



राजस्थान राज्य अभियांत्रिकी सेवा (संयुक्त प्रतियोगी परीक्षा द्वारा सीधी भर्ती) नियम, 1991

(दिनांक 15.06.2024 तक संशोधित)

राजस्थान सरकार
कार्मिक (क-2) विभाग
(सेवा नियम अद्यतन प्रकोष्ठ)
शासन सचिवालय, जयपुर
[\[https://dop.rajasthan.gov.in\]](https://dop.rajasthan.gov.in)

GOVERNMENT OF RAJASTHAN
DEPARTMENT OF PERSONNEL & ADMINISTRATIVE REFORMS
(Department of Personnel-A-II)

No. F. 1(4)DOP/A-II/81

Dated : 09-10-1991

NOTIFICATION

In exercise of the powers conferred by the proviso to Article 309 of the Constitution of India, the Governor of Rajasthan hereby makes the following Rules, namely:-

**THE RAJASTHAN STATE ENGINEERING SERVICES (DIRECT
RECRUITMENT BY COMBINED COMPETITIVE EXAMINATION) RULES,
1991.**

PART-I-GENERAL

1. Short title and commencement:- (1) These Rules may called the Rajasthan State Engineering Services (Direct Recruitment by Combined Competitive Examination) Rules, 1991.

(2) They shall come into force from the date of their publication in the Rajasthan %“Gazette”.

2. Definitions:- (1) In these Rules, unless the context otherwise requires:-

- (a) "**Commission**" means the Rajasthan Public Service Commission;
- (b) "**Direct Recruitment**" means recruitment made in accordance with these Rules;
- (c) "**Government**" means the Government of Rajasthan and;
- (d) "**Schedule**" means the schedule appended to these Rules;

(2) All other words and expression used in these Rules and not defined shall have the meaning respectively assigned to them in the Rajasthan Service Rules, 1951. The Rajasthan Civil Services (Classification, Control and Appeal) Rules, 1958 and the particular service Rules regarding the recruitment and the conditions of service of persons appointed to the service and posts in connection with the affairs of the State issued under proviso to Article 309 of the Constitution of India and for the time being in force.

3. Interpretation:- Unless the context otherwise requires the Rajasthan General Clauses Act, 1955 (Rajasthan Act, No. 8 of 1955) shall apply for the interpretation of these Rules, as it applies for the interpretation of a Rajasthan Act.

PART-II- @“EXAMINATION”

4. Combined Competitive Examination for State Engineering Services:- Notwithstanding anything contained in any rules governing direct recruitment through the agency of the Commission to the posts in State Engineering Services +“and the Rajasthan Rural Development and Panchayti Raj State Service” mentioned

% Substituted for “Gazettee” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

@ Substituted for “Examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

+ Inserted vide corrigendum No. F. 1(1)DOP/A-II/96, dated 06.11.1998.

in Schedule-I, direct recruitment to such posts shall be by a Combined Competitive Examination to be conducted by the Commission in accordance with these rules.

5. Frequency of Examination:- The competitive examination for recruitment to the posts specified in Schedule shall be held at least once a year unless the Government decides that a competitive examination for any of these posts shall not be held in any particular year.

PART-III-PROCEDURE FOR HOLDING EXAMINATION

6. Syllabus for examination:- Notwithstanding anything to the contrary contained in the rules relating to a particular service, the scheme of examination will be as specified in Schedule-II.

7. Inviting of applications:- On requisitions having been received from the Government for specified posts to be filled by direct recruitment in services mentioned in Scheduled-I the Commission shall call for applications for permission to appear in the examination by publishing a notice to that effect in the official Gazette or in such other manner as the Commission may deem fit.

8. Contents of Notice and Instructions connected therewith:- (1) Subject to the provisions of these rules such notice shall among other things state-

- (i) number of posts to be filled in the various services on the result of each examination, indicating separately the number of post reserved for Women Candidates, candidates of the Backward Classes, More Backward Classes, and Economically Weaker Sections.”
- (ii) date of submission of applications for admission;
- (iii) qualifications required for admission at the examination and the steps to be taken by the candidates to establish their eligibility; and
- (iv) date and place of examination.

(2) In addition to the notice, the Commission may issue, in such other manner as the Commission may deem fit, such instructions including the syllabus for the guidance of the candidates.

[£] Substituted for “Frequency of examination” and provision for not holding an examination in a particular year:- The Combined Competitive Examination for recruitment to the posts in the services specified in Schedule-I, shall be held at least once a year unless, the Government in consultations with the Commission decide that a Combined Competitive Examination for any of these posts shall not be held in any particular year.” vide Notification No. F. 7(6)DOP/A-II/2008, dated 23.09.2008.

^ß Substituted for “examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

[@] Substituted for “6. Syllabus for examination”:- Notwithstanding anything to the contrary contained in the rules relating to a particular service, the syllabus for these examination shall be as specified in Schedule-II.” vide Notification No. F. 5(4)DOP/A-II/88, dated 31.05.1999.

^{*} Substituted for “examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

[#] Inserted vide Notification No. F. 7(2)DOP/A-II/88, dated 01.08.1997. (w.e.f. 22.01.1997)

[%] Substituted for “Backward Classes, More Backward Classes, Economically Backward Classes and Economically Weaker Sections” vide Notification No. F. 7(10)DOP/A-II/2023, dated 28.07.2023.

^Ω Substituted for “Backward Classes, Special Backward Classes and Economically Backward Classes”, Scheduled Castes and the Scheduled Tribes;” vide Notification No. F. 7(1)DOP/A-II/2019, dated 19.02.2019.

[§] Substituted for “Other Backward Classes” vide Notification No. F. 7(8)DOP/A-II/2008, dated 28.08.2009.

[¥] Inserted vide Notification No. F. 7(2)DOP/A-II/93, dated 24.05.1994. (w.e.f. 28.09.1993)

9. Form of application and examination fee:- ^s“(1) (a) The application for appearing at the Examination shall be made in the format approved by the commission.

(b) Those candidates who qualify for interview shall be subsequently required to submit more detailed information in the printed form approved by the commission and obtainable from the secretary to the commission on payment of such fee, if any, as may be fixed by the commission from time to time.”

(2) A candidate for direct recruitment to the posts in the State Engineering Services, specified in Schedule-I shall pay an examination fee fixed by the Commission from time to time, in such manner as may be indicated by them.

*“(3) No claim for the refund of the examination fee shall be entertained nor the fee shall be held in reserve for any other examination except when the advertisement is cancelled by the Commission because of withdrawal of requisition by the Requisitioning Authority or for any other reason in which case the amount shall be refunded:

Provided that no claim for the refund of fee shall be entertained after a period of one month from the date issue of the letter of refund by the Commission to the candidate.”

@“(4) Any person may apply to be admitted as a candidate for appearing at the Examination for any one or more of the Posts/Services specified in the Notice for which he/she is eligible and in such case only one application and one payment of fees shall be sufficient. Those of the candidates who qualify at the Examination to be summoned by the Commission for an interview shall be required to indicate in the printed application form their preference for the Posts/Services for which they would like to be considered for allotment on the date of interview of the concerned candidate.”

10. Admission to the &“examination”:- (1) The number of chances which a candidate, except in the case of candidates belonging to the scheduled Castes or Scheduled Tribes, appearing at such, an examination can avail of shall be restricted to three excluding the chances which he has already availed of at &“examination” or selections held before the promulgation of these rules for direct recruitment to posts specified in schedule-I.

^s Substituted for “(1) The application shall be made in the form approved by the Commission and obtainable from the Secretary to the Commission on payment of such fee, if any, as the Commission may, from time to time, fix.” vide Notification No. F. 1(5)DOP/A-II/91, dated 19.09.1996.

* Substituted for “(3) No claim for the refund of any of these fees shall be entertained nor can any such fees be held in abeyance for any examination or selection, except when a candidate is not admitted to any examination to be conducted by the Commission in which case the amount shall be deducted by Rs.5/- before a refund is made.” vide Notification No. F. 1(5)DOP/A-II/91, dated 03.09.1993.

@ Substituted for “(4) Any person may apply to be admitted as a candidate for appointment to posts in any one or more of the service mentioned in the notice for which he is eligible. He shall state in the application the post of the various services he wishes to compete for and the order of his preference for such posts and in such case only one application and one payment of the fees shall be sufficient.

No request for alteration the preference indicated by a candidate in respect of services for which he/she is competing or in respect of the cadres to which he would like to be considered for allotment would be Considered unless the request for such alternative or new insertion, if any, is received in the office of the Commission within 30 days of the date of declaration of the result of the written examination. No communication either from the Commission or from the Government would be sent to the candidates asking them to indicate their revised preferences, if any, for the various cadres/services after they have submitted their application.” vide Notification No. F. 1(5)DOP/A-II/91, dated 19.09.1996.

