are the following famous for? (5)

1.) Chera Punzi. 2.) Mount Everest. 3.) Peramboor. 4.) Khadankvasala.

5.) Konark.

Q. 5 – Write short notes on any Two of the following: - (6)

1. Operating Ratio 2. Official languages Act

1. Reasons for Black money & its prevention method. 4) Railway Electrification.

Q. 6 – Explain briefly – (9)

* 1. When the relative humidity is more than 90%, Than why it is difficult to keep cool in the summer season.
  2. Why red colour selected for the danger signal.
  3. If air is the bad conductor of heat, Then why don’t we feel hot, when we are cloth less.

Q. 7 – Do discussion for – ( 10 )

( a ) By passing strong laws , Dowry system and bride burning cannot be controlled.

Or

( b ) Position of drought in the country and the effect of there preventive measure on the country.

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**CENTRAL RAILWAY**

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 07 – 11 – 1987 Time : 3 Hours.

PAPER – II ( i ) Marks : 100

PROFESSIONAL SUBJECT

NOTE : All questions carry equal marks.

Answer any FIVE questions.

Marks given in bracket.

Q. 1 – ( i ) What is Least Count of the Theodolite. ( 5 )

( ii ) A man standing on the bank of a river sees a tower on the for bank magnetic bearing 40 degree. He walks 200 m. along the bank to ward east and find that its magnetic bearing is now 310 degree. If the river flows east west find its width. ( 15 )

Q. 2 – The following in the extract of a page of level field book fill in the missing reading and calculate the RL apply arithmetical check. ( 20 )

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| STN | BS | IS | FS | RISE | FALL | RL | REMARK |
| 1 | 2.285 |  |  |  |  | 232.460 | BM No. 1 |
| 2 | 1.650 |  | X | 0.020 |  | X |  |
| 3 |  | 2.105 |  |  | X | X |  |
| 4 | X |  | 1.960 | X |  | X |  |
| 5 | 2.050 |  | 1.925 |  | 0.300 | X |  |
| 6 |  |  | X | X |  | 232.252 | BM No. 2 |

Q. 3 - A Beam A B 12 meter long rests on supports 7 meter apart the right hand end over hanging the supports by 3 meter and the left hand end by 2 meter. The beam carries a uniformly distributed load of 450 kg per meter. The beam also carries a point load of 4000 kg at center

Construct the shear force and bending moment diagrams and also calculate the maximum bending moment. (20)

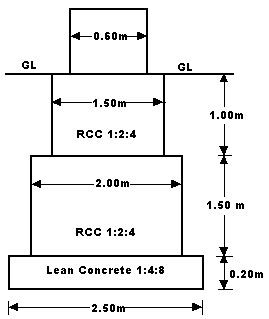
Q. 4 – There is a railway colony 2000 house holds source of water is from a tube well 2 km away the colony is 10 m higher then the ground at source. Tube well is 20 m deep & height of tank 10 m. Design the water supply system a high service Tank. (20)

Q. 5 – Calculate quantity of Steel & Concrete of RCC Column footing blow ground level - (20)

1. Lean Concrete Course (1 : 4 : 8 ) 20 cm thick.
2. 1 : 2 : 4 C. C. Footing 2m x 2m.
3. Depth of second footing 1,5 m.
4. Depth of first footing 1.0 m and size 1.5 m x 1.5 m.
5. Steel Reinforcement –

( a ) 12mm φ Bar 15 cm. Center to center both side For each footing.

( b ) 16 mm φ Bar – 6 nos. which are projected over ground level. Assumed cover 5 cm.



Q.No. 6 - Write short notes on any four of the following, illustrating with sketches where necessary: - (20 marks) ( a ) Plumb concrete. ( b ) Coursed Rubbal masonry. ( c ) Water cement ratio. ( d ) Pre stressed concrete sleeper. ( e ) Rapid sand filter. ( f ) Well foundation.

Q. 7 – Write short notes on any two of the specification of the following –

1. Wood work for door & windows.
2. Brick Work.
3. Railway Ballast for Track route.
4. Pitching of slope. ( 20 )

Q. 8 – Describe different types of foundations for buildings & Bridges in civil engineering Railway Department. Explain briefly with sketches. ( 20 )

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**CENTRAL RAILWAY**

**Limited Departmental Competitive Examination**

**Civil Engineering Department**

Date : 08 – 11 – 1987 Time : 3 Hours.

PAPER – II ( ii) Marks : 100

NOTE : i ) All questions carry equal marks.

ii ) Answer any FIVE questions.

iii ) Wherever required the written material should be supplemented by neat explanatory sketches.

Q. 1 – Write short notes on any four of the following :- ( 20 )

( a ) Rulling Gradient . ( b ) Curve compensation in B. G. ( c ) Transition Length

( d ) Cant deficiency in B. G. ( e ) Maximum Cant on B. G. ( f ) Equilibrium Cant.

Q. 2 - Explain in details the various operations involved in Through Packing – conventional Maintenance by beater Packing. ( 20 )

Q. 3 - Write short notes on any four of the following :- ( 20 )

( a ) Measured Shovel Packing. ( b ) Directed Track Maintenance. ( c ) P.Q.R.S.

( d ) Anti – creep device. ( e ) Building cost Index.

( f ) Permanent adjustment of dumpy level.

Q. 4 – As an AEN in charge, what inspection will you under taken at the time of inspection of Girder Bridge 3 x 60 feet. (20)

Q. 5 -( a ) What are the items of works requiring the sanction of the CRS? (10 marks)

( b ) Describe the procedure for obtaining sanction of CRS for a re – building of 2 x 10 ft. arch bridge. (10 marks)

Q. 7 - Write short notes on any five of the following: - (20)

( a ) Measurement book. ( b ) Limited tender. ( c ) Cash imp rest. ( d ) Danger Level & High Flood Level in 1 x 60 ft. girder bridge. ( e ) Engineering Time allowance mark. ( f ) Manson Patrolling. ( g ) Central Railway schedule of rates.

Q. 8 – Explain briefly along with comparative assessment any two of the following: - (20)

1. Flush butt-welding and Thermite welding.
2. Short welded rail and Long welded Rail.
3. Pile foundation & open foundation.
4. Railway land given on license and lease.
5. I.T.K.M. and E.T.K.M.

Q. 9 - Write short notes on any five of the following: - (20)

( a ) Urgency Certificate. ( b ) Private Siding. ( c ) U.S.F.D. ( d ) O.D.C.

( e ) R. H. Girder. ( f ) Revised Estimate. ( g ) On account Bill to Contractor.

( h ) Rail Lubrication.

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – FINANCIAL RULES

Date : 08 – 11 – 1987 Time : 1 hour. Max. Marks : 25

Q. 1 - Write short notes on any three of the following: - (15)

( a ) Draft Para. ( b ) Consolidated fund of India. ( c ) Deposit Works.

( d ) Material Modification. ( e ) Departmental Charge.

( f ) Late tender and delayed tender.

Q. 2 – What are the economies that can be achieved in civil engineering department and how? OR

What are the conditions governing examination of tenders by tender committee? What are responsibilities of tender committee? (10)

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**CENTRAL RAILWAY – ENGINEERING DEPARTMENT**

**Limited Departmental Competitive Examination – Class II**

PAPER III – ESTABLISHMENT RULES

Date : 08 – 11 – 1987 Time : 1 hour. Max. Marks : 25

Q. 1 – What constitutes a break in service for a –

( a ) Casual labour for the purpose of continuity in service to attain temporary status?

( b ) Under what circumstances an employee is not liable to pay any compensation to a workman in respect of an injury caused by an accident arising out of and in the course of employment.

( c ) What procedure is followed to change the classification of a gate man under HOER.

Q. 2 - Write short notes on any three of the following: -

( a ) Hospital Leave. ( b ) Family pension. ( c ) Trade Test. ( d ) Over Time.

( e ) Substitute. ( f ) Zonal corporate enterprise group.

Q. 3 - ( a ) How many hours in a day a workman governed by factories act can normally be asked to work.

( b ) Can a monthly rated casual labour be a member of a Railway institute.

( c ) How many passes the widow of an employee is entitled to.

( d ) Name the two recognized unions on Indian Railways.

( e ) When does a project CL become entitled for a temporary status?

( f ) What is the maximum gratuity payable to a Railway employee on superannuation.

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**CENTRAL RAILWAY**

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

Date :- 8 – 4 – 1989 Paper – I Max. Marks : 50

Time : - Two hours GENERAL KNOWLEDGE

NOTE :- Answer Six Questions. Questions 1 and 6 are compulsory.

Q. 1 – For each of the following questions tick mark the choice that best answers the question.

15

1. The country popularly known as the land of the “ Rising Sun” is: -

( a ) Japan ( b ) Norway ( c ) China ( d ) India

1. The heart of a young man beats approximately: -

( a ) 90 times a minute , ( b ) 100 times a minute,

( c ) 82 times a minute , ( d ) 72 times a minute.

1. Indian National Congress was founded by :-

( a ) Bal Gangadhar tilak , ( b ) Mahatma Gandhi,

( c ) Subhash chandra Bose, ( d ) A. D. Huma.

1. Tropic of Cancer is :-

( a ) A kind of disease , ( b ) A scientific apparatus to detect cancer,

( c ) 23½0 S. latitude, ( d ) 23½0 N. latitude,

1. Whose signature is found on the one-rupee currency note in India :-

# ( a ) President of India, ( b ) Prime Minister of India, ( c ) Cabinet Secretary of India,

# ( d ) Finance Secretary, ( e ) Ministry of Finance.

# When an element burns in air it :-

# ( a ) Changes into energy, ( b ) Changes into a gas,

# ( c ) Is converted into a compound , ( d ) Is destroy.

# Meningitis is a disease of human beings that of facts :-

( a ) Kidney, ( b ) Heart, ( c ) Liver, ( d ) Central Nervous system.

1. Deficiency of vitamin ‘A’ in man results in :-

1) Short stature, 2) Night Blindness , 3) Colour Blindness, 4) Xeropthamia.

( a ) 1 & 4 , ( b ) 2 & 4 , ( c ) 1 & 3 , ( d ) 3 & 4.

1. Which of the following is incorrectly matched :-

( a ) Lignite - Nayvelli, ( b ) Mica – singarani

( c ) Diamond – Panna , ( d ) Kyanite – Mayur Bhanj .

1. Second largest spoken language in India is :-

( a ) Tamil, ( b) Bengali , ( c ) Telegu , ( d ) Urdu .

1. Road construction in south – India is cheaper than that in Gangetic plain because of :-

( a ) Abundance of cheap ballast, ( b ) Hard rocky land surface ,

( c ) Availability of cheap labour, ( d ) None of the above.

1. The value of π was first given by :-

( a ) Bhaskara, b ) Aryabhatta , ( c ) Varahmihir , ( d ) None of the above.

1. Sonar is used in :-

( a ) Detecting object in air , ( b ) detecting object under water ,

( c ) Measuring intensity of sound waves , ( d ) Measuring intensity of light waves.

1. Which is/are the most important row materials required in Cement industry :-

( a ) Limestone , ( b ) Clay , ( c ) Limestone & clay , ( d ) Gypsum & clay.

1. Who is the Supreme Commander of Armed Forces ?

( a ) President , ( b ) Prime Minister , ( c ) Defence Minister, ( d ) Chief of Army staff .

Q. 2 – Expand the following abbreviations :- 7

( i ) N.T.P.C. ( ii ) D.M.K. ( iii ) B.H.E.L. ( iv ) A.I.D.S. ( v ) R.I.T.E.S. ( vi ) I.P.K.F.

( vii ) UNICEF.

Q. 3 - Name the following :- 7

1. Chairman , Law Commission.
2. Chief of Air Staff.
3. Governor of Madhya Pradesh.
4. Chief Minister of Bihar.
5. Speaker, Lok Sabha.
6. Prime Minister of Sri Lanka.
7. Member ( Engineering ) , Railway Board.

Q. 4 – Why were the following in news recently ? 7

( i ) Salman Rushdie , ( ii ) R. K. Dhawan , ( iii ) Namibia ,

( iv ) Jalalabad, ( v ) AIADMK, ( vi ) V. T. Station ,

( vii ) Mrs. Pamella Bordes .

Q. 5 - Explain briefly : -

1. Why do stars twinkle ? 2½
2. When metallic objects are touched in winter, they give a colder sensation as compared to wooden object . 2
3. Why is mercury commonly used as a thermometric fluid rather than water ? 2½

Q. 6 – write a short note on any one of the following :- 7

* 1. Highlights of the Railway budget 1989 – 90 .
  2. High speed trains on Indian Railways.
  3. Settlement of claims of Bhopal gas tragedy victims.
  4. Reduction in voting age from 21 to 18 years.

Q. 7 – ( a ) What are the States coming under ‘A’ and ‘B’ regions. 7

( b ) What are the provisions under Official languages Act 12 .

Q. 8 - What are the following famous for ? 7

1 ) Rabindra Nath Tagore , 2 ) Rana Pratap ,

3 ) Bal gangadhar Tilak , 4 ) Satchidanand Rautroy ,

5 ) G. B. Shaw , 6 ) Borie Becker,

7 ) Shyam benegal .

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**L.D.C.E. – CIVIL ENGG. DEPARTMENT , 8th APRIL, 1989**

## GROUP ‘ B ‘

PART II ( i ) PROFESSIONAL SUBJECT

All questions carry equal marks.

Answer any five questions. Where needed, illustrate simple sketches .

