



Advertisement No.IIE-22/2024/1233/OSSC Date: 14.03.2024
**DETAILED ADVERTISEMENT FOR COMBINED TECHNICAL SERVICES
RECRUITMENT EXAMINATION (CTSRE)-2024 FOR GROUP-B POSTS/SERVICES
UNDER DIFFERENT DEPARTMENT/HoDs OF GOVERNMENT OF ODISHA.**

(POST CODE: CTS/302)
(WEBSITE: www.osscc.gov.in)

1. Application Invited:

	Start Date	End Date
Online Registration	02.04.2024	01.05.2024
Submission of Online Application Form	02.04.2024	04.05.2024
Date of editing of Online Application form	02.04.2024	07.05.2024
Mode of Application	Online Mode only through the website " www.osscc.gov.in ". No Physical copy/Hard copy of the Online Application Form needs to be submitted by the applicant.	

a. This Appointment shall be guided by "**Combined Technical Services Recruitment Examination Rules-2022**" as amended from time to time. (Copy enclosed)

b. Applications are invited only through Online mode in the website "www.osscc.gov.in" for recruitment to fill up the vacancies reported by the following Department/HODs under Govt. of Odisha shown in the table below.

Sl. No	Name of the Post/ Services	Name of the Department/Heads of Department in which vacancy exists for this recruitment	No. of Vacancy (Out of which Women)	Group of Post/Services	Pay Matrix Level
1	Junior Engineer (Civil)	Engineer-in-Chief (Public Health), Odisha, Bhubaneswar.	365 (W-122)	Group-B	Level-9 of ORSP, 2017
2	Junior Engineer (Civil)	Directorate of Fisheries. Odisha, Cuttack	15 (W-05)	Group-B	Level-9 of ORSP, 2017
3	Junior Motor Vehicle Inspector	State Transport Authority, Odisha, Cuttack.	01 (w-01)	Group-B	Level-9 of ORSP, 2017

a. Candidates must possess a valid e-mail Id and Mobile number while applying for the post and keep the same active till the completion of this recruitment process, to receive important messages from the Commission.

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- b. The appointment will be only against one of the posts carrying corresponding pay as indicated in the above table and candidates need to give options for the post/service and Department/HoDs.
- c. The examination fee has been exempted for all categories of candidates as per G.A. & P.G. Department Notification No.9897/Gen, dtd.11.04.2022.
- d. Appointments shall be on a regular basis carrying the level of Pay as mentioned in the table above. The appointment shall be guided by "Odisha Group-'B', 'C' and Group-'D' Posts (Repeal and Special Provisions) Rules, 2022 notified vide Govt. in GA and PG Department Notification No. 29076 dated 16th October2022.
- e. Candidates should ensure that they fulfil all the eligibility criteria prescribed for the post as laid down in the advertisement. Admission of a candidate to the written examination and other tests shall be provisional and on the basis of information furnished by her/him in the Online Application Form.
- f. Online applications submitted to OSSC found to be incomplete in any respect are liable for rejection without entertaining any correspondence with the applicants on that matter.
- g. If at any stage of recruitment or thereafter, it is found that any information furnished by the candidate in her/his Online Application Form is false/incorrect or the candidate has suppressed any relevant information or the candidate otherwise does not satisfy the eligibility criteria prescribed for the post, her/his candidature for the posts shall be cancelled. She/ He may further be debarred either temporarily or permanently from the recruitment examination(s) conducted by the Commission.
- h. Commission will adopt a "**Normalisation Formula**" published in Commission's website vide Notice No.2444/ OSSC dated 02.09.2021 for processing the result if any examination is conducted through CBRE (Computer Based Recruitment Examination) mode in multiple batches using different sets of question papers so as to offset the difficulty level that may arise in such use of multiple set of question papers in the said examination, and such normalized score will be used to determine cut-off marks.
- i. No Admission Letter for recruitment at any stage shall be sent by post. The candidates are therefore advised to be in touch with the Commission's website www.osscc.gov.in regularly to know updates regarding the date of examination, downloading of Admission Letter and to know the status of their applications etc.
- j. The candidates are advised to submit the Online Application Form well in advance without waiting for the closing date to avoid the last-hour rush.



- k. For those eligible for and applying for more than one post/ service, the Commission will make the final allotment to post/ service on the basis of merit-cum-preference of post/ service given by the candidate and once a post is allotted, no change of posts will be made by the Commission due non-fulfilment of any post-specific requirements of Physical/medical/educational standards, etc. Candidates thus must ensure that they fulfil all the requirements of the posts before giving their preference/options for any post/ service.

NOTE: Important instructions to candidates about filling up of Online Application and “How to Apply” is enclosed as Annexure-A to this advertisement.

2. a. Category-wise break -up of vacancy positions along with reservation thereof:

Sl. No	Name of the Posts/ Services	Name of the Department	Category wise Vacancy				
			UR (Out of which women)	SEBC (Out of which women)	SC (Out of which women)	ST (Out of which women)	Total (Out of which women)
1	Junior Engineer (Civil)	Engineer-in-Chief (Public Health), Odisha, Bhubaneswar.	183 (W-61)	41 (W-14)	59 (W-20)	82 (W-27)	365 (W-122)
2	Junior Engineer (Civil)	Directorate of Fisheries, Odisha, Cuttack	07 (w-02)	03 (w-01)	03 (w-01)	02 (w-01)	15 (w-05)
3	Junior Motor Vehicle Inspector	State Transport Authority, Odisha, Cuttack.	Nil	Nil	01 (w-01)	Nil	01 (w-01)

UR: Unreserved

SEBC: Socially and Educationally Backward Class

SC: Scheduled Caste

ST: Scheduled Tribe

W: Women

NOTE:

- Candidates belonging to the Transgender community are also eligible to apply.
- The number of vacancies and other conditions of vacant posts to be filled up on the basis of this recruitment are subject to change without any prior notice as per discretion of the Commission, the Requisitioning Authorities and the Government.
- Male candidates of SC category may apply for the post of Junior Motor Vehicle Inspector but selection will be done only in case of non-availability of women candidates of the same category.

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b. Reservation of Special Category vacancies:

There is no post reserved for Special Category for the post of Junior Motor Vehicle Inspector. As per the Social Security & Empowerment of Persons with Disabilities Department, Govt. of Odisha Resolution No.1843/SSEPD Dtd.25.02.2021, the PWD candidates having disability of permanent nature not below 40% in the following categories and benchmark disability shall be eligible to get reservation for the posts: -

Sl No.	Name of the Posts/ Services	Special Category					Physical Requirements
		Ex-Servicemen (ESM)	Sports Person	Persons with Disability (PwD)			
				Total PwD Vacancy (Out of which Women)	Category, No. of Vacancy & Benchmark of Disability		
1	Junior Engineer (Civil) under the Engineer-in-Chief (Public Health), Odisha, Bhubaneswar	11	04	15 (w-04)	Cat-I: 04 Cat-II: 04 Cat-III: 04 Cat-IV: 03	Blindness & Low Vision Deaf & Hard of Hearing Locomotor Disabilities Autism/ Intellectual Disabilities/ Multiple Disabilities	MF- Work Performed by Manipulating (with fingers) H- Work Performed by Hearing/Speaking ST- Work Performed by Standing. W- Work Performed by Walking SE- Work Performed by Seeing R & W- Work Performed by Reading & Writing BN-Work Performed by Bending
2	Junior Engineer (Civil) under the Directorate of Fisheries. Odisha, Cuttack.	Nil	Nil	01	Cat-I-01	Visually Impaired	As above

N.B- PwD candidates belonging to Category-III (Orthopedically Handicapped) having the following functional classification are eligible to apply and avail age relaxation for the post of J.E (Civil) under the Directorate of Fisheries, but they have to compete in their own category only.

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- i. BLA – Both Legs and Both Arms Affected (Mobility not be restricted)
- ii. OL- One Leg Affected (Right or Left) (Mobility Not Be Restricted)
- iii. BL (MNR)- Both Legs Affected Not Arms (Mobility Not Be Restricted)

c. Provision of assistance of Scribe and availing compensatory time

PwD candidates with disabilities not less than 40% of permanent nature and limitations in writing have the option to use her/his own scribe with due permission of the Commission. The intending candidates must give option for scribe in the appropriate place while filling up the Online Application Form and will have to submit the required certificate/ documents prescribed in the Advisory Notice No.3453/OSSC dated 24.10.2019 published by the Commission which is available in the website of the Commission "www.osscc.gov.in". They should also state whether they intend to avail the benefit of compensatory time for the examination.

- d. PwD candidates must ensure that they possess permanent disability certificate and must upload the scanned copy of the original (not photocopy) UDID card issued by the competent authority.
- e. In case of non-availability of eligible/suitable Women candidates belonging to the respective categories, the unfilled vacancies of that category shall be filled up by eligible suitable male candidate(s) of the same category.
- f. The number of vacancies and reservation of Vacancies to be filled up on the basis of this recruitment are subject to change without any prior notice as per the discretion of the Commission/ the Requisitioning Authorities/ the Government.

3. Eligibility:

a. General criteria of eligibility: -

Candidates applying for the above post should be

- a citizen of India,
- of good character,
- of sound health, good physique and free from organic defects or bodily infirmity
- If married, must not have more than one spouse living: Provided that the State Government, if satisfied that such marriage is permissible under the personal law applicable to such person or there are other grounds for doing so, exempt any person from the operation of this order.
- Must be able to read, write and speak Odia fluently and:-



- i. Must have passed Middle School Examination with Odia as a language subject, or
- ii. Must have passed HSC Examination or equivalent examination with Odia as Medium of examination in non-language subject, or
- iii. Must have passed in Odia as language subject in the final examination of Class-VII or above from a school or educational institution recognised by the Govt. of Odisha or the Central Govt., or
- iv. Must have passed a test in Odia in Middle English School standard conducted by the School and Mass Education Department, Govt. of Odisha.

b. Educational Qualification required for the posts:

Sl No.	Name of Post	Essential Educational Qualification
1	Junior Engineer (Civil) under the Engineer-in-Chief (Public Health), Odisha, Bhubaneswar	She/he must possess a Diploma in Civil Engineering or an equivalent qualification from an institution recognized by the Odisha Council of Technical Education & Vocational Training.
2	Junior Engineer (Civil) under the Directorate of Fisheries. Odisha, Cuttack.	She/he must possess a Diploma in Civil Engineering or an equivalent qualification from an institution recognized by the Odisha Council of Technical Education & Vocational Training.
3	Junior Motor Vehicle Inspector under State Transport Authority, Odisha, Cuttack.	<p>She/he must possess a Diploma in Automobile Engineering (03 years course) or Diploma in Mechanical Engineering (03 years course) awarded by State Council of Technical Education or such other courses declared equivalent to either of the above disciplines by the Central Government or the State Government.</p> <p>However, the candidates having higher qualifications like Graduate Engineers in Automobile Engineering or Mechanical Engineering from a recognized University approved by AICTE are also eligible to apply.</p> <p style="text-align: center;">and</p> <p>the candidate must have a driving license authorizing him/her to drive motorcycle and Transport Vehicle *</p> <p style="text-align: center;">and</p> <p>must have adequate Knowledge in Computer Application</p> <p>*Note- The candidates not possessing a valid Driving License for Transport Vehicle, shall undergo driving training of Transport Vehicle in a recognized Heavy Motor Vehicle Driving Training school during the probation period and possession of a valid driving license for Transport Vehicle</p>

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		will be a pre-requisite for completion of probation period and confirmation in the service. Failure to possess a driving license for transport vehicle before completion of probation period shall make the candidate liable for termination from service.
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c. Age:

Minimum Age as on 01.01.2024	Maximum Age as on 01.01.2024
21 Years	38 Years

However, the upper age limit is relaxable by 5 years for candidates belonging to SEBC, SC, ST & all Women candidates, 10 years for candidates belonging to PwD category & the total period of service rendered in defence service in case of Ex-servicemen. PwD candidates in the ST & SC category shall be entitled to cumulative age relaxation of ten years over & above the normal relaxation specified for the category. However, a candidate who comes under more than one category shall be eligible for only one benefit of age relaxation as per rule which will be most beneficial to her/him. To be eligible, candidates not enjoying any relaxation of upper age limit, must not have been born earlier than **2nd January 1986** and not later than **1st January 2003**.