& Substituted for “examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

(2) The eligibility, including factors relating to nationality and training of a candidate for admission to the examination for appointment to a particular post in a service shall be considered in accordance with the provisions contained in the rules in that behalf relating to that particular service.

(3) (i) The applications which are found to be incomplete and have not been filled in accordance with the instructions issued by the Commission shall be rejected by them at the initial stage. The Commission shall permit rest of those candidates to appear in the examination provisionally to whom they consider it proper to grant the certificate of admission. No candidate shall be admitted to an examination unless he holds a certificate of admission to that examination granted by the Commission. Before appearing at the examination it should be ensured by the candidate himself/herself that he/she fulfills, the condition in regard to age, educational qualifications, experience number of chances, if any, etc. as provided in the Rules. Being allowed to take the examination shall not entitle the candidate to presumption of eligibility. The Commission shall scrutinize later on the applications of such candidates only who qualify in the written examination and shall call only the eligible candidates to viva-voce, if any.

(ii) The decision of the Commission as to the admission of a candidate to an examination, eligibility and consequent admission to viva-voce, if any, shall be final.

11. Educational qualifications:- A candidate for direct recruitment to the post to be filled in by combined competitive examination conducted by the Commission under these Rules must hold the qualification as specified in the rules relating to particular service.

[#]Provided that the person who has appeared or is appearing in the final year examination of the course which is the requisite educational qualification for the post as mentioned in the rules or schedule for direct recruitment, shall be eligible to apply for the post but he/she shall have to submit proof of having acquired the requisite educational qualification to the appropriate selection agency:-

- (i) before appearing in the main examination, where selection is made through two stages of written examination and interview;
- (ii) before appearing in interview where selection is made through written examination and interview;
- (iii) before appearing in the written examination or interview, where selection is made through only written examination or only interview, as the case may be.

12. Age:- Notwithstanding anything contained regarding age limit in any of the service Rules governing direct recruitment through the agency of the Commission to the posts in the State Services mentioned in Schedule-I, a candidate for direct recruitment to the posts to be filled in [£]“by” combined competitive ^{*}“examination” conducted by the Commission under these rules must [€]“have” attained the age of 21 years and must not have attained the age of ¹“40 years” on the first day of the January next following the last date fixed for receipt of applications:-

[#] Added vide Notification No. F. 8(7)DOP/A-II/97, dated 17.09.1999.

[£] Substituted for “any” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

[€] Inserted vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

^{*} Substituted for “examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

Substituted for ⁰“37 years” vide Notification No. F. 7(2)DOP/A-II/84 Pt., dated 06.03.2018.

⁰ Substituted for “35 years” vide Notification No. F. 7 (2) DOP/A-II/84 Pt. dated 25-06-2004 (w.e.f. 24.05.2004).

Provided:

%“(1) the upper age limit mentioned above shall be relaxed by-

- (a) 5 years in the case of male candidates belonging to the Scheduled Castes, Scheduled Tribes, Backward Classes, More Backward Classes and Economically Weaker Sections;
- (b) 5 years in the case of woman candidates belonging to General Category; and
- (c) 10 years in case of woman candidates belonging to the Scheduled Castes, Scheduled Tribes, Backward Classes, More Backward Classes and Economically Weaker Sections.”

(2) that the upper age-limit mentioned above shall not apply in the case of an ex-prisoner who had served under the Government on a substantive basis on any post before conviction and was eligible for appointment under the rules;

(3) that the upper age limit mentioned above shall be relaxed by a period equal to the term of imprisonment served in the case of ex-prisoner who was not overage before his conviction and was eligible for appointment under the rules;

(4) that the upper age limit mentioned above shall be relax-able by a period equal to the service rendered in the N.C.C., in the case of Cadet [¥]“Instructors” and if the resultant age does not exceed the prescribed maximum age limit by more than three years, they shall be deemed to be within the prescribed age-limit.

(5) that the upper age limit for the reservist namely the defence personnel transferred to the reserve, and the ex-service personnel shall be 50 years;

(6) that the ^Ω“Released” Emergency Commissioned Officers and short service Commissioned officers after release from the Army shall be deemed to be within the age-limit even though they have crossed the age-limit when they appear before the Commission had they been eligible as such at the time of their joining the Commission in the Army;

[@](7) If a candidate would have been entitled in respect of his/her age for direct recruitment in any year in which no such recruitment was held, he/she shall be deemed to be eligible in the next following recruitment, if he/she is not overage by more than 3 years.

(8) that the upper age limit for persons serving in connection with the affairs of the State in substantive capacity shall be 40 years.

% Substituted for [§]“(1) that the upper age limit mentioned above shall relaxed –
(i) by 5 years in the case of male candidates belonging to the Scheduled Castes and the Scheduled Tribes,
(ii) by 5 years in the case of ⁰“woman candidates belonging to general category and Economically Backward Classes”; and
(iii) by 10 years in the case of women candidates belonging to Scheduled Castes, Scheduled Tribes and the [#](Backward Classes and Special Backward Classes).” vide Notification No. F. 7(1)DOP/A-II/2019, dated 12.02.2024.

^S Substituted for “(1) that the upper age limit mentioned above shall be relaxed by 5 years in the case of women candidates and the candidates belonging to the Scheduled Castes and the Scheduled Tribes of Rajasthan.” vide Notification No. F. 7(2)DOP/A-II/84/Pt. dated 30.04.2001.

⁰ Substituted for “woman candidates belonging to general category” vide Notification No. F. 7(8)DOP/A-II/2008, dated 28.08.2009.

[#] Substituted for “Other Backward Classes” vide Notification No. F. 7(8)DOP/A-II/2008, dated 28.8.2009.

[¥] Substituted for “instructors” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

^Ω Substituted for “released” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

[@] Substituted for “If a candidate would have been entitled in respect of his age to appear at the examination in any year in which no such examination was held, he shall be deemed to be entitled in respect of his age to appear at the next following examination.” vide Notification No. F. 7(6)DOP/A-II/2008, dated 23.09.2008.

(9) that no relaxation or concession contained in the above, provisos shall be allowed to a candidate who has already attained the age of 50 years ^s“on” the first day of January next following the last date fixed for receipt of applications.

(10) that there shall be no age limit in the case of widows and divorcee women.

Explanation:- That in the case of widow, she will have to furnish a certificate of death of her husband from the Competent Authority and in case of divorcee she will have to furnish the proof of divorce.

¹(11) that the upper age limit for persons serving in Connecting with the affairs of the Panchayat Samities and Zila Parishads and in the State public Sector Undertaking/Corporation in substantive capacity shall be 40 years.

[£](12) “Deleted”

[#](13) the upper age limit mentioned above shall be relaxed by 5 years in the case of candidates belonging to the Other Backward Classes.

[%](14) the person who was within the age limit on 31.12.2020 shall be deemed to be within the age limit up to 31.12.2024.

13. Employment by irregular or improper means:- A candidate who is or has been declared by the Commission guilty of impersonation or of submitting fabricated documents which have been tempered with or of making statements which are incorrect or false or of suppressing material information or using or attempting to use unfair means in the examination or interview or otherwise resorting to any other irregular or improper means for obtaining admission to the examination or appearance at any interview, in addition to rendering himself liable to criminal prosecution, be debarred either permanently or for a specified period-

- (a) by the Commission from admission to any examination or appearance at any interview held by the Commission for selection of candidates; and
- (b) by Government from employment under the Govt.;

^Ω14. Scheme of examination, personality and viva-voce test:- (1) The competitive examination shall be conducted by the Commission in two stages i.e.

^s Substituted for “in” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹ Added vide Notification No. F. 7(1)DOP/A-II/78, dated 30.11.1998.

[£] Deleted [&](12) that where the upper age-limit to post/posts is prescribed as 33 years or less in the rules or schedule, as the case may be, it shall be relaxed by 2 years in the case of candidates belonging to the Other Backward Classes." vide Notification No. F. 7(2)DOP/A-II/93/Pt. dated 25.05.2000.

[&] Added vide Notification No. F. 7(2)DOP/A-II/84, dated 13.11.1996.

[#] Added vide Notification No. F. 7(2)DOP/A-II/93/Pt., dated 25.05.2000.

[%] Added vide Notification No. F. 7(2)DOP/A-II/84/pt., dated 23.09.2022.

