



ODISHA PUBLIC SERVICE COMMISSION
ADVERTISEMENT NO. 04 OF 2020-21

Recruitment to the posts of Asst. Executive Engineer (Civil) in Group- 'A' of Odisha Panchayati Raj Engineering Service under the Panchayati Raj & Drinking Water Department

WEBSITE – <http://opsc.gov.in>

Online applications are invited from the prospective candidates through the Proforma application to be made available on the Website (<http://opsc.gov.in>). The link for registration / re-registration and payment of examination fee shall be available **from 26.08.2020 to 25.09.2020 (Note: 05.10.2020 is the last date for submission of Registered online Application)** for recruitment to 210 (Two hundred ten) posts of Assistant Executive Engineer (Civil), under Panchayati Raj & Drinking Water Department in Group - A of Odisha Panchayati Raj Engineering Service, 2017 carrying the scale of pay in level 12 of pay matrix provided under Rule - 3 of ORSP Rules, 2017 corresponding to pre-revised scale of Pay Band – 3 (Rs. 15,600-Rs.39,100/-) carrying Grade Pay of Rs. 5,400/- with usual dearness and other allowances as may be sanctioned by the Government of Odisha from time to time.

2. **Vacancy Position:** As per requisition filed by the Panchayati Raj & Drinking Water Department of Government of Odisha, the vacancy positions are given below:

Sl. No.	Category	No of Vacancies
1	2	3
1	UR	105 (35-w)
2	SEBC	24 (08-w)
3	SC	34 (11-w)
4	ST	47 (16-w)
Total		210 (70-w)

Out of the total 210 number of vacancies mentioned above, the reservation of vacancies in respect of Sports Person and Persons with Disabilities (having not less than 40% permanent disability) are given below. Candidates belonging to PWD and Sports Persons shall be adjusted against the categories to which they belong.

Sl. No.	Sub-Category	No. of Posts
1	2	3
(i)	Sports Person	02 (01-w)
(ii)	Persons with Disabilities	08 (03-w)
	(a) Blindness or Low Vision	02 (01-w)
	(b) Deaf & Hard of Hearing	02 (01-w)
	(c) Locomotors disability including cerebral palsy, leprosy cured dwarfism, acid attack victims and muscular dystrophy.	02 (01-w)
	(d) Autism, Intellectual disability, specific learning disability and mental illness, Multiple disabilities from amongst persons under Clause (a) to (d) including deaf-blindness in the posts identified for each disabilities.	02

(Contd...)

As per G.A. Department Resolution No. 33044 dated 11.12.2014 published in the Odisha Gazette on 15.12.2014 the Government have extended the benefit of reservation for Sports persons enumerated in G.A. Department Resolution No. 24808 dated 18.11.1985 in case of direct recruitment to Group A (JB) services / posts.

NOTE :- The Physical requirement and Functional Classification for the above posts, as specified in G.A. Department Resolution No. 34450 dated 03.12.2013, No.37181 dated 26.12.2013, Letter No. 11819 dated 30.4.2013 and SSEPD Department Letter No.7140 dated 05.9.2017 for the candidates belonging to Persons with Disabilities are mentioned below:-

Name of the Post	Physical Requirements	Categories of disabled suitable for the job
Assistant Executive Engineer (Civil) Panchayati Raj & Drinking Water Dept.	S, ST, BN, W, SE, RW, H, C Note:- {S- work performed by sitting (on bench or chair), ST-work performed by standing, BN-work performed by bending, W- work performed by walking, SE- work performed by seeing, RW- work performed by reading and writing, H- work performed by hearing/speaking, C- work performed by communication}	[HI, OA, OL, BL (MNR)] Note:- {HI-Partially deaf (with suitable aid), OA- one arm affected (R or L)- (a) impaired reach; (b) weakness of grip; (c) ataxia, OL- one leg affected (R and/or L), BL- both legs affected but not arms (Mobility not be restricted)}

- N.B.- (1) Out of 4% (four percent) reservation for Persons with Disabilities, 1% (one percent) reservation shall be for women with disabilities.
(2) One-third (0.33%) of the posts reserved for Sports Persons shall be for women Sports Persons.