- d. Note for Ex-Servicemen-** Once an Ex-Serviceman has joined the Govt. Service in civil side after availing the benefit as an Ex-Serviceman for his re-employment, his ex-serviceman status for the purpose of re-employment in Govt. Jobs shall cease to exist. He can avail age relaxation only. However as per clause-4 of the O.M. No. 36034/2014-Estt. (Res) dt.14 August 2014 of Ministry of Personnel, Public Grievances and Pensions, Department of Personnel & Training, Government of India, if an Ex-Serviceman applies for various posts before joining any civil employment, he/she can avail of the benefit of reservation as ex-serviceman for any subsequent employment, provided the applicant as soon as joins any civil employment, should give self-declaration/undertaking to the concerned employer about the date-wise details of application for various posts for which he/she had applied for before joining. The applicant should furnish the copy of above declaration duly endorsed by the employer on the date of Document Verification for consideration of the claim under Ex-Serviceman category.

(NOTE: Border Security Force, Indian Coast Guard, CRPF and other Para Military Forces are not within the definition of Ex-Servicemen.)

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- e. The persons in Defence Forces who are to retire within six months from the last date of Online Application form are eligible to apply on obtaining NOC from the Appropriate Authority indicating there in the date of enrolment and expected date of discharge and year of service rendered in Defence Forces. They should note that they must submit the discharge certificate on the date of certificate verification.
- f. Sports person candidates claiming reservation must submit sports ID Card issued by Director of Sports & Youth Service Department, Government of Odisha.
- g. Only Date of Birth entered in the High School Certificate Examination by the Board of Secondary Education, Odisha or equivalent Certificate issued by the recognised Board/Council/ by an Indian University as equivalent there to shall be acceptable by the Commission.
- h. A candidate who claims change in her/his name after having passed the High School Certificate Examination is required to furnish a copy of the publication of the changed name in a local leading daily newspaper as well as a copy of notification in the Odisha Gazette in support of her/his change of name.

4. a. Plan and Pattern of Examination:

There shall be two stages of examination followed by Certificate Verification.

- (i) Preliminary Examination
- (ii) Main Written Examination
- (iii) Certificate verification

Stages of Examination	Type of Examination	No. Of Paper & Marks	Total Marks	Duration	Remarks
Stage-I	Preliminary Examination	<p><u>One Paper</u></p> <ul style="list-style-type: none"> • Arithmetic– 10th standard • Data Interpretation (Chart, Graph, Table, Data Sufficiency etc.) – 10th standard • Logical Reasoning and Analytical Ability, General Mental Ability. • Current Events of National and International Importance. <ul style="list-style-type: none"> • Computer / Internet Awareness 	150	150 minutes	<ul style="list-style-type: none"> • The question will be of MCQ type (OMR/CBRE). • There shall be negative marking @ 0.25 marks for each wrong answer. • Candidates who obtain minimum qualifying marks in the preliminary examination as fixed by Commission at its discretion shall be shortlisted for next stage i.e Main written examination. The Commission may fix different minimum qualifying marks for different category of candidates (UR, SC, ST, SEBC etc.). • The Commission at its discretion may fix different minimum

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					<p>qualifying marks for different services/ posts, if Technical paper is different. However, same qualifying marks will be fixed if Technical paper is same.</p> <ul style="list-style-type: none"> • A minimum of five (05) times the number vacancies category wise shall be shortlisted for the Main Written Examination.
Stage-II	Main Written Examination	Technical Paper	200	3 hours (180 minutes)	<ul style="list-style-type: none"> • Candidates numbering 1.5 times of the vacancies advertised (post-wise and category-wise) shall be shortlisted for Certificate Verification based on the marks secured in the Main Written Examination (Technical Paper). However, if the number of candidates in any category is less than ten (10), then candidates numbering two (2) times of the vacancies advertised (Post Wise and category-wise) shall be shortlisted for Certificate Verification. • The Commission at its discretion may fix different minimum qualifying marks for different services/ posts, if Technical paper is different. However, same qualifying marks will be fixed if Technical paper is same. • The Commission may fix different minimum qualifying marks for different category of candidates (UR, SC, ST, SEBC etc.).
Stage-III	Certificate Verification				<p>The candidature of candidate, who remain absent in certificate verification shall be cancelled. No request for a change of date of certificate verification ordinarily shall be entertained.</p>

The candidature of the candidates will be rejected /not considered for selection if she/he fails to attend any of the tests/examinations/Certificate Verification.

Note: In pursuance of GA & PG Department Notification No-29246, Dated-18th October 2022, the question paper of Preliminary and Main Examination, shall be both in Odia version and English



version. The candidate shall exercise his/her option for medium of examination in the online application form. All may note that the option once given cannot be changed.

- i. There shall be no provision for re-evaluation/ re-checking of the scores. No correspondence in this regard shall be entertained.
- ii. The Commission may conduct the Preliminary examination and the Main Written examination with objective papers through CBRE (Computer Based Recruitment Examination) Mode. In case of CBRE mode of examination is conducted in more than one session/sitting Commission will adopt the normalization process for processing the result so as to offset the difficulty level that may arise in such use of multiple set of question papers in the said examination.
- iii. There will be a penalty (Negative marking) for wrong answers marked by the candidate in examinations consisting of Multiple Choice Questions. The Quantum of penalty/ negative marking will be **1/4 of the total** mark for each wrong answer if four options are there, **1/3 of the total marks** if three options are there and so forth.
- iv. The candidates who fail to appear at any stage of the recruitment process will not be considered for final selection and their names will not be included in merit list.
- v. If enough suitable women candidates are not available, the shortfall can be made up by correspondingly increasing the number of men candidates in that category.
- vi. The Commission shall sponsor exactly the same number of candidates as the total number of vacancies notified with it for each service or post.
- vii. Any complaint on the conduct of the examination must be sent to the commission by email "support.osscc@gov.in" within 05(five) days of completion of examination.

5. Place and Date of examination:

- a. The tentative date for the Preliminary examination will be June-August 2024. More specific date will be conveyed in due course through a Notice on the website of OSSC.
- b. The Date, Time and Venue of the Main written examination and Certificate Verification will be conveyed to the candidates through OSSC website as well as in the Admission Letter(s) in due course. The Admission Letters can be downloaded by the eligible candidates by accessing the Commission's website from time to time.

6. *Option/Preference of Candidates:

The candidate applying for the post of Junior Engineer(Civil) shall have to specify clearly in his/her application the office(s) for which he/she wishes to be considered in order of his/her preference. Where application is invited for vacancies of different Heads of



Department/Department for the same Service/posts, candidate will also indicate his/her order of preference for Service/posts of such Heads of Departments/Departments. Candidates should give preference only for such post/service for which they are eligible.

Commission will decide whether and till when such preference can be modified.

Allotment to post or service will be made on the basis of merit-cum-preference. If allotted to a service/post where vacancies of different HoD/Departments are collated, allotment to a particular HoD/Departments will also be made on the basis of merit-cum-preference.

7. Certificate verification and submission of Detailed Application Form (DAF):

Candidates shall be shortlisted for Certificate Verification based on the marks secured in the Main Written Examination (Technical Paper). In case during the stage of Certificate Verification the commission observes that the vacancy (ies) for a particular category of post(s) is/are not getting filled up completely, an additional number of candidates in order of merit may be called only for one more time at the discretion of the Commission so as to fill up the number of vacancies.

The candidates will be required to produce their Original Academic Certificates, Mark sheets, caste certificate, special category certificate, NOC in case of State/Central Govt. servants/PSU employees and other documents as intimated in the admission letter for verification along with a set of self-attested photocopies of the same and OSSC copy of the online application form duly signed by the applicant. **(Details are enclosed in Annexure-B).**

NOTE: Candidates who fail to appear for document verification will not be considered for final selection.

8. Admission Letter:

- a. The Commission shall upload the admission letter(s) on its website www.osscc.gov.in for the convenience of the candidates.
- b. Admission of a candidate for the written examination & other tests shall be provisional and shall be on the basis of the information furnished by her/him in the online application form.
- c. The admitted candidates will have to produce the print out of the admission letter at the venue allotted for appearing in the examination/test.
- d. The admission letter contains date, time and venue of the examination, and bears the photo and signature of the candidate and facsimile signature of the Secretary of Commission.



9. Merit List:

The Merit list of the candidates who are found suitable in certificate verification shall be prepared in order of merit, category-wise equal to the vacancies advertised, based on their marks secured in the main written examination.

A common Merit list shall be prepared for more than one service or post, if there is a common Technical Paper for such service(s)/post(s). The names of candidates shall be arranged in the order of merit.

Resolution of Tie Cases: In the event of tie in scores of candidates, merit will be decided by applying following criteria, one after another in the given order, till the tie is resolved.

- (i) Marks in Preliminary Examination.
- (ii) Date of Birth, with older candidate placed higher and
- (iii) Alphabetical order in which the names of the candidate appear.

Action against candidates found guilty of misconduct/ malpractice:

- a. If a candidate is found to indulge at any stage in any of the malpractices/ misconduct listed below, before during or after the conduct of the examination, her/his candidature for this examination will be cancelled and he/she will be debarred from the examinations of the Commission for a specified period or permanently.
 - Taking away any Examination related material such as OMR sheets, Rough Sheets, Answer Sheets etc. from the examination hall unauthorizedly or passing it on to unauthorized persons during the conduct of the examination.
 - Leaving the Examination Venue uninformed during the Examination.
 - Misbehaving, intimidating or threatening in any manner the examination functionaries i.e. Supervisor, Invigilator, Security Guard or Commission's representatives etc or any of the functionaries of the Commission (OSSC).
 - Obstructing the conduct of the examination/ instigating other candidates not to take the examination.
 - Making statements, submitting information in applications which are incorrect or false, suppressing material information, submitting fabricated documents, etc.
 - Obtaining support/ influence for his candidature by any irregular or improper means.
 - Possession of Mobile Phone during examination.
 - Appearing in the same examination more than once in contravention of the rules.
 - A candidate who is working on examination-related matters in the same examination.
 - Damaging examination-related infrastructure/ equipment.

- Appearing in the Exam with forged Admit Card, identity proof, etc.
 - Possession of firearms/ weapons during the examination.
 - Submitting more than one application for any recruitment examination.
 - Assault, use of force, causing bodily harm in any manner Threatening/ intimidating to the examination functionaries i.e. Supervisor, Invigilator, Security Guard or Commission's functionaries or representatives.
 - Using unfair means in the examination hall like copying from other candidates or unauthorized sources such as written material on any paper or body parts, etc.
 - Possession of Bluetooth Devices, spy cameras, and any other electronic gadgets in the examination hall.
 - Impersonation/Procuring impersonation by any person.
 - Taking snapshots, making videos of question papers or examination material, labs, etc.
 - Sharing examination terminal through remote desktop software/ Apps/ LAN/ VAN, etc. or attempting the same.
 - Attempt to hack or manipulate examination servers, data and examination systems at any point before, during or after the examination.
 - Obtaining question paper(s)/Examination-related materials before the due date/time, irregularly.
- b. The Commission may also report the matter to Police/ Investigating Agencies, as deemed fit and the Commission may also take appropriate action to get the matter examined by the authorities/ forensic experts concerned.

10. Commission's Decision Final:

The decision of the Commission in all matters relating to eligibility, acceptance or rejection of the applications, penalty for false information/misconduct/malpractice, mode of selection, conduct of examination(s), allotment of examination centres and preparation of merit list & post allocation, debarment will be final and binding on the candidates and no correspondence will be entertained in this regard.

