No. 5/1/2012-EI(B): An examination for selection of candidates for appointment as Special Class Apprentices in Mechanical Department of Indian Railways is to be held by the Union Public Service Commission on 20th January, 2013 in accordance with the Rules published by the Ministry of Railways (Railway Board) in the Gazette of India dated the 13th October, 2012 at the following centres:

AGARTALA GAGITOK PANAI (GAO)
AHMEDABAD HYDERABAD PATNA
AIZAWL IMPHAL PORT BLAIR
ALLAHABAD ITANAGAR RAIPUR
BANGALORE JAMMU RANCHI
BAREES JAMMU SAMBALPUR
BHOPAL JORVAT SHILLONG
CHANDIGARH KODI SHMLA
CHENNAI KOHIMA SRINAGAR
COIMBATORE KOLKATA TIRUVTANJUR
DEHRADUN LUCKNOW THAPURAM
DELHI MADURAI TIRUPATI
DHANBAD MUMBAI UDANWAR
DURGAPUR NAGPUR UDAIPUR
GANGANAGAR PATNAM

The centres and the date of the holding the examination as mentioned above are liable to be changed, at the discretion of the Commission. Applicants should note that there will be a ceiling on the number of candidates allotted to each of the Centres, except Chennai, Delhi, Coimbatore and Nagpur. Allotment of Centres will be on the basis of First-come-first-allowed basis, and once the capacity of a particular Centre is attainted, the same will be frozen. Applicants, who cannot get a Centre of their choice due to ceiling, will be required to choose a Centre from the remaining ones. Applicants are, therefore, advised to apply early so that they could get a Centre of their choice.

Note: Notwithstanding the aforesaid provision, Commission reserve the right to change the Centre of examination in their discretion if the situation demands.

Candidates admitted to the examination will be informed of the time table and place or places of examination. Candidates who do not receive intimation should note that no request for change of centre will normally be granted.

2. The approximate number of vacancies, to be filled by the examination is 42. Note: One vacancy is reserved for physically challenged candidates belonging to Orthopaedically Handicapped having functional classifications of O/W and V. The number of vacancies mentioned above is liable to alteration.

Reservation will be made for candidates belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes and Physically Disabled categories in respect of vacancies as may be fixed by the Government.

A candidate will be eligible to the benefit of community reservation only in case the particular caste to which the candidates belongs is included in the list of reserved communities issued by the Central Government. If a candidate indicates in his/her application form for SCRA Examination an application for admission to General Category but subsequently writes to the Commission to change his/her category, to a reserved one, such request shall not be entertained by the Commission. While the above principle will be followed in general there may be a few cases where there was a little gap (say 2-3 months) between the issuance of the Online Application Form and the date of the examination in such cases, the candidates may be given only after the necessary eligibility certificate has been issued to him by the Government.

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Mere issue of admission certificate to the candidate will not imply that his/her candidature has been finally cleared by the Commission. Verification of eligibility conditions with reference to original documents is taken up only after the candidate has qualified for Interview/Personality Test.

2. HOW TO APPLY:
Candidates are required to apply online by using the website www.upsc.gov.in. Brief instructions for filling up the Online Application Form have been given in the Appendix II. Detailed instructions are available on the above mentioned website.

3. LAST DATE FOR SUBMISSION OF APPLICATIONS:
The Online Application can be filled up 12th November, 2012 till 11.59 PM after which the link will be disabled.

4. The eligible candidates shall be issued an e-Admission Certificate three weeks before the commencement of the examination. The e-Admission Certificate will be made available on the UPSC website for being downloaded by candidates. No Admission Certificate will be sent by post.

The all applicants are required to provide valid & active e-mail i.d., while filling up Online application form as the Commission may use electronic mode for contacting them.

5. PENALTY FOR WRONG ANSWERS:
Candidates should note that there will be penalty (Negative Marking) for wrong answers marked by the candidate in the Objective Type Question Papers.

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Candidates should note that there will be penalty (Negative Marking) for wrong answers marked by the candidate in the Objective Type Question Papers.

6. For both writing and marking answers in the OMRF sheet [Answer Sheet], candidates must use black ball pen only. Pens with any other colours are prohibited. Do not use Pencil or any other pen. Candidates should note that any omission/mistake/discrepancy in encoding/filling of details in the OMRF answer sheet, especially with regard to Roll Number and Test Booklet Series Code, will render the answer sheet liable for rejection.

Candidates are further advised to read carefully the “Special Instructions” contained in Appendix-II of the Admit Card.

7. FACILITATION COUNTER FOR GUIDANCE OF CANDIDATES:
In case of any guidance/information/clarification regarding their applications, candidates can contact UPSC’s Facilitation Counter near Gate ‘C’ of its campus in person or over Telephone No. 011-23385271/ 011-23381125/011-23098543 on working days between 10.00 hrs and 17.00 hrs.

8. MOBILE PHONES BANNED:

(a) Mobile phones, pagers or any other communication devices are not allowed inside the premises where the examination is being conducted. Any infringement of these instructions shall entail disciplinary action including ban from future examinations.

