The Tripura Engineering Service Rules, 1987

(As Amended upto 7th Amendment, dated 10-06-2014)

(14)

GOVERNMENT OF TRIPURA
GENERAL ADMINISTRATION (P&T) DEPARTMENT

No.F. 6(14)-PWD(E)/83/ Dated Agartala the 23rd April, 2007

MEMORANDUM

The Tripura Engineering Services Rules, 1987 have been amended by the Tripura Engineering Service (3rd Amendment) Rules, 2007 vide Notification No.F.20(4)/GA(P&T)/2005 dated 19th March, 2007 of this Department. A copy of the Tripura Engineering Service Rules, 2007, as compiled upto 5th April, 2007 is enclosed.

23/4/07
(A Debnath)
Under Secretary to the
Government of Tripura

Enclo : As stated

Copy with enclosure to:

1. The Chief Secretary, Tripura.
2. Principal Secretary to the Govt. of Tripura, Power Department
3. Commissioner & Secretary to the Govt. of Tripura, RD Department.
4. Commissioner & Secretary to the Govt. of Tripura, Agriculture Department
5. The Commissioner & Secretary to the Govt. of Tripura, Public Works Department
6. Law Department, Government of Tripura.
7. Secretary, Tripura Public Service Commission.
8. Chief Engineer, PWD, Govt. of Tripura

23/4/07
(A Debnath)
Under Secretary to the
Government of Tripura

Record file's Copy

(13)

GOVERNMENT OF TRIPURA

GENERAL ADMINISTRATION (PERSONNEL & TRAINING) DEPARTMENT

THE TRIPURA ENGINEERING SERVICE RULES, 1987

(AS COMPILED UPTO 5TH APRIL, 2007)

(12)

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(11)

TRIPURA ENGINEERING SERVICE RULES, 1987

(As compiled upto 5th April, 2007)

Extra-ordinary issue of the Tripura Gazette

Agartala, Wednesday, March 11, 1987 A.D.
Phalguna 20,1908 S.E.

GOVERNMENT OF TRIPURA
PUBLIC WORKS DEPARTMENT

No.F.6(14)-PWD(E)/83 Dated Agartala, the 5th March,1987

NOTIFICATION

In exercise of the powers conferred by the proviso to Article 309 of the Constitution of India and all other powers enabling him in this behalf the Governor, in consultation with the Public Service Commission, makes the following rules further to amend the Tripura Engineering Service Rules, 1987, namely –

PART-I
[GENERAL]*

1. **Short title & Commencement** –

(a) These rules may be called the Tripura Engineering Service Rules, 1987.

[(b) They shall apply to the Engineers of the following Wings of the Public Works Department, Government of Tripura :-

(i) Roads & Buildings Wing;

(ii) Water Resources Wing;

(iii) Public Health Engineering Wing; and

(iv)* any other Wing or Wings or unit or units which are placed or may be placed under the Public Works Department from time to time.]*

(c) They come into force on and from the date of their publication in the official gazette.

Note - * Substituted by the TES (3rd Amendment) Rules, 2007

2. **Definition**

In these rules, unless the context otherwise requires :-

(a) "Commission" means Tripura Public Service Commission.

[(b) 'Duty post' means any post specified in the **Schedule** appended to these rules and includes a temporary post carrying the same designation as any of the post specified in the schedule and the scale of pay of which is identical to that attached to any Grade of the Service.]*

(c) "Government" means the Government of Tripura.

[(d) "Member of the Service" means a person appointed in a substantive capacity to any Grade of the Service and includes a person appointed on probation.]*

(e) "Schedule" means the Schedule [appended]** to these Rules.

(f) "Service" means Tripura Engineering Service.

PART-II
[CONSTITUION OF THE SERVICE, ITS CLASSIFICATION AND AUTHORIZED STRENGTH]#

[3. **Constitution of the Service and its classification**

(1) There shall be constituted a State Civil Service to be known as the Tripura Engineering Service.

(2) The Service shall have the following 7(seven) Grades, namely -

(i) Grade-I (A) -- Group-A, gazetted
(ii) Grade-I(B) -- Group-A, gazetted
(iii) Grade-II -- Group-A, gazetted
(iv) Grade III - Group –A gazetted
(v) Grade IV - Group-A, gazetted
(vi) Grade-V(A) - Group-B, Non-gazetted; and
(vii) Grade-V(B) -- Group C, Non-gazetted.