11. Important Instruction/Information to the Candidates: -

- a. The candidate has to fill/confirm in the OMR answer sheet or CBRE Screen, as the case may be, correct Roll Number and other data as required in the place(s) indicated therein and darken the appropriate circles in Blue or Black Ball Point Pen only properly in case of OMR-based examination. If the information so furnished is incomplete or different from

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the application form or if appropriate circle is not darkened properly, then zero marks will be awarded.

- b. In Descriptive Paper, the candidate must write her/his correct Roll Number at the prescribed place on the cover page of the Answer Book. Candidates must also affix their signature in the relevant columns of Attendance Sheet. Answer Books not bearing Roll Number will not be evaluated and such candidates shall be awarded zero marks.
- c. Candidates shall not write any identity particulars e.g., name, Roll number, Mobile number, address, etc. inside the Descriptive Answer Book. Candidates who fail to adhere to these instructions will be awarded zero marks.
- d. There is no provision for re-evaluation/ re-checking of scores in the Examination. No correspondence in this regard shall be entertained.
- e. Sharing of marks with the candidate: Marks obtained by an applicant in Preliminary Examination and Main Examination are proposed to be shared with him/her after final merit list is published.
- f. These are State Cadre posts. The candidate, on selection, may be asked to serve anywhere in Odisha.
- g. If a candidate scoring more than cut-off marks at any Tier/stage of the examination is not shortlisted/ selected for the subsequent stage/ final selection due to any reason, he must represent to the Commission within 05 days of the declaration of the said result through e-mail support.osscc@gov.in.
- h. **Applicants who are Odisha Government servants/Central Govt. servants/Public Sector Undertaking employees should obtain a "No Objection Certificate" from their controlling authority and upload the same with the Online Application failing which their candidature for the post will be rejected. At the certificate verification stage they must produce the original "No Objection certificate". Those who were not Odisha Government Servants/Central Govt./PSU employees at the time of submission of application but became Government Servants/ Public Sector Undertaking employees subsequently during the recruitment process, must submit No Objection Certificate at the stage of certificate verification. Those Odisha Govt. servants/Central Govt. servants/Public Sector Undertaking employees who are unable to produce the No Objection Certificate during the Certificate Verification, will not be included in the merit list. Similarly, if any candidate hides her/his employment/service status, and found to be an Odisha Government servant/Central**

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Govt. servant/Public Sector Undertaking employee on the day of Certificate Verification or before, he/she will not be included in the Merit List.

By Order of the Commission

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14.03.2024
Secretary

Annexure-A

Important Instructions to Candidates about filling up Online Application:

- Before applying, candidates must go through the instructions given in the notice of examination very carefully.
- Candidates in their own interest should submit online applications much before the closing date and not to wait till the last date to avoid the possibility of disconnection/ inability or failure to login to the OSSC website on account of heavy load on the website during the closing days or for any other reason.
- The Commission is not like to undertake detailed scrutiny of applications for the eligibility and other aspects at the time of written examination and, therefore, candidature will be accepted only provisionally. Candidates must go through the requirements of educational qualification, age, physical and medical standards etc. and satisfy themselves that they are eligible for the post(s). Copies of supporting documents will be sought at the time of Certificate Verification. When scrutiny is undertaken, if any claim made in the application is not found substantiated, the candidature will be cancelled and the Commission's decision shall be final.
- Candidates seeking reservation benefits available for SC/ ST/ SEBC/ PwD/ ESM/Sports Person must ensure that they are entitled to such reservation as per eligibility prescribed in the Notice. They should also be in possession of the certificates in the prescribed format in support of their claim.
- Candidates with only **benchmark physical disability** mentioned in Clause-2 of the Advertisement will be considered as Persons with Disabilities (PwD) and entitled to age-relaxation/ reservation for Persons with Disabilities.
- When the application is successfully submitted, it will be accepted 'Provisionally'. Candidates should take the printout of the online Application Form for their own records.
- Only one online application is allowed to be submitted by a candidate for any recruitment Examination, Therefore, the candidates must exercise due diligence at the time of filling

their online Application Forms. In case, more than one application of a candidate with different registration numbers is detected, all the applications will be rejected by the Commission and his candidature for the examination will be cancelled. If a candidate submits multiple applications and appears in the examination (at any stage) more than once, his candidature will be cancelled and he may be debarred from all the examinations of the Commission.

- Before submission of the online application, candidates must check that they have filled correct details in each field of the form. After submission of the corrected/ final online application, no change/ correction/ modification will be allowed under any circumstances. Requests received in this regard in any form like Post, Fax, Email, by hand, etc. shall not be entertained by the Commission and will be summarily rejected.
- The candidates must write their name, Date of Birth, father's name and mother's name as given in the Matriculation Certificate otherwise their candidature may be cancelled at the time of Certificate Verification or as and when it comes into the notice of the Commission.
- Applications with blurred/ illegible Photograph/ Signature will be rejected.
- Candidates must fill their correct and active e-mail addresses and mobile number in the online application as correspondence may be made by the Commission through e-mail/ SMS.
- Candidates may fill their correct Aadhaar number.
- Candidates must carry two passport size recent colour photographs and one original valid Photo ID Proof such as Aadhaar Card/ printout of E-Aadhaar, Driving License, Voter Card, PAN Card, Identity Card issued by University/ College/ Government, Employer ID Card, ESM Discharge Book issued by Ministry of Defence or any photo-bearing ID card issued by Central/ State Government to the Examination Venue, failing which they will not be allowed to appear for the same. If Photo Identity Card does not have the Date of Birth printed in it, then the candidate must carry an additional original certificate in proof of her/his Date of Birth. In case of mismatch in the date of birth mentioned in the Admission Certificate and Photo ID/ Certificate brought in support of date of birth, the candidate will not be allowed to appear in the examination. PwD candidates availing the facility of scribes shall also be required to carry required Medical Certificate/ Undertaking/ Photocopy of the Scribe's Photo



ID Proof, as specified in advisory Notice No.3453/OSSC dated 24.10.2019 available in the website of the Commission.

- In case of fake/ fabricated application/ registration by misusing any dignitaries name/ photo, such candidate/ cyber cafe will be held responsible for the same and liable for suitable legal action under Cyber/ IT act.

How to Apply:

- The applicants should go through this detail advertisement before filling up the online application form.
- The candidate may apply for the post as per her/his eligibility as per terms of the advertisement.
- All eligible candidates have to register themselves by clicking on “APPLY ONLINE” button on the home page of the Commission’s website www.osscc.gov.in.
- Those candidates who are applying for the first time have to register for the post by clicking on “NEW USER” button shown on the screen. On submitting the registration form a User Id and Password will be generated.
- On clicking “New user” or “Registered User”, instruction for filling up the Online Registration/ Re-registration and Application Forms shall appear on the computer screen. These instructions should be read carefully before proceeding with filling up the Application Form.
- Step-by-step procedure for registration/re-registration can be viewed by clicking on “Instruction to fill up Online Application Form”.

Pre-requisites for filling up Online Application Form:

- Applicants should possess and maintain a valid e-Mail Id and Mobile Number for accessing the OSSC web portal and to make Online Registration/Re-Registration and Application Form. Candidates should keep that e-mail Id and Mobile Number (used by them during registration) active so as to receive all important communication from the Commission till publication of the final result of this recruitment examination.
- Recent Passport size Colour Photograph of the Applicant, scanned in “jpg/jpeg” format with file size range of 20 kb to 100kb may be kept handy for uploading during Registration.



- Full Specimen Signature & Left /Right Thumb Impression of the Applicant, scanned in “jpg/ jpeg” format ranges up to 20 kb shall be kept handy for uploading during Registration.
- Scanned document must be in “Pdf” format between ranges of 100kb to 500 kb.
- Applicants may keep their required Certificates, Mark sheets, Aadhaar Number & other documents ready while filling up the details of the educational qualification & other fields of Online Application Form.
- **Candidates are required to upload Diploma Certificate & Mark sheet. If the relevant Certificate/document is not uploaded or the uploaded Certificate/document is not visible, in such cases their candidature for the post shall be rejected.**
- SC/ST/SEBC category candidates need to submit detail information of the valid online Caste Certificate issued by competent Authority in the online application form. If the valid online Caste Certificate issued by the competent Authority is not in possession of the applicants at the time of submission of the online application form, she/he must give a self-declaration in the format appended in the online application form.
- Candidate claiming age relaxation under “Ex-Servicemen” category need to upload any one of the Ex-Servicemen Documents i.e. Discharge Certificate/ Identity card/ PPO (wherein the date of entry, date of discharge and period of service rendered in Defence Forces have been reflected). Ex-Servicemen who is going to retire within six months from the closing date of online application may apply for the post by obtaining “No Objection Certificate” from the appropriate authority mentioning therein the date of appointment, date of retirement and years of service rendered in Defence Forces. However, such candidates have to submit the discharge certificate on the date of certificate verification for considering their claims under Ex-Servicemen category. The scanned document must be in “Pdf” format between ranges of 100 kb to 500 kb.
- Candidates claiming reservation/ age relaxation under “PwD (Persons with Disabilities)” category need to upload a valid online PwD certificate issued by Unique Disability Identification (UDID). The scanned document must be in “Pdf” format between ranges of 100kb to 500 kb.
- Candidate claiming reservations under Sports Person category need to **upload sports identity card issued by Director of Sports and Youth Services Department, Odisha**. The scanned document must be in “pdf” format between ranges of 100kb to 500kb.
- **Candidates claiming Special Category (Ex-Servicemen/PwD/Sports Person) must upload their relevant Certificate as mentioned above. If the relevant**



Certificate/document is not uploaded or the uploaded Certificate/document is not visible, in such cases their candidature for the post shall be rejected.

- The candidate should ensure that the scanned Photograph and full Signature, Left/Right Hand Thumb Impression and other relevant documents are clearly identifiable/ visible. Otherwise, the registration and application shall be liable for rejection. No correspondence on this account shall be entertained.
- Applicants who are Odisha Government servants/Central Govt. servants/ Public Sector Undertaking should obtain a “**No Objection Certificate**” from their controlling authority and upload the same with the Online Application. At the certificate verification stage they must produce the original “No Objection Certificate”. Those who were not Odisha Government Servants/Central Govt. servants/ Public Sector Undertaking at time of application but became Government Servants/Public Sector Employees subsequently during the recruitment process, must submit No Objection Certificate at stage of certificate verification. Non Submission of No Objection Certificate shall be treated as disqualification and the candidate shall forfeit his/her candidature for the post.
- Candidates must submit correct data/information in the Online Application Form. If at any stage of recruitment or thereafter, it is found that any information furnished by the candidate in her/his online application is false/incorrect or the candidate has suppressed any relevant information or the candidate otherwise does not satisfy the eligibility criteria prescribed for the post, her/ his candidature for the post will be cancelled forthwith.



Annexure-B

Document to be submitted at the time of Certificate Verification:

- a. Downloaded copy of Admission letter for Certificate Verification.
- b. Downloaded copy of Bio-Data-cum-Attestation form duly filled and signed.
- c. Copy of the Online Application form legibly signed by the candidate at the appropriate place.
- d. HSC Certificate & Mark Sheet or equivalent certificate in support of Date of Birth, issued by the concerned Board/Council.
- e. Diploma pass Certificate & Marksheet.
- f. Caste certificate issued by the competent authority for the purpose of employment/service. (In case of ST, SC& SEBC Candidates only) SEBC category candidates must submit a photocopy of a valid SEBC certificate issued by the competent authority which must be within one year prior to the closing date of the Online Application.
- g. Certificate either of passing HSC examination with Odia as a compulsory subject, or in lieu thereof a certificate of passing Odia of M.E. standard issued by competent authority.
- h. Photocopy of permanent disability certificate (online) issued by Appropriate Medical Authority in case of PwD candidates.
- i. Discharge certificate, identity card and document indicating the period of service rendered in defence forces in case of Ex-Servicemen candidates. Ex-Serviceman candidates also have to give declaration whether they have availed the benefit of Ex-Servicemen in a format devised by the Commission.
- j. Sports Identity Card issued by Director of Sports & Youth Service Department, Govt. of Odisha in case of sports person candidates.
- k. NOC in case of candidates working in Government Service/PSU.