NOTE:

- The probation period of the above post is two years.
- In the event of non-availability or availability of insufficient number of eligible women candidate(s) belonging to any particular category, the remaining vacancies will be filled up by male candidate(s) of that category.
- Exchange of reservation between Scheduled Caste and Scheduled Tribe will not be considered in the event of non-availability of eligible and suitable S.C./S.T. candidates.
- The number of vacancy to be filled up on the basis of this recruitment is subject to change by Government without notice, depending upon the exigencies of public service at the discretion of the State Government.
- Candidates belonging PWD category and Sports Persons shall be adjusted against the categories to which they belong.

3. EDUCATIONAL QUALIFICATION: A candidate must have possessed a Degree in Engineering (Civil) from any University or Institution recognized by the Government or he/she must be an Associated Member of the Institution of Engineers of India.

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4. **AGE:** A candidate must have attained the age of 21 (twenty one) years and must not be above the age of 32 (thirty two) years on the 1st day of January 2020 i.e. he/she must have been born not earlier than 2nd January 1988 and not later than 1st January 1999. Age relaxation for candidates in different categories for availing relaxation and reservation benefits will be as per Government Rules prescribed for the purpose. The upper age limit is relax-able by 5 (five) years for candidates belonging to the categories of Scheduled Castes (S.C.), Scheduled Tribes (S.T.), Socially & Educationally Backward Classes (S.E.B.C.), Women, and by 10 (ten) years for candidates belonging to PWD category, whose permanent disability is 40% and more. As per G.A Department Notification No. 17376/GAD-SC-Rules-008/2016/Gen, dated 10.8.2016 the Persons with Disabilities shall be entitled to cumulative age relaxation of 10 years over and above the normal age relaxation.

Provided that a candidate who comes under more than one category mentioned above he/she will be eligible for only one age relaxation benefit.

SAVE AS PROVIDED ABOVE THE AGE LIMITS PRESCRIBED CAN IN NO CASE BE RELAXED.

Date of birth entered in the High School Certificate or equivalent certificate issued by the concerned Board/Council will only be accepted by the Commission.

5. **EXAMINATION FEE:** A candidate is required to pay a non-refundable and non-adjustable fees of Rs. 500/- (Rupees five hundred) only. Candidates belonging to Scheduled Caste/ Scheduled Tribe of Odisha only and Persons with disability (whose permanent disability is 40% and more) are exempted from payment of this fees.

The candidates are required to make Online payment of applicable Examination Fee(s) through OPSC portal using Debit Card/Credit Card /Net Banking facilities and other financial instruments enlisted in the Payment Page/Gateway of the Odisha Government Treasury Portal. The fee(s) paid shall neither be refunded under any circumstances nor can be adjusted or held in reserve for any other examination or recruitment.

6. **METHOD OF SELECTION:** The selection of candidates for recruitment to the above posts shall be made on the basis of **Written Test & Viva Voce test**. The written test shall comprise of **Preliminary & Main written examination (objective type test) and viva voce test**.

- (A) Competitive examination shall comprise as follows:-
- (i) The Preliminary examination shall be of one paper of 100 questions carrying 100 marks with duration of one and half hours with objective type questions of multiple choice with negative marking of 0.25 for every wrong answer allotted to that particular question.
 - (ii) The Main Examination consisting of the following two papers of 150 questions each & having 300 marks with duration of two & half hours each with objective type questions of multiple choice with negative marking of 0.5 for every wrong answer allotted to that particular question.
 - (a) General Studies including Basic Sciences and General Awareness / Knowledge. – 300 marks
 - (b) Specialized paper relating to the stream of Civil Engineering – 300 marks

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(iii) Viva Voce test shall be of 75 marks

(B) The broad outlines of the syllabi for the above said examinations are annexed at the **Annexure - A & Annexure – B.**

(C) The qualifying marks in the Preliminary Examination shall be fixed by the Commission. The candidates who qualify in the preliminary examination shall be called for to appear the main examination.