^Ω Substituted for [@]“14. Scheme of Examination, Personality and Viva-voce Test:- The competitive examination shall be conducted by the Commission in two stages i.e. preliminary examination and main examination as per the scheme specified in Schedule-II. The marks obtained in the preliminary examination by the candidates, who are declared qualified for admission to the main examination, will not be counted for determining their final order of merit. The number of candidates to be admitted to the main examination will be fifteen times the total approximate number of vacancies (Category wise) to be filled in the year in the various services and posts but in the said range all those candidates who secure the same percentage of marks as may be fixed by the Commission for any lower range will be admitted to the main examination. Candidates who obtain such minimum qualifying marks in the Main Examination as may be fixed by the commission in their discretion shall be summoned by them for an interview. The commission shall award marks to each candidate interviewed by them, having regard to their character, personality, address, physique and knowledge of Rajasthan Culture. The marks so awarded shall be added to the marks obtained in the Main Examination by each such candidate.” vide Notification No. F. 1(5)DOP/A-II/91/pt., dated 23.02.2021.

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preliminary examination and main examination as per the scheme specified in Schedule-II. The marks obtained in the preliminary examination by the candidates, who are declared qualified for admission to the main examination, will not be counted for determining their final order of merit.

(2) The number of candidates to be admitted to the main examination will be fifteen times the total approximate number of vacancies to be filled in the year through the examination in the various services and posts, but in the said range all those candidates who secure the same marks as may be fixed by the Commission for any lower range will be admitted to the main examination:

Provided that, if the Commission is of the opinion that sufficient number of candidates belonging to reserved category are not available on the basis of general standard for appearing in the main examination, relaxed standard may be applied by the Commission for admitting candidates belonging to such reserved category so that sufficient number of candidates in that category are available to appear in the main examination. For this purpose, the zone of consideration of fifteen times the total approximate number of vacancies shall stand relaxed. However, candidates so additionally qualified for the main examination will be eligible for selection to the posts reserved for respective reserved categories only.

Provided further that in case of Rajasthan State Engineering Services Combined Competitive Examination, 2018 process for which has already been commenced, candidates belonging to reserved category called by the Commission in excess of fifteen times the posts reserved for respective reserved categories for appearing in the main examination, as candidates of respective reserved categories, because of having secured equal or more marks than the cut-off marks for general category in preliminary examination for that year, shall be considered qualified for appearing in the main examination for that year.

Note: For the purpose of this rule "reserved category" means any such category for which reservation, either horizontal or vertical is applicable.

(3) Candidates who obtain such minimum qualifying marks in the main examination as may be fixed by the Commission in their discretion shall be summoned by them for an interview.

(4) The Commission shall award marks to each candidate interviewed by them, having regard to their character, personality, articulation, physique and knowledge of culture of Rajasthan. The marks so awarded shall be added to the marks obtained in the main examination by each such candidate.

15. Medical Examination Fee:- Candidates who may be required to appear before a Medical Board shall pay to the President of the Medical Board in cash a non-refundable Fee of Rs.16/- or Rs.8/- if they are members of the Scheduled Castes/Tribes, before the medical examination is held.

@ Substituted for "14. Personality and viva-voce examination:- Candidate who have obtain a minimum of 35% marks in each of the General papers and a minimum of 40% marks in the aggregate for the written test shall be considered to have obtained qualifying marks at the examination. The Commission may in its discretion award grace marks up to one in each of the General papers and up to three in the aggregate. Candidates who obtained such minimum qualifying marks in the written examination as may be fixed by the Commission in their discretion shall be summoned by them for an interview. The Commission shall award marks to each candidate interviewed by them, having regard their Character, personality, address, physique and knowledge of Rajasthani Culture. The marks so awarded shall be added to the marks obtained in written test by each such, candidates." vide Notification No. F. 5(4)DOP/A-II/88, dated 31.05.1999.

16. Recommendation of the Commission:- (1) The Commission shall prepare for each service, a list of the candidates arranged in order of merit of the candidates as disclosed by the aggregate marks finally awarded to each candidate. If two or more of such candidates obtain equal marks in the aggregate, the Commission shall arrange their names in the order of merit on the basis of their general suitability for the service:

Provided that:

- (i) the Commission shall not recommend any candidate for the State Engineering services, who has failed to obtain a minimum of ^s“Deleted” 50 % marks in the aggregate.
- (ii) the Commission, on requisition, further recommend the names of the candidates in addition to the advertised vacancies against additional vacancies intimated by the Government before the final result of the Combined Competitive Examination is declared by the Commission.

(2) Notwithstanding anything contained in proviso (1) to sub-rule (1) above the Commission shall, in case of [£]“Women Candidates” candidates belonging to the [%]“Backward Classes, More Backward Classes, and Economically Weaker Sections,” Scheduled Castes and the Scheduled Tribes recommend the names of such candidates, up to the number of vacancies reserved for them from amongst those who have qualified for interview, [#]“even if they fail to obtain the aggregate marks prescribed under proviso (1) to sub-rule (1) above.”

(3) The Commission, while giving weight to the preference for the posts in the different services expressed by a candidate in his application, may recommend him for appointment to any post in any such service for which it considers him suitable.

(4) The list compiled under this rule shall be immediately sent to the Government and also be published for general information.

@“17. Retotaling marks:- (1) The Commission may order re-totaling of the marks obtained by a candidate during such period as may be decided by the Commission in their discretion on payment such fee as may be fixed by the Commission from time to time but evaluation of the answer paper shall not be re-examined.

(2) The Commission may take step to rectify such mistake as are detected on re-totaling of the marks in pursuance of the provisions of (1) above.”

^s Deleted “33% marks in the personality and viva-voce examination and a minimum of” vide Notification No. F. 1(5)DOP/A-II/91, dated 16.05.2000.

[£] Inserted vide Notification No. F. 7(2)DOP/A-II/88, dated 01.08.1997. (w.e.f. 22.01.1997)

[%] Substituted for ^Ω“Backward Classes, More Backward Classes, Economically Backward Classes and Economically Weaker Sections” vide Notification No. F. 7(10)DOP/A-II/2023, dated 28.07.2023.

^Ω Substituted for [§]“Backward Classes, Special Backward Classes and Economically Backward Classes”, vide Notification No. F. 7(1)DOP/A-II/2019, dated 19.02.2019.

[§] Substituted for [¥]“Other Backward Classes” vide Notification No. F. 7(8)DOP/A-II/2008, dated 28.08.2009.

[¥] Inserted vide Notification No. F. 7(2)DOP/A-II/93, dated 24.05.1994. (w.e.f. 28.09.1993)

[#] Substituted for “even if they fail to obtain the minimum marks in viva-voce or the aggregate prescribed under proviso (1) to sub-rule (1) above.” vide Notification No. F. 1(5)DOP/A-II/91, dated 09.01.2001.

[@] Substituted for “17. Rechecking of the marks:- (1) The Commission may order arithmetical scrutiny and retotaling of marks obtained by a candidate on payment of a fee of Rs. 10/- per paper for post mentioned in Schedule-I within 20 days from the date of issue of the marks-sheet to the candidate.

(2) The Commission may take steps to rectify such mistakes as are detected on scrutiny, re-checking and re-totaling of the marks in pursuance of the provisions of sub-rule (1).” vide Notification No. F. 1(5)DOP/A-II/91, dated 03.09.1993.

(3) If as a result of such rectification the Commission discovers that the candidate becomes eligible for selection, such fact shall be immediately and in any case not later than 40 days from the date of announcement of the result reported to the Government and to that extent the recommendation of the Commission made under rule 16 shall stand protanto modified.

18. No right to appointment on inclusion of a name in the list:- The inclusion of candidate's name in the list confers no right to appointment, unless the Government is satisfied, after such enquiry, as may be considered necessary that the candidate is suitable in all respect for appointments to the service.

19. Selection by Government:- (1) Subject to the number of posts specified in the notice issued under rule 7, and subject to reservations of posts in favour of candidates belonging to Scheduled Castes/Scheduled Tribes in respect of posts included in Schedule-I, the Government shall select candidates who stand, highest in the order of merit in the list prepared by the Commission under rule 16 strictly in accordance with the order of preference given by the candidates in their application forms for different services/posts:

Provided that it is satisfied after such enquiry as may be considered necessary that such candidates are suitable in all other respects for appointment to the posts in the service:

Provided further that the order of preference once exercised by a candidate shall not @“be” changed:

Provided further also that the Government #“may” further select, against additional vacancies in the order of merit from the list prepared under rule 16 by the Commission for appointment to posts in the service specified in Schedule-I, candidates up to the number of vacancies intimated by them to the Commission before final declaration of the result of the combined competitive Examination conducted by the Commission.

(2) If a person, selected under sub-rule (1) above and appointed to a post/service concerned in accordance with the relevant service Rules against the vacancy of a particular year for which the Combined Competitive Examination was conducted by the Commission in accordance, with these rules, has resigned or expired in any subsequent year, in that event the said vacancy shall be treated as a fresh vacancy.

20. Canvassing:- Any attempt on the part of a candidate to enlist support directly or indirectly for his candidature by any means may be held by the Commission to disqualify him for recruitment.

21. Removal of doubts:- If any doubt arises relating to the interpretation of these Rules, it shall be referred to the Government in the Department of Personnel whose decision thereon shall be final.