(b) Candidates are advised in their own interest not to bring any of the banned item inside the examination centre premises. Any unattended items to the venue of the examination as arrangements for safe keeping cannot be assured. Commission will not be responsible for any loss in this regard.

Candidates are required to apply online only. No other mode is allowed for submission of application.
SAVING AS PROVIDED ABOVE THE AGE LIMITS PRESCRIBED CAN IN NO CASE BE RELAXED.

The date of birth accepted by the Commission is that entered in the Matriculation or Secondary School Leaving Certificate or in a certificate recognized by an Indian University as equivalent to Matriculation or in an extract from a Register of Matriculates maintained by a University, which extract must be certified to be a true copy by the University or in the Higher Secondary or an equivalent examination certificate. These certificates are required to be submitted at the time of application and at the time of the examination if the candidate has already been admitted to the examination. No other document relating to age like horoscopes, affidavits, birth extracts from the Census, revenue records and the like will be accepted.

The expression Matriculation/Higher Secondary Examination Certificate in this part of the instruction includes the alternative certificates mentioned above.

Note I: Candidates should note that only the Date of Birth as recorded in the Matriculation/Higher Secondary Examination Certificate or its equivalent certificate as on the date of submission of applications will be accepted by the Commission and no subsequent request for its change will be considered or granted.

Note II: Candidates should also note that once a Date of Birth has been claimed in the application, it will be based on the records of the Commission for the purpose of admission to an Examination, no change will be allowed subsequently (or at any other Examination of the Commission) on any grounds whatsoever.

Note III: The candidates should exercise due care while entering their date of birth. If any variation is found in their date of birth from the one entered in their Matriculation or equivalent Examination certificate, disciplinary action will be taken against them by the Commission under the Rules.

(i) Educational Qualifications

For admission to the examination a candidate should:

(a) have passed in the first or second division, the Intermediate or an equivalent Examination of a University or Board approved by the Government of India, or a recognised Board of one of the subjects Physics and Chemistry as subjects of the examination;

Graduates with Mathematics and at least one of the subjects Physics and Chemistry as their degree subjects may also apply;

(b) have passed in the first or second division, the Higher Secondary (12 years) Examination under 10 plus 2 pattern of School Education with Mathematics as one of the subjects and Chemistry as one of the subjects of the examination;

(c) must have passed the first year Examination under the three-year degree course or the first examination of the three-year diploma course in Rural Service of the National Council for Rural Higher Education (Executive Diploma in Rural Education) for promotion to the 4th year of the four-year B.A./B.Sc. (Evening College) Course of the Matlabikottai Medical College, or at least one of the subjects Physics and Chemistry as subjects of the examination; or

(d) must have passed the first year Examination of the five-year Engineering Degree Course of a University, provided that he/she has passed the Degree Course, he/she passed the Higher Secondary or pre-University or equivalent Examination in the first or second division.

Candidates who have passed the first year Examination of the five-year Engineering Degree Course in the first or second division, or Pre-Engineering Examination of the Universities of Kerala and Calicut with Mathematics and at least one of the subjects Physics and Chemistry as subjects of the Examination.

Note I: Candidates who are not awarded any specific division by the University/Board in the intermediate or any other Examination mentioned above will be considered educationally eligible provided their aggregate of marks falls within the range of marks for first or second division as prescribed by the University/Board.

Note II: Candidates who have appeared in the examination the passing of which is a condition precedent to being eligible to appear at the Examination but have not been informed of the results, may apply for admission to the examination. Candidates who intend to appear at such a qualifying examination may also apply. Such candidates will be admitted to the Examination, if otherwise eligible but the Pre-Engineering would be deemed to be provisional and subject to cancellation, if they do not produce proof of having passed the requisite qualifying Examination along with their completed application form, which will be required to be submitted by the candidates who qualify on the results of the written part of the Examination.

Note III: In exceptional cases, the Commission may treat a candidate who has not any of the qualifications prescribed above, as otherwise eligible but the Pre-Engineering would be deemed to be provisional and subject to cancellation, if he/she does not possess qualifications the standard of which in the opinion of the Commission, justifies admission to the examination.

Note IV: Diplomas in Engineering awarded by the State Boards of Technical Education are not acceptable for admission to the Special Class Railway Apprentices Examination.

(iv) Physical Standards:

Candidates must be physically fit according to physical standards for admission to Special Class Railway Apprentices, 2013, given in Appendix-II of the rules for the Special Class Railway Apprentices, Examination, 2013 published in Gazette of India dated 13th October, 2012.

4. FEE:

Candidates (excluding Female/SC/ST/PH candidates who are exempted from payment of fees) must pay an examination fee of Rs. 100/- (Rupees one hundred only) either by depositing the money in any one of Branch of SBI or by using net banking services of Punjab National Bank, Bikaner & Jaipur/State Bank of Hyderabad/State Bank of Mysore/State Bank of Patiala/State Bank of Travancore or by using Visa/Master Credit/Debit Card.

Note: 1. Candidates should note that payment of examination fee can be made only through the modes prescribed. Fee paid in any other mode is neither valid nor acceptable.