Time : 3 hrs. Total marks : 100

Q. 1 - ( i ) What is Bench Mark ? ( 5 marks )

( ii ) What is plane of collimation ? ( 5 marks )

( iii ) Enumerate the permanent adjustment of a dumpy level and explain the adjustment by a two peg method . ( 10 marks )

Q. 2 - A man standing on the bank of a river sees a tree on the for bank in the direction N 30 degree W . He walk 100 meters. Along the bank to wards west and find that its direction is now N 30 degree E . If the river flows east west find its width ? ( 20 marks )

Q. 3 - A simply supported beam 10 m long is subjected to three point loads of 1 T, 2 T and 3 Tones each at distance of 3m, 5m and 8m from the left end. draw S. F. & B. M. diagram for the beam. (20)

Q.No. 4 – Write short notes on any four of the following, illustrating with sketches where necessary: - (20 marks)

1. Rolled steel channel section.
2. Flash Butt welding.
3. Infiltration Gallery.
4. Drop Man – hole.
5. Water cement ratio.
6. Plum concrete.
7. Open Foundation.

Q. 5 – Write short notes on any two of the specification of the following –

* 1. Brick work.
  2. Liquid limit, Plastic limit and Plasticity Index.
  3. Pile foundations.
  4. Advantage of Pre – stressed concrete. (20 marks)

Q. 6 - Design a RCC column and footing to carry a load of 100 tonnes. Soil at 8 ft. depth has a safe bearing capacity of 15 tonnes per M2. propose the quality of concrete, footing and illustrate by a dimensional sketch. (20 marks)

Q. 7 - There is a railway colony of 500 house holds source of water is from a tube well 800 m away. The colony is 10 m higher then the ground at source. Tube well is 60 meters deep. Design the water supply system a high service tank. (20 marks)

Q. 8 - The following figures are extracted from a level field book. some of the entries being missing. Calculate all the figures by the rise and fall method. (20 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| STN | BS | IS | FS | RISE | FALL | RL |
| 1 | 3.235 |  |  |  |  | X |
| 2 | 1.660 |  | X | 0.825 |  | X |
| 3 | X |  | 0.145 | X |  | X |
| 4 |  | 3.175 |  |  | 0.290 | 850.000 |
| 5 |  | X |  |  | 0.225 | X |
| 6 | 1.115 |  | 3.805 |  | X | X |
| 7 |  | 3.900 |  |  | X | X |
| 8 |  | 2.905 |  | X |  | X |
| 9 |  |  | X | 1.340 |  | X |

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**LDCE**

**ENGINEERING DEPARTMENT**

DATE :- 9th April , 1989 . Marks – 25

Subject :- Establishment Total time – One hour.

Q.No. 1 – ( a ) What are the various Penalties that can be imposed on Railway Servant under DAR? 5

( b ) In which cases of imposing a Major Penalty an enquiry is not necessary. 5

Q. 2 – Write short notes on any three of the following: - 15

( a ) PNM ( b ) staff benefit fund. ( c ) Family Pension. ( d ) Corporate Enterprise Group ( CEG ).

( e ) Industrial Despute Act. ( f ) HOER ( g ) Official Language Act.

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**CENTRAL RAILWAY**

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION – CLASS II**

**CIVIL ENGINEERING DEPARTMENT**

Date :- 9 – 4 – 1989 Total Marks : 25

Time : - One hour. Paper – FINANCIAL RULES

Q. 1 – Write short notes on any three :- 15

( a ) Financial appraisal of Railway Projects . ( b ) Completion Estimate.

( c ) depreciation Reserve Fund . ( d ) Public Accounts Committee.

Q. 2 – Define Operating Ratio. In what way dose it serve to judge the efficiency of a Railway . OR

What are the demands for Grants? How do they serve as a tool for Budgeting control.

10

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**L.D.C.E. – CIVIL ENGG. DEPARTMENT , 9th APRIL, 1989**

## GROUP ‘ B ‘

PART II ( ii )

All questions carry equal marks.

Answer any five questions. Where needed, illustrate by simple sketches .

Time : 3 hrs. Total marks : 100

Q. 1 – Write short notes on any four of the following :- ( 20 marks )

( a ) Cant deficiency. ( b ) Equilibrium Cant. ( c ) Catch siding. ( d ) Slip siding. ( e ) Curve compensation. ( f ) Cant gradient in transition length.

Q. 2 – Explain the various operations as per the Permanent Way Manual for through packing .

( 20 marks )

Q. 3 – Write short notes on any four of the following :- ( 20 marks )

( i ) End cropping of rails. ( ii ) De – stressing in LWR. ( iii ) Deep screening under traffic. ( iv ) Building Cost Index . ( v ) Mansoon patrolling. ( vi ) Method to improve track alignment.

Q. 4 - ( a ) What are the items of works requiring the sanction of the CRS ? ( 10 marks )

( b ) Describe the procedure for obtaining sanction of CRS for a re – building of 12 ft. arch bridge. ( 10 marks )

Q. 5 - Write short notes on any four of the following :- ( 20 marks )

( i ) Danger level and high flood level in an important bridge .

( ii ) safety precautions in track renewal work . ( iii ) Measurement book .

( iv ) Central Railway’s Schedule of Rates. ( v ) Limited tenders.

( vi ) Tree Plantation on Central Railway in your section.

Q. 6 – Draw a dimensional sketch for proposed diversion with a bank height of 3 meters on a bridge re – habilitation work of 4 x 10 ft. arch . Calculate the grades, curvatures, and length for the diversion. (20 marks)

Q. 7 – Explain briefly along with comparative assessment any two of the following: - (20 marks)

( a ) Licensing and leasing of Railway land. ( b ) Major bridge and important bridge.

( c ) free rail and long welded rail. ( d ) Flash Butt Welding and Thermit Welding.

Q. 8 – Write briefly on any four of the following: - (20 marks)

( a ) Rail lubrication . ( b ) Weld failures in track . ( c ) Inspection of track on a through girder. ( d ) Urgency Certificate. ( e ) U. S. F. D.

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# CENTRAL RAILWAY

# L.D.C. Examination – Civil Engineering – 1992

# PAPER I Maximum marks 150

# 27 – 6 – 1992 Time : 3 hours

Note : Candidates should write their Roll number clearly in words also.

Candidates may please answer both Part A and Part B separately as per instructions. The same answer book should be used.

### PART – A [ Max. marks 50 ]

All questions carry equal marks.

Q. 1 – Give expanded form of the following –

(a) JNR (b) NIC (c) IMF (d) NTPC (e) CAD 5 x2 =10

Q.2 – Give the correct answer out of the multiple choice given to the questions below: - 5x2 =10

(a) Amjad Ali Khan is associated with –

(i) Sitar (ii) Cricket (iii) Films (iv) Sarod (v) Shehnai

(b) Water has highest density at a temperature of -

1. 00 C (ii) 40 C (iii) 100 C (iv) 1000 C (v) None of these

(c) Who holds the record for the highest score in a single Innings in test Cricket in the world –?

(i) Don Brad man (ii) Sunil Gavaskar (iii) Kapil Dev (iv) Garfield Sobers (v) Hanif Mohammad

(d) First man to walk on the moon –

(i) Yuri Gegaria (ii) Amstrong (iii) Rakesh Sharma (iv) Edmund Hillary

( e ) The latest film stare to have been elected to the Lok Sabha –

(i) Shatrughan Sinha. (ii) Sunil Dutt (iii) Rajesh Khanna (iv) Deepika Topiwala

Q. 3 - ( a ) What is the past while U.S.S.R. now called? Name as man / Status as you can into which this mighty country can stands divided? 6

( b ) In Europe we have also had the occurrence of unification of a few countries recently. Name them, What is their common name now? 4

Q. 4 - Name the following – 10 x1 = 10

1. President of Russia
2. An Industrious Industrialist of India on whom the title of ‘’ Bharat Ratna “ was conferred recently.
3. Speakar of Lok Sabha
4. Prime Minister of Israel
5. Chairman / Chairperson of Rajya Sabha
6. Chief of P.L.O.
7. Union Minister for External Affairs
8. Capital of Nagaland
9. Currency of Italy
10. Youngest player to play Test Cricket in India

Q. 5 – ( a ) Write briefly what you know about – 5

Recent Security Scandal [ SCAM ]

OR

New economical Policy of Government

( b ) In how many regions has the country been divided under the Official Language Policy? What do these region signify? 5

**PART B Max. marks 100**

N.B. Attempt any FIVE Questions. All Questions carry equal marks. Wherever applicable, neat sketches should be used in your answers.

Q. 1 – Write short notes on any FOUR of the following :- 4x5 = 20

1. Triangulation
2. G.T.S. Bench Mark
3. Quick Sand Effect
4. Permanent adjustment of a Dumpy level
5. Water Cement Ratio
6. Least Count of a Theodolite

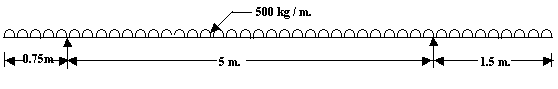
Q. 2 – What are under-reamed piles? Where are they used on the Railways and under what circumstances? Describe briefly the procedure for laying of there piles. 20

Q. 3 - ( a ) What do you understand by the following: -

1. Aerobic and anaerobic action 3
2. Self Cleaning Velocity 2
3. Septic Tank 3
4. Residual Chlorine 2

( b ) Give salient features of “ SUJALA” Filtration Plant. 10

Q. 4 - ( a ) Draw the shear force and bending moment diagram of a RCC Beam with the following loading? 15



( b ) Show in a rough sketch the type of reinforcement required for this beam. No calculations or size of reinforcement is required. 5

Q. 5 - In order to as certain the height of a light house, a surveyor seiec to two points A & B on the sea shore collinear with the base of the light house. He measures an angle of elevation 30 0 and 45 0 to the top of the light house from A & B separately. The distance from A to B taped by the surveyor come to 102.92 meters. Find-

1. The height of the light house.
2. The distance of light house from A. 20

# Q. 6 – ( a ) Define young’ s modulus. 5

# ( b ) What force would be required to cause an elongation of 1 mm

# in a steel rod of diameter 25 mm and a length of 5 m ,

# young’ s modulus of steel 1.5 x 10 6 kg cm 2 13

# ( c ) Which material would have higher modulus of elasticity rubber or steel. 2

Q. 7 – Give in brief the current specifications for any two of the following: -

1. First Class bricks
2. Track Ballast
3. Earthwork in high embankments
4. Reinforced Cement Concrete 10 x 2 = 20

Q. 8 - ( a ) What are the different type of foundations used for bridges and under what conditions is each type recommended? 8

( b ) What is understand by the yield of a Tube well? How is it determined? 8

( c ) What do you understand by Venturimeter? 4

Q. 9 -( a ) What is the basic difference between Reinforced Concrete and Prestressed concrete? What are the advantages of latter over the former? 10

( b ) What type of a road would you construct in a Railway Colony at a wayside station having 80 staff quarters. Briefly describe the method of construction of this road. 10

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# CENTRAL RAILWAY

# L.D.C. Examination – Civil Engineering – 1992

# PAPER II Maximum marks 150

# 28 – 6 – 1992 Time : 3 hours

Note : Candidates should write their Roll number clearly in words also .

Candidates may please answer both Part A and Part B separately as per instructions. The same answer book should be used.

### PART – A [ Max. marks 50 ]

Q. 1 – write short notes on any three of the following: - 12

1. Assessed Rent of Quarters
2. Canons of financial Propriety
3. Local Purchase
4. Cash Imp rest
5. Payment of wages act
6. Retirement benefits

Q. 2 – What penalities can be inflicted on a non-gazetted Railway Servant? What procedure is to be followed to remove a PWI Gr. III from service? 15

Q. 3 – What are the various types of Audit and accounts Inspection reports / Notes? At what level are these finalised and closed? 12

OR

Write brief notes on any three: - 3 x 4 = 12

i ) ACSPF ( ii ) Reappropriation iii ) Depreciation Reserve Fund ( iv ) Final Modification

Q. 4 – Describe in brief the procedure to rescind a works contract. 11

OR

Describe in brief the various types of Engineering Estimates. 11

**PART B**

N.B. First three questions ( Q.1, Q.2 and Q.3 ) are COMPULSORY. Answer any two from the remaining. All questions carry equal marks.

Q. 1 – Write short notes on any four of the following :- 4 x 5 = 20

1. Open and limited Tenders
2. Urgency Certificate
3. Chamfering of rail – holes
4. Engineering Speed Restrictions
5. Rail – tensors
6. HFL and Danger Level of an important Bridge

Q. 2 – Draw a neat dimensioned cross-sectional sketches of a - 20

* 1. New single Line B.G. track in a cutting on a mainline route.
  2. New double Line B. G. track on a trunk route having MBC sleepers with 60 kg CWR track on embankment.

Q. 3 – An Express train has derailed in mid-section in your jurisdiction as an AEN. You are the first officer to reach the site. On reaching the site, you are sure that apart from serious injuries, some deaths have also taken place. Explain in brief what action would you take in order of precedence till a more senior officer arrives and thereafter. 20

Q. 4 - ( a ) What do you understand by the Schedule of dimensions for Railways? Who is competent authority to issue or modify them? How many schedules does Schedule of B. G. contain? What is the significance of each? 12

( b ) Indicate the prescribed dimensions in metric system for any four of the following on B. G.