@ Inserted vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

Substituted for “any” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

SCHEDULE-I

Posts in the following State Services to be filled by direct recruitment for which a Combined Competitive Examination shall be held:-

S. No.	NAME OF THE SERVICE	POSTS
1	2	3
1	The Rajasthan Service of Engineers (Building and Road Branch)	Assistant: Engineer (Civil/Mech./Elect.)
2	The Rajasthan Service of Engineers (Irrigation Branch)	Assistant: Engineer (Civil/Mech./Elect.)
3	The Rajasthan Service of Engineers (Public Health Branch)	Assistant: Engineer (Civil/Mech./Elect.)
^s 4	The Rajasthan Rural Development and Panchayati Raj State and Subordinate Service	Assistant Engineer

^s Substituted for [%]4. The Rajasthan Rural Development and Panchayati Raj state Service - Assistant Engineer (Civil)" vide Notification No. F. 1(5)DOP/A-II/91, dated 06.03.2013.

[%] Added vide Notification No. F. 1(1)DOP/A-II/96, dated 02.05.1998 and Corrigendum even No. dated 6.11.1998.

“(i) Preliminary Examination:- The preliminary examination will consist of two papers, i.e. one compulsory paper and one optional paper, which will be of objective type and carry a maximum of 400 marks in the subjects mentioned in section 'A' and 'B'. The examination is meant to serve as a screening test only. The

^Ω Substituted for “(i) Preliminary Examination:- The Preliminary Examination will consist of two papers, i.e. one compulsory paper and one Optional paper, which will be of objective type and carry a maximum of 400 marks in the subjects mentioned in Section ‘A’ and ‘B’. The examination is meant to serve as a screening test only. The marks obtained in the preliminary examination by the candidate who are declare qualified for admission to the main examination will be counted for determined their final order of merit. The number of candidates to be admitted to the main examination will be 15 times the total approximate number of vacancies (category wise) to be filled in the year in the various services or posts, but in the said range all these candidates who secure the same percentage of marks as may be fixed by the Commission for any lower range will be admitted to the main examination.

SECTION-A		
Compulsory Paper	Maximum marks	Time
General Knowledge & General Science including General Knowledge of Rajasthan and its Geography, Economy and Culture.	200	2 hours

SECTION-B

List of optional papers (any one paper to be opted by a candidate) :-

Paper	Maximum marks	Time
Civil Engineering	200	2 hours
Electrical Engineering	200	2 hours
Mechanical Engineering	200	2 hours”
^θ “Agriculture Engineering	200	2 hours”

vide Notification No. F. 1(5)DOP/A-II/91 pt., dated 23.02.2021.

^θ Added vide No. F. 1(5)DOP/A-II/91, dated 6.03.2013

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III. Mechanical Engineering paper for the post of Assistant Engineer (Mechanical):-

- | | | |
|---|-----------|------------------------|
| 1. Paper -I | 200 Marks | ^β “2 hours” |
| (i) Thermodynamics | | |
| (ii) Fluid Mechanics and fluid Machinery | | |
| (iii) Heat transfer | | |
| (iv) Thermal Energy conversion | | |
| (v) Environmental Engineering | | |
| 2. Paper-II | 200 Marks | ^β “2 hours” |
| (i) Theory Machines | | |
| (ii) Machine Design | | |
| 3. Paper-III | 200 Marks | ^β “2 hours” |
| (i) Production Engineering | | |
| (ii) Industrial Engineering | | |
| (iii) Production Management and operation Research. | | |
2. PERSONALITY AND VIVA-VOCE EXAMINATION (see rule 14):
- Candidates who obtain such minimum qualifying marks in the written test as may be fixed by the Commission in their discretion shall be summoned by them for interview. Provided that no candidate who fails to obtain a minimum of 35% marks in each of the two General papers and a minimum of 40% marks in the aggregate shall be called by the Commission for interview which carries 100 marks.
 - The Commission shall award marks to each candidate interviewed by them. In interviewing the candidates ^θ“besides awarding marks in respect of character,” personality, address and physique, marks shall also be awarded for the candidate's knowledge of Rajasthani Culture. The marks so awarded shall be added to the marks obtained in the written test by each such candidate.
 - The standard of the paper will be that of a Degree examination of the University in Rajasthan. A brief outline of the scope of each paper is given below for general guidance of candidates but is not intended to be [§]“exhaustive”.
 - All papers unless specifically [#]“required” shall be answered either in Hindi or in English, but no candidate shall be permitted to answer any one paper partly in Hindi and partly in English unless specifically allowed to do so.
 - If a candidate's hand-writing is not easily legible, a deduction will be made on this account from the total marks otherwise accruing to him.
 - Credit will be given for orderly, effective and exact expression combined with due economy of words in all subjects of the examination.
 - It is obligatory for a candidate to appear in all the General papers and in optional papers.

SCOPE OF PAPERS

GENERAL KNOWLEDGE AND GENERAL SCIENCE

1. CURRENT AFFAIRS:- Current events of State, Nationals and International importance. International agencies, their activities economic and political aspects in India and organizations and institutions working in these fields. Games and Sports at State, National and International levels.

2. GENERAL SCIENCE:- Questions on General Science will cover general appreciation and understanding of science including matters of everyday observations and experience as may be expected of a well-educated person who has made a special study of any scientific discipline. Questions to test the candidate's acquaintance with matters such as Electronics, Tele-communication, satellites and the like should also be included.

3. GEOGRAPHY AND NATURAL RESOURCES:- (a) Broad physical features of the world, important places, Rivers, mountains, continents, oceans; (b) environment ecology, and wild-life in India; (c) Rajasthan's physiography, climate, vegetation and soil regions, broad physical divisions of Rajasthan, Human resources, problems of population/unemployment, poverty, draught and famine in Rajasthan. Natural resources of Rajasthan, Mines and Minerals, Forests, Land and Water, Animal resources, Wild-life and their preservation.

Energy problems and conventional and non-conventional sources of Energy.

marks obtained in the preliminary examination by the candidates who are declared qualified for admission to the main examination, will not be counted for determining their final order of merit. The number of candidates to be admitted to the main examination will be fifteen times the total approximate number of vacancies to be filled in the year through the examination in the various services and posts, but in the said range all those candidates who secure the same marks as may be fixed by the Commission for any lower range will be admitted to the main examination:

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4. AGRICULTURE AND ECONOMIC DEVELOPMENT WITH SPECIAL REFERENCE TO RAJASTHANI :- Food and Commercial Crops of Rajasthan, agriculture based Industries, Major Irrigation and River Valley projects, Projects for the development of the desert and waste:- lands, Indira Gandhi Canal Project, Growth and location of Industries, Industrial raw material, Mineral based Industries, Small Scale and Cottage industries, export items, Rajasthani handicrafts, Tribes and other economy, various economic plans, programmes and institutions for development, Co-operative movements, Small enterprises and Financial institutions.

5. HISTORY & CULTURE:- Important civilization and culture of the world, famous works in Art, Literature and Culture, Important Historical events and monuments of India, Indian Culture, National integration, History of freedom struggle in Rajasthan, Political integration of Rajasthan, Important historical events of Rajasthan, religious and cults in Rajasthan, Social reforms and Culture, renaissance in India with special reference to Rajasthan. Rajasthani Art, Culture and Literature, Folk songs and dances, Pairs/Festivals, costume and costumes of Rajasthan, Rajasthani dialects and their regions Contribution of various castes and tribes of Rajasthan in the promotion of Art literature, and culture.

General paper - II

Social Aspects of Engineering

Brief coverage of following subject/aspects in paper-II:-

- (i) Economical/Financial aspects of Engineering Planning. Cost-benefit ratio. Cost Control & quality Control.
- (ii) Human relations in work and behavioral aspects leadership qualifies and personality development.
- (iii) Environmental concerns in development.
- (iv) Conservation of Resources.
- (v) Rural Needs.
- (vi) Population forecasts and Planning for future. (Weightage to language abilities may be kept in consideration during the personality test/viva-voce.)

PAPER-I (CIVIL ENGINEERING)

¹“Deleted”

(Each portion to have roughly equal weightage)

Applied Mechanics:-

Strength of Materials:- Behaviour of Engineering materials in tension, compression and shear, Elastic limit, Yield point, Proof stress, Nominal stress, Ultimate, Strength, factor of safety, Load factor, Elastic constants.

Principal stress and strains, strain energy, Elements of strength. Theories of elastic failure, Analysis of structures.

Fluid Mechanic:- Fluid properties, types of flow, fluid statics, forces on fully and partially submerged bodies, stability of floating bodies, Fluid kinematics, acceleration of fluid particle, velocity potential and stream function, irrotational flows, Ideal fluid flow, Bernoulli equation, applications, flow measuring device.