Applications submitted without the prescribed fee/mode (unless remission of fee is claimed, shall be summarily rejected. Fee once paid and not be refunded under any circumstances nor can the fee be held in reserve for any other examination or selection. In the event of applications in whose case payments details have not been received from the bank, they will be treated as fictitious payment cases and their applications will be summarily rejected. A list of all such applicants shall be made available on the Commission website within two days after the last day of submission of online application. Fee once paid will be non-refundable except in the case of published fee payment details having 10 days from the date of such communication either by hand or by speed post to the Commission. On the expiry of 10 days from the date of the publication of the fee payment details receive, genuine fee payment cases will be considered and their applications will be revivified, if they are otherwise eligible.

Application without prescribed fee will be summarily rejected. This does not apply to the candidates who are seeking remission of the prescribed fee under the following paragraphs.

Applications from candidates and candidates belonging to Scheduled Castes/Scheduled Tribes are not required to pay any fee.

No fee is payable, however, available to OBC candidates and they are required to pay the full prescribed fee.

Physically Handicapped persons are entitled to pay the fee only if they are otherwise eligible for appointment to the Posts to be filled on the results of this examination on the basis of the standards of medical fitness for the post (Appendix-II of the regulations specifically extended to the Physically handicapped).

A Physically Handicapped candidate who is otherwise eligible but has not been provided with the fee exemption will be required by the Commission to submit along with their Detailed Application Form, a certified copy of the certificate issued by the Government Hospital/Medical Board in support of his/her claim for being Physically Handicapped.

Those who are granted the aforesaid provision for age relaxation/fee exemption, a Physically Handicapped candidate will be considered to be eligible for appointment only if he/she (after such physical examination as the Government or the appointing authorities, as the case may be, may prescribe) is found to satisfy the requirements of physical and medical standards for the concerned Services/Posts to be allotted to Physically Handicapped candidates of Government.

6. HOW TO APPLY

Candidates may apply Online by using the website www.upsconline.nic.in Detailed instructions for filling up online application form are available on the above mentioned website.

The applicants are advised to submit only simple application; however if due to any unavoidable exigency they are required to submit another/multiple applications, then he/she must ensure that application with the higher RID is complete in all respects like photograph, signature, fee etc. The applicants who are submitting multiple applications should note that only the applications with higher RID (Registration ID) and fee paid against one RID shall not be adjusted against any other RID. All candidates, whether already in Government Service, or in Government owned industrial undertakings or other similar organisations or in private employment should submit their applications directly to the Commission.

Persons already in Government service, whether in a permanent or temporary capacity or as work charged employees other than casual or daily rate employees or those serving under Public Enterprises are however, required to inform in writing their Head of Office/Department that they have applied for the Examination. Candidates should note that in case a communication is received from their employer by the Commission withholding permission to the candidates applying for appearing at the examination, their applications will be liable to be rejected/candidate will be liable to be cancelled.

Note V: The Commission in his/her e-Application form, the candidate should carefully decide about his/her choice for the centre. If any candidate appears at a centre other than the one of his/her choice, the Commission in his/her e-Application Certificate, the papers of such a candidate will not be valued and his/her candidature will be liable to be cancelled.

Note VI: Candidates are not required to submit hard copy of the application to the Commission at this stage. The candidates applying for appearing for the examination are required to ensure that they fulfil all the eligibility conditions for admission to the Examination. Their admission at all the stages of examination for which they have applied, is subject to their satisfying the prescribed eligibility conditions, as certified and verified at any time before or after the Written Examination or Interview Test, it is found that they do not fulfil any of the eligibility conditions for the Examination, the Examination will be cancelled by the Commission.

Candidates are requested to keep ready the recent photograph and signature details for submission to the Commission soon after the declaration of the result of the written part of the Examination which will be available on website http://www.upsc.nic.in during the month of March/April, 2013.

1. Certificate of Age.
2. Certificate of Educational Qualification showing the subjects and division secured.
3. Certificate in support of claim to belong to Scheduled Caste, Scheduled Tribe and Other Backward Classes where applicable.
4. Certificate in support of claim for age/fee concession, where applicable.
5. Certificate in support of claim for being physically handicapped (where applicable).
After the Commission from any examination, success of the candidate will be intimated by the Commission electronically and they shall be asked to submit Detailed Application Form (DAF) online. The successful candidates have to send the printout of this DAF with each page duly signed along with the attested copies of the above mentioned certificates to the concerned authorities at the concerned time and date as per the information given to them.

A candidate who is or has been declared by the Commission to be guilty of:
(i) Obtaining support for his/her candidate by any means; or
(ii) impersonating; or
(iii) procuring impersonation by any person;
(iv) submitting fabricated documents or documents which have been tampered with;
(v) making false or incorrect statements which are incorrect or false or suppressing material information;
(vi) resorting to any other irregular or improper act in connection with his/her candidacy for the Examination or
(vii) using unfair means during the Examination;
(viii) writing irrelevant matter, including obscene language or pornographic matter, in the script(s); or
(ix) misbehaving in any other manner in the Examination hall;
(x) harassing or doing bodily harm to the Staff employed by the Commission for the conduct of their Examination; or
(xi) being in possession of or using mobile phone, pager or any electronic equipment or device or any other equipment capable of being used as a communication device during the Examination;
(xii) violating any of the instructions issued to candidates along with their e-Admission Certificate/e-Admission to the Examination; or
(xiii) attempting to commit or as the case may be, violating any of the instructions issued to candidates along with their e-Admission Certificate/e-Admission to the Examination.