1. Minimum radius of curvature
2. Recommended maximum gradient in Station Yards in new constructions.
3. Minimum height above rail level at center of track for road –over bridge in 25 kv A.C. Traction Territory.
4. Maximum and minimum horizontal distance from the centerline of track to face of a passenger platform.
5. Minimum horizontal distance from center of track to any structure from 1065 mm to 3355 mm above rail level in new construction. 4 x 2 = 8

Q. 5 - ( a ) What is the minimum prescribed track structure for LWR / CWR on Broad Gauge? 6

( b ) What do you understand by “distressing” of LWR / CWR? Why is it required? 4

( c ) Explain how you would distress a recently laid LWR of one km. length on MBC sleepers with Elastic clips using rail-tensors. 10

Q. 6 - ( a ) What are R.H. Girder? Where are these required? 5

( b ) Explain with a free hand sketch the outline of procedure to be adopted to rebuild a distressed arch bridge of 2 x 3.0 m. span. 15

Q. 7 - A complete Track Renewal work of 20.52 km has been sanctioned with 60 kg rails laid on MBC sleepers. The existing track consists of 52 kg CWR laid on CST-9 sleepers. Explain briefly step by step the procedure to be adopted to carry out this work using track machines (available on Central Railway) to the maximum extent possible. 20

Q. 8 - Write short notes on any four of the following :- 4 x 5 = 20

1. Cant Deficiency.
2. Building Cost Index.
3. Arbitration.
4. On account bills and final bills.
5. Reconnaisance Survey
6. Final Location Survey
7. Hot Weather Patrolling

Q. 9 – What are the detailed duties of an AEN on the Indian Railways? Give prescribed schedule of his inspections on the Central Railway. 20

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**CENTRAL RAILWAY**

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PROFESSIONAL PAPER – I – PROFESSIONAL AND GENERAL KNOWLEDGE

Date : 10 – 02 – 1996 Time : 3 hours Marks : 150

PART – I – General Knowledge and Hindi Policy

In this Part all Questions are to be attempted -

Q.1 – Please give salient features of the present policy of the Central Government on Raj Bhasha {Hindi}. Also indicate the policy for writing name board on the stations. 15

OR

Write 2 pages on measures that you will suggest for increasing the use of Raj Bhasha {Hindi} in your office in Railways.

Q.2 – In the Answer sheet write the correct answer in the form of (a) (b)(c) etc. for each on i.e. (i) (ii) (iii) etc. [One mark for each part] 20

1. The first nuclear experiment on India took place at –

a) Pokhran, b ) Bombay , c ) Nellie.

1. Black soil is best suited for the cultivation of –

A ) Wool , b ) Tea , c ) Cotton , d ) Coffee

1. Uttar Pradesh tops the list of sugarcane producing states of India, which of the following states holds the 2nd position –

a) Bihar , b ) Maharashtra , c ) Karnataka , d ) Madhya Pradesh.

1. Konarak temple is situated in –

A ) Andhra Pradesh, b ) Bihar, c) West Bengal , d ) Orissa.

1. Michael Ferreira is associated with –

a) Chess , b ) Billiards , c ) Badminton , d ) Tennis.

1. Yuan is the currency of –

A ) Japan , b ) China , c ) Indonesia , d ) Burma.

1. Gandhiji started Dandi March –
   1. To demonstrate against the British empire , b ) To break the salt law ,

c ) To boycott foreign goods.

* + 1. Who was the first woman President of Indian National Congress –

A ) Sarojini Naidu , b ) Vijaya Lakshmi Pandit , c ) Raj Kumari Amrit Kaur.

* + 1. Union Territories are headed by –

A ) The President , b ) The Lt. Governors , c ) The Governors.

* + 1. India’s first underground Metro services started at –

A) Delhi, b) Calcutta, c) Bombay, d) Madras.

* + 1. In which Indian city ‘ Operation Blue Star’ took place –

A ) Ludhiana , b ) Delhi , c ) Bombay , d ) Amritsar.

* + 1. Who is the speaker of Lok sabha –

A ) Madhav Rao Scindia , b ) Shivraj Patil , c ) Najma Haptullah.

* + 1. Where is the National Defence Academy situated –

A ) Khadakvasala , b ) New Delhi , c ) Jhansi .

* + 1. The 1996 Olympics comes will be played at –

A ) Sharjah , b ) Atlenta , c ) Delhi , d ) Seol .

* + 1. ‘ Bombay High ‘ is famous for –

a ) High City , b ) Having Highways , c ) Offshore Oil exploration , d ) High Buildings.

* + 1. The first Indian to go into space was –

A ) L. M. Katre , b ) Prakash Padukone , c ) Rakesh sharma.

* + 1. Who is the Supreme Commander of Armed Forces –

A ) The President , b ) The Prime minister , c ) defence .

* + 1. Occean currents originate due to –

A ) Winds , b ) temperature difference , c ) Difference in the density of sea water ,

d ) All of the above .

* + 1. Genetic information is decoded in –

A ) Blood , b ) Bones , c ) Brain , d ) DNA.

* + 1. Which statement is correct about the Solar Eclipse –

A ) It occurs on new moon day , b ) It dose not occur on new moon day ,

c ) It occurs on full moon day.

Q. 3 - each part i.e. ( i ) , ( ii ) etc. are of 3 marks . 15

1. Name of the following –

A ) Governor of Maharashtra , b ) Chairman of Railway Board ,

c ) Chief Election Commissioner of India .

1. What are the following associated with –

A ) Boris Becker , b ) Ravi Shankar , c ) R . K. Laxman .

1. What do the following abbreviations stand for –

A ) AIRF , b ) UNICEF , c ) INTUC.

1. Match the following –

A ) Gulzari Lal Nanda .... First Prime Minister of India .

B ) Jawahar Lal Nehru .... Second Prime Minister of India .

C ) Lal Bahadur Shastri .... Twice Acting Prime Minister of India .

1. With which game the following terms are associated with –

a ) Checkmate , b ) Deuce , c ) LBW .

**PART II – PROFESSIONAL.**

Note: Please answer question totaling 100 marks. At least one question from each group “A” ,”B”, ”C”,”D”,”E” & ”F” should be attempted.

Answer to questions of 20 marks need not to be more than 3 pages & for those of 10 marks need not to be more than 2 pages.

**Group ‘’ A ‘’**

Q.1 - For a curve of 50, apex angle of 900 & transition length of 60m, calculate the parameters for setting out curve by a Theodolite for TTP, mid point of transition, CTP and a point 100m from CTP. Make out a dimension sketch showing transition tangent point, curve tangent point, transition length and length of curve. (20)

Q. 2 - Write notes / attempt on any two: - (20)

1. Explain calculation of cross sectional area by midordinate rule. What method do you follow for calculation for volume of earth work in a railway embankment when cross sectional area are known? Give the formula used.
2. What leveling instrument are being used by the railways? What are the permanent adjustments in a dumpy level? How these are done?
3. In running fly level from a bench mark of RL 365.655, the following readings were obtained.

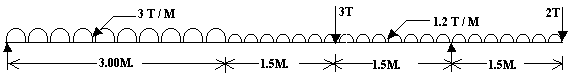
Back sight - 0.964, 1.632, 1.105, 0.850,0.369.

Fore sight - 0.947, 1.953, 1.184, 1.125.

For the last position of the instrument , seven pegs at 10 m interval are to be set out from a uniform gradient of 1 in 50. The first peg is to be have RL of 365.000. Workout the staff reading required for setting out the tops of pegs on the given gradient and enter the results in level book form.

**Group ‘’ B “**

Q. 1 - Draw the shear force and bending movement diagram for the following beam configuration. (20)

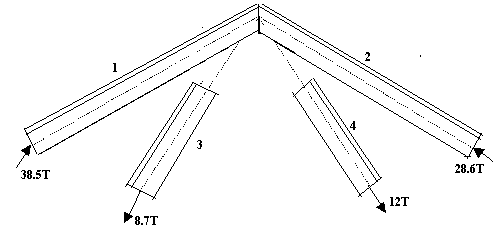


Q. 2 – What are influence line diagrams on a simply supported beam AB of 6 m span, a single wheel load of 8 tonnes moves from A to B. Draw influence line diagram for bending movement at 2 m from B. Also draw a maximum bending movement diagram for the beam taking dead load on the beam to be 0.5 t. per meter. (20)

Q. 3 – A rectangular beam section 300 mm width and 550 mm deep is reinforced with 4 x 14 mm dia. Tension bars (center line of bars from the beam is 50 mm). Determine stress induced in top compression fiber of concrete and in steel for a bending moment of 55 KNM. Concrete is of M 15 grade? (20)

Q.4 - 4 member of a steel truss are connected to a gusset plate 12 mm thick by 22 mm power driven shop rivets as per sketch below. Find the number of rivets required in each member to take the load mentioned in the sketch. Member 1 and 2 are double angle sections and 3 & 4 are single angle sections.

Permissible stresses for power driven rivet are -In shear Ps = 1025 kg / cm2, in bearing Pb = 2360 kg / cm2. (20)



**Group ‘’ C ‘’**

Q. 1 – Explain any two of the following - (20)

1. Hooks Law and Elastic limit.
2. Neutral axis and radius of gyration.
3. Euler’s Theory for long column and Slenderness ratio.
4. Water cement ratio, slump in concrete and grading of concrete as M15, M20 etc.

Q. 2 - Explain any two of the following - (20)

1. What is the difference between painting, polishing and varnishing as for as woodwork is concerned? What are their advantages and disadvantage?
2. What are the various types of tiles available in the market for floor and for walls? What basic precaution would you take for their laying and for choosing the type, colour and size of tiles?
3. What water proofing materials are available for ensuring leak proof roofs of new buildings? Make sketches showing arrangements of roof slabs, water proofing arrangements and terracing, including junction arrangements with parapets.
4. What elements of railway track are more prone to corrosion? For each of them, indicate the preventive maintenance, precautions required to be taken.

Q.3 – Draw a realistic dimensioned sketch of - (20)

1. RCC ‘T’ beam, showing its reinforcement in a longitudinal section, cross section and a sectional plan.
2. Details ‘A’ of the ‘N’ truss shown in the sketch, indicating gusset plate, rivet connection and bearing plates.

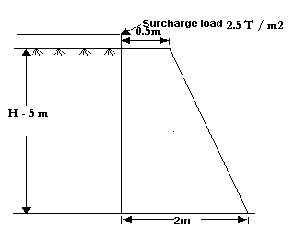
**A**

**Group ‘’ D ‘’**

Q.1 – What do you understand by ’bad formations’ for track? Give in short, various methods available for improvement to bad formations. (10)

Q.2 – Define water content, void ratio and dry density of a soil. If wet density of a soil is 1.9 gm per cm at a moisture content of 24%, what will be its dry density? (10)

Q.3 - A retaining wall 5 m height is shown in the sketch. Density of the back fill is 1.9 T / m3 its angle of shear resistance is 30o and cohesion is zero. Work out the resultant earth pressure on the wall and its point of application. (20)



**Group ‘’ E “**

Q. 1 – What is the method of calculation of flood discharge for a new flood opening? What surveys will it require? What formula will be used? (10)

Q. 2 – How would you decide the water way required for a new flood opening after knowing the design discharge and the alignment and cross section of river. Explain by sketches. (10)

Q. 3 – Make out a typical sketch of guide bunds for an important river. How do you calculate the width of apron for the guide bund? Give formulas used. (10)

**Group “ F “**

Q. 1 - State different types of chlorination processes available in Railway & market for disinfect ion of water. What type of chlorine used in the above different process. What do you understand by Residual Chlorine and how it is measured? (10)

Q.2 – There is a colony having 15 blocks of Type – II quarters, each block having 8 quarters. Make out a diagram of distribution pipelines from an overhead tank and up to the quarters. Showing diameter of pipeline in various sketches. (10)

Q.3 – Make out a dimension free hand sketch for a septic tank for 300 users, also indicating there in the disposal of affluent from the septic tank. Justify size of the septic tank by calculation. (10)

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PAPER – II

PROFESSIONAL SUBJECT AND ESTABLISHMENT & FINANCIAL RULES

Date: 11 – 02 – 1996 Time: 3 hours Marks: 150

Note – Each question carry 15 marks. Attempt 10 questions in all choosing at least 2 questions from each of the sections (a) (b) and (c). Reply to each question need not Exceed 2 pages.

###### Section “ A “

Q.1 – What are avoidable Rail fractures? List out preventive action and precautions that you will take to reduce rail fractures separately for fish plated zone and non-fish plated zone.

Q.2 – What are special precautions that you must take while maintaining LWR on CST-9 sleepers? Draw sketches showing ballast profiled for LWR on MBC and on CST-9 sleepers.

Q.3 – What are the causes of buckling of track in short welded Rails? What preventive measures, precautions would you take to prevention of buckling?

Q. 4 – Design super – elevation and transition length for a 30 curve on a ‘ B ‘ route with maximum permissible speed of 105 KMPH for passenger train and 65 KMPH for goods train permissible cant deficiency 75 mm.

Q. 5 – Draw neat sketches showing recommended formation width for bank and cutting for concrete sleeper track on B.G. as per latest guidelines of the Railway Board for double line. Side drain required in cutting should also be shown?

Q. 6 – Draw a sketch showing telescopic speed restriction required for deep screening work with BCM and duematic and location of speed restriction boards. The work is progressing on the double line against direction of traffic.

Q. 7 – Write notes on any two –

1. Working of CSMS in design mode.
2. Preventive maintenance of track machines.
3. Classification of spare parts required for track machines on the basis of their criticality. What are critical parts of a CSMS?

Q.8 – Make out a sketch of a typical PQRS train and explain field working of renewal with PQRS.

**Section “ B “**

Q.1 – List out various surveys carried out for a new line, in their order of precedence. Indicate type of drawings and estimates prepared in the preliminary survey.

Q.2 – Make out a dimensioned sketch showing temporary arrangements for rebuilding a 2 x 2.4 m. arch bridge with 1x 6m. PRC slab where height of formation is about 8 mt. Give reasons for choosing the length of temporary span. What will be the permissible speed on the arrangement during the period of rebuilding?

Q. 3 – 9 m. span steel girder on a double line section with bank of 6 m. is to be replaced with PRC girders. Explain with sketches methodology that you will adopt for this re-girdering on down line when 1 m. deep water is flowing in the bridge?

Q.4 – What are yard sticks for manning and up gradation of level crossing? What safety boards and at what distance are to be provided for road user and track for un manned level crossing?

Q.5 – What are rules for working of dip lorries and their protection arrangements on a single line section? Explain with sketches.