Momentum and angular momentum principles as applied to fluid in a control volume, applications to jets, propeller rotodynamic machines etc. Introduction of viscous flow, BOZARE concept of drag, flow through pipes, dimensional analysis and similitude techniques.

Soil & Foundation Engineering:

Soil exploration:- Methods of site exploration, boring, sampling, standard Penetration test.

Preliminary definitions and relationships:- Water content and unit weight, specific gravity, void ratio, porosity and degree of saturation, density index functional relationship.

Index properties:- Specific gravity, particle size distribution consistency of soils, classification of soils.

Laboratory Test:- Particle size analysis, liquid limit, plastic limit, proctor density, field density, permeability, box shear and consolidation.

Soil Water:- Intergrenular and pore water pressure, sapling phenomenon, permeability.

Compressibility and consolidation:- Concept of one dimensional consolidation, Laboratory ²“consolidation test-settlement Analysis”.

Shear Strength:- Basic concept, strength theory, ³“mohr's” stress circle, ³“mohr's” column failure theory. Measurement of shear strength.

Earth pressure:- Lateral earth pressure (Active & Passive), Theory Rankine's and Coulomb's theory.

Stability of slopes:- Methods of slices, friction circle method factor of safety under various conditions.

Bearing Capacity:- Definition, Ranking's method Terzaghi's analysis Plate load test, Penetration test.

Compaction:- Field compaction method, placement water content, field compaction control and factors affecting compaction.

Mechanical & Power Application:- Selection of equipments, equipments involved in excavation, conveyance, compaction, spreading of earth, pneumatic equipment, equipments involved in concrete making, mixing, conveying and vibrating, use of pulley blocks, lifting tackles shear gins, derricks, grabs, winches and gin poles.

PAPER-II (CIVIL ENGINEERING)

⁴“Deleted”

PART-I

A. Surveying:-

Distance Measurements:- Use of steel and metallic tapes, applications of corrections measurement of base line, errors in baseline measurements, reduction to mean sea level, specifications for base line. Measurement, optical measurement of distances, use of substance bars, geodimeters and use of radar and laser systems in trilateration.

Angle Measurements:- Principles of theodolite constructions, temporary and permanent adjustments, precision in relation to nature of work, compass, varieties, limitations, adjustments.

Provided that, if the Commission is of the opinion that sufficient number of candidates belonging to reserved category are not available on the basis of general standard for appearing in the main examination, relaxed standard may be applied by the Commission for admitting candidates belonging to such reserved category so that sufficient number of candidates in that category are available to appear in the main examination. For this purpose, the zone of consideration of fifteen times the total approximate number of vacancies shall stand relaxed. However, candidates so additionally qualified for the main examination will be eligible for selection to the posts reserved for respective reserved categories only.

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Vertical Measurement:- Use of levelling instruments, components of level, level tubes, estimation of sensitivity, optics, care and maintenance parameters to define quality of telescope, levelling instruments and theodolites, methods of recording and reducing, stadia reductions, use of level rods, Contouring, drainage and water shed lines.

Methods of filling in Detail:- Chain and compass, plane table and traverse surveys, Principles and adjustments of closed traverses, determination of missing data, solution of two point and three, point problems, use of station pointer.

Other Surveys:- Curve ranging using linear and angular measurements, employing simple, compound and spiral curve's hydrographic surveys, Aerial photogrammetry, setting out culverts, 16110 bridges, buildings, gardens, and tunnels.

Office Computations and Testing of Instruments- adjustment of precise level network, measurements of area from plan field notes, and with the use of planimeter, measurement of volumes from cross - section including pris-moidal and curvature corrections.

B. Construction Materials:-

(i) Building Materials:- Building stones, building bricks, steal (Plain, Tor, Hightensile and structural) , Timber, lime, ¹⁴“cement”, Sand, Surkhi, Cinder, Stone slabs and lintels, aggregates for cement concrete, paints, distempers, use of pozzolana- manufacture of lime concrete, cement concrete for plain, reinforced and prestressed concrete work, additives and admixtures in concrete.

(ii) Road Material:- Stone for soling, coarse aggregate, screenings and binding materials for WBM, Bricks for soling, coarse and fine aggregate for bituminous roads, IRC Standard: size aggregates, Asphalts, Asphaltic concrete, Asphaltic Emulsions and Mineral fillers,

(iii) Constructions:

Stone Masonary:- Ashlar, coursed rubble, Random rubble, Stone pillar, dry stone and arch masonry,

Brick Masonary:- Types and their uses, hollow and reinforced brick work.

Wood Works:- Doors, Windows, Ventilators, roof trusses etc.

Steel Work:- Structural Steel work, metal doors, windows and ventilators, welding.

Roofing:- Stone slab roofing, G.C. Steel sheet roofing, Asbestos cement sheet roofing, Jack arch roofing, Tile and Thetch roofing.

Flooring:- Lime concrete base for floors, cement plaster over L.C. base, cement concrete flooring, Flag Stone flooring, Terrazzo mosaic flooring, cement tile flooring, Brick on edge flooring, Granolithic floor finish, linoleum & other floorings.

Plastering:- Lime plaster, cement sand plaster, composite plaster, rough cost. plaster, Araish, plastering with Gypsum, painting.

Miscellaneous:- Damp proof course, anti - termites treatment, lintels, parapets, sill, coping etc.

Centering & Shuttering:- Centering, form work, shuttering and moulds, timber trestles and false work, scaffolding and shoring, under pinning.

Electrification:- Method of measurement of electrical installations in buildings, systems of wiring, fitting and fixtures, Tough rubber sheathed or P.V.C. sheathed wiring system, Recessed conduct wiring system, Bus & Bar Chamber, Pointing, Earthing, testing of installation, ⁵“preventing” maintenance, protection against lightning, underground cables, overhead lines.

Sanitary and Water Supply:- Providing & Laying Galvanised Iron PVC, asbestos cement, stone ware, cast iron and RCC pipes, Sewerage & drainage system over head and underground tanks, manholes, Gully Chambers, septic tank, sockage pit, dispersion trench, fittings and fixtures like water closets, flushing cisterns, urinals, wash basins, sinks, draining oboards, bath tubs, showers, mirrors, towel rails, bib cooks, stop cocks, flushing cocks, mixer cocks and glazed, tile work.

Construction Management:- Management of construction plant and equipment, Planning for construction using network analysis C.P.M. and PERT Techniques.

Shallow Foundation:- Spread foundation, combined footing and. strap footing, Mel or Raft footing.

PART-II (OPTIONAL)
(ATTEMPT ANY ONE SECTION)
EITHER A OR B

SECTION – A:-

Hydrology and Water Resources Engineering Hydrology:- Hydrologic cycle, precipitation, evaporation, evapotranspiration and infiltration. Estimation of [^]“dependable” runoff factors effecting runoff, Rainfall runoff relationship, flood estimation using frequency analysis and unit Hydrograph methods.

Storage Works:- Different types of dams. Elementary concept of masonry, concrete, earthen, buttress and arch dams. Forces gravity dams, Structural behaviour, stability considerations and stressvariation in gravity dams. Apportenances, Foundation treatment and control of seepage.

Homogeneous & Zoned embankments, Seepage analysis, Filters' Cutoffs, stability analysis of embankment. Pore pressures during construction. Instrumentation in Gravity and earthen dans. Different types of spillways, spillways design considerations and suitability, Cavitation damage of DOEN spillways. Different types of energy dissipators, selection ⁶“criteria” and basic design.

Multipurpose Projects:- Compatibility of multipurpose uses, Date needed in Planning of multipurpose water resources projects, Reservoir Planning, Environmental Consequences of irrigation. Problems of alkalinity and salinity, Farm. drainage and CAB works.

OR
SECTION - B:
STRUCTURAL DESIGN:

Provided further that in case of Rajasthan State Engineering Services Combined Competitive Examination, 2018 process for which has already been commenced, candidates belonging to reserved category called by the Commission in excess of fifteen times the posts reserved for respective reserved categories for appearing in the main examination, as candidates of respective reserved categories, because of having secured equal or more marks than the cut-off marks for general category in preliminary examination for that year, shall be considered qualified for appearing in the main examination for that year.

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Reinforced Cement/Prestressed Concrete:

Loads:- Specification for loads on buildings and bridges.

Reinforced Cement Concrete:- Elastic and ultimate load. Theories, resistances to bending, shear and bond. Designs (by both theories where-ever applicable) of singly and doubly reinforced beams, one way, two way and flat slabs, columns, with axial and moment loading, footings, cantilever and counterfort retaining walls, simple underground and elevated reservoirs, cantilever sheds, simple portal frames, spherical domes and framed structures.

Prestressed Concrete:- Properties of high grade concrete and high tensile steel, pretensioning and post tensioning, losses in prestress, Analysis and design of beams and slabs deflections, grouting.