Syllabus for Written Examination of Junior Engineer (Civil)

STRUCTURAL MECHANICS

Review Of Basic Concepts

Basic principle of mechanics: force, moment, support conditions, conditions of equilibrium, C.G & M.I, free body diagram, review of C.G and M.I of different sections.

Simple Stresses and Strains

Introduction to stresses and strains: mechanical properties of materials – rigidity, elasticity, plasticity, compressibility, hardness, toughness, stiffness, brittleness, ductility, malleability, creep, fatigue, tenacity, durability, types of stresses -tensile, compressive and shear stresses, types of strains - tensile, compressive and shear strains, complimentary shear stress - diagonal tensile / compressive stresses due to shear, elongation and contraction, longitudinal and lateral strains, poisson's ratio, volumetric strain, computation of stress, strain, poisson's ratio, change in dimensions and volume etc, Hooke's law - elastic constants, derivation of relationship between the elastic constants.

Application of simple stress and strain in engineering field

Behaviour of ductile and brittle materials under direct loads, stress strain curve of a ductile material, limit of proportionality, elastic limit, yield stress, ultimate stress, breaking stress, percentage elongation, percentage reduction in area, significance of percentage elongation and reduction in area of cross section, deformation of prismatic bars due to uni-axial load, deformation of prismatic bars due to its self weight.

Complex stress and strain

Principal stresses and strains: occurrence of normal and tangential stresses, concept of principal stress and principal planes, major and minor principal stresses and their orientations, Mohr's circle and its application to solve problems of complex stresses.

Stresses In Beams and Shafts

Stresses in beams due to bending: Bending stress in beams – theory of simple bending assumptions– moment of resistance – equation for flexure– flexural stress distribution – curvature of beam – position of n.a. and centroidal axis – flexural rigidity – significance of section modulus.

Shear stresses in beams: Shear stress distribution in beams of rectangular, circular and standard sections symmetrical about vertical axis.

Stresses in shafts due to torsion: Concept of torsion, basic assumptions of pure torsion, torsion of solid and hollow circular sections, polar moment of inertia, torsional shearing stresses, angle of twist, torsional rigidity, equation of torsion.

Combined bending and direct stresses: Combination of stresses, combined direct and bending stresses, maximum and minimum stresses in sections, conditions for no tension, limit of eccentricity, middle third/forth rule, core or kern for square, rectangular and circular sections, chimneys, dams and retaining walls.

Columns and Struts

Columns and struts, definition, short and long columns, end conditions, equivalent length / effective length, slenderness ratio, axially loaded short and long column, Euler's theory of long columns, critical load for columns with different end conditions.

Shear Force and Bending Moment

Types of loads and beams: Types of loads: concentrated (or) point load, uniformly distributed load (udl), types of supports: simple support, roller support, hinged support, fixed support, types of reactions: vertical reaction, horizontal reaction, moment reaction, types of beams based on support conditions: calculation of support reactions using equations of static equilibrium.

Shear force and bending moment in beams

Shear Force and Bending Moment: Signs convention for S.F. and B.M, S.F and B.M of general cases of determinate beams with concentrated loads and udl only, S.F and B.M diagrams for cantilevers, simply supported beams and over hanging beams, position of maximum B.M, point of contra flexure, relation between intensity of load, S.F and B.M.

Slope and Deflection

Introduction: Shape and nature of elastic curve (deflection curve); relationship between slope, deflection and curvature (no derivation), importance of slope and deflection. slope and deflection of cantilever and simply supported beams under concentrated and uniformly distributed load (by double integration method, Macaulay's method).

Indeterminate Beams

Indeterminacy in beams, principle of consistent deformation/compatibility, analysis of propped cantilever, fixed and two span continuous beams by principle of superposition, S.F and B.M diagram (point load and udl covering full span).

Trusses

Introduction: Types of trusses, statically determinate and indeterminate trusses, degree of indeterminacy, stable and unstable trusses, advantages of trusses.

Analysis of trusses: Analytical method (method of joints, method of section).

GEOTECHNICAL ENGINEERING

Introduction

Soil and soil Engineering, scope of soil mechanics, origin and formation of soil

Preliminary Definitions and Relationship

Soil as a three phase system, water content, density, specific gravity, voids ratio, porosity, percentage of air voids, air content, degree of saturation, density index, bulk / saturated / dry / submerged density, inter-relationship of various soil parameters.

Index Properties of Soil

Water content, specific gravity, particle size distribution: sieve analysis, wet mechanical analysis, particle size distribution curve and its uses, consistency of soils, Atterberg's limits, plasticity index, consistency index, liquidity index.

Classification of Soil

General, I.S. classification, plasticity chart.

Permeability and Seepage

Concept of permeability, Darcy's law, co-efficient of permeability, factors affecting permeability, constant head permeability and falling head permeability test, seepage pressure, effective stress, phenomenon of quick sand.

Compaction and Consolidation

Compaction: Compaction, light and heavy compaction test, optimum moisture content of soil, maximum dry density, zero air void line, factors affecting compaction, field compaction methods and their suitability.

Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications.

Shear Strength

Concept of shear strength, Mohr- Coulomb failure theory, cohesion, angle of internal friction, strength envelope for different type of soil, measurement of shear strength;- direct shear test, triaxial shear test, unconfined compression test and vane-shear test

Earth Pressure on Retaining Structures

Active earth pressure, passive earth pressure, earth pressure at rest, use of Rankine's formula for the following cases (cohesion-less soil only)

(i) Backfill with no surcharge (ii) backfill with uniform surcharge

Foundation Engineering

Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches, types of failure (general shear, local shear & punching shear), bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & I.S code formulae for strip, circular and square footings, effect water table on bearing capacity of soil, plate load test and standard penetration test.

BUILDING MATERIALS AND CONSTRUCTIONS TECHNOLOGY

BUILDING MATERIALS

Stone

Classification of rock, uses of stone, natural bed of stone, qualities of good building stone, dressing of stone, characteristics of different types of stone and their uses.

Bricks

Brick earth – its composition, brick making – preparation of brick earth, moulding, drying, burning in kilns (continuous process), classification of bricks, size of traditional and modular bricks, qualities of good building bricks.

Cement, Mortar and Concrete

Cement: Types of cements, properties of cements, manufacturing of cement, importance and application

of blended cement with fly ash and blast furnace slag.

Mortar: Definition and types of mortar, sources and classification of sand, bulking of sand, use of gravel, morrum and fly ash as different building material.

Concrete: Definition and composition- water cement ratio- workability, mechanical properties and grading of aggregates, mixing, placing, compacting and curing of concrete.

Other Construction Materials

Timber: Classification and structure of timber, seasoning of timber - importance, characteristics of good timber, clay products and refractory materials - definition and classification, properties and uses of refractory materials- tiles, terracotta, porcelain glazing iron and steel: uses of cast iron, wrought iron, mild steel and for steel.

Surface Protective Materials

Composition of paints, enamels, varnishes, types and uses of surface protective materials like paints, enamels, varnishes, distempers, emulsion, french polish and wax polish.

CONSTRUCTIONS TECHNOLOGY

Introduction

Buildings and classification of buildings based on occupancy, different components of a building site investigation - objectives, site reconnaissance and explorations.

Foundations

Concept of foundation and its purpose, types of foundations - shallow and deep.

shallow foundation- constructional details of : spread foundations for walls, thumb rules for depth and width of foundation and thickness of concrete block.

Deep foundations: Pile foundations-their suitability, classification of piles based on materials, function and method of installation.

Walls & Masonry Works :

Purpose of walls, Classification of walls - load bearing, non-load bearing walls, retaining walls. classification of walls as per materials of construction: brick, stone, reinforced brick, reinforced concrete, precast, hollow and solid concrete block and composite masonry walls (Concept Only).

Partition Walls : Suitability and uses of brick and wooden partition walls.

Brick masonry : Definition of different terms.

Bond - meaning and necessity: English bond for 1 and 1-1/2 Brick thick walls. T, X and right angled corner junctions, Thickness for 1 and 1-1/2 brick square pillars in English bond.

Stone Masonry :

Glossary of terms -String course, corbel, cornice, block-in-course, grouting, mouldings, templates, throating, through stones, parapet, coping, pilaster and buttress.

Doors, Windows And Lintels

Glossary of terms used in doors and windows, doors - different types of doors, windows - different types of windows, purpose of use of arches and lintels.

Floors, Roofs and Stairs

Floors: Glossary of terms ,types of floor finishes - cast-in-situ, concrete flooring(monolithic, bonded), terrazzo tile flooring, cast in situ terrazzo flooring, timber flooring (Concept only)

Roofs: glossary of terms, types of roofs, concept and function of flat, pitched, hipped and sloped roofs

Stairs: Glossary of terms; stair case, winder, landing, stringer, newel, baluster, rise, tread, width of stair case, hand rail, nosing, head room, mumty room, Various types of stair case - straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), bifurcated stair, spiral stair, cantilever stair, tread riser stair.

Protective, Decorative Finishes, Damp and Termite Proofing

Plastering - purpose - types of plastering, Types of plaster finishes - grit finish, rough cast, smooth cast, sand faced, pebble dash, acoustic plastering and plain plaster etc., proportion of mortars used for different plasters, preparation of mortars, techniques of plastering and curing

Pointing - purpose -types of pointing

Painting - objectives - method of painting new and old wall surfaces, wood surface and metal surfaces - powder coating and spray painting on metal surfaces.

White washing - colour washing - distemping - internal and external walls.

Damp and Termite proofing - Materials and methods.

Green Buildings, Energy Management and Energy Audit Of Buildings & Project

Concept of green building, introduction to energy management and energy audit of buildings, aims of energy management of buildings, types of energy audit, response energy audit questionnaire, energy surveying and audit report.

ESTIMATION & COST EVALUATION - I

Introduction

Types of estimates - Plinth area, floor area / carpet area, units and modes of measurements as per IS 1200, accuracy of measurement for different item of work.

Quantity Estimate of Building

Short wall long wall method and centre line method, deductions in masonry, plastering, white washing, painting etc., multiplying factor (paint coefficients) for painting of doors and windows (paneled/glazed), grills etc., detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.

Analysis of Rates and Valuation

Analysis of rates for cement concrete, brick masonry in cement mortar, laterite stone masonry in Cement Mortar, cement plaster, white washing, artificial stone flooring, tile flooring, concrete flooring, R.C.C. with centering and shuttering, reinforcing steel, painting of doors and windows etc. as per O.P.W.D, calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Odisha P.W.D. system (Concept of C.P.W.D./Railways provisions), abstract of cost of estimate.

Valuation- Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolesce, methods of valuation.

Administrative Set-Up of Engineering Organisations:

Administrative set-up and hierarchy of Engineering department in State Govt./Central Govt./PSUs/Private Sectors etc. duties and responsibilities of engineers at different positions /levels.

ENVIRONMENTAL STUDIES

The Multidisciplinary nature of environmental studies, definition, scope and importance, need for public awareness.

Natural Resources, Renewable and non renewable resources

Natural resources and associated problems.

Forest resources: Use and over-exploitation, deforestation, case studies, timber extraction mining, dams and their effects on forests and tribal people.

Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.

Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity.

Energy Resources: Growing energy need, renewable and non- renewable energy sources, use of alternate energy sources, case studies.

Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification.

Role of individual in conservation of natural resources, equitable use of resources for sustainable life styles.

Systems

Concept of an eco system, structure and function of an eco system, producers, consumers, decomposers, energy flow in the eco systems, ecological succession, food chains, food webs and ecological pyramids, introduction, types, characteristic features, structure and function of the following eco system: forest ecosystem: aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity and it's Conservation

Introduction-Definition: genetics, species and ecosystem diversity, biogeographically classification of India, value of biodiversity: consumptive use, productive use, social ethical, aesthetic and option values, Biodiversity at global, national and local level, threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts.