Q.6 – Make out a checklist of all elements of good drainage, sanitation and cleanliness in a residential colony that should be checked during the inspection.

Q. 7 – Reply any two of the following: -

1. What is grade compensation on curves? Why it is provided? What compensation will be provided for 1 in 100 gradient on 5-degree curve on BG line and what will be absolute gradient are on this compensation.
2. What is a vertical curve? Why and where are they provided? What are stipulations in engineering code for them for B. G. Railway track?
3. What are various classes of ODCs ? What precautions are to be taken for their movements? Who is the competent authority to sanction the movements of ODCs, of different classes?

**Section “ C “**

Q. 1 – Write notes on any two: -

1. Urgency certificate.
2. Deposit works.
3. On account bills.
4. Issue of tools and plants to contractors.

Q.2 – What are the various types of estimates prepared for Railway works? Essence in 5 lines for each one of them.

Q.3 - Write notes on any two: -

1. Prevention of encroachment.
2. Material at site account.
3. Single tender.

Q.4 - Write notes on any two: -

1. Hours of employment regulations
2. Major Penalties.
3. Railway service conduct rules.

Q.5 – Under what demand of grant and sub – head the following expenditure will be booked (Reply any 7).

1. Maintenance of water supply in a staff colony.
2. Cleanliness of a station.
3. Trial bore for water supply for a workshop.
4. Survey for re modeling of a yard.
5. Salary of divisional officers.
6. Maintenance of track machines.
7. Casual renewal of fitting in a track.
8. Replacing of rails and sleepers damaged in an accident.
9. Track renewal.
10. Casual labours of bridge branch.

Q. 6 - Write notes on any two: -

1. Compassionate appointment.
2. Entitlement of MRCL.
3. Permanent negotiating machinery.

Q.7 – Indicate steps that you will take to reduce unauthorised absenteeism of staff working under you also indicate 5 important steps that you will take to improve productivity of departmental labour.

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# CENTRAL RAILWAY

# LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION

**CIVIL ENGINEERING DEPARTMENT**

PROFESSIONAL PAPER – I – PROFESSIONAL AND GENERAL KNOWLEDGE

Date : 26 – 04 – 1997 Time : 3 hours Marks : 150

Note - 1) Candidate should clearly write their roll number in words also.

2) Attempt all questions in part ‘ A ‘.

3) Be brief in your answers.

**PART – I – General Knowledge and Hindi Policy**

Q. 1 – Give the full form of –

a) I.M.F. b) U.S.F.D. c) N.A.M. d) UNICEF e) CAD (5 marks)

Q.2 – Name the following –

a) The Prime Minister of UK. b) Chairman Railway Board.

c) Governor of the reserve Bank of India.

d) Chief Election Commissioner of India.

e) The Richest man in the World. (5 marks)

Q.3 – Which sport do you associate the following with –

* 1. Vishwanathan Anand b) Leander Pace c) Rahul Dravid d) Pargat Singh

e) Mohammed Ali (5 marks)

Q.4 – What is the Capital of –

A) Bangladesh b) Gujrat c) Tripura d) Malaysia e) Iran (5 marks)

Q.5 – Where are the following situated –

a) Jalianwala Bagh b) Brindavan Gardens c) Rail Coach Factory

d) National Defence Academy e) Eiffel tower (5 marks)

Q.6 – Fill in the blanks –

1. Water has the highest density at ............
2. ........... is the lightest element.
3. The first nuclear explosition in India took place at ..............
4. ........... is the currency of Japan.
5. The S.I. unit of force is .............. (5 marks)

Q.7 - a) Who was the first Indian to receive the Noble Prize for Physics?

* 1. Who is the author of the book “ The Golden Gate”?
  2. Name the Supreme Commander of the Armed Force of India.
  3. Which metal is found in liquid form at room temperature?
  4. Who was the first Indian to go into space? (5 marks)

Q. 8 – State True or False –

1. Solar eclipse occurs on full moon day.
2. Sound travels faster in steel then in water.
3. Diamond is harder than Granite.
4. The sun never sets at the North Pole.
5. India gate is located in Mumbai. (5 marks)

Q. 9 – What are your obligation under sec. 3 (3) of the official Language Act? (10 marks)

OR

What measure would you suggest to increases the use of?

Rajbhsha (Hindi) in the day-to-day working of the Railways? (10 marks)

**PART II – PROFESSIONAL**

Q.1 – Write short notes on any four of the following –

1. Elastic Limit.
2. Residual Chlorine.
3. Workability of Concrete.
4. Optimum moisture content.
5. Self-Cleaning Velocity.
6. Under reamed piles.
7. Influence line diagram. (4 x 5 marks)

Q. 2 – Design a footing for a rectangular column 500mm x 300mm to carry a vertical load of 8,000,000 N. The bearing capacity of the soil is 200 KN / m. Use M- 15 concrete. Take C = 5 N / mm, t = 140 N / mm and m = 18. Values not given may be assumed. (20 marks)

Q. 3 - a) Explain briefly the measures you will take to ensure quality of Concrete for a major bridge construction project. (5 marks)

b) What are the important considerations for deciding the depth of the foundation of a pier to be located in an alluvial river? (5 marks)

Q. 4 – a) A beam A B C with an overhang is simply supported at A & B, AB = 8 meters and BC = 2 meters. The beam supports a Uniformly distributed load of 6 KN / m and a concentrated load Of 28 KN at 3m from A. Calculating the bending moment and Shear force at a cross section located 5 m from A? (15 marks)

b) What advantage can be derived by making a beam Continuous? (5 marks)

Q. 5 - a) What is pressure filter and where will you recommend its Use? (10 marks)

b) What is the function of Alum Dosing in a filtration plant? (5 marks)

c) What is a Venturimeter? ( 5 marks )

Q. 6 - a) What do you understand by Aerobic and an- aerobic action? (5 marks)

b) What is a septic tank? Draw a neat sketch for a septic tank for 100 users. (15 marks)

Q. 7 – Write in brief the current specifications for any two of the

following –

1. Fine aggregate for concrete.
2. First class bricks.
3. Wood for framework.
4. Distempering.
5. Water bound macadam road. (5 marks)

Q. 8 – In a 16 m span truss, the bottom tie is subjected to a tensile force of 52.5 KN. The tie member is ISA60, 60,6. The welded construction is proposed to be adopted Design the gusset joint for the bottom tie. The properties of ISA60, 60,6 are A = 684mm, t = 6mm, Cy = 16.9mm, Fy = 250 N / mm. Any data not given may be assumed. (20 marks)

Q. 9 – Answer any five of the following – (4 x 5 marks)

1. Define Poisson’s ratio.
2. What is the function of Shear Connectors in a Composite girder?
3. What is the importance of bond in R.C.C.?
4. Which material would have higher modules of elasticity rubber or steel?
5. What is a Slender column?
6. What do you understand by dynamic augment?

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PAPER – II

PROFESSIONAL SUBJECT AND ESTABLISHMENT & FINANCIAL RULES

Date: 27 – 04 – 1997 Time: 3 hours Marks: 150

Note - 1) Candidate should clearly write their roll number in words also.

2) a) Attempt question No. 1 and any other two, questions from Part ‘ A ‘.

b) Attempt any five questions from Part ‘B’. All questions carry Equal marks.

3) Be brief in your answers.

# Part A - ESTABLISHMENT & FINANCIAL RULES

Q. 1 – Write short notes on any five of the following –

1. Depreciation Reserve fund. ii. Urgency Certificate.
2. Single tender. iv. Material modification.
   1. Qualifying service. vi. D.C.R.G.

vii. Commutation of Pension**.** (5 x 4 = 20)

Q.2 -a) What are the circumstances under which a railway servant can be placed under suspension? (8)

b) State the circumstances under which an employer is liable to pay compensation to a workman under Workmen’s Compensation Act. (7)

Q.3 –a) How does the parliament exercise control over Railways Finances? (5)

b) What are main reasons for excess / over expenditure in Railways? What are you suggestions to keep the expenditure under control? (10)

Q.4 - a) Describe in brief the procedure to terminate a works contract. (10)

b) What are the service conditions of a casual labour? (5)

## Part B – Professional

Q.1 – a) Why there are restrictions on taking LWR through girder bridges? (5)

b) What precautions will you take to avoid buckling of track in LWR section? (8)

Q. 2 – Write short notes on any four of the following –

1. Cant deficiency.
2. Cold weather patrolling.
3. Building cost index.
4. OMS – 2000
5. ETKM
6. Elastomeric bearings.
7. Ruling gradient.
8. Final location survey. (4 x 5 = 20)

Q. 3 – a) what is cumulative frequency diagram? (5)

b) A curve on a B.G. section has to be laid with a radius of 875 m. Actual cant to be provided is 100mm and maximum cant deficiency of 75mm is permitted. Determine the maximum permissible speed and desirable length of transition. (15)

Q. 4 – a) What aspects you will check while inspecting a 3 x 18.3m girder bridge. Sub – structure is of mass concrete and the river has a non-corrodible bed. (12)

b) A stone masonry arch bridge 1 x 3.05 m has developed a transverse crack near the crown. What action will you take to rehabilitate the bridge? (8)

Q. 5 – What are the duties of an Assistant Engineer in charge of an open line sub- division? Give the prescribed schedule of his inspection on central Railway. (20)

Q. 6 –a) Draw out a checklist of all-important elements for inspection of a residential colony.

(10)

b) What steps will you take to ensure that good quality water is supplied at railway stations and for staff quarters? (10)

Q.7 – a) Describe the construction of a 6.0 m high embankment with soil requiring mechanical compaction. (15)

b) What do you understand by Bulk age factor and Shrinkage allowance? (5)

Q. 8 – a) What are the works for which CRS’s prior sanction is necessary before their commencement? (5)

b) Write a short note on mechanical relaying of track with concrete sleepers. (15)

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PROFESSIONAL PAPER – I – PROFESSIONAL AND GENERAL KNOWLEDGE

Date : 12 – 06 – 1999 Time : 3 hours Max. Marks : 150

Note - 1) Candidate should clearly write their roll number in words also.

2) Attempt all questions in part I .

Attempt any five questions in Part II.

All questions carry equal marks.

3) Be brief in your answers.

**PART – I – General Knowledge and Hindi Policy**

Q. 1 – Give the full form of - ( 5 marks )

( a ) R.A.W. ( b ) U.N.E.S.C.O. ( c ) S.P.C.A. ( d ) G.A.T.T. ( e ) N.T.P.C.

Q. 2 – Name of the following - ( 5 marks )

1. Chairman, Planning Commission.
2. Chairman, Atomic Energy Commission.
3. Secretary General , U.N.O.
4. Chief Election Commissioner.
5. Supreme Commander of Armed Forces of India .

Q. 3 – What is Capital of - ( 5 marks )

( a ) Mizoram , ( b ) Arunachal Pradesh , ( c ) Norway , ( d ) Thailand , ( e ) Mauritius .

Q. 4 – What sport do you associate the following with ? ( 5 marks )

( a ) Dingko Singh , ( b ) Mahesh Bhupati , ( c ) Robin Singh , ( d ) Geet Sethi ,

( e ) Jyotirmoyee Sikdar

Q. 5 - In the answer sheet, write the correct answer in the form of ( a ) , ( b ) , ( c ) , .... etc. for each of the following. ( 20 marks )

( i ) Which of the following sports personalities received the Rajiv Khel Ratan Award 1998 ?

1. Sachin tendulkar.
2. Leander Paes.
3. K. Malleshwari.
4. Limba Ram.
5. Vishwanathan Anand.

( ii ) Which of the following is not a programming language of computer ?

( a ) BASIC ( b ) FORTRAN ( c ) LASER ( d ) PASCAL

( e ) All are programming languages .

( iii ) Prof. Amratya Sen, who was awarded the 1998 Nobel Prize has contributed to which of the following fields?

( a ) PHYSICS ( b ) CHEMISTRY ( c ) MEDICINE ( d ) WORLD PEACE

( e ) ECONOMICS

( iv ) OLYMPICS 2004 is to be held in –

( a ) JOHANNESBERG ( b ) CAPE TOWN ( c ) ROME ( d ) SYDNEY

( e ) None of these.

( v ) The currency of the proposed European Monetary Union is –

( a ) DOLLAR ( b ) EURO ( c ) GUILDER ( d ) MARK ( e ) None of these.

( vi ) The city, which has been given the name of Silicon Valley of India , is in which State ( a ) Karnataka ( b ) Kerala ( c ) Maharashtra ( d ) Haryana

( vii ) India is the largest producer of –

( a ) MICA ( b ) COAL ( c ) TIN ( d ) LEAD

( viii ) Which of the following crops has most dispersed distribution in India ?

( a ) COFFEE ( b ) COTTON ( c ) JUTE ( d ) TEA

( ix ) The Dandi March was the Satyagraha against –

( a ) Untouchability ( b ) Salt Tax ( c ) Prohibition ( d ) Child marriage

( x ) Who among the following remarked that “Swaraj is my birth- right and I shall have it “

( a ) Dadabhai Nauroji ( b ) Aurobindo Ghosh ( c ) Gopal Krishna Gokhale

( d ) Bal Gangadhar Tilak

( xi.) The soil with poor water- holding capacity is –

( a ) SILT ( b ) CLAY ( c ) SAND ( d ) LOAM

( xii ) The latest Magsaysay Award winner from India is –

( a ) B. G. Varghese ( b ) Kiran Bedi ( c ) T. N. Seshan ( d ) M. S. Swaminathan

( xiii ) The filament of an electric bulb is made of –

( a ) COPPER ( b ) SOFT IRON ( c ) CAST IRON ( d ) TUNGSTEN

( xiv ) The acid used in car battery is –

( a ) Hydrochloric acid ( b ) Boric acid ( c ) Sulphuric acid ( d ) Carbonic acid.

( xv ) A characteristic gas smells near unclean public urinals. Which is this gas?