Steel Structures:- Tension and compression members, single and built up section, connections and splices, Roof trusses, simple beams and purlin connections, columns, lacing and battering, Grillage, Gussseted and slab base foundation, plates and Gantry Girders, Sheds, Thorough and deck type plate girder, bridges with lateral bracings, Foot over bridges, water tanks and design of revetted and welded connections.

Bridge Engineering:- Components of bridge, classification of bridges, requirement of an ideal-bridge, selection of bridge site, Bridge alignment, site investigation and collection of data, waterway of bridges, Economic span, scour depth of foundation, Afflux, clearance, Free board. Type of bridge superstructures and methods of excise, bridge bearings, joints. in bridges, Wearing Cost, Raillings Parapet and approach slab.

Type of bridge foundation, bridge pier, abutments and wing walls. Training work for bridges and protection works. Low cost bridges, causeways, timber bridges, suspension bridges, floating bridges, pipe and slab culverts.

PAPER - III (CIVIL ENGINEERING)

7. "Deleted"

(Each Part & portion has equal marks)

PART-I (COMPULSORY)

THEORY OF STRUCTURES:

(a) Statically Determinate Structures:- Bending Moment and Shear Force in statically determinate beams, analytical and graphical methods, stress due to Bending Moment and Shear Force, Design of sections, section Modulus, Elementary theory of torsion, Combined bending and torsion, Force in statically determinate plane, trusses analytical and graphical method.

Slope and deflection of statically determinate beams, Deflection of statically determinate planner trusses, Columns and struts, Buckling of columns, Euler's, Ramkine's and Sec- and Formulae for long columns, Combined, direct and bending stresses for short columns.

(b) Statically Indeterminate Structures:- Static and Kinetic indeterminacy: Energy theorems, Stiffness and Flexibility methods, Element's of materials analysis of structures, methods of donstant Deformation, slope. deflection and Moment distribution, Analysis of beams (including continuous) and Portal frames, Influence lines, Influence lines for moment, shear and reaction for statically determinate beams and planner trusses, Muller Breslau Principles and Influence Lines for simple cases of indeterminate beams.

Arches-Three hinged arches, two-hinged arches and ⁸ "rigid" arches, Bending moment, Normal thrust and Radial Shear and their influence lines.

(c) Foundation Engineering:-

Pile Foundations:- Types of piles, driving of piles, load carrying capacity of piles, piles load testing, under-reamed pile foundation, bored compaction piles.

Well Foundations:- Caissons, shape a of wells and component parts depth well foundation and bearing capacity, forces acting on a well foundation, analysis of well foundation, well curb, cutting edge, stening, bottom, intermediate and top plugs, well sinking, Pneumatic caissons.

PART-II-OPTIONAL

(Attempt any one section)

SECTION - A:- Highways, Traffic Engineering, Transport & Traffic Management.

Survey investigation and preparation of road project, Highway standard classification, land width, building line, Centre line, formation width, Terrain classification, pavement width, Camber, longitudinal gradients, sight distance, horizontal curve, Super elevation, vertical curve, lateral and vertical clearances.

Design of Pavement:- Flexible and rigid pavements.

Pavement Construction-

(i) Sub-bases, base course and shoulder stone/kankar/brick soling, WBM, Courses, Shoulders, Granular sub-base, stabilized soil roads, cement/lime stabilized sub-base, sand bitumen base course, crushed cement concrete base/sub-base course.

(ii) Bitumenous Courses, Priming and tack coats, surface, dressings, open, graded premix carpet, semidense carpet, built up spray groud base course, bituminous base binder course, sphaltic concrete, ceal coats, mixed seal surfacing, Penetration macadam base/binder course, full and semi-grouts.

Traffic Engineering:- Traffic characteristics, road user characteristics, vehicular characteristics, volume, speed, speed and delay stuffes, origin and destination study, traffic flow characteristics, traffic capacity and parking studies, traffic regulation, traffic control devices, Inter-section control.

Systems approach in Traffic Management.

OR

SECTION-B

Water Supply & Sanitary Engineering:

Water Supply Engineering- Population for cast and quantitive requirements of water supply for urban and rural areas, veriation in demand. Different sources of water supply; Lakes, rivers and ground water. Intake arrangements. Drinking water standards

Note: For the purpose of this clause "reserved category" means any such category for which reservation, either horizontal or vertical is applicable.

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for water. Water chemistry and water analysis. Bacteriological test. Pumping of raw water. Design of rising mains. Water treatment, sedimentation, coagulation, filtration and disinfection. Water softening and aeration of water. Service reservoirs, Intze and other types of tanks, their hydraulic and structural design, water distribution system and their design and analysis. Boosting stations, Maintenance of treatment works and distribution system. Clear water reservoirs. Rural water supply and sanitation. Problems of low cost potable water for rural population. Tube wells for water supply. Safe yield from tube wells.

Sanitary Engineering- Sewerage, Separate sewers and combined sewers, Hydraulic and structural design considerations. Different types of pipe material and different shapes of built up sewers. Superimposed load sewers. Marston formula for buried pipes. House plumbing, various accessories and arrangement. Sewage pumping Station.

Characterization of sewage:- Physical, chemical and biological analysis. Industrial ⁹“Waste” water its problems, Natural purification process through soil mass and through water bodies self-purification of streams. Sewage treatment.

Physical treatment:- reening skimming, tanks, Gritchamber, Settling tanks. secondary (biological) treatment, Trickling filters and brate bio filters. Activated sludge and excelerat deration plants. Secondary, settling tanks, sludge thickness, sludge digestors and sludge drying. Final disposal. Low cost water treatment. Oxidation ponds. Oxidation ditches. Aerated lagoons. Septic and imhoff tanks. Anaerobic lagoons. Design considerations and general arrangement. Dry refuse disposal Anaerobic composting and semi-aerobic composting using ¹⁰“windroming”. Urban and Rural sanitation. Environmental Impact Assessment & Management.

¹¹“Deleted”

SECTION-C:

Crops and Water Requirements:- Consumptive use of water. Water depth and frequency of irrigation. Soil moisture and its variation in the root zone. Wilting point. Field capacity. Different methods of irrigation and irrigation efficiency. Duty delta and outlet factor.

Cropping Patterns. Intensity of irrigation, Command area development and its related problems. Micro level irrigation-Management, War abondi Farm drainage.

Diversion Head Works:- Principles of design of weirs on non-permeable and permeable foundations Khosla's theory, design for uplift and exit gradient, Silt exclusion from canal head works, Regulators, aqueducts, butlets, falls, cross drainage works etc.

Canals:- Lined and unlined canals. Kennedy's Laccya's theories, Tractive force approach, Cross drainage works, Hydro power generation on canals, canal seepage, Types at lining and its selection criteria.

Lift Irrigation from Canals and Wells:- Groundwater availability in unconfined and confined aquifers. Safe yield formulas. Relative merits of lift irrigation and flow irrigation. Lift schemes from rivers and canals.

ELECTRICAL ENGINEERING PAPER -I

1. C.M.Induction: Electromagnetic induction, self and mutual induction growth and decay of current for L. R. circuit, charge and discharge of condensor through L. R. circuits, induction coil power and reactive power, power factor and power factor correction.

2. A/c single phase, and ployphase circuits: Alternating quantities, sinusoidal voltage and current RMS and average values of voltages and current, form factor purely resistive, purely inductives and purely capacitive circuits, concept of impedance, series and parallel circuits, Generation of a phase supply, a phase delta connections, balanced impedance and unbalanced voltage connected to balanced impedences, applorent or complex power and reactive voltampere in a 3 wire system, Watt meter methods of power measurement. Tariffs for energy.

3. Instrument Transformers: Principle and construction of CTs and PTs, ratio and phasor angle error, effects of variation in power factor burden and frequency tests for ratio error and phase difference.

4. Cables: Types, construction details, voltage gradient, method of grading of insulation, selection of cable is specification for cable.

5. Semi conductors: Resistivity and conduction properties of Ge, Si, GaA, Cis, Ga Asp, Phs materials hall effect, spacifications of diodes, transistors, PET and their applications, thermistor theory, specification and applications, of thermist.

6. Metal detector circuits: Convayor helt, metal detector, electrical metal detector, General idea of the use of electricity in the following field. ¹²“Domestic applications, medicine, Electroytic and electrometallurgical process automobiles.”

7. Indian electricity Rules and Acts: As amended up to date.

8. Illumination: Nature of light, definitions, plan and solid angle, light energy, luminous flux, luminesous intensity, illumination spectra distribution cures and laminous flux, luminous intensity. Illumination spectra distribution curve and luminous efficiency, polar curve, electric light source, incandescent and electric lamps (mercury sodium (Low and high) invarse square law of illumination, co-sine, law illumination level-absence of contract, shadows glare light calculation.