Note:- 1.* Inserted by the TES (3rd Amendment) Rules, 2007
2.** Substituted for "attached" by the amendment ibid.
3.# Substituted by the amendment ibid.

4. **Strength of the Service**

(1) The authorized permanent strength of the service and the duty posts included therein shall be as specified in the **Schedule** to these rules.

(2) The Government may, by order, create duty posts for such period as may be specified therein.

(3) Distribution of posts of Grade-V between Grade V(A) and V(B) shall be 70:30.

(4) Distribution of posts between Degree Holder and Diploma Holder in Grade - V(Grade –V(A) and Grade –V(B) together) shall be 50:50.]#

PART-III
[METHODS OF RECRUITMENT]

[5. Appointment to the service shall be made by the following methods, namely -

(1) Direct recruitment

(a) 20% of the posts in the authorized permanent strength of Grade-IV of the service shall be filled by direct recruitment from **candidates who have at least a degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification** and **at least** 3 years' experience of service under the Government or a Government Undertaking or a registered Public Sector Unit in the manner as specified in PART-IV of these rules;

Provided that the candidates having a Post-Graduate Degree in engineering shall be given preference.

(b) 71% of the posts in the authorized permanent strength of Grade-V(A) of the service shall be filled by direct recruitment from candidates who have at least a degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification in the manner as specified in PART-IV of these rules.

(c) All the posts in the authorized permanent strength of Grade-V(B) of the service shall be filled by direct recruitment only from candidates who have a diploma in an appropriate branch of engineering or its equivalent academic qualification from a recognized Institution in the manner as

Note:- (1) # Substituted by the TES (3rd Amendment) Rules, 2007

specified in Part-II of these rules.

(2) **Recruitment by selection**

The remaining substantive vacancies in the permanent strength of various Grades of the Service shall be filled by selection in the manner as specified in PART-V of these rules.

Provided that —

(a) 70% of the posts in Grade-III of the service shall be filled by Degree-holder engineers and the remaining 30% by Diploma-holder engineers;

(b) 40% of the posts in Grade-IV of the service shall be filled by Degree holder engineers of Grade-V(A) and the remaining 40% of the posts in Grade-IV of the service shall be filled by Diploma holder engineers of Grade-V(A);

(c) 29% of the posts in Grad-V(A) of the service shall be filled by Diploma holder engineers of Grade-V(B).]*

PART-IV
[DIRECT RECRUITMENT]*

[6. Selection to be made by the Commission

Selection of candidates for direct recruitment to the Service shall be made by the Commission.

7. Competitive Examination

A competitive examination for direct recruitment to the Service shall be held at such intervals as the Government may, in consultation with the Commission from time to time determine. The dates on which and the place at which the examination shall be held shall be fixed by the Commission.]*

[8. Admission to competitive examination

The qualification for admission to the examination and the conduct thereof shall

Note:- * Substituted by the TES (3rd Amendment) Rules, 2007.

be in accordance with such regulations as the Government may, from time to time, issue in this behalf in consultation with the Commission.

9. **Decision of the Commission to be final**

The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the examination shall be final and no candidate to whom a certificate of admission has not been issued by the Commission shall be admitted to the examination.

10. **Commission to forward a list in order of merit**

The Commission shall forward to the Government a list arranged in order of merit of the candidates who have qualified by such standard as the Commission may determine and of the candidates belonging to the Scheduled Castes and the Scheduled Tribes who, though not qualified by that standard, are declared by the Commission to be suitable for appointment to the Service with due regard to the maintenance of efficiency in administration.

11. **Inclusion in the list not to confer right to appointment**

The inclusion of a candidate's name in the list referred to in rule-10 above confers no right to appointment unless the Government is satisfied, after such inquiry as it may consider necessary, that the candidate is suitable in all respects for appointment to the Service and an actual offer of appointment is made.

12. **Physical fitness**

No candidate shall be appointed to the Service unless he is declared, after such medical examination as the Government may prescribe, to be in good mental and bodily health and free from such mental or physical defect which is likely to interfere with the discharge of the duties of the Service.