( a ) Ammonia ( b ) Chloride ( c ) Sulpher dioxide ( d ) Carbon monoxide

( xvi ) Which of the following is a result of surface tension?

( a ) Gravitational pull ( b ) Viscosity ( c ) Capillary action ( d ) Radiation

( xvii )The first session of the Indian National Congress was held at –

( a ) Bombay ( Mumbai ) ( b ) Delhi ( c ) Calcutta ( d ) Madras ( chennai )

( xviii ) Deccan Trap areas in Western India Largely have –

( a ) Alluvial soil ( b ) Black soil ( c ) Red soil ( d ) Laterite soil

( xix ) The natural wax and lac are obtained as –

( a ) Petroleum products ( b ) Resins of forest Plants

( c ) Byproducts of Sugar Industry ( d ) Insect secretions

( xx ) Ist December of every year is observed to mark –

( a ) World Habitat day ( b ) Universal Children’s day

( c ) World AIDS day ( d ) Anniversary of United Nations.

Q. 6 – In how many regions has country been divided under the Official Language Act ?

( 5 marks )

Q. 7 – What are your obligations under sec. 3 (3) of the Official Language Act ? ( 5 marks )

**PART II ( PROFESSIONAL )**

Q. 1 – ( a ) What Leveling instruments are being used in Railway ? What are the Permanent adjustment in a Dumpy Level, How are they done? ( 10 )

( b ) In running fly level from a bench mark of RL 375. 655, the Following reading were obtained -

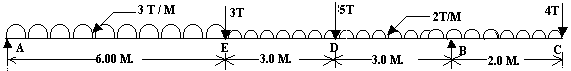
Back sight : - 0.964 , 1.632 , 1.105 , 0.850 , 0.369 .

Fore Sight - 0.948 , 1.953 , 1.184 , 1.125 .

From the last position of the instrument, five Pegs at an interval of 10 m. are to be set up on a uniform gradient of 1: 60. The first peg is to have 365.00. Work out the staff reading required for setting out the top of pegs on the given gradient and enter the results in a level book form? ( 10 )

Q. 2 - Draw Shear Force and Bending Moment diagram for the following beam configuration.

( 20 marks )



Q. 3 - A rectangular beam section 400 mm width and 650 mm deep is reinforced with 4 x 20 mm dia. Tension bars, center line of bars from the bottom of the beam is 50 mm. determine stress induced in top compression fiber of concrete and in steel for a bending moment of 60 KNM. Concrete is of M 20 grade? ( 20 marks )

Q. 4 – ( a ) Explain by sketch the working of NEERI type latrine. What are the merits and demerits compared to Aqua privy? ( 8 marks )

( b ) Give a typical cross section of a manhole in a sewarage scheme at the intersection of two sections, 5 m deep from the ground level. ( 8 )

( c ) What is self cleansing velocity. ( 4 marks )

Q. 5 – Explain any four of the following, with relevant formula, wherever necessary?

( i ) Afflux ( ii ) Foundation design discharge ( iii ) Hydraulic Jump

( iv ) Grip length for the foundation of a bridge

( v ) Quick sand effect ( vi ) Economic span of a bridge . ( 4 x 5 marks )

Q.6 - ( a ) What are different methods of chlorination available for disinfection of water ? Indicate the form of chlorine used in each of them. ( 6 marks )

( b ) What do you mean by and how do you check residual chlorine ? ( 4 marks )

( c ) There is a Railway Colony of 500 type quarters, source of water is from a tube-well 800 m away . The colony is 10 m higher than the ground at source . Tube – well is 60 m deep . Design water supply system with a High Service Tank . ( 10 marks )

Q. 7 - ( a ) Explain the Unit hydrograph Method for estimation of peak flood discharge in a river.

( 8 marks )

( b ) Draw neat sketches of the following - ( 3 x 4 marks )

( i ) Typical cross section of BG track where soil stabilisation

has been carried out on BC soil .

( ii ) Joint of a parapet wall and a roof slab on the terrace .

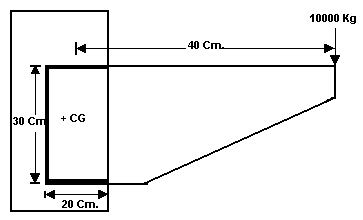
( iii ) Cross section of a deep well foundation on sand .

( iv ) Water – proofing with Indian Patent Stone .

Q. 8 – The piers and abutments of a bridge come rising 5 x 30.5 m span girders are ready. How would you organise launching the girders ? Give details including sketches, with the requirements of tools & equipment and manpower etc. the girder material are being received from CWM Manmad. ( 20 marks )

Q. 9 - ( a ) What are the advantages and disadvantages of welding in fabrication of steel structures ? ( 4 marks )

( b ) Calculate the size of weld required for the welded bracket loaded as shown in figure blow . ( 16 marks )



Take allowable shear stress in weld as 1025 kg / cm2.

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PAPER – II

PROFESSIONAL SUBJECT AND ESTABLISHMENT & FINANCIAL RULES

Date: 13 – 06 – 1999 Time: 3 hours Marks: 150

Note - 1) Candidate should clearly write their roll number in words also.

2) Be brief in your answers.

3) Blank space in answer sheet should be crossed.

###### Part A - ESTABLISHMENT & FINANCIAL RULES

( Attempt question No. 1 and any other two, questions from Part ‘ A ‘.)

Q. 1 – Write short notes on any five of the following – ( 5 x 4 = 20 marks )

( a ) Canons of financial propriety. ( b ) Hours of Employment Regulations.

( c ) Draft Paras. ( d ) Late and delayed tenders. ( e ) Pink Book .

( f ) Railway Service Conduct Rules . ( g ) DCRG ( h ) Qualifying service.

Q. 2 - ( a ) Describe the procedure to rescind a Works contract. ( 6 marks )

( b ) Describe in brief the various types of Engineering estimates. ( 9 marks )

Q. 3 - ( a ) What are the main provisions of the Payment of Wages Act? What are the permissible deductions under this Act? (8 marks)

( b ) What procedure is to be followed to remove a PWI Gr. III from service under D & A Rules? ( 7 marks )

Q. 4 – Distinguish between any three of the following – ( 5 x 3 = 15 marks )

( a ) Earnest Money and security deposit.

( b ) General Conditions of Contract and Special Conditions of Contract.

( c ) Developmental Fund and Depreciation Reserve Fund.

( d ) Final Modification and Material Modification.

##### PART B - PROFESSIONAL

( Attempt Question No. 1 and any other four questions from Part B )

Q. 1 – Answer briefly the following with sketches where necessary**.** ( 20 x 2 = 40 marks )

1. What should be the maximum difference in height between running rail and guard rail on a girder bridge?
2. What is the spacing of trolly refugee on ballasted deck bridges?
3. What are the ‘d Special’ and ‘B special’ routes on C. Rly.?
4. What is the spacing of distance pieces on track adjacent to platforms?
5. What is the maximum value of Cant excess and cant deficiency on BG for speeds more than 100 kmph?
6. In Which month gap survey on SWP should be done and under what weather conditions should it be done?
7. What is the height of speed indicator board from rail level?
8. At what distance, speed breakers should be provided on unmanned level crossing?
9. What is the minimum permissible radius of curve and steepest permissible grade on which LWR can be laid?
10. What should be the minimum distance of SEJ from a girder Bridge on which LWR can not be carried through?
11. On LWR track, in what temperature range, maintenance of track can be done? What action should be taken if the temperature exceeds the prescribed range, after the maintenance operations.
12. Where distressing of LWR is required to be done?
13. Where is ‘hot weather’ and ‘cold weather’ patrolling started on LWR track?
14. In need-based concept of USFD testing, what will be the frequency of testing in the following cases?

( a ) Group ‘B’ route - Annual GMT 16.

( b ) Group ‘D’ route – Annual GMT 10, during previous testing 17 REM defects were noticed over a length of 10 km.

1. In need-based concept of USFD testing, what action should be taken when a ‘REM rail or Defective weld is detected?
2. What is the minimum radius of vertical curve on A & B routes?
3. What are the Railway Affecting Works?
4. For what purpose are the following track machines used? ( a ) CSM ( b ) FRM ( c ) DTS ( d ) BCM
5. What are ‘Buffer rail’? Where are they used?
6. Draw a sketch showing telescopic speed restrictions required for deep – screening work with BCM and duomatic and location of speed restriction boards. The work is progressing on up line against the direction of traffic.

Q. 2 – Explain briefly, with comparative assessment, any three of the following –

(3 x 5 marks)

* 1. Licensing and leasing of Railway land.
  2. Major bridge and Important bridge.
  3. Flash butt welding and Thermit welding.
  4. Rocker and Roller bearings.
  5. Slip siding and catch siding.

Q. 3 – ( a ) What are the items of work requiring the sanction of CRS? (6 marks)

( b ) Describe the procedure for obtaining sanction of CRS for rebuilding of 4 m arch

bridge. (9 marks)

Q. 4 – Write short Notes on any three of the following - (3 x 5 marks)

( a ) Danger Level and High flood level in an important bridge. ( b ) Measurement Book

( c ) Limited Tenders ( d ) Building Cost Index ( e ) Tree plantation in your section.

( f ) Chamfering of Rail holes.

Q. 5 – What are the various types of surveys? Explain the procedure for conducting final location survey in case of doubling of a section consisting of 3 block sections. Indicate the type of drawings and estimates prepared after the survey. (15 marks)

Q. 6 – ( a ) Budget for maintenance of service buildings is very tight these days. Describe the procedure you would adopt to maintain service buildings within available funds to ensure long life and functional usefulness of service buildings. (10 marks)

( b ) Why roofs of the buildings leak? What are the different methods you would adopt to repair leaking roofs? (5 marks)

Q. 7 – What are the functions of track ballast? Why it is important to have clean ballast in the track? What would be the procedure for manual deep – screening in LWR track? (15)

Q. 8 – ( a ) How can the incidence of rail and weld fractures under traffic be reduced? (6 marks)

( b ) What could lead to buckling of track, both under LWR and SWR? What precautions should be taken to prevent this, in both such tracks? (9 marks)

Q. 9 - Write short Notes on any three of the following - (3 x 5 marks)

( i ) Zero Based Budget. ( ii ) Procedure for passing road traffic at manned level crossing

Gate. ( iii ) Off track tampers . ( iv ) Annual review of Gang strength.

( v ) Directed Building Maintenance. ( vi ) R. H. Girder . ( vii ) Submerged Arc Welding.

( viii ) Grade Compensation on Curves. ( ix ) TGI

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### CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PROFESSIONAL PAPER – I – PROFESSIONAL AND GENERAL KNOWLEDGE

Date : 20 – 05 – 2000 Time : 3 hours Max. Marks : 150

Note - 1) Candidate should clearly write their roll number in words also.

2) Attempt all questions in part I .

Attempt any five questions in Part II.

All questions carry equal marks.

3) Be brief and to the point in your answers.

4) Score out blank space in answer sheet .

**PART – I – General Knowledge and Hindi Policy**

Q. 1 – Give the full form of - ( 5 marks )

( a ) FRCS ( b ) ECAFE ( c ) MRVC ( d ) NEFA ( e ) SAARC

Q. 2 – Why were the following in news recently? (5 marks)

( a ) Jhmpa Lahiri ( b ) Courteny Walsh ( c ) Yukta Mookhey ( d ) Vladimir Putin

( e ) Manoj Prabhakar

Q. 3 – Who are the authors of the following books? (5 marks)

( a ) Gitanjali ( b ) India Wins Freedom ( c ) Mahabharat ( d ) Mother ( e ) Saket

Q. 4 – What are the following instruments used for? (5 marks)

( a ) Anemometer ( b ) Lactometer ( c ) Pyrometer ( d ) Tacheometer ( e ) Hygrometer

Q. 5 – What is the capital and currency of the following countries? (5 marks)

(a) Nepal (b) New Zealand (c) Sweden (d) China (e) Switzerland

Q. 6 – In the Answer sheet, writes the correct answer in the form of (a) (b) (c)... for each of the following - (15 marks)

1. Filament of an electric bulb is made of –

(a) Iron (b) Copper (c) Tungsten (d) None of these.

* 1. Best conductor of heat is -

( a ) Iron ( b ) Copper ( c ) Aluminum ( d ) Silver .

* 1. Oil in a vick of lamp rises due to -

( a ) Pressure difference ( b ) Capillary action ( c ) Low viscosity of oil

( d ) Gravitational force.

* 1. In the process of galvanisation , an iron sheet is coated with -

( a ) Aluminium ( b ) Zinc ( c ) Tin ( d) Galena

* 1. Velocity of sound is maximum in -

( a ) Air ( b ) Water ( c ) Steel ( d ) Vacuum.

* 1. Water filled in the reservoir of a dam possesses -

( a ) Potential Energy ( b ) Kinetic Energy ( c ) Electric Energy ( d ) Light Energy.

* 1. Bauxite is an ore of -

( a ) Iron ( b ) Zinc ( c ) Tin ( d ) Aluminium

* 1. If the velocity of a particle is reduced to half of its initial value, the kinetic energy of the particle -

( a ) Gets doubled ( b ) becomes four times ( c ) reduces to half of its original value.

( d ) Reduces to one-fourth of its original value .

* 1. If the volume and surface area of a cube are equal, then the side of the cube is - ( a ) 3 ( b ) 4 ( c ) 5 ( d ) 6
  2. The gas used to extinguish fire is -

( a ) Neon ( b ) Nitrogen ( c ) Carbon dioxide ( d ) Carbon monoxide .

* 1. Plaster of Paris is made from –

( a ) Bauxite ( b ) Gypsum ( c ) Lime ( d ) None of these

* 1. The conversion of a substance directly from solid to vapour is known as

( a ) Decomposition ( b ) Vaporisation ( c ) Ionisation ( d ) Sublimation.