(D) The candidates who secure minimum qualifying marks in the main examination fixed by the Commission shall be called for to appear the viva voce test.

(E) The Commission shall prepare a list of selected candidates arranged in order of merit equal to the number of advertised vacancies on the basis of the marks secured in the main examination and viva voce test.

7. PLACE OF EXAMINATION

The written examination will be held at Cuttack. It may also be held at Bhubaneswar, Balasore, Berhampur and Sambalpur depending on the number of candidates applied for from the respective zones as decided by the Commission.

The candidates are to mention their choice of examination zone at appropriate place in the online application form.

8. OTHER ELIGIBILITY CONDITIONS:

- (i) The candidate must be a citizen of India;
- (ii) The candidate must be of (a) good moral character, and (b) good mental condition and bodily health, good physique and active habits and free from organic defects or bodily infirmity so as not to create an impairment in the due discharge of duties;
- (iii) The candidate must have Knowledge in Odia: He / She must be able to read, write and speak and must have:-
 - (a) Passed Middle School Examination with Odia as a Language subject; or
 - (b) Passed Matriculation or equivalent Examination with Odia as medium of examination in non- language subject; or
 - (c) Passed in Odia as language subject in the final examination of Class-VII or above from a School or Educational Institution recognized by the Government of Odisha or the Central Government; or
 - (d) Passed a test in Odia in Middle English School Standard conducted by the School and Mass Education Department/Board of Secondary Education, Odisha
- (iv) A candidate, who has more than one spouse living, will not be eligible for appointment unless the State Government has exempted his/her case from operation of this limitation for any good and sufficient reasons;

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- (v) Government servants, whether temporary or permanent, are eligible to apply provided that they possess the requisite qualification and are within the prescribed age-limit as provided under Para 3 & 4 of the Advertisement. They must inform their respective Heads of Offices/Departments in writing regarding submission of their applications for this recruitment and obtain **"No Objection Certificate"**;
- (vi) If a candidate has at any time, been debarred for a certain period/chance(s) by the Odisha Public Service Commission or other State Public Service Commission or U.P.S.C. from appearing at any examination / viva voce test, he/she will not be eligible for such recruitment for that specified period / chance(s);
- (vii) **Only those candidates, who possess the requisite qualifications, are within the prescribed age limit and fulfill other eligibility conditions etc. by the closing date for submission of online application form, will be considered eligible;**
- (viii) A candidate who claims change in his/her name after having passed the H.S.C. examination, is required to furnish copy of publication of the changed name in the local leading daily news paper as well as copy of notification in the Odisha Gazette in support of his/her change of name.
- (ix) Every candidate selected for appointment shall be examined by the Medical Board. A candidate, who does not satisfy the requirement after medical examination, shall not be appointed;

9. **IMPORTANT POINTS:**

- (i) The provisions of the Odisha Conduct of Examination Act, 1988 (Odisha Act-2 of 1988) are applicable to the examination conducted by the Odisha Public Service Commission.
- (ii) A candidate found guilty of seeking support for his/her candidature by offering illegal gratification or applying pressure on any person connected with the conduct of the recruitment process or found indulging in any type of malpractice in course of the selection or otherwise, shall, in addition to rendering himself/herself liable to criminal prosecution, be disqualified not only for the recruitment for which he/she is a candidate, but also may be debarred, either permanently or for a specified period, from any recruitment or selection to be conducted by the Commission;
- (iii) **Online applications submitted to OPSC if found to be incomplete in any respect, are liable for rejection without entertaining any correspondence with the applicants on that score;**
- (iv) This advertisement should not be construed as binding on the Government to make appointment;
- (v) Concessions meant for **S.C., S.T. & SEBC by Birth** are admissible to the Scheduled Caste, Scheduled Tribe and Socially & Educationally Backward Classes of candidates of **the State of Odisha only;**

(Contd...)