Environmental Pollution

Definition, causes, effects and control measures of: air pollution, water pollution, soil pollution, marine

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pollution, noise pollution, thermal pollution, nuclear hazards, solid waste management: causes, effects and control measures of urban and industrial wastes, role of an individual in prevention of pollution, disaster management: floods, earthquake, cyclone and landslides.

Social issues and the Environment

Form unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management, Resettlement and rehabilitation of people; its problems and concern, environmental ethics: issue and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust case studies, Air (prevention and control of pollution) Act., water (prevention and control of pollution) Act., public awareness.

Human population and the environment

Population growth and variation among nations, population explosion- family welfare program, Environment and human health, human rights, value education, role of information technology in environment and human health.

STRUCTURAL DESIGN - I

Working stress method (WSM)

Objectives of design and detailing, state the different methods of design of concrete structures, introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel, permissible stresses, assumption in W.S.M., flexural design and analysis of single reinforced sections from first principles, concept of under reinforced, over reinforced and balanced sections, advantages and disadvantages of W.S.M, reasons for its obsolescence.

Philosophy Of Limit State Method (LSM)

Definition, advantages of LSM over WSM, IS code suggestions regarding design philosophy, types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S: 875, study of I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab.

Analysis and Design of Single and Double Reinforced Sections (LSM)

Limit state of collapse (flexure), assumptions, stress-strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section, concept of under-reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section, analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections, necessity of doubly reinforced section, design of doubly reinforced rectangular section.

Shear, Bond and Development Length (LSM)

Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement, bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length, numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear, design of shear reinforcement; minimum shear reinforcement in beams.

Analysis and Design of T-Beam (LSM)

General features, advantages, effective width of flange as per IS: 456-2000 code provisions. analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange. Simple numerical problems on deciding effective flange width.

Analysis and Design of Slab and Stair case (LSM)

Design of simply supported one-way slabs for flexure check for deflection control and shear, design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear, design of two-way simply supported slabs for flexure with corner free to lift, design of dog-legged staircase, detailing of reinforcement in stairs spanning longitudinally.

Design of Axially loaded columns and Footings (LSM)

Assumptions in limit state of collapse- compression, definition and classification of columns, effective length of column, specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties, analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only), types of footing,

design of isolated square column footing of uniform thickness for flexure and shear.

HYDRAULICS AND IRRIGATION ENGINEERING

HYDRAULICS

Hydrostatics

Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses

Pressure and its measurements: Intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.

Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.

Kinematics of fluid flow

Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. practical applications of Bernoulli's equation.

Flow over Notches and Weirs: Notches, weirs, types of notches and weirs, discharge through different types of notches and weirs-their application (no derivation).

Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application

Losses of head of a liquid flowing through pipes: Different types of major and minor losses. simple numerical problems on losses due to friction using Darcy's equation, total energy lines & hydraulic gradient lines (concept only).

Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, best economical section.

Pumps

Type of pumps

Centrifugal pump: Basic principles, operation, discharge, horse power & efficiency.

Reciprocating pumps: Types, operation, discharge, horse power & efficiency.

IRRIGATION ENGINEERING

Hydrology

Hydrology cycle, rainfall: types, intensity, hycetograph, estimation of rainfall, rain gauges, Its types(concept only), concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae.

Water Requirement of Crops

Definition of irrigation, necessity, benefits of irrigation, types of irrigation Crop season, duty,delta and base period their relationship, overlap allowance, kharif and rabi crops, Gross command area, culturable command area, Intensity of irrigation,irrigable area, time factor, crop ratio.

Flow irrigation

Canal irrigation, types of canals, loss of water in canals, perennial irrigation, different components of irrigation canals and their functions, sketches of different canal cross-sections, classification of canals according to their alignment, various types of canallining – advantages and disadvantages.

Water logging and drainage

Causes and effects of water logging, detection, prevention and remedies.

Diversion head works and regulatory structures

Necessity and objectives of diversion head works, weirs and barrages, general layout, functions of different parts of barrage, silting and scouring, functions of regulatory structures.

Cross drainage works

Functions and necessity of cross drainage works - aqueduct, siphon, super-passage, level crossing concept of each with help of neat sketch.

Dams

Necessity of storage reservoirs, types of dams, earthen dams: types, description, causes of failure and protection measures, gravity dam- types, description, causes of failure and protection measures, spillways - types (with sketch) and necessity.

LAND SURVEY – I

Introduction to surveying, linear measurements

Surveying: Definition, aims and objectives, principles of survey-plane surveying- geodetic surveying-instrumental surveying, precision and accuracy of measurements, instruments used for measurement of

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distance, types of tapes and chains, errors and mistakes in linear measurement – classification, sources of errors and remedies, corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.

Chaining and chain surveying

Equipment and accessories for chaining, ranging – Purpose, signaling, direct and indirect ranging, line ranger – features and use, error due to incorrect ranging, methods of chaining – chaining on flat ground, chaining on sloping ground – stepping method, clinometer-features and use, slope correction, setting perpendicular with chain & tape, chaining across different types of obstacles – numerical problems on chaining across obstacles, purpose of chain surveying, its principles, concept of field book. selection of survey stations, base line, tie lines, check lines, offsets – necessity, perpendicular and oblique offsets, instruments for setting offset – cross staff, optical square, errors in chain surveying – compensating and accumulative errors causes & remedies, precautions to be taken during chain surveying.

Angular measurement and compass surveying

Measurement of angles with chain, tape & compass, compass – types, features, parts, merits & demerits, testing & adjustment of compass, designation of angles- concept of meridians – magnetic, true, arbitrary; concept of bearings – whole circle bearing, quadrantal bearing, reduced bearing, suitability of application, numerical problems on conversion of bearings, use of compasses – setting in field-centering, leveling, taking readings, concepts of fore bearing, back bearing, numerical problems on computation of interior & exterior angles from bearings, effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination, errors in angle measurement with compass – sources & remedies, principles of traversing – open & closed traverse, methods of traversing, local attraction – causes, detection, errors, corrections, numerical problems of application of correction due to local attraction, errors in compass surveying – sources & remedies, plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table.

Map reading cadastral maps & nomenclature

Study of direction, scale, grid reference and grid square study of signs and symbols, cadastral map preparation methodology, unique identification number of parcel, positions of existing control points and its types, adjacent boundaries and features, topology creation and verification.

Plane table surveying

Objectives, principles and use of plane table surveying, instruments & accessories used in plane table surveying, methods of plane table surveying – (1) radiation, (2) intersection, (3) traversing, (4) resection, statements of two point and three point problem, errors in plane table surveying and their corrections, precautions in plane table surveying.

Theodolite surveying and traversing

Purpose and definition of theodolite surveying, transit theodolite- description of features, component parts, fundamental axes of a theodolite, concept of vernier, reading a vernier, temporary adjustment of theodolite, concept of transiting – measurement of horizontal and vertical angles, measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, errors in theodolite observations, methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, plotting the traverse by coordinate method, checks for open and closed traverse, traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, numerical problems on omitted measurement of lengths & bearings, closing error – adjustment of angular errors, adjustment of bearings, numerical problems, balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.

Levelling and contouring

Definition and Purpose and types of leveling – concepts of level surface, horizontal surface, vertical surface, datum, R.L., B.M., instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, vertical axis, levelling staff – temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI, field data entry – level book – height of collimation method and rise & fall method, comparison, numerical problems on reduction of levels applying both methods, arithmetic checks, effects of curvature and refraction, numerical problems on application of correction, reciprocal leveling – principles, methods, numerical problems, precise leveling, errors in leveling and precautions, permanent and temporary adjustments of different types of levels, definitions, concepts and characteristics of contours, methods of contouring, plotting contour maps, interpretation of

contour maps, toposheets, use of contour maps on civil engineering projects – drawing cross-sections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure, map interpretation: interpret human and economic activities (i.e.: settlement, communication, land use etc.), interpret physical landform (i.e.: relief, drainage pattern etc.), problem solving and decision making.

Computation of area & volume

Determination of areas, computation of areas from plans, calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule, calculation of volumes by prismoidal formula and trapezoidal formula, prismoidal corrections, curvature correction for volumes.

HIGHWAY ENGINEERING

Introduction

Importance of highway transportation: Importance organizations like Indian Roads Congress, Ministry of Surface Transport, Central Road Research Institute, functions of Indian Roads Congress, IRC classification of roads organisation of state highway department.

Road Geometrics

Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient, design and average running speed, stopping and passing sight distance, necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation.

Road Materials

Difference types of road materials in use: soil, aggregates, and binders, Function of soil as highway subgrade, California Bearing Ratio: methods of finding CBR value in the laboratory and at site and their significance, testing aggregates: abrasion test, impact test, crushing strength test, water absorption test & soundness test.

Road Pavements

Road pavement: flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components, flexible pavements: sub-grade preparation, setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation, sub base course: necessity of sub base, stabilized sub base, purpose of stabilization (no designs) types of stabilization- mechanical stabilization, lime stabilization, cement stabilization, fly ash stabilization, base course: preparation of base course, brick soling, stone soling and metalling, water bound macadam and wet-mix macadam, bituminous constructions: different types surfacing: surface dressing (i) premix carpet and (ii) semi dense carpet, bituminous concrete grouting, rigid pavements: concept of concrete roads as per IRC specifications.

Hill Roads

Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling, breast walls, retaining walls, different types of bends.

Road Drainage

Necessity of road drainage work, cross drainage works, surface and sub-surface drains and storm water drains, location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.

Road Maintenance

Common types of road failures – their causes and remedies, maintenance of bituminous road such as patch work and resurfacing, maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices, basic concept of traffic study, traffic safety and traffic control signal.

Construction equipments

Preliminary ideas of the following plant and equipment: hot mixing plant, tipper, tractors (wheel and crawler), scraper, bulldozer, dumpers, shovels, graders, roller dragline, asphalt mixer and tar boilers, road pavers, modern construction equipments for roads.

ENTREPRENEURSHIP AND MANAGEMENT & SMART TECHNOLOGY

Entrepreneurship

Concept / Meaning of entrepreneurship, need of entrepreneurship, characteristics, qualities and types of entrepreneur, functions, barriers in entrepreneurship, entrepreneurs vrs. manager, forms of business

ownership: sole proprietorship, partnership forms and others, types of industries, concept of start-ups, entrepreneurial support agencies at national, state, district level(sources): DIC, NSIC, OSIC, SIDBI, NABARD, commercial banks, KVIC etc., technology business incubators (tbi) and science and technology entrepreneur parks.

Market Survey and Opportunity Identification (Business Planning)

Business planning, SSI, ancillary units, tiny units, service sector units, time schedule plan, agencies to be contacted for project implementation, assessment of demand and supply and potential areas of growth, identifying business opportunity, final product selection.

Project Report Preparation

Preliminary project report, detailed project report, techno economic feasibility, project viability

Management Principles

Definitions of management, principles of management, functions of management (planning, organising, staffing, directing and controlling etc.), level of management in an organisation

Functional Areas of Management

Production management- functions, activities, productivity, quality control, production planning and control, Inventory Management- Need for inventory management, models/techniques of inventory management, Financial Management- functions of financial management, management of working capital, costing (only concept), break even analysis, brief idea about accounting terminologies: book keeping, journal entry, petty cash book, p & l accounts, balance sheets(only concepts), Marketing management- concept of marketing and marketing management, marketing techniques (only concepts), concept of 4Ps (Price, Place, Product, Promotion), Human resource management- functions of personnel management, manpower planning, recruitment, sources of manpower, selection process, method of testing, methods of training & development, payment of wages.