* 1. Which of the following elements are main constituents of bronze ?

( a ) Nickle and Chromium ( b ) Lead and Tin ( c ) Copper and Zinc

( d ) Copper and Tin .

* 1. Food is normally digested in -

( a ) Liver ( b ) Stomach ( c ) Small intestines ( d ) Large intestines .

* 1. Who administers the Oath of Office to President of India ?

( a ) Speaker of Lok Sabha ( b ) Vice – President ( c ) Chief Justice of India

( d ) Prime Minister.

Q. 7 – Explain the salient features of the Official Language Act with reference to Use of Hindi ( Raj Bhasha ) in day – to – day working in Railway . ( 10 marks )

**PART II ( PROFESSIONAL )**

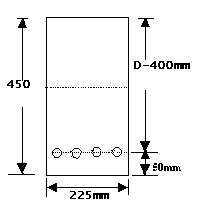
Q. 1 - ( i ) Explain briefly the following - ( 8 marks )

( a ) Triangulation ( b ) GTS Bench mark .

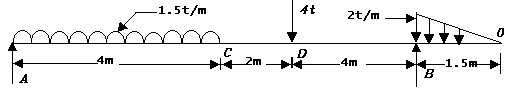
( ii ) In order to as certain the height of a light house ,a surveyor selects to two points A & B on the sea shore collinear with the base of the light house . He measures an angle of elevation 30degree and 45 degree to the top of the light house from A & B respectively . The distance from A to B taped by the surveyor is 105.32 meters. Find-

1. The height of the light house.
2. The distance of light house from A . ( 12 marks )

Q. 2 - A rectangular beam 225 mm x 450 mm is simply supported over a span of 5m. it is provided with 4 nos 20 mm dia mild steel bars as reinforcement . Calculate the maximum stress in steel and concrete in the beam ( see figure ) if it carries a UDL of 9000 N /m ( 900 kg / m ) including the self weight of the beam . m = 13 ? ( 20 marks )



Q. 3 – Draw the shear force and bending moment diagram of the following beam configuration . ( 20 marks )



Q. 4 - ( i ) Give in brief the current specifications of the following – ( 10 marks )

( a ) Earth work in high embankments.

( b ) Back – fill behind the abutments of bridges.

( ii ) What are the various types of tiles available in the market for floors and walls ? What basic precautions would you take for their laying and choosing the type ,colour and size of tiles ? ( 10 marks )

Q. 5 – ( i ) Write Short Notes on any three of the following - ( 12 marks )

1. Economic span of a bridge.
2. Elastomeric bearings.
3. Afflux in a river.
4. Controlled concrete
5. Foundation Design discharge for a bridge.

( ii ) What are the consideration in the selection of well foundation or Pile foundation for a bridge ? ( 8 marks )

Q. 6 – ( a ) Indicate how you will undertake the work of laying Three rows of pipes 600mm dia , under a railway track, where the formation is 7 m high. The work is to be carried out under traffic. ( 15 marks )

( b ) Explain the arrangement of 6 ( a ) above with a dimensioned sketch . ( 5 marks )

Q. 7 – ( a ) What precautions will you take for construction of a single – storeyed building in Black cotton soil areas . ( 6 marks )

( b ) What is the difference between polishing and varnishing as far as wood – work is concerned ? What are their advantages and disadvantages ? ( 6 marks )

( c ) What precautions should be taken while painting of steel girder bridge. ( 8 marks )

Q. 8 - A retaining wall 6 m high has smooth vertical back. The backfill has a horizontal surface in level with the top of wall . There is a uniformly distributed surcharge load of 3.6 t / m2 intensity over the backfill. The density of back fill is 1.8 t / m2 its angle of shear resistance is 30o and rise cohesion is zero.

Determine the magnitude and point of application of active pressure per meter length of the wall. ( 20 marks )

Q. 9 - Write short Notes on any four of the following with sketches, where necessary . ( 5 x 4)

1. Infiltration gallery.
2. Liquid limit, plastic limit and plasticity Index .
3. Developing a Tube – well.
4. Septic tank.
5. Design mix for concrete
6. Water – proofing of flat roofs .
7. Compaction of Earth work at OMC

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

PAPER – II

PROFESSIONAL SUBJECT AND ESTABLISHMENT & FINANCIAL RULES

Date: 21 – 05 – 2000 Time: 3 hours Marks: 150

Note - 1) Candidate should clearly write their roll number in words also.

2) Be brief and to the point in your answers.

3) Blank space in answer sheet should be crossed .

###### Part A - ESTABLISHMENT & FINANCIAL RULES

( Attempt question No. 1 and any other two, questions from Part ‘ A ‘.)

Q. 1 – Write Short Notes on any five of the following - ( 4 x 5 marks )

( a ) Trade Tests. ( b ) PREM.

( c ) Commutation of Pension. ( d ) Urgency Certificate.

( e ) Demands of Grants. ( f ) Productivity Linked Bonus.

( g ) Depreciation Reserve Fund ( h ) Compassionate Appointment.

Q. 2 – Explain briefly any three of the following - ( 5 x 3 marks )

( a ) Hours of Employment Regulations ( b ) Major penalties.

( c ) Payment of wages Act. ( d ) Deposit Works.

( e ) Zonal Contracts.

Q. 3 – What are the various types of Audit and Accounts Inspection Reports / Notes ? At what level, are these finalised and closed ? ( 15 marks )

Q. 4 – Explain why Stores are procured on the basis of Tender System and what different forms of Tender System are adopted ? ( 15 marks )

Q. 5 – ( i ) Explain briefly any two of the following - ( 2 x 4 marks )

1. Late and Delayed Tender.
2. Revised and Supplementary Estimate.
3. Out of Turn Sanction.
4. Operating Ratio.

( ii ) Under what Demand of Grant and Sub – head, the following expenditure will be booked ? ( 7 marks )

1. Maintenance of Water supply in a Staff Colony.
2. Maintenance of Track Machines.
3. Casual Renewal of fittings in track.
4. Replacing rails and sleepers demaged in the accident.
5. Track Renewal.
6. Rebuilding of a distressed bridge.
7. Salary of Divisional Officers.

**( PART ‘ B ‘ – PROFESSIONAL )**

( Attempt Q. 1 and Any Other Four Questions from Part ‘ B ‘ )

Q. 1 – Answer the following with sketches, wherever necessary . ( 20 x 2 marks )

1. What is the basis of Classification of Routes in Group ‘A’ , ‘B’, ‘C’, ‘D’ for BG ?
2. When should tongue – rail be replaced / reconditioned ?
3. When should deep – screening of the track be carried out ?
4. What is the prescribed frequency of USFD testing in Group ‘A’ router under ‘Need Based’ concept ?
5. What is the criteria for planning through – rail renewal and through – sleeper renewal ?
6. What is the criteria for realignment of curve ?
7. What is the frequency of recording by CMS – 2000 on BG routes ?
8. What priority has been laid down for manning of Unmanned Level Crossings ?
9. What are the vulnerable locations and what action should be taken for guarding of such locations during monsoons ?
10. What are the works requiring sanction of CRS ?
11. On LWR track, in what temperature range, should the regular maintenance of the track be confined ? What action should be taken if the temperature exceeds the prescribed range after maintenance operations ?
12. When does destressing of LWR / CWR become necessary ?
13. What is TGI ? How is it made use of in planning track maintenance ?
14. For what purpose are the following Track machines used and what is their prescribed ideal monthly capacity ?

( a ) CSM ( b ) PQRS ( c ) BCM (d ) T – 28

1. What is the numerical Rating System for inspection of railway bridges ?
2. Name four small track machines which are normally used in track maintenance ?
3. What are ‘Rail Dolleys’ ? What precautions should be taken while working Rail Dollies in the section ?
4. What precaution should be taken for the maintenance of track in ‘ Track – circuited areas’ ?
5. In case of obstruction at the level crossing, how should the gate – man protect the lines in BG double line section ?
6. What is the ‘ Five- Step’ method prescribed to tackle the suspect weak formation stretches ?

Q.3 – ( a ) What loads are required to be considered for the design of railway Bridge ? ( 6 mark )

( b ) What are RH girders ? Where are they required ? ( 4 marks )

( c ) Indicate prescribed dimensions in metric system for the following in BG - ( 5 marks )

1. Minimum radius of curvature
2. Recommended maximum gradient in station yards in new construction.
3. Minimum height above rail level at center of track for ROB in 25 kv AC traction territory.
4. Maximum and minimum height of High Level platform above Rail Level .
5. Minimum horizontal distance from center of track to any structure from 1065 mm to 3355 mm above rail level in new construction.

Q. 4 – ( a ) What precaution should be taken while handing 90 and higher UTS rail ? ( 7 marks )

( b ) Describe the procedure for in situ Alumini Thermit Welding of Rail Joints by SKV Process. ( 8 marks )

Q. 5 – ( a ) What is the need for mechanised maintenance of track ? ( 4 marks )

( b ) What pre-tamping and post-tamping attention must be given to track for obtaining good results from Tamping machines ? ( 6 marks )

( c ) What adjustments should be made in the tamping machines before commencing tamping operations ? ( 5 marks )

Q. 6 – ( a ) Explain briefly - ( 4 marks )

( i ) Equilibrium Cant. ( ii ) Cant deficiency.

( iii ) Cant excess. ( iv ) Transition curve.

( b ) Calculate the Equilibrium Cant , maximum permissible speed and length of transition curve for 600 m radius curve in BG with the following data - ( 11 marks )

Maximum sectional speed - 110 km/h.

Speed for determining Equilibrium Cant - 80 km/h.

Booked speeds for goods trains - 50 km/h.

Permitted cant deficiency - 100 mm.

Permitted cant excess - 75 mm.

Q. 7 – ( i ) What precautions would you take to prevent buckling of LWR and SWR tracks ?

(8 marks )

( ii ) How would you restore the track after LWR has buckled ? ( 7 marks )

Q. 8 – Write Short Notes on any five of the following - ( 3 x 5 marks )

1. Colony Care Committees.
2. Zero Based Budget.
3. Grade Compensation on Curves.
4. Sedimentation tank.
5. Danger Level and High Flood Level in an important bridge.
6. Working of CSMs in Crane working.
7. Precautions in Crane working
8. Flash Butt Welding of rails.

Q. 9 – ( a ) What are the different types of ODCs ? Who is the competent authority to sanction the movement of ODCs of different classes ? ( 6 marks )

( b ) describe the various aspects to be looked into while inspecting 1 x 6 m arch bridge and 3 x 30.5 m through girder bridge. ( 9 marks )

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

Date : 20.12.2003 ( Maximum Marks 150 ) Time : 3 hours

PAPER – I – GENERAL KNOWLEDGE & PROFFSSIONAL

Note : 1) Candidate should clearly write their roll number in words also.

2) Be brief and to the point in your answer.

3) Score out blank space in answer sheet.

**PART – I -** **GENERAL KNOWLEDGE & HINDI POLICY**

1. Answer any two of the following questions
2. All questions carry equal marks : 2 x 25 = 50

1. a) Write all the salient features covered under section 3 (3) of Raj Bhasa Act 1963?

(10 marks)

b) Also indicate the target fixed for the year 2003-04 for the implementation of official language for ‘B’ region for various activities ? ( 10 marks )

c) Write the correct Hindi words for the following terms.

i) Top priority ii) Until further orders. iii) Self contained note iv) Put up for sanction

v) Funds not available. ( 5 marks )

2. Write full form of the following abbreviation. ( 2½ x 10 = 25 marks )

i) RBI ii) BSF iii) IMF iv) BHEL v) AIIMS

vi) PAC vii) GMT viii) SAIL ix) ADB x) UPSC

3. a) With which sports the following trophies/ tournaments are connected with. ( 5 Marks )

i) Wimbledon ii) Ashes iii) Durand Cup iv) Agha Khan Cup v) Duleep Trophy.

b) Name the personalities to whom the following Titles are connected with. ( 5 Marks )

i) Frontier Gandhi ii) Banga bandhu iii) Chacha iv) Man of Iron v) Sunny.

c) Write the capitals of the following Countries. ( 5 Marks )

i) France ii) Japan iii) Malaysia iv) Egypt v) Sri Lanka.

d) Write the name of the commodities to which the following trade names are connected with.

i) Dunlop ii) Omega iii) Vespa iv) Indane v) Broke Bond ( 5 Marks )

e) Unit of Measurement of the following. ( 5 Marks )

i) Electric Current ii) Heat iii) Power iv) Speed of Ship v) Resistance of a Conductor.

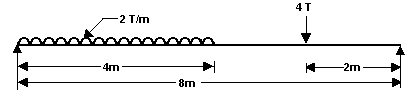
**PART – II – CIVIL ENGINEERING ( GENERAL )** ( 100 Marks )

Note : Answer any four questions out of the following

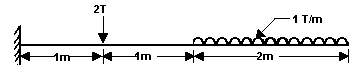
All questions carry equal marks : 4 x 25 = 100

1. Draw the Shear force and Bending movement diagrams in the following cases duly indicating the values at various locations.

a) ( 12½ Marks )



b) ( 12½ Marks )



2. The top of a hill subtends an angle of 390 28’ at a point ( A ) near its foot and angle of 530 49’ at a point ( B ), 80 m from ( A ) towards the hill. The points ( A ) and ( B ) being in line with its top. Determine the height of the hill and the horizontal distance from ( A ) to the top of the hill, assuming the elevation of the instrument axis to be the same for each setting.