- (vi) All persons appointed under the Government of Odisha on or after 1st January, 2005 shall not be eligible for pension as defined under sub-rule(1) of Rule-3 of the Odisha Civil Service (Pension) Rules, 1992; but shall be covered by the new structured defined Contribution Pension Scheme in accordance with the Odisha Civil Services (Pension) Amendment Rules, 2005;
- (vii) **Any misrepresentation or suppression of information by the candidate in the online application will result in cancellation of his/her candidature or penalty be imposed on the candidate as decided by the Commission;**
- (viii) Mere empanelment in the select list shall not confer any right for appointment unless the Government is satisfied after making such enquiry as may be deemed necessary that the candidate is suitable in all respects for appointment to the service.

10. CERTIFICATES / DOCUMENTS TO BE ATTACHED:

Only those candidates, who are called for the Viva Voce test, will be required to submit the printout / hard copy of online applications, true copies of the following certificates / documents, mark sheets etc. along with original of the same for verification on the date fixed by the Commission. The candidates are required to mention on the copy of each document "Submitted by me" and put their full signature & date on the same.

If a candidate fails to produce any of the original documents in respect of the attested copies submitted with the application form for verification **on the date of verification fixed by the Commission**, he/she shall not be allowed to appear at the viva voce test and his/her candidature will be rejected.

- (i) H.S.C. or equivalent certificate in support of declaration of age issued by the concerned Board/Council.
- (ii) Intermediate / +2 Sc. Pass Certificate issued by the concerned University/Council;
- (iii) Degree (i.e. Engineering in Civil) pass certificate issued by the recognized University or AMIE of India;
- (iv) Mark-lists of all semesters / annual examinations in support of Degree (Engineering in Civil) passed including fail marks, if any, issued by the concerned Board/Council/University;

NOTE 1: (a) Candidates who have not been awarded percentage of marks, but only "grade marks", should, along with their applications, produce the Conversion Certificate from the concerned University indicating the actual equivalent percentage of marks and the conversion formula, failing which, their applications are liable to be rejected.

(b) While filling up the relevant box of the online application form, the candidate has to mention the marks secured (excepting marks secured in the Extra Optional/4th Optional Subject) in each examination passed (i.e. H.S.C. to Degree).

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- (v) The candidates must take utmost care in filling up the marks secured and maximum marks for each year. Any mistake in filling up the marks will be at the risk of the candidates.
- (vi) A "No Objection Certificate" from the Head of Office / Head of the Department in case of Government Servant.
- (vii) Two recent passport size photographs (unsigned and unattested) with the printout / hard copy of online application form which has been uploaded.
- (viii) Certificates of character and conduct from the Principal/Proctor/Dean or Professor in charge of teaching department of the College or University in which he/she last studied;
- (ix) **Caste Certificate by birth in support of claim as SC / ST / SEBC, wherever applicable;**
- (x) Challan / Document regarding payment of examination fees.

NOTE 2: Candidates claiming to be belonging to S.Ts. /S.Cs./ S.E.B.Cs Category by birth are required to submit copy of the relevant Caste Certificate as mentioned in their online application form and issued by the competent authority in the prescribed form. Candidates of SEBC category (other than Creamy Layer) must submit copy of Caste Certificate issued by the competent authority within the last three years by the closing date for submission of online application form in the prescribed form. The SEBC certificate which is more than three years old by the closing date of submission of online application form is liable for rejection.

- (i) Women candidates belonging to S.C. /S.T. /S.E.B.C Categories are required to submit Caste Certificates by birth showing "daughter of". Caste Certificates by virtue of marriage (i.e. showing "wife of") are not acceptable and liable for rejection.
- (ii) **O.B.C. CERTIFICATES WILL NOT BE ACCEPTED IN LIEU OF S.E.B.C. CERTIFICATES AND CANDIDATES SUBMITTING OBC CERTIFICATES ARE LIABLE FOR REJECTION.**
- (iii) **CANDIDATE WHO SUBMITS S.E.B.C CERTIFICATE WHICH IS MORE THAN THREE YEARS OLD BY THE CLOSING DATE FOR SUBMISSION OF ONLINE APPLICATION FORM ARE LIABLE FOR REJECTION.**
- (iv) Community (Caste status) once mentioned by the candidates shall not be changed under any Circumstances.