Leadership and Motivation

Leadership- Definition and need/importance, qualities and functions of a leader, manager vs leader, style of leadership (autocratic, democratic, participative).

Motivation- Definition and characteristics, Importance of motivation, Factors affecting motivation, Theories of motivation (Maslow), Methods of Improving Motivation, Importance of Communication in Business, types and barriers of communication.

Work Culture, TQM & Safety

Human relationship and performance in organization, relations with peers, superiors and subordinates, TQM concepts: quality policy, quality management, quality system, accidents and safety, cause, preventive measures, general safety rules, personal protection Equipment(PPE).

Legislation

Intellectual property rights(IPR), patents, trademarks, copyrights, features of factories act 1948 with amendment (only salient points), features of payment of wages act 1936 (only salient points).

Smart Technology

Concept of IOT, how IOT works, components of IOT, characteristics of IOT, categories of IOT, applications of IOT- smart cities, smart transportation, smart home, smart health care, smart industry, smart agriculture, smart energy management etc.

STRUCTURAL DESIGN-II

Introduction

Common steel structures, advantages & disadvantages of steel structures, types of steel, properties of structural steel, rolled steel sections, special considerations in steel design, loads and load combinations, structural analysis and design philosophy, brief review of principles of limit state design.

Structural Steel Fasteners and Connections

Bolted connections, classification of bolts, advantages and disadvantages of bolted connections, different terminology, spacing and edge distance of bolt holes, types of bolted connections, types of action of fasteners, assumptions and principles of design, strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity), reduction factors and shear capacity of HSFG bolts, analysis & design joints using bearing type and HSFG bolts (except eccentric load and prying forces), efficiency of a joint, welded connections, advantages and disadvantages of welded connection, types of welded joints and specifications for welding, design stresses in welds, strength of welded joints.

Design of steel tension Members

Common shapes of tension members, maximum values of effective slenderness ratio, analysis and design of tension members (considering strength only and concept of block shear failure).

Handwritten signature

Design of steel compression members

Common shapes of compression members, buckling class of cross sections, slenderness ratio, design compressive stress and strength of compression members, analysis and design of compression members (axial load only).

Design of Steel beams

Common cross sections and their classification, deflection limits, web buckling and web crippling, design of laterally supported beams against bending and shear.

Design of Tubular Steel Structures

Round tubular sections, Permissible stresses, tubular compression & tension members, joints in tubular trusses.

Design of Masonry Structures

Design considerations for masonry walls & columns, load bearing & non-load bearing walls, permissible stresses, slenderness ratio, effective length, height & thickness.

RAILWAY & BRIDGE ENGINEERING

RAILWAYS

Introduction

Railway terminology, advantages of railways, classification of Indian railways.

Permanent way

Definition and components of a permanent way, concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions.

Track materials

Rails, functions and requirement of rails, types of rail sections, length of rails, rail joints-types, requirement of an ideal joint, purpose of welding of rails & its advantages, creep-definition, cause & prevention, Sleepers, definition, function & requirements of sleepers, classification of sleepers, advantages & disadvantages of different types of sleepers, ballast, function & requirements of ballast, materials for ballast, fixtures for broad gauge, connection of rails to rail - fish plate, fish bolts, connection of rails to sleepers.

Geometric for broad gauge

Typical cross-sections of single & double broad gauge railway track in cutting and embankment, permanent & temporary land width, gradients for drainage, super elevation- necessity & limiting valued.

Points and Crossing

Definition, necessity of points and crossing, types of points & crossing with tie diagrams.

Laying & maintenance of track

Methods of laying & maintenance of track, duties of a permanent way inspector.

BRIDGES

Introduction to bridges

Definitions, components of a bridge, classification of bridges, requirements of an ideal bridge.

Bridge site investigation, hydrology & planning

Selection of bridge site, alignment, determination of flood Discharge, waterway & economic span, afflux, clearance & free board.

Bridge Foundation

Scour depth, minimum depth of foundation, types of bridge foundations-spread foundation, pile foundation, well foundation, sinking of wells, caisson foundation, coffer dams.

Bridge substructure and approaches

Types of piers, types of abutments, types of wing walls, approaches.

Culvert & Cause ways

Types of culverts- brief description, types of causeways- brief description

WATER SUPPLY AND WASTE WATER ENGINEERING

WATER SUPPLY

Introduction to Water Supply, Quantity and Quality of Water

Necessity of treated water supply, per capita demand, variation in demand and factors affecting demand, methods of forecasting population, numerical problems using different methods, Impurities in water- organic and inorganic, harmful effects of impurities, analysis of water- physical, chemical and bacteriological, water quality standards for different uses.

Sources and Conveyance of Water

Surface sources- Lake, stream, river and impounded reservoir, underground sources- aquifer type &

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occurrence- infiltration gallery, infiltration well, springs, well, yield from well- methods of determination, numerical problems using yield formulae (deduction excluded), Intakes- types, description of river intake, reservoir intake, canal intake, pumps for conveyance & distribution- types, selection, installation, Pipe materials- necessity, suitability, merits & demerits of each type, pipe joints- necessity, types of joints, suitability, methods of jointing laying of pipes-method.

Treatment of Water

Flow diagram of conventional water treatment system, treatment process/units, aeration; necessity, Plain sedimentation: necessity, working principles, sedimentation tanks- types, essential features, operation & maintenance, sedimentation with coagulation: necessity, principles of coagulation, types of coagulants, flash mixer, flocculator, clarifier (definition and concept only), filtration: necessity, principles, types of filters, slow sand filter, rapid sand filter and pressure filter- essential features, disinfection: necessity, methods of disinfection, Chlorination- free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination, softening of water- necessity, methods of softening-lime soda process and ion exchange method (concept only).

Distribution system and Appurtenance in distribution system

General requirements, types of distribution system- gravity, direct and combined, methods of supply- intermittent and continuous, distribution system layout- types, comparison, suitability, valves- types, features, uses, purpose- sluice valves, check valves, air valves, scour valves, fire hydrants, water meters.

W/s plumbing in building

Method of connection from water mains to building supply, general layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S code.

WASTE WATER ENGINEERING

Introduction

Aims and objectives of sanitary engineering, definition of terms related to sanitary engineering, systems of collection of wastes-conservancy and water carriage system-features, comparison, suitability.

Quantity and Quality of sewage

Quantity of sanitary sewage-domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage, computation of size of sewer, application of Chazy's formula, limiting velocities of flow: self-cleaning and scouring, general Importance, strength of sewage, characteristics of sewage- physical, chemical & biological, concept of sewage- sampling, tests for- solids, PH, dissolved oxygen, BOD, COD.

Sewerage system

Types of system- separate, combined, partially separate, features, comparison between the types, suitability, Shapes of sewer- rectangular, circular, avoid- features, suitability, laying of sewer- setting out sewer alignment.

Sewer Appurtenances and Sewage Disposal

Manholes and Lamp holes- types, features, location, function, inlets, grease & oil trap- features, location, function, storm regulator, inverted siphon- features, location, function, disposal on land- sewage farming, sewage application and dosing, sewage sickness- causes and remedies, disposal by dilution- standards for disposal in different types of water bodies, self purification of stream.

Sewage treatment

Principles of treatment, flow diagram of conventional treatment, Primary treatment- necessity, principles, essential features, functions, Secondary treatment- necessity, principles, essential features, functions.

Sanitary plumbing for building

Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage, Plumbing arrangement of single storied & multi storied building as per I.S. code practice, sanitary fixtures- features, function, and maintenance and fixing of the fixtures- water closets, flushing cisterns, urinals, inspection chambers, traps, anti- syphonage pipe.

ESTIMATION & COST EVALUATION-II

Detailed estimate of culverts and bridges

Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule, RCC hume pipe culvert with splayed angled wing wall.

Estimate of irrigation structures

Detailed estimate of simple type of vertical fall to given specification, detailed estimate of drainage siphon to given specification.

Detailed estimate of roads

Detail estimate of a water bound macadam road, detailed estimate of a flexible pavement in cutting/filling, detailed estimate of septic tank and soak pit for 50 users.

Miscellaneous estimates

Tube well, piles and pile cap, Isolated and combined footing.

PWD Accounts works

Works, classification of work- original, major, petty, repair work, annual repair, special repair, quadrantal repair, concept of method of execution of works through the contractors and department, contract and agreement, work order, types of contract, piece work agreement, Accounts of works - explanation of various terms- administrative approval, technical sanction, tender, preparation of notice inviting tender, quotations, earnest money, E-tendering, security deposit, advance payment, Intermediate payment, final payment, running bill, final bill, regular and temporary establishment, cash, major & subhead of account, temporary advance (imprest money), supervision charges, suspense account, debit, credit, book transfer, voucher and related accounts, measurement book use & maintenance, procedure of marking entries of measurement of work and supply of materials, labour employed, standard measurement books and common irregularity, Muster roll: Its preparation & use for making payment of pay & wages, Acquaintance Roll: Its preparation & use for making payment of pay & wages, labour & labour report, method of labour payment, use of forms and necessity of submission, classification of stores, receipt/ issue statement on standard form, method of preparation of stock account, preparation and submission of returns, verification of stocks, shortage and excess, building BY LAWS and regulatory bodies, development authorities, types and their levels, RERA etc.

LAND SURVEY- II

Tacheometry

Principles, stadia constants determination, Stadia tacheometry with staff held vertical and with line of collimation horizontal or inclined, numerical problems, Elevations and distances of staff stations - numerical problems.

Curves

Compound, reverse and transition curve, purpose & use of different types of curves in field, elements of circular curves, numerical problems, preparation of curve table for setting out, setting out of circular curve by chain and tape and by instrument angular methods (i) offsets from long chord, (ii) successive bisection of arc, (iii) offsets from tangents, (iv) offsets from chord produced, (v) Rankine's method of tangent angles (no derivation), obstacles in curve ranging - point of intersection inaccessible.

Basics on scale and basics of map

Fractional or ratio scale, linear Scale, graphical scale, what is map, map scale and map projections, how maps convey location and extent, how maps convey characteristics of features, how maps convey spatial relationship, classification of maps, physical map, topographic map, road map, political map, economic & resources map, thematic map, climate map.

Survey of India map series

Open series map, defense series map, map nomenclature, quadrangle name, latitude, longitude, UTM's, contour lines, magnetic declination, public land survey system, field notes.

Basics of aerial photography, photogrammetry, dem and ortho image generation

Aerial Photography

Film, focal length, scale, types of aerial photographs (oblique, straight).

Photogrammetry

Classification of photogrammetry, aerial photogrammetry, terrestrial photogrammetry.

Photogrammetry Process

Acquisition of imagery using aerial and satellite platform, control survey, geometric distortion in imagery, application of imagery and its support data orientation and triangulation, stereoscopic measurement, 19.9.1 X-parallax, 19.2.2 Y-parallax.

DTM/DEM Generation

Ortho Image Generation

Modern surveying methods

Principles, features and use of (i) Micro-optic theodolite, digital theodolite, working principles of a total station (set up and use of total station to measure angles, distances of points under survey from total station and the co-ordinates (X, Y & Z or northing, easting, and elevation) of surveyed points relative to total station position using trigonometry and triangulation.

Basics on GPS & DGPS and ETS

GPS:- Global Positioning System, working principle of GPS, GPS signals, errors of GPS, positioning methods.

DGPS:- Differential Global Positioning System, base station setup, rover GPS set up, download, post-process and export GPS data, sequence to download GPS data from flashcards, sequence to post-process GPS data, sequence to export post-process GPS data, sequence to export GPS time tags to file.

ETS:-

Electronic Total Station, distance measurement, angle measurement, leveling, determining position, reference networks, errors and accuracy.

Basics of GIS and map preparation using GIS

Components of GIS, integration of spatial and attribute information, three views of information system, database or table view, map view and model view, spatial data model, attribute data management and metadata concept, prepare data and adding to arc map, organizing data as layers, editing the layers, switching to layout view, change page orientation, removing borders, adding and editing map information, finalize the map.