6. LAST DATE FOR SUBMISSION OF APPLICATIONS

The Online Application can be filled upto 12th November, 2012 till 11.59 P.M, after which the link will be disabled.

2. COMPLIANCE WITH THE COMMISSION:

The Commission will not enter into any correspondence with the candidates about their candidature except in the following cases:
(i) The eligible candidates shall be issued an e-Admission Certificate three weeks before the commencement of the examination. The e-Admission Certificate will be made available in the UPSC web-site [www.upsc.gov.in] for downloading by candidates. An e-Admission Certificate must be printed out by the candidate and brought to the Examination site along with a recent photograph and father's name and date of birth available with him/her.
(ii) If a candidate does not receive her/his e-Admission Certificate/e-admission to the Examination for some reason or any other reason, she/he must get in touch with the Commission immediately.

3. Roll Number (if received).

The roll number will be communicated to the candidates around the 3rd week of December, 2012, through e-mail, which will also be intimated by the Commission electronically and they shall be asked to submit Detailed Application Form (DAF) online. The successful candidates have to send the printout of this DAF with each page duly signed along with the attested copies of the above mentioned certificates to the concerned authorities at the concerned time and date as per the information given to them.

N.B. (i) All communications to the Commission shall be, one of the following, consistent with the requirement of the concerned Service/Post:

- Written Examination Hall.
- The UPSC web-site [www.upsc.gov.in]
- Any other publication of the Government.
- Any publication of the Commission.

N.B. (ii) The functional classification in their case shall be, of the following, consistent with the requirement of the concerned Service/Post:

- Polar.
- P W 9. Work performed by reading, writing, crouching.
- SE 7. Work performed by seeing, working, sitting.
- K C 2. Work performed by kneeling, working, standing.
- M F 1. Work performed by manipulating, working, sitting.
- R W 11. Work performed by reading, writing, sitting.

N.B. (iii) The mere fact that an e-Admission Certificate to the Examination has been issued to a candidate will not imply that his/her candidacy has been finally cleared by the Commission or that entries made by the candidate in his/her application for the examination have been accepted by the Commission as true and correct. Candidates may note that the Commission reserves the right to verify the eligibility conditions of a candidate, with reference to original documents, on the occasion when the candidate has qualified for interview or Personality Test on the results of the Written Examination. Under such circumstances the Commission will conduct interviews.

3. The mere fact that an e-Admission Certificate to the Examination has been issued to a candidate will not imply that his/her candidacy has been finally cleared by the Commission or that entries made by the candidate in his/her application for the examination have been accepted by the Commission as true and correct. Candidates may note that the Commission reserves the right to verify the eligibility conditions of a candidate, with reference to original documents, on the occasion when the candidate has qualified for interview or Personality Test on the results of the Written Examination. Under such circumstances the Commission will conduct interviews.

4. (i) If a candidate and/or his/her candidate for the conduct of their Examination; or
(ii) being in possession of or using mobile phone, pager or any electronic equipment or device or any other equipment capable of being used as a communication device during the Examination;
(xii) violating any of the instructions issued to candidates along with their e-Admission Certificate/e-Admission to the Examination;

(iii) The UPSC web-site [www.upsc.gov.in]
(iv) Any other publication of the Government.
(v) Any publication of the Commission.

6. EADMISSION CODE

A candidate must see that communication regarding non-receipt of his/her Admission Certificate for the Examination. On the receipt of e-Admission Certificate for the Examination, the e-Admission Certificate must be authenticated by a recent photograph and father’s name and date of birth available with him/her.

7. The details regarding scheme and Syllabus of Examination, Guidelines for filling up the Application Form, Conditions of Apprenticeship, Special Instructions to Candidates for Objective Type Tests are given in Appendices I, II, III and IV respectively.

S.M. SUNDARAM
Deputy Secretary
Union Public Service Commission

APPENDIX-I

SCHEDULE OF EXAMINATION

Part I.

The Examination shall be conducted according to the following plan.

1. The examination shall consist of two papers, each of Three Hours, carrying a maximum of 600 marks in the subjects as shown below.

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<td>Maximum Marks</td>
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<td>Total Marks</td>
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3. The papers in all subjects will consist of Objective (multiple choice answer) Type questions only. The Question Papers (Test Booklets) will be set in English only.

4. In the question paper, wherever it is mentioned as C (Calcutta), the candidates will have the option to write in English, Hindi or Urdu.

5. Question Papers will be approximately of the Intermediate standard.

6. Candidates must write the answers in their own hand. In no circumstances, will the answers will be accepted from typewritten or printed papers.

7. The Commission have discretion to fix qualifying marks in any or all the subjects of the examination.

8. Candidates are not permitted to use calculators for answering objective type papers (Test Booklets). They should not, therefore, bring the same inside the Examination Hall.
The questions will be designed to test a candidate's general awareness of the environment around him/her and its application to society. The standard of answers to questions should be as expected of students of standard 12 or equivalent.