The competent authorities to issue caste certificates are: - District Magistrate/ Collector or Additional District Magistrate or Sub-divisional Magistrate/Sub-Collectors or Executive Magistrates or Revenue Officers, not below the rank of Tahasildar /Additional Tahasildar of Government of Odisha;

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- (xi) Required Odia Pass Certificate from the Board of Secondary Education, Odisha indicating Odia as a language subject equivalent to M.E. School Standard or a certificate from the Principal/Headmaster of the recognized school indicating that the candidate has passed Odia up to M.E. standard; if not passed Odia as a subject in the High School certificate examination or equivalent examination;
- (xii) Disability Certificate (indicating percentage of disability) issued by the concerned Medical Board, wherever applicable;
- (xiii) If a candidate claims to possess qualification, equivalent to the prescribed qualification, the rule/authority (with number and date) under which it is so treated, must be furnished with the print out/hardcopy of online application form.
- (xiv) Candidates claimed to be Sports persons are required to submit Identity Card issued by the Director of Sports, Odisha, wherever applicable;

NOTE 3: Degree Certificate, Caste Certificate, Odia Test Pass Certificate and Disability certificate of Physically Handicapped Persons must have been issued by the competent authority within the last date fixed for receipt of application form as indicated above.

II. "GROUNDS OF REJECTION OF APPLICATIONS"

Applications of the candidates will be rejected by the Commission on any of the following grounds:-

- (a) **In complete online application form.**
- (b) **Declaration not signed (full signature) by the candidate in the hard copy of online application form.**
- (c) Age limit of candidate not coming under Para - 4 of the Advertisement (Overage relaxation shall not be allowed to PWD candidates having 40% or more permanent disability).
- (d) No required educational qualification as provided under para-3 of the advertisement.
- (e) Not furnished copies of certificates/documents etc. as provided under Para - 10 of the advertisement.
- (f) Odia test (M.E. standard) not passed/Odia test pass evidence not furnished as required under para-8 (iii) of the advertisement (**certificate/document showing Odia/Studied Odia/learned Odia/ taken Odia will not be accepted**).
- (g) Submission of wrong information /false information about qualification/ age/Odia test pass evidence/category status (SC/ST //PWD/Woman etc).
- (h) Suppression of facts/ information about eligibility, if any.
- (i) Any other grounds as per decision of the Commission.
- (j) Application submitted by the candidate to OPSC, if found to be incomplete in any respect and at any stage.
- (k) If a candidate fails to furnish any of the original certificates and documents for verification on the date fixed by the Commission.
- (l) Application received through any other mode (except online through the proforma application to be made available on the **WEBSITE of OPSC**)
- (m) Non-payment of examination fees; wherever applicable as prescribed under Para 5 of the advertisement.

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- (ii) The candidates rejected on the ground of non-payment of fees may inform to the office of the Commission within 07 days from date of rejection notice published, failing which his/her case will not be entertained.

N.B:- APPLICATION / CANDIDATURE OF A CANDIDATE SHALL BE REJECTED AT ANY STAGE OF RECRUITMENT PROCESS, WHEN DISCREPANCY IS NOTICED / DETECTED.