CONSTRUCTION MANAGEMENT

Introduction To Construction Management

Aims and objectives of construction management, functions of construction management, the construction team components- owner, engineer, architect, contractor-their functions and interrelationship and jurisdiction, Resources for construction management-men, machines, materials, money.

Constructional Planning

Importance of construction planning, developing work breakdown structure for construction work, construction planning stages-pre-tender stage, post-tender stage, construction scheduling by bar charts-preparation of bar charts for simple construction works, preparation of schedules for labour materials, machinery, finance for small works, limitation of bar charts, construction scheduling by network techniques-definition of terms ,PERT and CPM techniques, advantages and disadvantages of two techniques, network analysis, estimation of time and critical path, application of PERT and CPM techniques in sample construction works.

Materials and Stores Management

Classification of stores-storage of stock, Issue of materials-indent , invoice, bin card.

Construction Site Management

Job lay out- Objectives, review plans, specifications, lay out of equipments, location of equipment, organizing labour at site, job lay out for different construction sites, principle of storing material at site.

Construction Organization

Introduction - Characteristics, structure, importance, organization types-line and staff, functions and their characteristics, principles of organization- meaning and significance of terms- control, authority, responsibility, job & task, leadership-necessity, styles of leadership, role of leader,human relations-relations with subordinates, peers, supervisors, characteristics of group behavior, mob psychology, handling of grievances,absenteeism, labour welfare, conflicts in organization- genesis of conflicts, types-intrapersonal,interpersonal, intergroup, resolving conflicts.

Construction Labour and Labour Management

Preparing labour schedule, essential steps for optimum labour output, labour characteristics, wages & their payment, labour incentives, motivation- classification of motives, different approaches to motivation.

Equipment Management

Preparing the equipment schedule, identification of different alternative equipment, importance of owning & operating costs in making decisions for hiring & purchase of equipment, inspection and testing of equipment, equipment maintenance.

Quality Control

Concept of quality in construction, quality standards- during construction, afterconstruction, destructive & non destructive methods.

Monitoring Progress

Programme and progress of work, work study, analysis and control of physical and financial progress corrective measures.

Safety Management in Construction

Importance of safety, causes and effects of accidents in construction works, safety measures in work sites for excavation, scaffolding, formwork, fabrication and erection, demolition, development of safety

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consciousness, safety legislation- workman's compensation act, contract labour act.

Role of Vulnerability Atlas of India in construction projects

Introduction to vulnerability atlas of India, concepts of natural hazards and disasters and vulnerability profile of India. definition of disaster related terms, earthquake hazard and vulnerability, magnitude and intensity scales of earthquake, seismic zones, earthquake hazard maps, types of structures and damage classification, effects in housing and resistant measures, wind / cyclone hazard and vulnerability, wind speed and pressures, wind hazard and cyclone occurrence maps, storm surveys and cyclone resistant measures, flood hazard and vulnerability, flood hazard and flood prone areas of the country, general protection of habitants and flood resistant construction, landslides, tsunamis and thunderstorm hazards and vulnerability, landslide & thunderstorm incidence maps, measures against tsunami hazards, housing vulnerability risk tables and usage of vulnerability atlas of India, inclusion of vulnerability atlas in tender documents.

ADVANCED CONSTRUCTION TECHNIQUES & EQUIPMENT

Advanced construction materials

Fibers and Plastics-

Types of fibers- steel, carbon, glass fibers, use of fibers as construction material, properties of fibers, Types of plastics- PVC, RPVC, HDPE, FRP, GRP etc. colored plastic sheets. use of plastic as construction material, Artificial timbers- Properties and uses of artificial timber, types of artificial timber available in market, strength of artificial timber, Miscellaneous materials – Properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, artificial sand, bonding agents, adhesives etc.

Prefabrication

Introduction, necessity and scope of prefabrication of buildings, history of prefabrication, current uses of prefabrication, types of prefabricated systems, classification of prefabrication, advantages and disadvantages of prefabrication, the theory and process of prefabrication, design principle of prefabricated systems, types of prefabricated elements, modular coordination, Indian standard recommendation for modular planning, earthquake resistant construction, building configuration, lateral load resisting structures, building characteristics, effect of structural irregularities-vertical irregularities, plan configuration problems, safety consideration during additional construction and alteration of existing buildings, additional strengthening measures in masonry building-corner reinforcement, lintel band, sill band, plinth band, roof band, gable band etc., retrofitting of structures, seismic retrofitting of reinforced concrete buildings, sources of weakness in RC frame building, classification of retrofitting techniques and their uses, building services, cold water distribution in high rise building, lay out of installation, hot water supply – general principles for central plants-layout, sanitation-soil and waste water installation in high rise buildings, electrical services – i) Requirements in high rise buildings ii) Layout of wiring -types of wiring iii) Fuses and their types iv) Earthing and their uses, Lighting – requirement of lighting, measurement of light intensity, ventilation - methods of ventilation (natural and artificial systems of ventilation) problems on ventilation, mechanical services- lifts, escalator, elevators – types and uses.

Construction and earth moving equipments

Planning and selection of construction equipments, study on earth moving equipments like drag line, tractor, bulldozer, powershovel, study and uses of compacting equipments like tamping rollers, smooth wheel rollers, pneumatic tired rollers and vibrating compactors, owning and operating cost – problems, soil reinforcing techniques, necessity of soil reinforcing, use wire mesh and geo-synthetics, strengthening of embankments, slope stabilization in cutting and embankments by soil reinforcing techniques.

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Syllabus for Junior (MVI)

1. AUTOMOTIVES SYSTEM & HEAVY EQUIPMENTS

A. FRONT AXLE

Introduction & study of front axle assemblies

Front axle function, construction & Types of stub axle

Front wheel assembly

B. STEERING & STEERING GEOMETRY

Introduction of steering system, function of steering

Principle of correct steering & Components of steering system & Types of steering gear.

Steering geometry i.e camber, caster, king-pin, Inclination, understeer, oversteer, combined angle.

Toe-in Toe-out, wheel alignment & effects of incorrect wheel alignment, steering turning angle and turning radius.

C. SUSPENSION SYSTEM

Introduction & function & requirement of suspension system.

Types of suspension spring like leaf spring, coil spring, rubber torsion unit, Torsion bar.

Types of suspension system such as independent suspension system, rigid axle

Suspension system, its advantages and disadvantages. Stabilizer bar & shock absorber.

D. BRAKE SYSTEM

Introduction, Principle of operation and requirements of brakes.

Types of brakes such as drum brakes and its leading & trailing shoes, disc brakes.

Brake fade.

Hydraulic brakes and its components like master cylinder, tandem master cylinder,

wheel cylinder, brake fluid and brake fluid grades. Advantages and disadvantages

of hydraulic brakes.

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Power brake types, working and construction of air brake & handbrake.

Adjustment and bleeding of brake.

Common brake problems.

Anti-lock braking system.

E. WHEEL & TYRES

Introduction

Basic construction of a tyre

Tyre dimension

Classification of tyre, advantages and disadvantages of radial ply tyres over cross ply tyre.

Tyre size designation

Different types of tyre damages

Wheel and its type

Wheel dimensions

Wheel designation.

F. CHASSIS & HEAVY EQUIPMENTS

Introduction and lay out of chassis showing its main components.

Types of chassis, frame and important chassis layouts.

Tractor and its construction, classification, construction and description of dump truck, grader, road roller, dozer, loader, cranes, scraper.

2. VEHICLE MAINTENANCE AND MOTOR VEHICLE ACT

A. VEHICLE MAINTENANCE

Introduction

Need of maintenance

Type of maintenance systems

Breakdown maintenance

Preventive maintenance

Predictive maintenance

Total productive maintenance.

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B. SERVICE STATION

Service station and types.

Private service stations

Company's authorized service stations

Company's dealer service stations

Criteria for service station

Workshop layout

Important elements in workshop layout

Workshop documents and records

Job card and its importance

C. TOOLS AND EQUIPMENTS

Introduction

List of tools

List of equipments

Spanners or wrenches

Double ended open jaw spanner (fix spanner)

Double ended ring spanner

Combination spanner

Socket or box spanner

Screw driver

Types of screw and screw drivers

Torque wrenches

Pliers

Allen keys

Hammers

Chisels

Files

Hacksaws

Wire brush and scraper

Taps and dies
Drill bits
Reamers
Measuring tools
Valve spring compressors
Piston ring compressor
Oil filter wrenches
Puller
Coil spring compressor set
Tyre levers
Tool box
C-clamp
Pneumatic tools
Drilling machine
Grinder
Jack-(mechanically operated jack and hydraulic jack)
Lubrication equipments
Tyre changer
Wheel balancer
Wheel aligner
Brake bleeding equipments
High pressure compressor
High pressure car wash machine
Engine analyser
Hydraulic press
Spark plug tester and cleaner machine
Injector tester and cleaner machine
Battery charging and testing machine

D. SERVICE, REPAIR AND OVERHAUL

22

Troubles, Causes & remedies in engine, fuel system, cooling system, lubrication system & MPFI Engine.

Service, repair and overhaul of engine.

Service, repair and overhaul of chassis and body.

E. MOTOR VEHICLES ACT, 1988

Introduction

Short explanation on different sections like 3, 4, 5, 19, 39, 49, 50, 51, 128, 129, 130, 133,

Driving license.

Necessity for driving license.

Restrictions on granting of learner's licenses for certain vehicles.

Grant of learner's licenses.

Grant of permanent driving licenses.

Documents required for driving licenses.

Certification of Registration.

Necessity of registration of vehicle.

Registration-where to be made.

Procedure for registration.

Condition for refusal of registration.

Temporary registration.

Permanent registration.

Renewal of registration certificate.

3. ELECTRIC & HYBRID VEHICLE and EMISSION CONTROL ..

A. ELECTRIC VEHICLE

Introduction

Need for electric vehicle

Problems of electric vehicles-(range and batteries, charging, lack of performance, purchase price, safety and reliability)

Advantage of electric vehicle

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Disadvantage of electric vehicle

Major component of electric vehicle- (motor, battery, charger, controller, DC converter, energy management system).

B. CLASSIFICATION OF EVs

Battery Electric Vehicle (BEV)- (advantage, disadvantage, application)

Hybrid Electric Vehicle (HEV)- (advantage, disadvantage, application)

Plug- In Hybrid Electric Vehicle (PHEV) - (advantage, disadvantage, application)

Energy sources (battery, ultra capacitors, fly wheels, fuel cells)

Requirements of EVs energy sources.

Battery- requirement of EV batteries, selection of battery, deep cycle battery

Types of battery for EVs (lead-acid battery, lithium-ion battery) and their advantages and disadvantages.

Ultra capacitor and its working principle

Flywheel and its advantage and disadvantage.

C. ELECTRIC MOTOR

Electric motor

Requirements of EV motor

Brushed DC motor

Brushless DC motor

Switched reluctance motor

AC induction motor

Indian electric vehicle (4 wheeler, 3 wheeler, 2 wheeler)

D. HYBRID VEHICLES

Hybrid Electric Vehicle (HEV)

Advantage and disadvantage of HEV

Components of HEV

Working of hybrid vehicle

Hybridization (micro hybrid, mild hybrid, full hybrid)

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Fuel cell electric vehicle (FCEV) working principle, advantages and disadvantages.

E. VEHICLE EMISSION CONTROL TECHNOLOGIES

Advanced Engine Design

Variable Valve Timing

Turbo charging systems

Catalytic Converters

The Two- Way Catalyst

The Three- Way Catalyst

Diesel Oxidation Catalyst (DOC)

Selective Catalytic Reduction (SCR)

Nitrogen -Oxide (NOx) Adsorber Catalyst

The Diesel Particulate Filter (DPF)

Exhaust Gas Recirculation (EGR)

Crankcase Emission Control System.