Man and his environment:

- Evolution of life, plants and animals, heredity and environment—Genetics, cells, chromosomes, genes.
- Knowledge of the human body—nutrition, balanced diet, substance foods, public health and sanitation, control of epidemics and common diseases. Environmental pollution and its control. Food adulteration, proper storage and preservation of food grains and finished products, population explosion, control population. Production of food and raw materials. Breeding of animals and plants, artificial insemination, manures and fertilizers, pest and disease protection measures, high yielding varieties and green revolution, main cereal and cash crops of India.

- Solar system and the earth. Seasons, Climate, Weather, Soil—its formation, erosion. Forests and their uses. Natural calamities cyclones, floods, earthquakes, volcanic eruptions. Mountains and rivers and their role in irrigation in India. Distribution of natural resources and industries in India. Exploration of under-ground minerals including Oil Conservation of natural resources with particular reference to the flora and fauna of India.

- History, Politics and Society in India:

- Constitution of India and its characteristic features—Democracy, Secularism, Socialism, equality of opportunity and Parliamentary form of Government. Major political ideologies—Democracy, Socialism, Communism and Gandhian idea of non-violence. Modern social and political parties, their origins, the Press, the electoral system. India’s foreign policy and non-alignment. Arms race, balance of power. World organisation—political, social, economic and cultural. Important events (including sports and cultural activities) in India and abroad during the past two years.

- Broad features of Indian social system—The caste system, hierarchy—recent changes and trends, social and economic policies, marriage, family, religion and acculturation. Division of labour, co-operation, conflict and competition. Social control—reward and punishment, art, law, customs, propaganda, public opinion, agencies of social control—family, religion, State educational institutions; factors of social change—economic, political, sociological, demographic.

- Social disorganisation in India—Castesm, communalism, corruption in public life, youth unrest, beggary, drugs, delinquency and crime, poverty and unemployment.

- Social planning and welfare in India, community development and labour welfare, welfare of Scheduled Castes and Backward Classes.

- Monopolies and Monopolistic trends, national income, economic growth.

- Private and Public Sectors; economic and non-economic factors in planning, balanced versus unbalanced growth, agricultural versus industrial development; inflation and price stabilization, problem of resource mobilisation. India’s Five Years Plans.

(III) Psychological Test:

The questions will be designed to assess the basic intelligence and mechanical aptitude of the candidate.

Paper-II

(I) PHYSICS

- Measurement of time and mass.

- Straight line motion and relationships among displacement, velocity and acceleration.

- Newton’s Laws of Motion, Momentum, impulse, work, energy and power.


- Pressure in a fluid and its variation with depth. Pascal’s Law, Principle of Archimedes.

- Floating bodies, Atmospheric pressure and its measurement.

- Temperature and its measurement. Thermal expansion, Gas laws and absolute temperature. Specific heat, latent heats and their measurement. Specific heat of gases.

- Measurement of time and mass.

- Length measurements using vernier, screw gauge, spherometer and optical lever.

(II) CHEMISTRY


- Group I Elements: Manufacture of sodium hydroxide, sodium carbonate, sodium bicarbonate and sodium chloride.


- Group III Elements: Borax, Alumina and Alum.

- Glass (Elementary treatment).


- Hydrogen peroxide, allotropy of sulphur, sulphuric acid. Oxides of sulphur.


- Group O. (Noble gases) Helium and its uses.


- Alcohols and Phenols: Results of alcohol and phenol. Aldehydes and ketones: Formaldehyde, Acetaldehyde, Benzaldehyde, acetic acid, acetoephone.

- Nitro compounds amines: Nitrobenzene TNT, Aniline, Diazonium Compounds, Nitric acid, Nitration, and nitrobenzene.

- Carboxylic acids: Formic, acetic, denezoic and salicylic acids, acetyl salicylic acid.

- Esters: Ethylacetate, Methyl salicylates, ethylbenzoate.

- Polymers: Polyethylene, Teflon, Perpex, Artificial Rubber, Nylon and Polyester fibres.

- Carbohydrates: Sugars, mono and disaccharides, polysaccharides, mono and disaccharides.

- Non-starch foodstuffs: Carbohydrates, Fats and Lipids, amino acids and proteins - Vitamins and hormones.

Paper-III

MATHMATICS

Matrices and Determinants: Types of matrices, equality, matrix addition and scalar multi-
lication - properties. Matrix multiplication — non-commutative and distributive prop-
erty over addition. Transpose of a matrix. Determinant of a matrix. Minors and Con-
stant terms. Adjoint of a square matrix. Inverse of a square matrix. Solution of a system of linear equations in two and three variables-elimination method, Cramers rule and Matrix inversion method (Matrices with m rows and n columns where m, n ≥ 3 are to be considered).

2. Trigonometry : 
Addition and subtraction formulae, multiple and sub-multiple angles. Product and factoring 
formulae. Inverse trigonometric functions — Domains, Ranges and Graphs. DeMoivre’s the-

3. Analytic Geometry (two dimensions): 
Rectangular Cartesian. Coordinate system, distance between two points, equation of a straight line in various forms, angle between two lines, distance of a point from a line. Transformation of equations of straight lines into normal form and y — condition to represent a pair of straight lines, point of intersection, angle between two lines. Equation of a circle in standard and in general form, equations of tangent and normal at a point, orthogonality of two circles. Standard equations of parabola, ellipse and hyperbola — parametric equations, equations of tangent and nor-
mal co-ordinates of the parametric forms.