13. **Appointment of candidates included in the list**

Subject to the provision of these rules the candidates will be considered for appointment to the available vacancies in the order in which their names appear in the list referred to in rule 10 above.]*

Note:- * Substituted by the TES (3rd Amendment) Rules, 2007

PART-V
[RECRUITMENT BY SELECTION]*

[14. Constitution of Selection Committees

(1) Recruitment to Grade-I(A), Grade-I(B), Grade-II, Grade-III and Grade-IV of the service under sub-rule (2) of rule-5, shall be made on recommendation of a Selection Committee (hereinafter referred to as the Committee) consisting of :

(i)	Chairman of the Commission -	Chairman,
(ii)	One senior Secretary to the Government to be nominated by the Chief Secretary -	Member,
(iii)	Secretary, Public Works Department -	Member,
(iv)	Secretary, Tribal Welfare Department -	Member,
(v)	Secretary, SC, OBC & Minority Welfare Department. -	Member

(2) Recruitment to Grade-V(A) of the service under sub-rule(2) of rule-5 shall be made on recommendation of a Selection Committee consisting of :-

(i)	The Secretary, Public Works Department -	Member
(ii)	The Secretary, Tribal Welfare Department -	Member
(iii)	The Secretary, SC, OBC & Minority Welfare Department. -	Member

(3) The Senior-most Secretary shall preside over the meeting of the Selection Committee constituted under sub-rule (2) above.

15. Conditions of eligibility for selection

Other than direct recruitment posts, all substantive posts in various Grades of the service shall be filled by selection from officers as shown below:-

Note:- * Substituted by the TES (3rd Amendment) Rules,2007

(1) **Grade-I(A) posts** shall be filled :-

(i) by officers who hold Grade-I(B) posts and have rendered not less than one years' regular service in the Grade; and

(ii) failing that, by officers who hold Grade-I(B) posts and have rendered not less than 5 years' regular service both in Grade-I(B) and Grade-II taken together; and

(iii) failing both, by officers who hold Grade-II posts and have rendered not less than 5 years' regular service in the Grade.

(2) **Grade-I(B) posts** shall be filled by officers who hold Grade-II posts and have rendered not less than **4 years' regular service** in the Grade.

(3) **Grade-II posts** shall be filled by officers who hold Grade-III posts and have rendered not less than **7 years' regular service** in the Grade and have at least a degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification.

(4) **Grade-III posts** shall be filled in the manner as specified in sub-rule (2) of rule-5 by officers who hold Grade-IV posts and have rendered not less than 7 years' regular service in the Grade.

(5) **Grade-IV posts** shall be filled in the manner as specified in sub-rule (2) of rule-5 by officers who hold Grade-V(A) posts and have rendered not less than 3 years' regular service in the Grade; and

(6) **Grade-V(A) posts** shall be filled in the manner as specified in sub-rule (2) of rule-5 by officers who are Diploma-holder engineers holding Grade-V(B) posts and have rendered not less than 4 years' regular service in the Grade.

16. **Procedure for selection**

(1) The Committee constituted under sub-rule (1) and sub-rule-(2), as the case may be, of rule-14 shall consider from time to time, cases of those officers who are eligible **under rule -15** for promotion to a higher Grade and prepare a list of persons recommended taking into account the actual number of vacancies at the time of selection and those likely to occur during a year. The selection for inclusion in the list shall be based on merit and suitability in all respects for appointment to the Service with due regard to seniority;

Provided that where a person is considered for such appointment to a higher grade from a lower grade, all persons senior to him in the lower feeder grade, shall also be considered irrespective of whether or not they fulfill the requirement of the minimum period of regular service in the lower grade as provided in rule-15.

(2) The names of persons included in the list shall be arranged in the order of merit and be forwarded to the government.

17. **Consultation with the Commission:**

(1) The list prepared under sub-rule(2)of rule-16 shall be forwarded by the Government to the Commission along with the relevant records, where consultation with the Commission is necessary or where the Chairman of the Commission desires that a reference be made to the Commission.

(2) If the Commission considers it necessary to make any change in the list received from the Government, the Commission shall inform the Government of the changes proposed.

(3) The list shall finally be approved by the Government after taking into account the changes, if any, proposed by the Commission.

(4) The list thus finally approved shall ordinarily be in force until a fresh list is prepared for the purpose in accordance with these rules.

18. **Appointment to the Service.**

Appointment to the Service shall be made in the order of merit as shown in the list referred to in sub-rule (3) of rule 17.]*

PART-VI
[ELIGIBILITY FOR DIRECT RECRUITMENT]*

[19. Candidates for direct recruitment to the Service must fulfill the following conditions :-

(1) **Common eligibility conditions**

For direct recruitment to any Grade of the Service a candidate :-

Note :- * Substituted by the TES (3rd Amendment) Rules, 2007

(i) must be a citizen of India; and

(ii) must not be less than 18 and more than 37 years of age;

Provided that the Scheduled Castes, Scheduled Tribes and Physically Handicapped category of candidates and the Government servants shall get an upper age relaxation of 5 (five) years;

Provided further that the Government servants of Scheduled Castes, Scheduled Tribes and Physically Handicapped category shall not get the upper age relaxation of 5 years over and above the upper age relaxation of 5 years' admissible to them as Scheduled Castes, Scheduled Tribes and Physically Handicapped.