( cos390 28’ = 0.7720 ; sin 390 28’ = 0.6356 ; cos 530 49’ = 0.5904 ; sin 530 49’ = 0.8072 )

( 25 Marks )

3. a ) Fill up the missing data in the following entries in a level book ( 20 Marks )

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Station | Distance | Readings | | | Collimation | Reduced level | Remarks |
| Back sight | Inter sight | Fore sight |
| ( A ) | 0 m | ------- |  |  | 521.035 | 520.450 |  |
|  | 30 m |  | ---------- |  |  | 520.099 |  |
|  | 60 m |  | 1.953 |  |  | --------- |  |
|  | 90 m |  | --------- |  |  | 518.189 |  |
|  | 120 m |  | 3.644 |  |  | ---------- |  |
|  | 150 m | 0.962 |  | ------------ | --------- | 517.097 | Change point |
|  | 180 m |  | --------- |  |  | 517.024 |  |
|  | 210 m |  | 1.689 |  |  | 516.370 |  |
|  | 240 m |  | 2.534 |  |  | 515.525 |  |
|  | 270 m | ----------- |  | 3.844 | 515.171 | ---------- | Change point |
|  | 300 m |  | 1.579 |  |  | 513.592 |  |
| ( B ) | 330 m |  |  | ---------- |  | 512.155 |  |

b) Determine the gradient of the line AB in the above case. ( 5 Marks )

4. Write short notes on the following :

a) Points to be kept in mind while collecting water samples for testing from tap, stream & T/well separately. ( 5 Marks )

b) Where and why foot valve, check valve & gate valve to be provided for efficient running of pumps & maintaining the discharge in pipe line. ( 5 Marks )

c) What do you under stand by ‘Self Cleaning Velocity’ in a sewer design. Explain how ‘Egg shaped’ sewer lines are superior in comparison with ‘ Circular’ sewer lines. ( 5 Marks )

d) Explain so as to why provision of ‘Man holes’ is considered important/ necessary in laying a sewer line net work system. ( 5 Marks )

e) Explain the functioning of a ‘Septic tank’ in a sewerage disposal system with a sketch.

( 5 Marks )

5. Write short notes on the following :

a) ‘Water-Cement ratio’ in concrete & its importance on the property of the concrete. What is the recommended value of this item in concrete. ( 5 Marks )

b) Most commonly adopted field test to measure the workability of concrete. Explain the test procedure in detail. Also indicate the recommended values for RCC & Mass concrete works in this connection. ( 5 Marks )

c) Draw and explain the ‘Stress- Strain’ curve of mild steel. Also mark the corresponding points in the graph to represent the yield stress & ultimate strength. Which stress is taken in our design calculations and why? ( 5 Marks )

d) How ‘Prestressed Concrete Structure’ is considered superior to the ‘RCC Structure’? Explain the same by drawing the stress diagram for both type of designs. ( 5 Marks )

e) Name different methods of providing foundations to a structure ( building / Bridges ). Also explain so as to which type of foundation shall be adopted under different soil conditions in order to gain advantage of safety & economical. ( 5 Marks )

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

Date : 21.12.2003 ( Maximum Marks 150 ) Time : 3 hours

PAPER – II – PROFFSSIONAL SUBJECT, ESTABLISHMENT AND FINANCE RULES

Note : 1) Candidate should clearly write their roll number in words also.

2) Be brief and to the point in your answer.

3) Score out blank space in answer sheet.

**PART – I -** **PROFFSSIONAL SUBJECT**

Note : Answer any four of the following questions

All questions carry equal marks : 4 x 25 = 100

1. a) Precautions to be taken while working in track circuited areas? Name the two methods to insulate the track circuited section from the adjacent section. (10 Marks)

b) Explain the purpose of providing ‘Structure Bonds’ and Jumbers’ in Electrified areas.

( 5 Marks )

c) Explain in detail the system of carrying out ‘ Gap Survey & adjustment of gaps’ in SWR track. ( 10 Marks )

2. a) With a clear sketch indicate the position of Engineering Indicators in case of Multi speed restriction where the Ist speed restriction is lower in comparison to the 2nd speed restriction on one of the line of a double line section in the direction of train movement in a BG section . ( 12½ Marks )

b) With a clear sketch indicate the system of protection of line for works of short duration where ‘ Stop dead restriction’ need to be observed on a single line section on a BG track. . ( 12½ Marks )

3. a) A 600 m radius Curve on a B.G. line on which the speed for determining the equilibrium Cant is fixed at 80 km/h. the maximum sectional speed is 110 km/h. calculate the equilibrium cant, the actual cant that can be provided on this curve, the maximum permissible speed on this curve, the length of the transition curve assuming that the maximum permissible cant, cant deficiency, cant excess as 165 mm, 100 mm and 75 mm respectively. Take the booked speed of goods train as 50 km/h. ( 17 Marks )

b) What do you understand by compensation for curvature on gradient for a ruling gradient of 1 in 200, on a curve of 583 m radius in BG, calculate the actual gradient to be provided in the field. ( 8 Marks )

4. a) Briefly explain the various kinds of surveys that are carried out as a part of a new Railway Project. ( 8 Marks )

b) What will be considered as a material modifications on line under construction and open line works estimated to cost Rupees one crore & over. ( 8 Marks )

c) What do you understand by ‘ Time is the essence of Contract ? Explain the GCC clauses under which extension of time is granted under different circumstances leading to delay in executing of work. ( 9 Marks )

5. a) Precaution to be taken before the commencement of Monsoon ? ( 5 Marks )

b) Scheme of painting of bridge girders as laid down in the Bridge Manual for areas with severe corrosion and not severe corrosion. ( 5 Marks )

c) An existing bridge is having only one span of 20 ft. steel girder. However one of the Abutment of this bridge is in a badly distressed condition and hence has to be rebuilt at the same location under traffic flow condition. Accordingly make out a rehabilitation scheme in the form of a neat sketch. Also indicate the sequence of execution of this work and the precautions to be taken at site while execution of the work. ( 15 Marks )

**PART – II – ESTABLISHMENT, LABOUR RELATIONS & FINANCE RULES** – 50 Marks

Note : Answer any two of the following questions

All questions carry equal marks : 2 x 25 = 50

1. a) Explain about ‘ canons of financial propriety’. ( 10 marks )

b) Explain all the salient feature of ‘ Houre of Employment Regulations(HOER) along with classification of Rly. Employees for the purpose of hours of work. Give one example of category of staff under each classification. ( 10 marks )

c) What do you understand by ‘ Operating Ratio’? How this aspect determine the efficiency of working of a particular Rly system. ( 5 Marks )

2. a) What do you understand by ‘ corporate Enterprise Group’, now known as ‘PREM’ group ? Explain the working system of PREM group at Divisional level. Also indicate so as to how it is different from PNM set up. ( 10 marks )

b) Write in detail the procedure & rules laid down in connection with promotion to Group ’B’ posts in Railways. ( 10 marks )

c) What do you understand by ‘ROR of a Rly project? Why the factor ‘POR’ is important before a project is sanctioned for execution in field. ( 5 Marks )

3. a) Explain about ‘Exchequer Control’. ( 5 Marks )

b) Explain so as to under what clauses of GCC, a contract can be terminated between the Railways and the contractor. ( 5 Marks )

c) When a Rly servant shall be deemed to have been placed under suspension by an order of the Competent Authority. ( 5 Marks )

d) Under what circumstances the ‘Out of turn allotment of quarters’ can be made as per rules laid down. ( 5 Marks )

e) Explain briefly the system laid down for filling up of Non selection posts & Selection posts. ( 5 Marks )

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**West Central Railway**

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION - CIVIL ENGINEERING**

Date : 11.06.2005 ( Maximum Marks 150 ) Time : 3 hours

PAPER – I – GENERAL KNOWLEDGE & Civil Engineering

Note : 1) This question paper has 2 parts, Part – I & Part – II:

Answer any two question from Part – I

Answer any four question from Part – II

2) Total only 6 ( Six ) questions are to be answered.

3) Answers may be written in Hindi or English.

4) Question on Rajbhasha may be replied in Hindi only.

5) Answers should be brief and to the point.

6) Before depositing the answer books, blank pages should be crossed by the Candidates.

7) Candidates should write their roll numbers in words also.

8) Making any identification marks or writing name in the answer books is strictly prohibited. \any candidate not observing this will be disqualified.

9) Marks allotted for each question are written in the right hand side margin in brackets.

**PART – I -** **GENERAL KNOWLEDGE & HINDI POLICY**

Q.1.- ( a ) Write full form of the following abbreviations : [ 1 x 10 = 10 ]

( i ) NDDB ( ii ) LED ( iii ) DGCA ( iv ) GATT ( v ) CBDT ( vi ) GPS ( vii ) VAT

( viii ) ONGC ( ix ) BCCI ( x ) IMA

( b ) Write the correct answer in the form of ( a ), ( b ), ( c ), …. For each of the following :

( i ) Bauxite is an ore of – [ 1 x 15 = 15 ]

( a ) Copper ( b ) Zinc ( c ) Tin ( d ) Aluminium

( ii ) X-rays were discovered by -

( a ) Isaac Newton ( b ) Wilhalm Konrad Roentgen ( c ) Thomas Alva Edison

( d ) Albert Einstein.

( iii ) The Capital of Oman is -

( a ) Peru ( b ) Baghdad ( c ) Lagos ( d ) Muscat

( iv ) FIFA World Cup 2006 is slated to be held in -

( a ) USA ( b ) Poland ( c ) Brazil ( d ) Germany.

( v ) The largest river in the world is -

( a ) Brahmaputra ( b ) Mississippi ( c ) The Nile ( d ) Chenab.

( vi ) The present prime minister of China is -

( a ) Deng Xiaoping ( b ) Wen Jiabao ( c ) Sun Zhenyu ( d ) Sun Yuxi

( vii ) Indian Sepoy Mutiny took place in the year -

( a ) 1843 ( b ) 1857 ( c ) 1889 ( d ) 1904

( viii ) Pangolin is a type of -

( a ) Animal ( b ) Musical instrument ( c ) Flower ( d ) Fish.

( ix ) The 2005 – 06 Union budget envisages achieving a growth rate between -

( a ) 5 – 6% ( b ) 6 – 7% ( c ) 7 – 8% ( d ) 8 – 9%

( x ) If the volume and surface area of a cube are equal than the side of the cube is -

( a ) 2 ( b ) 4 ( c ) 6 ( d ) 8

( xi ) 9/11 is referred to a happening which took place in -

( a ) New York ( b ) Bhopal ( c ) Baghdad ( d ) Kabul

( xii ) Bronze is an alloy of -

( a ) Copper & Zinc ( b ) Copper & Tin ( c ) Copper & iron ( d ) Copper & nickel

( xiii ) The farthest planet in our solar system is -

( a ) Pluto ( b ) Jupiter ( c ) Uranus ( d ) Neptune

( xiv ) The metal / alloy widely used in aircraft is called -

( a ) Aluminium ( b ) Chrome steel ( c ) Zinc ( d ) Duralumin

( xv ) The study of heredity is called -

( a ) Cytology ( b ) Anatomy ( c ) Genetics ( d ) Paleontology

Q.2.- ( a ) Write the salient features covered under Sec 3 ( 3 ) of Rajbhasha Adhiniyam 1963.

( 10 )

( b ) In how many regions has the country been divided under the Official language Act?

( 5 )

( c ) Answer the following ( answer should be to the point and few words ) [ 1 x 10 = 10 ]

1. What does a SPURT car do?
2. Where is the headquarters of Integral Coach factory?
3. What is SRSF?
4. Give an example of a renewable energy source.
5. What is referred to as FMCG?
6. Name the manual that lays down the rules and procedure for conducting the LDCE.
7. What is the coldest possible temperature that can be achieved?
8. What is the unit of coefficient of linear thermal expansion?
9. At what temperature, the density of pure water is 1 g/ cm3?
10. Marble is formed from which rock?

Q.3.- ( a ) Write whether the following statements are true or false: [ 1 x 20 = 20 ]

1. Warm air can hold more moisture than cold air.
2. Proteins are made of fatty acids.
3. Altemator is an electrical generator that produces direct current.
4. The currency of Israel is Rail.
5. Japan is known as the Land of Midnight Sun.
6. Construction of a new railway line is charged to Development Fund.
7. Midnight Children is written by Salman Rushdie.
8. Sachin Tendulkar is the only Indian cricketer to be awarded the Rajiv Gandhi Khel Ratna Award.
9. A profit making Railway’s operating ratio will be more than 100.
10. Principal Director of audit works under the Ministry of Railways.
11. Nightblindness is caused generally due to deficiency of vitamin E.
12. The sun’s light takes about 8 minutes to reach the earth.
13. An earthquake of magnitude 4 on the Richter scale is 10 times as powerful as one of magnitude 3.
14. Of all the Seven wonders of the world only one wonder survives today.
15. Prithviraj Kapoor is known as the father of Indian cinema.
16. Kolkata is known as the city of palaces.
17. Dribbling is a term associated with football.
18. Acupuncture is an ancient Japanese technique of deadening pain.
19. Greenwich Mean Time is the standard time of UK.
20. Guwahati – Trinandrum Express is the longest distance covering train of India.

( b ) What are the following instrument used for - [ 1 x 5 = 5 ]

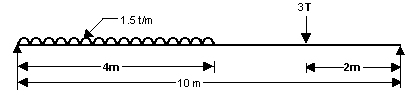
* 1. Echo-sounder.
  2. Alcometer.
  3. Hydrometer.
  4. Pyrometer.
  5. Geophone.

**Part-II : Civil Engineering ( General )**

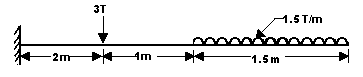
**( Answer any four questions : 4 x 25 = 100 Marks )**

**Q.4.-** Draw the Shear force and Bending movement diagrams in the following cases duly indicating the values at various critical locations.

a) [ 12½ ]



b) [ 12½ ]



**Q.5.-** Write short notes on any five of the following : [ 5 x 5 = 25 ]

1. Differential settlement.
2. Setting and hardening of cement.
3. Percussion boring.
4. Water hammer in pipe lines.
5. Punching shear on footing.
6. GTS Bench Mark.