12. HOW TO APPLY:

- (a) Candidates must go through the details of this Advertisement available in the Website of OPSC before filling up online application form.
- (b) Candidates must apply online through the concerned Website of the OPSC <http://opsc.gov.in>. Applications received through any other mode would not be accepted and summarily rejected.
- (c) **Before filling up the online application form, the candidates must go through the following documents available at OPSC portal.**
- (i) Instructions to fill up online application.**
- (d) Candidates are requested to upload the scanned image of latest passport size photograph along with scanned image of his/her full signature and scanned image of Left hand Thumb Impression(LTI) in the online application form. Uploaded photograph, Specimen (full) signature and LTI must be clearly identifiable / visible, otherwise the application of the candidate is liable to be rejected by the Commission and no representation from the candidate will be entertained.
- (e) Candidates should keep at least two copies of latest passport size photograph which is uploaded to the online application form for future use.
- (f) *On successful submission of the online Registration, an unique "Permanent Public Service Account Number (PPSAN)" will be assigned to the applicant. Applicants are required to take printout of the finally submitted online Registration/Re-registration and Application forms for submission to OPSC with ink signed signature and along with copies of requisite certificate & documents.*
- (g) The candidates are advised to submit the Online Application Form well in advance without waiting for the closing date to avoid last hour rush.
- (h) *Admission Letter for the eligible candidates to appear in the Examination shall be uploaded in the Website of the OPSC prior to the date of examination which will be published in the Website and Newspapers. The candidates are required to download their Admission Letter from the Website of the Commission and produce the same at the Examination centre for admission to the examination. No separate correspondence will be made on this score.*

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- (i) Any complaint on the conduct of examination must be sent to the Grievance Wing of the Commission by e-Mail (opsc@nic.in) within 05 (Five) days of completion of the examination.

13. FACILITATION COUNTER :-

To resolve any Technical problem faced in filling up of online Registration/ Re-registration and Application forms, candidate may contact OPSC Technical Support over Telephone between 10.30 A.M. to 1.30 P.M. & 2.00 P.M. to 5.00 P.M. on any Odisha Government working days.

In case of any guidance/information on this advertisement & recruitment, candidates may go through the **FAQ** available in the website of the Commission or contact the O.P.S.C. Facilitation Counter over Telephone No. 0671-2304141/2305611 & Extn.- 227 on any working day between 10.30 A.M. to 1.30 P.M. & 2.00 P.M. to 5.00 P.M.

The candidates are required to visit the website of the Commission at <http://www.opsc.gov.in> for detail information about important notice, rejection of application, the date & time of Interview and also keep track of publication of various notices to the effect in the leading local daily newspapers for information.

Closing Dates

(A) ONLINE REGISTRATION/RE-REGISTRATION AND ONLINE PAYMENT OF EXAMINATION FEES SHALL BE AVAILABLE IN THE WEBSITE FROM 26.08.2020 TO TILL 25.09.2020 (11:59 P.M).

(B) SUBMISSION OF ONLINE REGISTERED APPLICATIONS CAN BE DONE IN THE WEBSITE FROM 26.08.2020 TO TILL 05.10.2020 (11.59 P.M).

NB: - THE ONLINE APPLICATION FORMS IF FOUND DEFECTIVE IN ANY RESPECT, ARE LIABLE TO BE SUMMARILY REJECTED.

CUTTACK
DATE : 17.08.2020


SECRETARY
ODISHA PUBLIC SERVICE COMMISSION,
CUTTACK.

Annexure – A

Syllabus of Preliminary Examination

For recruitment to the Odisha Panchayati Raj Engineering Service.

Distribution of marks

1. Engineering Mechanics-	10
2. Strength of materials-	10
3. Structural Analysis-	10
4. Concrete Structure -	10
5. Steel Structure -	10
6. Solid Mechanics -	10
7. Fluid Mechanics -	10
8. Irrigation -	10
9. Transportation Engineering -	10
10. Survey -	10

Total -	100

The questions shall be of objective type of MCQ consisting 100 nos. of questions carrying 01 mark each with negative marking of 25% for every wrong answer allotted to that particular question with duration of one & half hour.

Annexure – B

Syllabus of Main written examination

For recruitment to the Odisha Panchayati Raj Engineering Service.