4. Differential Calculus: 
Concept of a real valued function — domain, range and graph. Composite functions, one 
to one, onto and inverse functions, algebra of real functions, examples of polyno-
mial, rational, trigonometric, exponential and logarithmic functions. Notion of limit, 
Standard limits - examples. Continuity of functions - examples, algebraic operations on 
continuous functions. Derivative of a function at a point, geometrical and physical inter-
pretation of a derivative - applications. Derivative of sum, product and quotient of 
functions, derivative of a function with respect to another function, derivative of a compos-
fundamental principles. Role of Rolle’s theorem (statement only), increasing and decreasing functions. Application of derivatives to problems in maxima, 
mimina, greatest and least values of a function.

5. Integral Calculus and Differential equations : 
Integral Calculus : Integration as inverse of differential, integration by substitution and by parts, standard integrals involving algebraic expression, trigonometric, exponential and hyperbolic functions. Evaluation of definite integrals-determination of areas of plane 
regions bounded by curves - applications.

6. Vectors and its applications : 
Magnitude and direction of a vector, equal vectors, unit vector, zero vector, vectors in two 
and three dimensions, position vector. Multiplication of a vector by a scalar, sum and 
difference of two vectors, Parallelogram law and triangle law of addition. Multiplication of vectors — scalar product or dot product of two vectors, perpendicular-
ity, commutative and distributive properties. Vector product or cross product of two vec-
tors. Scalar and vector triple products. Equations of a line, plane and sphere in vector 
form - simple problems. Area of a triangle, parallelogram and problems of plane geom-
etry and trigonometry using vector methods. Work done by a force and moment of a 
force.

7. Statistics and probability : 
Statistics : Frequency distribution, cumulative frequency distribution - examples. Graphical representation - Histogram, frequency polygon - examples. Measure of cen-
tral tendency - mean, median and mode. Variance and standard deviation - determina-
tion of arithmetic Mean. Correlation and regression. 
Probability : Random experiment, outcomes and associated sample space, events, 
mutually exclusive and exhaustive events, impossible and certain events. Union and 
intersection of events. Complementary, elementary and composite events. Definition of 
probability : classical and statistical - examples. Elementary theorems on probability 
- addition, multiplication, Bayes' theorem - simple problems. Random variable as a function on a sample space. Binomial distribution, examples of random 
experiments giving rise to Binomial distribution.

Personality Test 
Each candidate will be interviewed by a Board who will have before them a record of his 
character, conduct and personality. They will be asked questions on matters of 
general interest. Special attention will be paid to assessing their potential qualities of 
leadership, initiative and intellectual curiosity, tact and other social qualities, mental 
and physical energy, power of practical application and integrity of character.

APPENDIX - II 
INSTRUCTIONS TO THE CANDIDATES 
FOR FILLING ONLINE APPLICATIONS 
Candidates are required to apply Online using the Website www.upsconline nic.in. Salient Features of the Online Application Form are given hereunder:

Detailed instructions for filling the Online Application are available on the above mentioned 
Website 
Candidates will be required to complete the Online Application Form containing two stages viz. 
Part-I and Part-II as per the instructions available in the above-mentioned site through drop 
down menus.

The candidates are required to pay a fee of Rs.100/- (Rupees One Hundred only) (except 
SC/ST/Female/Physically Handicapped candidates who are exempted from payment of fee) 
either by depositing the money in any branch of SBI by cash, or by using net banking facility 
of State Bank of India, State Bank of Bikaner & Jaipur/State Bank of Hyderabad/State Bank 
of Mysore/State Bank of Patiala/State Bank of Travancore or by using any Visa/Master 
Card. 
Before start filling up of Online Application, a candidate must have his/her photograph 
and signature duly scanned in the jpg format in such a manner that each file should not exceed 
40 KB and should not be less than 3 KB each in size for the photograph and 1 KB for the 
signature.

Thefilling Application (Part I and II) can be filled from 13th October 2012 to 12th 
November, 2012 till 11.59 p.m., after which link will be disabled.

Applicants should avoid submitting multiple applications however if due to any unavoidable 
circumstance, any applicant submits multiple applications then he/she must ensure that the 
applications will be treated as a single one and the RJD will be charged for only one 
application.

In case of multiple applications, the application with higher RJD shall be entertained by the 
Commission and fee paid against one RJD shall not be adjusted against any other RJD 
application.

Candidates must ensure that while filling their Application Form, they are providing their 
valid and active E-mail ID as the Commission may use electronic mode of communications 
while contacting them at different stages of examination process.

The applicants are advised to check their emails at regular intervals and ensure that the 
email address ending with@gov.in are directed to their inbox folder and not to the SPAM folder 
or any other folder.

Candidates are strongly advised to apply online well in time without waiting for the last 
date for submission of online Application.