Distribution of lighting reflection refraction and diffusion, domestic commercial and industrial lighting; street lighting, flood lighting and special illumination; ¹³“photometers, designing”, street lighting internal lighting residential, officer educational institutions, medical buildings (hospital-colleges) and commercial complex etc. on the basis of illumination level. Comparison between different light source wiz: their illumination effect application etc. Simple iden about lamps available in market and their application.

9. Building Design - Concept of structural stability, loads, comming on the structures, static and dynamics loads and their relative importance in Engg. structure, concept of equivalent dead load.

Principles of load transfer frame action load bearing walls and composite action.

10. Elements of Supper-Structure:- Walls, (masonry, stone and bricks walls) lime and plain cement concrete-Requirements of good concrete, Various grades of concrete and their uses.

PAPER -II

1. Transformers- Single phase auto-transformer three phase transformer, uses of transformer, contructional principle of operation EMF equation efficiency regulation. Scott connection Vee connections (The oritical Treatment only). Significance of back EMF Torque speed equations, characteristic of different Types of D.C. motor and their speed control methods, starters of A.C. motor industrial applications.

2. A.C. Machines- 3 phase Synchronous machines operating characteristics and parallel operation. Poly-phase induction motor starting torque, maximum torque ¹⁴“slip” characteristics, equivalent circuit, circle, diagraeme method of starting and speed control.

SECTION-A

Compulsory Paper	Maximum marks	Time
General Knowledge & General Science including General Knowledge of Rajasthan and its Geography, Economy and Culture.	200	2 hours

SECTION-B

List of optional papers (any one paper to be opted by a candidate) :-

Paper	Maximum marks	Time
Civil Engineering	200	2 hours
Electrical Engineering	200	2 hours
Mechanical Engineering	200	2 hours”
^y “Agricultural Engineering	200	2 hours”

(ii) Main Examination:- The written examination will consist of the following papers which will be conventional type. A candidate must take all the compulsory subjects and any one of the optional subjects list below. Each of the optional subject will have two papers. The time allowed for each paper shall be three hours.

	<u>Compulsory Subject</u>	<u>Maximum Marks</u>
Paper-I	Hindi	100
Paper-II	Social aspects of Engineering	100

	<u>Optional Subject</u>	<u>Maximum Marks</u>
Paper-III and IV	(Any one subject to be opted by a candidate from the following list of optional subjects. Each subject will have two papers).	200 marks for each paper.

List of Optional Subjects

1. Civil Engineering
2. Electrical Engineering
3. Mechanical engineering
- ^z4. Agriculture engineering

^y Added vide Notification No. F. 1(5)DOP/A-II/91/Pt., dated 18.10.2021.

^z Added vide No. F. 1(5)DOP/A-II/91, dated 6.03.2013

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3. Single phase- Motors Principles and constructions of reluctance motor, servo motors, selsyns, synchron, slip of motor, motor application and control characteristics, of different types of motors, and their specific industrial application. General considerations in selection of motor for a given drive.
4. Types of insulated wires, wiring system, switches and accessories, filament lamps mercury vapour lamps, Sodium lamp their comparative study and efficiency Flourescent tubes and their circuits. Necessity of earthing, use of ammeter, voltmeter watrender energy meter and megger.
5. Electric relay circuits- D.C. operated and A/C operated time delay relays. Poly phase rectifiers, Principles of voltage stablizer, feedback amplifiers and simple equivalent circuit.
6. Temp. control of Furnances- Bimetallic strip temp. control system, wheat stone bridge temperature control system.
7. Photo electric devices- ¹⁵“Basic” photo cell relays and counters, photo electric smoke detectors.

PAPER -III

- 1 (a) Testing and commissioning of various electric Instalations viz Electric Motors, Generators, Transformers, Circuit Breakers etc. and the Safety Precautions, thereof.
- (b) Introduction to Transmission & Distribution system- Overhead and underground systems, Dc and Ac systems Comparision of different systems of transmission and distribution, radial ring and interconnected systems.
2. Line Parameters- Resistance, skin, proximity effects, Inductancer any number of conductors single, and 3 - phase lines, capacitance - single and 3 - phase lines, effect of earth. electrostatic and electromagnetic interference of transmission lines with communication circuits, reduction of interference.
3. Performance of Short medium and Long Transmission Lines- T Normal and ¹⁶“rigorous” solutions, generalised circuit constants, Circle, diagram, Conductors and supply for overhead transmissions lines. Bundle conductors.
4. Extra long distance transmission- Technoeconomic consideration of extra-long distance transmission. Series and Shunt compensation of long transmission line. Fields of application of EVPC Transmission, Surge impedance Loading (SIL)

2. PERSONALITY AND VIVA-VOCE EXAMINATION (see rule 14):-

- (i) Candidates who obtain such minimum qualifying marks in the written test of the main examination as may be fixed by the Commission in their discretion shall be summoned by them for interview.

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5. Electric heating- Electrical heating appliances for domestic water heater, coolers, Hot plates, domestic iron types of heating elements used in domestic and for industrial applications. Types of furnaces, Temp. control of resistance furnaces. Design of heating elements. Resistance even gas heating. Const and performance of high frequency induction and dielectric heating. Advantages and uses of induction and dielectric heating.

6. (a) Refrigeration and Air-Conditioning- Air conditioners, their types and characteristics, Electrical Installations of Air Conditioners, Electrical safety and precautions, wiring diagrams of Air Conditioning Units.

(b) Lift and Escalators- Design, consideration, no. of lifts and capacity occupant load, quality of service, carspeed, determination of handling capacity, postings of lifts, arrangement of lifts, passenger lifts, Hospital bad lift, good lifts, shape and size of lift car hoistway and machine 100m, structural considerations.

7. Testing- As per 24 OfIs 4666-1968 Specified for electric passenger and goods lift General information to be given with enquiry and order.

(1) Ref. IS 1860-1968 code of practice for installation operation and maintenance of electric passenger and goods lifts. IS 2524-1976 outline dimensions of elec. Light.

(2) IS 4666-1968 Specifications for electric passenger and goods lifts.

(3) IS 6282-1971 Electric service lift.

(4) IS 4289-1967 spec. for lift costs.

8. Earthing- earth material, arrangement of earth electrode pipe, earth plate, earth electrode, method of earthing strip or conductor, location of earth size of earthing lead, size of earth continuity conductor, method of connecting earthing lead to earth, protection of earth lead, no. of earth electrode required, resistance of earth.

9. Installation- Test to be conducted on completion of an installations or before an addition to an existing installation is put into service. Insulation resistance test potentiability test of earth/continuity test. Earth electrode test. Protection of loading against lightning, principle of protection, zone of protection, materials used down conductor, joints and boards fasteners earth terminations, earth electrodes. Ref. Specification for electrical works 1980 PWD Government of Rajasthan.

10. IS CODES- Earthing code of practice-2042-1966 electrical wiring installations (system voltage volts used 6500) 722-1962 Guide for electrical, layout in residential buildings. Protection of buildings and allied, structure against lighting.

MECHANICAL ENGINEERING

PAPER-I

MECHANICAL ENGINEERING

(1) THERMODYNAMICS:- P.E. & K.E, International Energy system, Temperature and its measurements, Temp. scales, PVT Relationship, Kinetic Energy of gases, Thermodynamic Process on Steam, change in enthalpy, entropy and condition of steam during thermodynamic process work done Gas power cycles:

Idel carnot, Otto, Diesel, Dual combustion, Joule, Sterling. Air standared efficiency. Effect of variable specific heat, Thermal Efficiency, Applications, Vapour power cycle, Rankine cycle, Modified Rankine cycle, Re – heat cycle Multi Staging, Re – heat factor, Reverse gas cycle.

(2) FLUID MECHANICS AND FLUID MACHINERY:- Continuity Equation, Bernoullies Theorem. Flow measuring devices like venturimeter or Orifice meter, ¹⁷“pitot” tube, notches and neir orifices and mouth pieces. Flow through pipes laminar and trubulant flow, between parallel plate boundry layer concept Bemb Boundary layer thickness, displacement thickness, momentum thickness, Boundary layer Equation, Blansis Solution Drag on flat plate, Boundary layer separation, Magnus effect and lift. Water turbines: - Classification, Pelton Whell, Fromcis and Kaplan turbines, relative performance specific speed and speed basis load efficiency cures, governing system. Centrifugal Pumps: types constructional details manometric and hypopaulic efficiencies specific speed, characteristics, series and parallel operation.

(3) HEAT TRANSFER:- Modes of heat transfers: one dimensional steady state conduction. Linear heat flow through planco wall Radial heat Flow through cylinders and spares. Composite walls cylinders and spheres, effect of variable conductivity. Nature of heat convection erce and Forced Imperical equations of connective heat transfer combined conduction and convection: heat transfer between two fluids. Types of heat exchangers EMT Heat exchanger effectiveness.