(2) **Educational qualification**

(a) For direct recruitment **to Grade-IV and Grade-V(A)** of the Service a candidate must have at least a Degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification.

(b) For direct recruitment to **Grade-V(B)** of the service a candidate must have a Diploma in an appropriate branch of engineering or its equivalent academic qualification from a recognized institution.] *

PART-VII
[APPOINTMENT, PROBATION, TRAINING AND CONFIRMATION] *

[20. **Appointment :**

All appointments to the Service shall be made to the Grade and not against any specific post included in the Service.

21. **Disqualification**:

(a) No person who has more than one spouse living or who, having a spouse living, marries in any case in which such marriage is void by reason of its

Note :- * Substituted by the TES (3rd Amendment) Rules, 2007

taking place during the life time of such spouse, shall be eligible for appointment to the service; and

(b) No woman whose marriage is void by reason of the husband having a wife living at the time of such marriage or who has married a person who has a wife living at the time of such marriage, shall be eligible for appointment to the service;

Provided that the State Government may, if satisfied that there are special grounds for so ordering, exempt any person from the operation of this rule.

(c) No officer who has not passed a departmental examination prescribed by the Government shall be eligible for selection to a higher grade of the service.

22. **Special provision for Scheduled Castes and Scheduled Tribes**

Appointment to every Grade of the Service made by direct recruitment or by selection or otherwise shall be subject to the laws in force in the State regarding special representation of the Scheduled castes and Scheduled Tribes in the Services under the State.

23. **Period of Probation:-**

(1) Every person appointed to Grade-IV, under rule-5(1)(a), to Grade-V(A) under rule-5(1)(b) and to Grade-V(B) of the service under rule-5(1)(c) shall be on probation for a period of two years.

(2) The State Government may in the case of any person extend the period of probation in consultation with the Commission.

(3) The Government may, in consultation with the Commission, discharge, at any time, a probationer from service without assigning any reason therefor.

(4) A person on probation who holds a lien on any permanent post under the Central or State Government may, if he so desires during the period of probation, has the option to be reverted to his parent Department or Government after giving such notice as may be prescribed by the Government.

24. **Training and Departmental Examination:**

(1) Every person appointed to the service under Rule-5 shall pass, during the period of probation, such examination and complete successfully such training as may be prescribed.

(2) Every person appointed to the service under rule-5 shall pass such Departmental Examination as the Government may, from time to time, prescribe.

25. **Confirmation in Service:**

A person appointed to the service under rule -5 may be confirmed in the service on the basis of general assessment of his performance during the period of probation and his performance in the training and the examinations as provided in rule-24.] *

PART-VIII
[MISCELLANEOUS] *

[26. **Posting of members of the Service**

Every member of the service shall, unless he is appointed to an ex-cadre post, or is otherwise not available for holding a duty post owing to the exigencies of service, be posted against a duty post under the Government.

27. **Deputation**

A member of the Service may, on deputation, be transferred to any post or be allowed deputation to any post outside the service under the Central or State Government, any company or organization.

28. **Private practice**

No member of the service shall undertake private practice of any kind in any form or manner without previous permission of the competent authority.

29. **Seniority** -

The State Government shall prepare a list of members of the service arranged in order of seniority as determined in the manner specified below:-

Note :- Substituted by the TES (3rd Amendment) Rules,2007.

(i) Seniority of officers in each grade of the service shall be determined separately.

(ii) Seniority of Degree-holder engineers and Diploma-holder engineers shall be determined separately and not clubbed together;

(iii) In the case of persons appointed on the results of a competitive examination, under rule-5(1) or by selection under rule-5(2) seniority in the service shall be determined by the order in which appointments are made to the Service;

Provided that-

(a) Persons recruited on the results of a competitive examination in any year shall be ranked inter se in the order of merit in which they are placed at the competitive examination on the result of which they are recruited, those recruited on the basis of an earlier examination being ranked senior to those recruited on the basis of later examination.

(b) The relative seniority inter se of persons recruited by selection shall be determined on the basis of the order in which their names are arranged in the list prepared under rule-16.