APPENDIX - III 
Conditions of Apprenticeship for Special Class Apprentices Selected through the Examination 
The terms and conditions of Apprenticeship will be as set out in the form of agreement 
practically agreed upon between the Railway Establishment Manual, brief particulars of which are given below :

1. A candidate offered appointment as a Special Class Railway Apprentice shall exe-
cute an agreement in the prescribed form binding himself/herself and one surety joint-
ly and severally, to refund, in the event of his/ her failure to complete training as a 
Special Class Railway Apprentices or to accept the service as an officer on probation 
in the Indian Railway Service of Mechanical Engineers, if offered to him/her to the sat-
faction of the Government, any money paid to him/her and any other money expend-
bled by him/her on his/her behalf, the exclusive judge of the quan-
tum of such expense. The apprentices will be liable to undergo practical and theoreti-
ical training for 4 years in the first instance under an indenture binding them, to serve 
on the Indian Railways on the completion of their training, if their services are required 
The period of apprenticeship from year one to year four will depend on satisfactory reports 
being received from the authorities under whom the apprentices may be working. If at 
any time during his/her apprenticeship, any apprentice does not satisfy the superior 
authorities that he/she is making good progress, he/she will be liable to be discharged from 
the service.

Note : The Government of India may at their discretion alter or modify the periods and 
courses of training.

2. Theoretical and practical training referred to above will be given in a Railway 
Workshop for four years of their apprenticeship. Special Class Railway Apprentice must 
pass within this period the Bachelor of Engineering in Mechanical Engineering from 
Birla Institute of Technology, Mesra (Ranchi). The apprentices will be granted a stipend 
subject to satisfactory reports on their work being received at the end of each year 
that they pass within this period the Bachelor of Engineering in Mechanical Engineer-
ing from Birla Institute of Technology, Mesra (Ranchi). The apprentices will be granted a stipend 
within this period the Bachelor of Engineering in Mechanical Engineering from 
Birla Institute of Technology, Mesra (Ranchi) within 4 years of their 
completion of training. The apprentices will be listed in order of merit on the results of the examination held 
and the reports of the apprentices received during the period of apprenticeship. Successful 
apprentices will be appointed on probation for 18 months in the Indian Railway Service of 
Mechanical Engineer.

Note : An apprentice will be considered to have obtained the qualifying standard if he/ 
she obtains a minimum of 40 per cent marks in the aggregate in all the examinations 
held during the Eight Semester Examination of his/her training and 60 percent marks in the 
reports of the Director Indian Railways Institute of Mechanical and Electric Engineers, 
Jamalpur and of the Chief Works Manager. Jamalpur Workshop provided 
that in each of the Eight Semester Examination he/she has obtained a minimum of 40 
per cent marks in the aggregate and minimum of 40 percent marks in all the subjects. 
4. Unsuccessful apprentices will be discharged from their apprenticeship, one month's 
notice of discharge being given along with the intimation that the apprentice has been 
unsuccessful.

5. After an unsuccessful completion of 4 years apprenticeship, the apprentices will be 
considered as probationers in the Indian Railway Service of Mechanical Engineers, 
subject to the proviso given below in Para 6. Particulars as to pay and general condi-
tions of service of officers of Indian Railway Service of Mechanical Engineers have 
been prescribed in the Government of India Letter No. 2/83-E-3(1) dated 13th October 
1983. The period of probation will be 16 months. The appointment and pay as probation-
ners will commence from (a) the date of completion of 4 years of the apprenticeship or 
(b) the actual date of completion of training whichever is later.

Note : The services of probationers may be terminated on 3 months notice on either-
side.
APPENDIX-IV

Special Instructions to Candidates for objective type tests

1. Articles permitted inside Examination Hall
   Clip board or hard board (on which nothing is written), a good quality black ball pen for making responses on the Answer Sheet, and sheet for rough work will be supplied by the Invigilator.

2. Articles not permitted inside Examination Hall
   Do not bring into the Examination Hall any article other than those specified above, e.g., books, notes, loose sheets, electronic or any other type of calculators, mathematical and drawing instruments, Log Tables, stencils of maps, slide rules, Test Booklets and rough sheets pertaining to earlier session(s), etc.

3. Penalty for Wrong Answers
   THERE WILL BE PENALTY (NEGATIVE MARKING) FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.
   (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one third (0.33) of the marks assigned to that question will be deducted as penalty.
   (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above for that question.
   (iii) If a question is left blank i.e. no answer is given by the candidate, there will be no penalty for that question.

4. Unfair means strictly prohibited
   No candidates shall copy from the papers of any other candidate nor permit his/her papers to be copied nor give nor attempt to get nor obtain under any guise or pretext the assistance of any person in answering any question.

5. Conduct in Examination Hall
   No candidate should misbehave in any manner or create disorderly scene in the Examination Hall or harass the staff employed by the Commission for the conduct of the examination. Any such misconduct will be severely penalised.