(4) THERMAL ENERGY CONVERSION- Combustion phenomena is S.I. Engines and C.I. Engines. Performance and various officiences. Centrifergal and arial compressors, operating characteristics. Steam turbines velocity cliagrams, Gas turbines. Modification in the simple gas turbines cycle to improve efficiency and specific output.

Automobiles:- Types, resistance to motion and Power requirement for propulsion, acceleration and gradiant automobile Electric system, Transmission System, Running system, Breaks, cooling and lubrication system.

(5) ENVIRONMENTAL ENGINEERING- Refrigeration cycles, heat pump cycle, bootstrap system and its application in air crafts air conditions. Properties of Important refrigerants. Psychrometrics, cooling and dehumidification, vapon compression and vapour absorption system. Use of multistage compressore, heat exchangers, receivers, pree coolars and false chambers, their effect on C.O.P.compression refrigeration machines.

PAPER – II

MECHANICAL ENGINEERING

(1) THEORY OF MACHINES:- Laws of various types of friction I nelined plance, simple and screw Jacks, mechanism of wear and its assesment Lubrication and its type selection, clutches Principle of ball, needle and Rollar bearing. Analysis of machine elements. Quadratic chain and its inversion, velocity and acceleration diagrams, power transmission through belts, ropes & chains. Various types of brakes. Geai trains, Motor car steering gears, Hookes Joint Diston effort, Crank efforts and turning moment diagrams. Fluctuation of energy and speed, fly wheels, Inertia force analysis. Velocity and acceleration curves for different cam follower system, consideration of pressure angle and wear, Gyroscopic couple of a plane, clise and its application to motion of slips, plances and automobiles, Balancing of reciprocating masses, primary and secondary balancing, Balancing of intime engines, free and forced vibrations with and without damping.

MACHINE DESIGN:- Consideration governing the choice of materials and manufacturing processes for design. Material standardisatic Fits, folerances, limits and surface roughness, Design of casting Design of machine members subjectal to banable load stress consideration and its influence on design. Endurance limit and its fatigne strength. Endurance limit Modifying factors. Design of machine members like shaft, axially loaded members and springs under variable loading. Design of C-clamps and brackets. Design of crank shaft, cam shaft, line shafts and connecting rods Design of belts pulleys and fly

Provided that no candidate who fails to obtain a minimum of 35% marks in each of the two Compulsory papers and a minimum of 40% marks in the aggregate shall be called by the Commission for interview which carries 72 marks.

Contd.

wheels, Bueclingham equations, wear consideration Design of Fixed ratio gear boxes. Static and Dynamic loads, Fatigue and creep considerations, Effect of temperature. Laminated springs, helical springs. Design of sliding and journal bearings considerations of minimum fil thickness. Design of thin and Thick Cylindess.

PAPER – III

(1) PRODUCTION ENGINEERING

Elements of cutting process, Geometry of single cutting tool, tool angles, chip formation, type of chip breakers. Effects of various factors on metal cutting. Tool life, type of tool failure and their remedies, reconditioning of tools, Expressions of relationship between cutting forces, Surface finish and power required Economics of metal machining. Cutting tool materials. Cutting fluids and methods of their applications. Linear and angular measurements. Screw thread and gear measurement. Measurement of straightness, flatness and surface finish. Various precision measuring instruments. Milling machines Industrial safety. Jigs and fixtures. Forging and press tool working. Gear manufacturing processes. Introduction of numerical controlled machine tools and transform machines, Numerical control systems. Binary code system. Design of single point cutting totals and milling cutters.

(2) INDUSTRIAL ENGINEERING

Evolution of management, scientific management. Contribution of different leaders to scientific management. Contribution of Taylor, Fayol, Mayo Reactions and criticism, levels of management. Administration and management, functions of management. Decision making. Computers and management. Forms of Business like, Single organizations Partnership, Joint Stock Company Pvt. Ltd. Companies and public limited companies Formating Joint Stock companies. Kinds of organization. Introduction Needs of Finance, kind of capital, Borrow capital. Surplus profits. Specialised Financial Institutions. Source of working capital. Management of working capital. Financial Statements. Interest and depreciations cost and cost accountancy. Calculation of product cost, cost control techniques budgets, Meaning, Kinds, Advantages, Budgetry control Break even analysis Personnel management origin and evolution Meaning and content, Different definitions of personnel manager. Functions of personnel Recruitment, Selection placement, training, promotions, transfer, dominations complaints and grievances, methods of settlement, Absentism Labour turnover over employees morals, moral and satisfaction. Welfare provisions. Retirement, pensions, Gratuity, Discharge and dismissal, merit ¹⁸“rating”, profit sharing, fringe benefits etc. for higher productivity. Meaning and scope, Trade Unions. Trade Unions in India. Employees Union Methods of Setting disputes. Trade Dispute Acts. Factory Act, Payment of Wages Act, workman compensation Act, Employers State Insurance Act, Provident Fund Act. Purchasing Important and objective. Function and duties of Purchase Department. Purchasing procedure Marketing meaning. Importance and functions of Marketing organisations.

(3) ¹⁹“PRODUCTION” MANAGEMENT AND OPERATION RESEARCH:

Utilisation of resources, National productivity, production design, process selection. Manufacturing Drawing, part lists and costing import substitution. Alternate material specification. Product value improvement. Concept of product reliability Initial date operation sequence. Selection of machines, capabilities. Process simplification process sheet, standards and allowed time. Bills of materials preparation. Man Machine time cost estimation. Choice of machines. Work scheduling and control. Grant chart, line balancing. Use of C.P.M., PERT and other network techniques. Works order, Job card, requisition slip's. Production reporting. Production, Planning objectives and importance, Its relationship with sales forecasting. Production programme. Material flow up. Production cost control. Inventory models. Inventory control systems. Forecasting methods. Economic under quantity. Material management, recering, stocking and issue procedure plant location layout. Selection of site, layout contributing factors. Facilities available, material handling system and equipment layout according to the manufacturing system. Produce and techniques of layout. Maintenance of plants, obsolescence, depreciation replacement, Management of preventive maintenance system, repair maintenance Plant services management Facilities, Safety legislation. Industrial accidents and compensation. Quality Controls-Operational; operational & economic definition of quality. Modern control planning and control concept. Sampling. Organization of quality.” vide Notification No. F. 5(4)DOP/A-II/88, dated 31.05.1999.

* Substituted for “Examinations” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¥ Substituted for “Engineers” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

ß Substituted for “3 hours” vide Notification No. F. 1(4)DOP/A-II/81, dated 12.02.1998.

0 Inserted vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

\$ Substituted for “exhausive” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

Substituted for “require” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹ Deleted “(All Compulsory), (Max. Marks: 100), (Duration: 3 hrs.)” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

² Substituted for “consolid lisat” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

³ Substituted for “Hours” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁴ Deleted “(Compulsory), (Max. Marks: 100), (Duration: 3 hrs.)” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

^u Substituted for “Corrent” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁵ Substituted for “Greventing” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

[^] Substituted for “depensable” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁶ Substituted for “Criterin” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁷ Deleted “(Max. Marks: 100), (Duration: 3 hrs.)” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁸ Substituted for “rigied” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

⁹ Inserted vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁰ Substituted for “indrowing” vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

- (ii) The Commission shall award marks to each candidate interviewed by them. In interviewing the candidates besides awarding marks in respect of character, personality, address and physique, marks shall also be awarded for the candidate's knowledge of Rajasthani Culture. The marks so awarded shall be added to the marks obtained in the written test or main examination by each such candidate.
- (iii) The standard of the paper will be that of a Bachelor's Degree level except of papers on Hindi which will be of secondary level.
- (iv) All papers unless specifically required shall be answered either in Hindi or in English, but no candidate shall be permitted to answer any one paper partly in Hindi or partly in English unless specifically allowed to do so.
- (v) If a candidate's hand-writing is not easily legible, a deduction will be made on this account from the total marks otherwise accruing to him.
- (vi) Credit will be given for orderly, effective and exact expression combined with due economy of words in all subjects of the examination.
- (vii) It is obligatory for a candidate to appear in all the Compulsory papers and in optional papers.

3. Syllabus and scope of papers:- The syllabus and scope of each paper for the examination will be as prescribed by the commission from time to time and will be intimated to the candidates within the stipulated time in the manner as the commission deems fit.

¹¹ Deleted "PAPER –II PAPAR – III" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹² Added vide Corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹³ Substituted for "photometers, desighing" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁴ Substituted for "shlip" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁵ Substituted for "Baxie" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁶ Substituted for "rigorees" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁷ Substituted for "pilot" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁸ Substituted for "reting" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

¹⁹ Substituted for "Procution" vide corrigendum No. F. 1(4)DOP/A-II/81, dated 15.09.1994.

By Order and in the name of the Governor

Sd/-

(Ram Lubhaya)

Special Secretary to the Govt.