(iv) The relative seniority of direct recruits and of promotees shall be determined according to the rotation of vacancies **filled in a recruitment year** between the direct recruits and the promotees which shall be based on the quotas of vacancies reserved for direct recruitment and promotion under rule-5.] *

[30. Pay and Allowances :

(1) The scales of pay attached to various grades of the service shall be as follows :-

(i)	Grade –I(A) -	Rs. 14,150/ – 20,000/-
(ii)	Grade-I(B) -	Rs. 14,150/ 20,000/-
(iii)	Grade-II :-	Rs. 12,000/ 18,400/-
(iv)	Grade-III :-	Rs. 11,000 18,000/-

Note:- Substituted by the TES (3rd Amendment) Rules, 2007

(v) Grade-IV :-

(a) For direct recruits at the entry stage - Rs. 10,000/-15,100/-

(b) For promotees at the entry stage - Rs. 10,000/- 15,100/-

(vi) Grade-V(A) : -

(a) For Degree-holder direct Recruits at the entry stage - Rs. 7,450/- 13,000/-

(b) For Diploma-holder promotees - Rs. 7,450/- 13,000/-

(c) For Degree-holders, after 8 years of service (under the Career Advancement Scheme) - Rs. 10,000/- 15,100/-

(vii) Grade-V(B) :-

(a) For direct recruits at the entry stage - Rs. 5,000/-10,300/-

(b) After 8 years of service (under the Career Advancement Scheme) - Rs. 7,450/- 13,000/-

Provided that the Government may from time to time revise the scales of pay.

(2) Dearness and other allowances shall be paid to persons holding duty posts at such rates as may be determined by the Government from time to time.

(3) When a member of the Service gets, under the Career Advancement Scheme or any other Scheme, the benefit of a higher scale of pay which is equal to the pay and allowances of a higher Grade of the Service, the member of the Service shall be entitled to the pay and allowances at the higher rate; but he shall not be entitled to the rank and status of that higher Grade or the duty posts included in that higher grade.

31. Transitional arrangement :

Transitional arrangement for adjustment of existing members of the service wherever found in excess, shall be considered in the following manner :-

(1) Degree-holders found in excess in Grade - IV , if any, shall immediately be adjusted against both the direct recruitment and promotion posts for Degree holders. These shall be adjusted finally as per amended rules hereby on availability of future vacancies.

(2) Diploma-holders, found in excess in Grade – IV, if any, shall immediately be adjusted against the vacancies of direct recruitment posts for Degree holders in Grade –IV. The same shall be adjusted finally as per amended rules hereby on availability of future vacancies.

(3) Degree-holders found in excess, in Grade – V(A), if any, shall immediately be adjusted against the vacancies in Grade V(A) for Diploma holders and shall be adjusted finally as per amended rules hereby on availability of future vacancies.

(4) Diploma-holders found in excess, in Grade –V(A) , if any, shall immediately be adjusted against the vacancies in Grade V(B) for Diploma holders and the same shall be adjusted finally as per amended rules hereby on availability of future vacancies.

32. Any occupied posts not possible to be adjusted in this service in accordance with the provisions of these rules as per transitional arrangement provided in rule- 31 may continue to be held by the officer(s) who are holding such posts before introduction of these amendments as if these amendments had not come into force.

33. Power to make regulations:

The Government may make regulations not inconsistent with these rules to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to these rules.

34. Residuary matters :

In regard to matters not specifically covered by these rules or by regulations or orders issued thereunder or by special orders, the members of the service shall be governed by the rules, regulations and orders applicable to the officers of the same status serving in connection with the affairs of the State Government.

35. Interpretation:

If any question arises as to the interpretation of these rules, the same shall be decided by the Government.] *

Note :- Substituted by the TES (3rd Amendment) Rules, 2007

PART-IX
[RELAXATION] *

[36. **Power to Relax :**

Where the Government is of the opinion that it is necessary or expedient so to do, it may, by order, for reasons to be recorded in writing and in consultation with the Commission, relax any of the provisions of these rules with respect to any class or category of persons or posts.] *

Note :- Substituted by the TES (3rd Amendment) Rules, 2007.