6. Answer Sheet particulars
   (i) Write in black ball point pen your Centre and subject followed by test booklet series (in bracket), subject code and roll number at the appropriate space provided on the answer sheet at the top. Also encode your booklet series (A, B, C or D, as the case may be), subject code and roll number in the circles provided for the purpose in the answer sheet. The guidelines for writing the above particulars and for encoding the above particulars are given in Annexure. In case the booklet series is not printed on the test booklet or answer sheet is un-numbered, please report immediately to the Invigilator and get the test booklet/answer sheet replaced.
   (ii) Candidates should note that any omission/mistake/discrepancy in encoding/filling of details in the OMR answer sheet, especially with regard to Roll Number and Test Booklet Series Code, will receive the answer sheet liable for rejection.
   (iii) Immediately after commencement of the examination please check that the test booklet supplied to you does not have any unprinted or torn or missing pages or items etc. if so, get it replaced by a complete test booklet of the same series and subject.

7. Do not write your name or anything other than the specific items of information asked for, on the answer sheet/test booklet/sheet for rough work.

8. Do not fold or mutilate or damage or put any extraneous marking in the Answer Sheet. Do not write anything on the reverse of the answer sheet.

9. Since the answer sheets will be evaluated on computerised machines, candidates should exercise due care in handling and filling up the answer sheets. They should use a black ball pen only to darken the circles. For writing in boxes also, they should use black ball pen. Since the entries made by the candidates by darkening the circles will be taken into account while evaluating the answer sheets on computerised machines, they should make these entries very carefully and accurately.

10. Method of marking answers
    In the "Objective Type" of examination, you do not write the answers. For each question (hereinafter referred to as "Item") several suggested answers (hereinafter referred to as "Responses") are given. You have to choose one response to each item. The question paper will be in the Form of Test Booklet. The booklet will contain item bearing numbers 1, 2, 3, ............ etc. Under each item, Responses marked (a), (b), (c), (d), will be given. Your task will be to choose the correct response. If you think that more than one correct response, then choose what you consider the best response.
    In any case, for each item you are to select only one response. If you select more than one response, your response will be considered wrong.
    In the Answer Sheet, Serial Nos. from 1 to 160 are printed. Against each numbers, there are circles marked (a), (b), (c), and (d). After you have read each item in the Test Booklet and decided which one of the given responses is correct or the best, you have to mark your response by completely blackening with black ball pen to indicate your response. For example, if the correct answer to item 1 is (b), then the circle containing the letter (b) is to be completely blackened with black ball pen as shown below:
    - Example: (a) (b) (c) (d)

11. Entries in Scannable Attendance List
    Candidates are required to fill in the relevant particulars with black ball pen only against their columns in the Scannable Attendance List, as given below:-
    (i) Blacken the circle [P] under the column [Present/Absent]
    (ii) Blacken the relevant circle for Test Booklet Series
    (iii) Write Test Booklet Serial No.
    (iv) Write the Answer Sheet Serial No. and also blacken the corresponding circles below
    (v) Append signature in the relevant column

12. Please read and abide by the instructions on the cover of Test Booklet. If any candidate indulges in disorderly or improper conduct, he will render himself liable for disciplinary action and/or imposition of a penalty as the Commission may deem fit.

How to fill in the Answer Sheet of objective type tests in the Examination Hall

Please follow these instructions very carefully. You may note that since the answer sheets are to be evaluated on machine, any violation of these instructions may result in reduction of your score for which you would yourself be responsible. Before you mark your responses on the Answer Sheet, you will have to fill in various particulars in it.

As soon as the candidates receives the Answer Sheet, he/she should check that it is numbered at the bottom. If it is found un-numbered he/she should at once get it replaced by a numbered one.

You will see from the Answer Sheet that you will have to fill in the top line, which reads thus:

\[ \text{Centre} \quad \text{Subject} \quad \text{S.Code} \quad \text{Roll Number} \]

If you are, say, appearing for the examination in Delhi Centre for the General Ability Test papers* and your Roll No. is 081276, and your test Booklet series is ‘A’ you should fill thus, using black ball pen.

- Centre Delhi Subject General Ability Test (A)
- Subject Code 01 Roll Number 08 1 2 76

You should write with black ball pen the name of the centre and subject in English or Hindi

The test Booklet Series is indicated by Alphabets A, B, C, or D at the top right hand corner of the Booklet.

Write your Roll Numbers exactly as it is in your e-Admission Certificate with black ball pen in the boxes provided for this purpose. Do not omit any zero(s) which may be there.

The next step is to find out the appropriate subject code from the Time Table.

Now encode the Test Booklet Series, Subject Code and the Roll Number in the circles provided for this purpose. Do the encoding with black ball pen.

The name of the Centre need not be encoded

Writing and encoding of Test Booklet Series is to be done after receiving the Test Booklet and confirming the Booklet Series from the same.

For General Ability Test *subject paper of ‘A’ Test Booklet Series you have to encode the subject code, which is 01. Do it thus:

- Booklet Series (A)
- Subject Code 01
- Roll Number 08 1 2 76

All that is required is to blacken completely the circle marked ‘A’ below the Booklet Series and below the subject code blacken completely the Circles for “0” (in the first vertical column) and “1” (in the second vertical column). You should then encode the Roll No. 081276. Do it thus similarly:

- Important: Please ensure that you have correctly encoded your subject. Test Booklet Series and Roll Number.

*This is just illustrative and may not be relevant to your Examination.