4. AUTOMOTIVE TRANSMISSION

A. COURSE CONTENTS:

(i) Clutch:

1.1 Introduction, requirement of clutch, types of clutch.

1.2 Clutch operation.

1.3 Clutch components, clutch facing.

1.4 Clutch problem & adjustment.

1.5 Fluids fly wheel & coupling.

(ii) Gear Box:

2.1 Introduction, functions & types of transmission.

2.2 Sliding mesh & constant mesh gearbox.

2.3 Epicyclical gear box overdrive.

2.4 Free-wheel drive, selector mechanism.

2.5 Fluid torque converter.

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- (iii) **Propeller shaft:**
 - 3.3 Introduction definition & types of propeller shaft.
 - 3.2 Universal joints & its types.
 - 3.4 Sliding joint.
- (iv) **Differential:**
 - 4.1 Function of differential gear box.
 - 4.2 Types of differential.
 - 4.3 Constructional details of a differential.
 - 4.4 Study & inspection of differential.
- (v) **Rear Axle:**
 - 5.1 Definition of rear axle, supporting of rear axle.
 - 5.2 Rear axle drives such as Hotchkiss drive, torque tube drive etc.
- (vi) **Two wheeler:**
 - 6.1 Power transmission system of moped.
 - 6.2 Power transmission system of scooter.
 - 6.3 Power transmission system of motorcycle.
 - 6.4 Power transmission system of bullet.
- (vii) **Performance of Automobile:**
 - 7.1 Power for propulsion resistances for vehicle.
 - 7.2 Traction & tractive effort, road performance curves.
 - 7.3 Acceleration grad ability & draw-bar pull.
 - 7.4 Calculation of equivalent weight.
 - 7.5 Calculation of maximum traffic effort.
- 5. **AUTOMOBILE ELECTRICITY:**
 - (i) **Storage Battery:**
 - 1.1 Purpose and types of battery.
 - 1.2 Construction capacity and charging of battery.
 - 1.3 Testing servicing and maintenance of battery.
 - (ii) **Starting System:**

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- 2.1 Principle and construction of starter motor.
 - 2.2 Drive arrangement and control.
 - 2.3 Servicing and maintenance of starter motor.
- (iii) **Generating System:**
- 3.1 Flemings right hand rule and Lenz's law.
 - 3.2 Principle and constructional details of generator.
 - 3.3 Current and voltage regulator.
 - 3.4 Cut-out relay, routine maintenance of generator.
- (iv) **Alternator:**
- 4.1 Principle and construction of alternator.
 - 4.2 Maximum R.M.S and average value.
 - 4.3 Maintenance of alternator.
- (v) **Ignition System:**
- 5.1 Principle and components (induction coil, contact breaker, spark plug, 5.2 distributor and condenser) of spark ignition system.
 - 5.2 Electronics spark timing computer controlled coil ignition system operation
 - 5.3 Electronics ignition system with distributor/distributor less.
 - 5.4 Types of ignition system such as-Coil ignition system magnet ignition system electronics ignition system, transistorized ignition system.
 - 5.5 Ignition system servicing and fault diagnosis.
- (vi) **Light:**
- 6.1 Setting of headlights.
 - 6.2 Tail and stoplights.
 - 6.3 Indicator and dim deeper mechanism.
- (vii) **Accessories & Control:**
- 7.1 Electric horn and screen wiper.
 - 7.2 Fuel gauge oil pressure gauge and water temperature gauge.
- (viii) **Wiring System:**
- 8.1 Types of wiring such as:- Earth returns and insulated return system.

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- 8.2 Wiring diagram of four wheelers and two wheelers.
- 8.3 Elective wiring layout in a four wheeler.
- 8.4 Inspection and maintenance of electrical systems.

6. AUTOMOBILE ENGINEERING AND HYBRID VEHICLES

(i) INTRODUCTION & TRANSMISSION SYSTEM:

- 1.1 Automobiles: Definition, need and classification: Layout of automobile chassis with major components (Line diagram).
- 1.2 Clutch System: Need, types (Single & Multiple) and Working principle with sketch.
- 1.3 Gear Box: Purpose of gear box, Construction and working of a 4 speed gear box.
- 1.4 Concept of automatic gear changing mechanisms.
- 1.5 Propeller shaft: Constructional features
- 1.6 Differential : Need, Types and working principle.

(ii) BRAKING SYSTEM:

- 2.1 Braking systems in automobiles: Need and types.
- 2.2 Mechanical Brake
- 2.3 Hydraulic Brake
- 2.4 Air Brake
- 2.5 Air assisted Hydraulic Brake
- 2.6 Vacuum Brake.

(iii) IGNITION & SUSPENSION SYSTEM:

- 3.1 Describe the Battery ignition and Magnet ignition system.
- 3.2 Spark plugs: Purpose, construction and specifications.
- 3.3 State the common ignition troubles and its remedies.
- 3.4 Description of the conventional suspension system for Rear and Front axle.
- 3.5 Description of independent suspension system used in cars (coil spring and tension bars).
- 3.6 Constructional features and working of a telescopic shock absorber.

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(iv) COOLING AND LUBRICATION:

- 4.1 Engine cooling: Need and classification.
- 4.2 Describe defects of cooling and their remedial measures.
- 4.3 Describe the function of lubrication.
- 4.4 Describe the lubrication System of I.C engine.

(v) FUEL SYSTEM:

- 5.1 Describe Air fuel ratio.
- 5.2 Describe Carburetion process for Petrol Engine.
- 5.3 Describe Multipoint fuel injection system for Petrol Engine.
- 5.4 Describe the working principle of fuel injection system for multi cylinder Engine.
- 5.5 Filter for Diesel engine.
- 5.6 Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine.

(vi) ELECTRIC AND HYBRID VEHICLES:

- 6.1 Introduction, Social and Environmental importance of Hybrid and Electric Vehicles.
- 6.2 Description of Electric Vehicles, operational advantages, present performance and applications of Electric Vehicles.
- 6.3 Battery for Electric Vehicles, Battery types and fuel cells.
- 6.4 Hybrid vehicles, Types of Hybrid and Electric Vehicles: Parallel, Series, Parallel and Series configurations.
- 6.5 Drive train.
- 6.6 Solar powered vehicles.



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GENERAL ADMINISTRATION & PUBLIC GRIEVANCE DEPARTMENT

NOTIFICATION

The 26th October, 2022

No. 30207-GAD-FE-OSSC-0013/2022/Gen.- In exercise of the powers conferred by the proviso to Article 309 of the Constitution of India and in supersession of any Rules or Regulation or Orders or Instructions except as respect things done or omitted to be done before such supersession, the Governor of Odisha is pleased to make the following rules to regulate the procedure of recruitment and conditions of service of persons appointed to different posts and services in the State Government, namely:-

1. Short title and commencement.- (1) These rules may be called the Combined Technical Services Recruitment Examination Rules, 2022.

(2) They shall come into force on the date of their publication in the *Odisha Gazette*.

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

- (a) "**Appointing Authority**" means the respective authorities specified in the respective recruitment Rules or Resolutions of different services or posts;
- (b) "**Commission**" means the Odisha Staff Selection Commission;
- (c) "**Examination**" means the Combined Technical Services Recruitment Examination;
- (d) "**Ex-serviceman**" means a person as defined in clause (b) of rule 2 of the Odisha Ex-servicemen (Recruitment to State Civil Services and Posts) Rules, 1985;
- (e) "**Government**" means the Government of Odisha;
- (f) "**Merit List**" means list of successful candidates for each service or post as published and recommended by the Commission;

- (b) have a minimum educational qualification and experience as prescribed in the relevant Recruitment Rule or Government Resolution noted in Column (3) of the Schedule-I;
- (c) have attained the age as prescribed in the relevant Recruitment Rule or Government Resolution as noted in Schedule-I or as notified by Government from time to time;
- (d) be able to speak, read and write Odia and must have,----
 - (i) passed Middle School examination with Odia as a language subject; or
 - (ii) passed Matriculation or equivalent examination with Odia as medium of examination in non - language subject ; or
 - (iii) passed in Odia as language subject in the final examination of Class - VII or above ; or
 - (iv) passed a test in Odia in Middle English School Standard conducted by the Board of Secondary Education, Odisha.

(e) not have more than one spouse living :

Provided that the State Government may, if satisfied that such marriage is permissible under the personal law applicable to such person or there are other grounds for doing so, exempt any person from the operation of this order.

5. **Holding of Examination.-** (a) The concerned Heads of Department or Departments of Government shall intimate each year to the Commission vacancy for Posts or Services mentioned in column (2) of Schedule-I required to be filled up by direct recruitment, also indicating the posts reserved for candidates belonging to the categories of Scheduled Caste, Schedule Tribe, Socially and Educationally Backward Classes, Ex - servicemen , Sportsmen, Women, Persons with Disabilities.
- (b) The Commission shall, on receipt of the vacancy position from the Heads of Department or Department of Government, invite application from eligible candidates. The advertisement for examination shall usually be issued once a year. However, with the approval of Government, Commission can issue another advertisement during a year in public interest and conduct examination.
 - (c) On further receipt of intimation from the Requisitioning Authority, the Commission may increase or decrease the number of vacant posts as and when required, with due intimation to the candidates by notification.

Department or Departments are collated, allotment to particular Heads of Department or Departments will also be made on the basis of merit *cum* preference. A merit list shall also be prepared for each post or service. A Common Merit List shall be prepared for more than one Service or Post, if there is a Common Technical Paper for such Service(s) or Post(s). The names of candidates shall be arranged in the order of merit.

- (c) The Commission shall sponsor exactly the same number of candidates as the total number of vacancies notified with it for each service or post.
 - (d) If enough suitable women candidates are not available, the shortfall can be made up by correspondingly increasing the number of men candidates in that category.
 - (e) In the event of tie in scores of candidates, merit will be decided by applying following criteria, one after another in the given order, till the tie is resolved.
 - (i) Marks in Preliminary examination;
 - (ii) Date of birth, with older candidate placed higher; and
 - (iii) Alphabetical order in which the names of the candidate appear.
 - (f) On acceptance of the list of candidates by the Appointing Authority the same will become the select list for the purpose of appointment of candidates.
 - (g) Appointment of candidates from the select list by Appointing Authority shall be made after re-verification of original certificates of his eligibility for the post. This will include certificates of age, caste or category, educational qualifications, certificates of special categories Certificate of Experience etc.
 - (h) The antecedents of the candidates shall be verified soon after their joining the posts in the respective services. In case of receipt of adverse report of antecedents, the person shall be discharged from the service forthwith.
- 8. Overriding effect.-** These rules shall have overriding effect on all the recruitment rules or resolutions or executive instructions or orders issued by the Administrative Departments governing the method of recruitment procedure.
- 9. Relaxation.-** Where the Government, are satisfied that it is necessary or expedient to do so, it may by order, for reasons to be recorded in writing, relax any of the provisions of this order with respect to any class or category of persons.
- 10. Interpretation.-** If any question arises relating to the interpretations of this order, it shall be referred to Government in the General Administration & Public Grievance for decision.

SCHEDULE -II**Combined Technical Services Recruitment Examination****(a) Indicative Syllabus of Preliminary Written Examination**

- (i) Arithmetic – 10th Standard
- (ii) Data Interpretation (Chart, Graph, Table, Data Sufficiency etc.) – 10th standard
- (iii) Logical Reasoning and Analytical Ability, General Mental Ability.
- (iv) Current Events of National and International Importance.
- (v) Computer or Internet Awareness.

- (b) Syllabus for Technical Paper for all services or posts as mentioned in column (2) of Schedule-I will be decided by the Commission in consultation with the Appointing Authority or Cadre Controlling Authority. If more than one Appointing Authorities are involved, syllabus will be decided by the Commission in consultation with Cadre Controlling Authority. Commission may decide to have a common Technical paper for more than one services or posts. Commission can update or revise the syllabus of Technical Paper in consultation with the Appointing Authority or Cadre Controlling Authority, from time to time.

By Order of the Governor

SURENDRA KUMAR

Principal Secretary to Government