Distribution of marks

Paper – I - General Studies - 300 marks

Part – I - General Science – 200 marks

1. Physics	- 20
2. Chemistry	- 20
3. Biology	- 20
4. Information Technology	- 20
5. Nuclear Science	- 20
6. Computer Technology	- 20
7. Defence Technology	- 20
8. Space Technology	- 20
9. Geology	- 20
10. Agriculture	- 20

Total - 200

Part – II - General Awareness / Knowledge - 100 marks

(a) History of Modern India and Indian Culture – 20 marks

(1) The History of Modern India will cover the following :

- History of India since 1857
- Important personalities who shaped the Freedom Movements in Odisha and India.
- Social Reform Movements.

(2) Indian culture will cover the following :- **- 20 marks**

- Indian Culture from ancient times to modern times.
- Temple architecture of Odisha
- Socio-cultural developments in Odisha

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(b) Geography of India will cover the following :-

- 20 marks

- Physical, economic and social geography of India
- Odisha's Physiography and Drainage system
- Odisha's Natural Resources – Water, forest and minerals, climates, Natural Calamity (Flood, Tsunami, Super Cyclone, Global warming etc.)

(c) Indian Polity will include the following :-

- 20 marks

- Constitution of India
- Political system of India
- Government and politics in Odisha
- Panchayat Raj Institutions (PRIs) in Odisha.

(d) **India and the World :**

- 10 marks

This part is intended to test candidate's awareness of India's relationship with the world in various spheres, such as the following;

1. Foreign Affairs
2. External security and related matters
3. Nuclear policy
4. Indians abroad

(e) **Indian Economy :**

- 10 marks

1. This part will include the following;

- I. Planning, economic development, economic reforms and development of the Corporate Sector in India.
- II. Economic and Trade issues
- III. Role and functions of IMF, World Bank and WTO V Reserve Bank of India – its role and functions.
- IV. Odishan Economy : Development during the post Reform Period.

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The questions shall be objective type (MCQ) carrying 2 mark each and with negative marking of 0.5 for every wrong answer allotted to that particular question with duration of two hours. Part - I will have 100 questions and Part - II will have 50 questions.

Paper -II - Specialized Paper (Civil Engineering) - 300 marks

1. **SOLID MECHANICS:-** Elastic constants, plane stress, plane strain, Mohr's circle, combined stress; Elastic theories of failure; Simple bending, Shear; Torsion of circular and rectangular sections and simple members. Bending Moment and Shear Force in statically determinate beams.
2. **STRUCTURAL ANALYSIS:-** Analysis of determinate structures - different methods including graphical methods. Analysis of indeterminate skeletal frames - moment distribution, slope deflection, stiffness and force methods, energy methods, Muller-Breslau principle and application. Plastic analysis of indeterminate beams and simple frames - shape factors. Basic concepts of matrix method of structural analysis
3. **DESIGN OF CONCRETE STRUCTURES:-** Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Principles of prestressed concrete design, materials, methods of prestressing, losses. Design of simple members.
4. **DESIGN OF STEEL STRUCTURES (Based on Limit State Method):-** Analysis and design of tension and compression members, Column bases, Connections- simple and eccentric beam-column connections. Plate girders and trusses.
5. **BUILDING MATERIALS AND BUILDING CONSTRUCTION:-**
 - (a) **Building Materials:-** **Cement:** Components, different types, setting times, strength. **Cement Mortar:** Ingredients, proportions, water demand, mortars for plastering and masonry.
Concrete: Importance of W/C Ratio, Strength, ingredients including admixtures, workability, testing for strength, non-destructive testing, mix design methods.
Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry.
 - (b) **Building Construction:-** Types of Foundations, Brick masonry, Stone masonry, Floorings, Causes and prevention of cracks in buildings, Damp proofing, Special maintenance of buildings.
6. **ESTIMATION, CONSTRUCTION PLANNING AND MANAGEMENT:-** Preliminary estimate, Detailed estimate, Specifications and cost analysis. Bar chart, Linked bar chart, Work-breakdown structures, Activity-on - arrow diagrams, critical path, probabilistic activity durations, Event-based networks, PERT networks: Time-cost study, Resource allocation.