**Q.6.-** ( a ) What are the various processes involved in the purification of water drawn from intake so as to make it potable? ( mention only the name of each process and what it achieves. Be brief.) [ 5 ]

( b ) What are the advantages and disadvantages of using cast iron pipes for water mains?

[ 5 ]

( c ) what do you understand by self- cleansing velocity of flow in drains and sewers? [ 5 ]

( d ) Explain the working principle of a septic tank? What will happen if the top cover of septic tank remains open? [ 5 ]

( e ) Draw a neat sketch showing the construction details of a typical manhole used for inspection of a drain or sewer line ( dimensions need not be given ). [ 5 ]

**Q.7.**- ( a ) Briefly explain the difference between compaction and consolidation of soil. What is the effect of compaction on soil properties? [ 5 ]

( b ) The field density of a compacted fill is determined by means of a core cutter whose empty weight is 1000 g and volume is 1000 cm3. The cutter full of soil weights 2890 g. If the water content is 11%, what is the dry density? [ 5 ]

( c ) What is a raft foundation and in what type of soil it is used? [ 5 ]

( d ) What do you understand by End Bearing Pile and Friction Pile? A pile to be constructed entirely in clay will be designed as a Friction Pile or an End Bearing Pile?

[ 5 ]

( e ) Describe briefly the method of construction of a bored cast-in-situ concrete pile with the help of a sketch. [ 5 ]

**Q.8.-** ( a ) The following consecutive readings were taken with a dumpy level : [ 20 ]

0.790, 1.645, 1.990, 3.115, 0.855, 0.925, 0.615, 0.110, 2.055, 0.995, 3.255.

The instrument was shifted after the fourth and the eight readings. The first reading was taken on a bench mark whose reduced level was 650.005 m.

Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the stations and apply arithmetical checks.

( b ) What are the disadvantages of Plane Table Surveying? [ 5 ]

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**West Central Railway**

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION - CIVIL ENGINEERING**

Date : 11.06.2005 ( Maximum Marks 150 ) Time : 3 hours

PAPER – II – Professional Subject, Establishment & Finance Rules

Note : 1) This question paper has 2 parts, Part – I & Part – II:

Answer any four questions from Part – I

Answer any two question from Part – II

2) Total only 6 ( Six ) questions are to be answered.

3) Answers may be written in Hindi or English.

4) Answers should be brief and to the point.

5) Before depositing the answer books, blank pages should be crossed by the Candidates.

6) Candidates should write their roll numbers in words also.

7) Making any identification marks or writing name in the answer books is strictly prohibited. \any candidate not observing this will be disqualified.

8) Marks allotted for each question are written in the right hand side margin in brackets.

Part-I : Professional Subject

**( Answer any four questions : 4 x 25 = 100 Marks )**

**Q.1.-** ( a ) What are the tolerances allowed in thermit welds? [ 5 ]

( b ) What precautions would you take to prevent buckling of SWR & LWR? [ 5 ]

( c ) Write the specifications of machine crushed stone ballast in regard to its quality and gradation. [ 5 ]

( d ) What will be the maximum permissible speed on a curve of radius 600 m if the actual cant ( Ca ) is 130 mm and cant deficiency ( Cd ) is 100mm? [ 5 ]

( e ) What is the frequency of running track recording car on Rajdhani route with speed 120 – 130 kmph, other A & B group routes and C & D routs ? [ 5 ]

**Q.2.-** ( a ) Mention the essential duties of Assistant Engineer in regard to works matters? [ 5 ]

( b ) Mention 5 essential properties a water proofing system should have? [ 5 ]

( c ) Show by neat sketch general arrangement at junction of roof and parapet wall. Mention the various parts including water proofing treatment and DPC in the sketch?

[ 5 ]

( d ) Mention the various categories of stations for provision of passenger Amenities? [ 5 ]

( e ) How will you check the verticality of a tubewell ? [ 5 ]

**Q.3.-** Write short notes on any five of the following : [ 5 x 5 = 25 ]

1. Hot Wether patrolling.
2. Compensation for curvature on gradient.
3. Danger Level & High flood Level in an important bridge.
4. Licensing and leasing of railway land.
5. Chamfering of rail holes.
6. Final Location survey.

**Q.4.-** ( a ) What type of bridge girders are provided with camber and why? [ 1 ]

( b ) What are the causes of loss of camber and measures taken to rectify the same. [ 4 ]

( c ) Draw a neat sketch showing a typical cross section of a circular well foundation. Name the various parts ( do not give any dimensions). [ 5 ]

( d ) Mention the various types of river training works generally adopted on the Indian railways. Draw a sketch showing a typical arrangement of guide bunds in a railway bridge. [ 5 ]

( e ) What are the various forms of corrosion? What method are adopted to prevent the same ( do not explain the detailed procedure ) ? [ 5 ]

( f ) What are the various types of defects that may develop in bed blocks? How these defects are rectified ? Be brief. [ 5 ]

**Q.5.-** ( a ) You are the first to arrive at the accident site of a passenger train as AEN. List the various actions you take in chronological order. [ 10 ]

( b ) What is a Railway Affecting Work ( RAW )? A Railway Affecting Work is situated at a distance of 1 km from a railway bridge. Show by a sketch the position of RAW tablet on the bridge and the details that will be painted on it. [ 10 ]

( c ) If the track is submerged with the water overtopping the rails. What precautions will you ensure before allowing the train over the track? [ 5 ]

**Part-II : Establishment & Finance Rules**

**( Answer any tow questions : 2 x 25 = 50 Marks )**

**Q.6.-** ( a ) Briefly describe the procedure of creating a work-charged post. [ 10 ]

( b ) Mention the various classifications of staff under HOER. Give one example for each case. [ 5 ]

( c ) When dose it become necessary to create a supernumerary post? Give an example. Be brief. [ 5 ]

( d ) Write the various steps involved chronologically in finalizing a major penalty charge-sheet ( only mention the steps without explaining the details there of ). [ 5 ]

**Q.7.-**  ( a ) Describe the procedure of terminating a works contract on risk and cost basis? [10]

( b ) What do you understand by the following terms ? Answers should be very brief preferably in one or two sentence : [ 2 x 5 = 10 ]

1. Demand No.16.
2. Budget Order.
3. Completion Estimate.
4. Delayed Tender.
5. Security Deposit.

( c ) How many budgetary reviews are made in a financial year and when and why?[5]

**Q.8.-** Write short notes on any five of the following : [ 5 x 5 = 25 ]

1. DAR action against retired employee.
2. Commutation of pension.
3. Productivity Linked Bonus.
4. Construction Estimate.
5. Delegation of Power.
6. Liability Register.
7. Out of Turn work.

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

Date : 07.01.2006 ( Maximum Marks 150 ) Time : 3 hours

PAPER – I – GENERAL KNOWLEDGE & PROFFSSIONAL

Note : 1) Candidate should clearly write their roll number in words also.

2) Be brief and to the point in your answers.

3) Score out blank space in answer sheet.

**PART – I -** **GENERAL KNOWLEDGE & HINDI POLICY**

Note : Attempt any five Questions in Part I, All questions carry equal marks.

1. Write the full form of the following abbreviations. 2 x 5 = 10 Marks.

a) GTKM b) ITKM c) GMT d) ETKM e) NTKM

2. Write the full form of the following commonly used terms. 2 x 5 = 10 Marks.

a) GPS b) GSM c) MMS d) SMS e) WLL

3. Write the full form of the following abbreviations. 2 x 5 = 10 Marks.

a) ASEAN b) SAARC c) GATT d) WTO e) IMF

4. Name of the following : 2 x 5 = 10 Marks.

1. Chief Minister of West Bengal.
2. General Manager, North Eastern Railway.
3. Vice President of India.
4. Finance Minister of India.
5. Member Engineering, Railway board.

5. In which State are the following situated - 2 x 5 = 10 Marks.

a) Ajanta. b) Hampi. c) Kaziranga. d) Nalanda e) Sanchi.

6. a) Write all the salient features covered under Section 3(3) of Official Language Act. 8 Marks.

b) What do you understand by Mul Ptrachar. 2 Marks.

**PART II – CIVIL ENGINEERING ( GENERAL )**

Note : Answer any Five Questions in part II; All questions carry equal marks.

1. Briefly describe the various stages of water treatment in a rapid sand filtration plant, from the stage of raw water to the final supply. 20 Marks.

2. Write short notes on any four of the following : 4 x 5 = 20 marks.

1. Most commonly adopted field test to measure the workability of concrete. Explain the test procedure in detail. Also indicate the recommended values for RCC & Mass concrete works in this connection.
2. Draw and explain the ‘Stress- Strain’ curve of mild steel. Also mark the corresponding points in the graph to represent the yield stress & ultimate strength. Which stress is taken in our design calculations and why?
3. Afflux in a river.
4. Controlled concrete.
5. Safe Bearing capacity.

3. a) How do you estimate the design discharge for bridges. What are factors considered for assessment of discharge. What do you understand by catchment area. ( 10 marks )

b) What do you under stand by ‘Self Cleaning Velocity’ in a sewer design. Explain how ‘Egg shaped’ sewer lines are superior in comparison with ‘ Circular’ sewer lines. ( 5 Marks )

c) Explain the functioning of a ‘Septic tank’ in a sewerage disposal system with a sketch.

( 5 Marks )

4. Write short notes on any four of the following : 4 x 5 = 20 marks.

1. Abrasion Test.
2. Impact Test.
3. Flakiness Index.
4. Specific Gravity and Water Absorption Tests.
5. California Bearing Ratio.
6. Optimum Moisture content.

5. a) What is Plane Table Surveying, its advantage and disadvantage. How do you control errors in Plane Tabling. 10 Marks.

b) A Flag Post marks an angle of 30 degree in vertical plain at point ‘A’. Person walks towards the Flag Post by distance of 100/√3 m to a point ‘B’. The elevation of the Flag Post is now 60 degree. Find out the height of the Flag Post? ( tan 300 = 1/√3 ).

10 Marks.

6. What do you understand by ( attempt any Five ) the following - 4 x 5 = 20 Marks.

1. Base failure of foundations.
2. Slip circle in embankment failure.
3. Slenderness ratio in design of steel structure.
4. Balanced cantilever beams in RCC bridges.
5. Influence Line Diagram.
6. Pre-camber and Loss of camber.

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# CENTRAL RAILWAY

**LIMITED DEPARTMENTAL COMPETETIVE EXAMINATION**

**CIVIL ENGINEERING DEPARTMENT**

Date : 08.01.2006 ( Maximum Marks 150 ) Time : 3 hours

PAPER – II – PROFFSSIONAL SUBJECT, ESTABLISHMENT & FINANCE RULES

Note : 1) Candidate should clearly write their roll number in words also.

2) Be brief and to the point in your answers.

3) Score out blank space in answer sheet.

**PART – I -** **PROFFSSIONAL SUBJECT**

Note : Attempt any Five questions in Part I ; All questions carry equal marks.

1. Write in brief the various causes of Rail Fracture, Weld Fracture and Fractures in fishplated zones. Also describe various maintenance precautions to control the fractures. 20 Marks.

2. Write short notes on any four of the following : 4 x 5 = 20 marks.

1. Under Water inspection of Bridges.
2. Joint inspection of Points & crossings.
3. SKV process of thermit welding.
4. Pre-tamping and Post-tamping operations.
5. Destressing of LWR.

3. a) Draw a neat sketch of 1 in 8½ diamond crossing with slips on concrete sleeper layout.

12 Marks.

b) Calculate the speed permitted on a curve of radius 600 m on BG fully transitioned. Also calculate the minimum length of transition required. 8 Marks.

4. Prescribed standard dimensions ( BG ) in the following cases - 2½ x 8 = 20 Marks.

1. Maximum clearance between toe of open switch.
2. Maximum degree of curvature.
3. The minimum clearance between toe of open switch and stock rail.
4. The maximum and minimum height above rail level of platform roof cover.
5. Minimum distance of the column of a platform roof from the center of nearest track.
6. Minimum clearance of a check rail for a curve.
7. Minimum clearance of toe of switch.
8. Minimum clearance for check rail for level crossing.

5. Describe briefly the various types of heavy track machines being used on BG concrete sleeper track. Also describe the output of each machine, the factors affecting the output and the quality of work. Also mention the daily maintenance schedule and the main reasons for failure during block. 20 Marks.

6. Write short notes on any four of the following : 4 x 5 = 20 marks.

1. Minimum eligibility criteria in tenders.
2. Measurement and training out of ballast.
3. Railway Affecting works ( RAW ).
4. Measurement Book & Site order book.
5. Schedule of Rates and Non schedule items.

PART II – ESTABILISHMENT, LABOUR RELATIONS & FINANCE RULES

Note : Attempt any Two questions in Part II ; All questions carry equal marks.

1. a) Describe the procedure to rescind a Works contract. 7 Marks.

b) Describe in brief the various types of Engineering Estimates. 8 Marks.

c) What are Major and Minor penalties. Describe procedure to impose Major penalty.

10 Marks.

2. a) What is Staff Benefit fund ? What are its sources of Revenues and what are its objectives? 7 Marks.

b) What do you mean by de-categorization of a railway staff? 6 Marks.

c) What is the distinction between non-selection and selection posts? 6 Marks.

d) What is break down allowances and night duty allowance? 6 Marks.

3. Write short notes on any five of the following : 5 x 5 = 25 marks.

1. Deposit Works.
2. The conditions under which railway accommodation can be allotted to – ( a ) Railway Consumer co-op society. ( b ) Handicraft and Vocational Training Center. ( c ) Refreshment Room run by contractor. ( d ) Civil Contractor at the Work site.
3. Procedure to terminate a Works Contract.
4. Material at Site account.
5. Assessed rent and Penal Rent.
6. Urgency Certificate.

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