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7. WATER RESOURCES AND HYDRAULIC ENGINEERING:-

(a) Irrigation Engineering:- Consumptive use of water, irrigation systems, water demand assessment; Storages and their yields, ground water and well hydraulics; Waterlogging, drainage design; Design of rigid boundary canals, Lacey's and Tractive force concepts in canal design, lining of canals; Sediment transport in canals; Forces acting on gravity dams and their design, Design of headworks, distribution works, falls, Cross-drainage works, outlets; River training

(b) Hydrology:- Hydrological cycle, precipitation and related data analyses, Probable maximum precipitation, unit hydrograph and synthetic unit hydrographs; Evaporation and transpiration; Floods and their management, Design Flood, Streams and their gauging; Routing of floods; Capacity of Reservoirs.

(c) Fluid Mechanics:- Fluid Properties, Pressure, Thrust, Buoyancy; Flow Kinematics; Integration of flow equations; Flow measurement; Relative motion; Moment of momentum; Viscosity, Boundary layer and Control, Dimensional Analysis, Flow development, losses in pipe flows, Pipe networks, Flow measuring equipment and structures.

(d) Open Channel Flow:- Momentum and Energy principles in Open channel flow, Types of flow, Flow sections and properties; Normal flow, Gradually varied flow, Hydraulic jump.

8. ENVIRONMENTAL ENGINEERING

(a) Water Supply Engineering:- Sources of supply, design of intakes, Estimation of demand; Water quality standards; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance of treatment units; distribution systems of treated water, leakages and control; Institutional and industrial water supply.

(b) Waste Water Engineering:- Urban rain water disposal; Quantity and characteristics of waste water, Collection of waste water, Primary, Secondary and tertiary treatment of waste water, Sludge disposal, effluent discharge standards, Institutional and industrial sewage management.

(c) Solid Waste Management:- Characteristics, Generation, Collection and Transportation, Engineered systems of solid waste management (reuse, recycle, recovery, treatment and disposal). Design and Management of landfills.

(d) Air and Noise Pollution:- Air pollution: sources and impacts, air pollution controls, standards and limits. Noise pollution- impacts of noise, permissible limits, measurements and control of noise pollution.

9. GEOTECHNICAL ENGINEERING:-

(a) Soil Mechanics:- Fundamental definitions and interrelationships; Properties and Classification of soils, Permeability and seepage, Effective stress principles, Shear strength, Consolidation, Compaction, stress distribution in soils.

Contd.....

(b) Foundation Engineering:- Types of foundations, Foundation design requirements, Shallow foundations - bearing capacity, settlement analysis in sands and clays, Deep foundations- pile types, dynamic and static formulae, load carrying capacity of piles in sands and clays, group action, negative skin friction, Earth pressure theories, effect of water table, layered soils, Stability of slopes, Sub-surface investigations- scope, drilling bore holes, sampling, penetration tests, plate load tests, geophysical tests.

10. TRANSPORTATION ENGINEERING:-

(a) Highway Engineering:- Geometric design of highways, Testing and specifications of paving materials, design of flexible and rigid pavements

(b) Traffic Engineering:- Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity.

11. SURVEYING:- Principles and classification of surveys, mapping concepts, Coordinate systems, Measurement of distance and directions, Leveling, Theodolite traversing, Contours, Plane table surveying, Errors and adjustments, Curves, Total station, Concept of Global Positioning System; Photogrammetry and Remote Sensing concepts.

Distribution of marks

1. Solid Mechanics	- 30
2. Structural Analysis	- 30
3. Design of Concrete Structure	- 30
4. Design of Steel Structure	- 30
5. Building Materials & Building Construction	- 30
6. Estimation, Construction Planning & Management	- 30
7. Water Resources & Hydraulic Engineering	- 30
8. Environmental Engineering	- 30
9. Geotechnical Engineering	- 30
10. Transportation Engineering	- 20
11. Surveying	- 10

Total -

300

The number of questions shall be 150 of objective type (MCQ) carrying 2 marks each and with negative marking of 0.5 for every wrong answer allotted to that particular question with duration of two hours.