Contd. to page -16

SCHEDULE

(See Rule-4)

TRIPURA ENGINEERING SERVICE GRADE-I(A)

Sl. No.	Name of the duty posts	Strength
1.	Chief Engineer (Civil), Roads & Buildings	1
2.	Chief Engineer (Civil), Water Resources	1
3.	Chief Engineer (Civil), Public Health Engineering	1
	Total	3
	Leave Reserve @ 30%	1
	Total	4
	Degree Holder	4

TRIPURA ENGINEERING SERVICE GRADE-I(B)

SL.No.	Name of the posts	Strength
1.	Additional Chief Engineer & Sole Arbitrator (Civil), Roads and Buildings.	1
2.	Additional Chief Engineer & Sole Arbitrator (Civil), Water Resources and Public Health Engineering	1
	Total	2
	Leave Reserve @ 30%	0
	Total	2
	Degree holder	2

TRIPURA ENGINEERING SERVICE GRADE-II

Sl. No.	Name of the duty posts	Strength
1.	Superintending Engineer, Planning Circle (Roads and Buildings/ Water resources/ Public Health Engineering)	3
2.	Superintending Engineer, Working Circle, (Roads and Buildings/ Water resources/ Public Health Engineering).	12
3.	Superintending Engineer, Monitoring Cell (Roads and Buildings)	1
	Total	16
	Leave Reserve @ 30%	5
	Total	21
	Degree Holder	21

TRIPURA ENGINEERING SERVICE GRADE-III

Sl. No.	Name of the duty posts	Strength
	Civil Engineering Branch	
1.	Executive Engineer (Planning) in Circle Offices	22
2.	Executive Engineer in Division Offices	41
3.	Engineering Officer to the Chief Engineer & Deputy Secretary (Civil)	5
4	Executive Engineer (Research, Development, Quality and Promotion Cell)	1
	Total	69
	Leave Reserve @ 30%	21
	Total	90
	Degree-holder	63
	Diploma-holder	27
	Mechanical Engineering Branch	
1.	Executive Engineer (Mechanical Division)	1
2.	Executive Engineer (Rig Division)	1
	Total	2
	Leave Reserve @ 30%	1
	Total	3
	Degree-holder	2
	Diploma-holder	1
	Electrical Engineering Branch	
1.	Executive Engineer (Internal Electrification Division)	2
2.	Electrical Inspector	1
	Total	3
	Leave Reserve @ 30%	1
	Total	4
	Degree holder	3
	Diploma holder	1
	Total Grade - III	97

TRIPURA ENGINEERING SERVICE GRADE-IV

Sl. No.	Name of the duty post	Strength
	Civil Engineering Branch	
1.	Assistant Engineer in Sub-Divisions	114
2.	Technical Assistant to Superintending Engineer	9
3.	Assistant Engineer , Soil Testing Laboratory	1
4.	Estate Officer	1
5.	Assistant Engineer (Planning) in the office of the Chief Engineer (Roads & Buildings)	3
6.	Assistant Engineer (Planning) in Circle Offices	84
7.	Assistant Engineer (Planning) in Division Offices.	137
	Total	349
	Leave Reserve @ 30%	105
	Total	454
	Degree-holder (promotion)	182
	Degree holder (direct)	90
	Diploma holder	182
	Mechanical Engineering Branch	
1.	Assistant Engineer in Sub-Divisions	7
2.	Assistant Engineer (Planning) in Circle Offices	5
3.	Assistant Engineer (Planning in Division Offices)	8
	Total	20
	Leave Reserve @ 30%	6
	Total	26
	Degree holder (promotion)	10
	Degree holder (direct)	6
	Diploma-holder(promotion)	10

(2)

Electrical Engineering Branch

1.	Assistant Engineers in Sub-Divisions	8
2.	Assistant Engineer (Planning) in Circle Office	0
3.	Assistant Engineer Planning in Division Office	1
	Total	9
	Leave Reserve @ 30%	3
	Total	12
	Degree holder (promotion)	5
	Degree Holder(direct)	2
	Diploma holder(promotion)	5
	Total Grade - IV	492

TRIPURA ENGINEERING SERVICE GRADE-V(A)

Sl. No.	Name of the duty post	Strength
	Civil Engineering Branch	
1.	Junior Engineer in Sub-Divisions (Roads & Buildings)	216
2.	Junior Engineer in Sub-Divisions (Water Resources)	77
3.	Junior Engineer in Sub-Divisions (Public Health Engineering)	71
4.	Junior Engineer in Circle Offices	27
5.	Junior Engineer in Division Offices	44
6.	Junior Engineer in Estate Office	1
7.	Junior Engineer in Soil Testing Laboratory	1
	Total	437
	Leave Reserve @ 30%	131
	Total	568
	Degree holder (direct)	406
	Diploma holder (promotion)	162

Mechanical Engineering Branch

1.	Junior Engineer in Sub-Divisions (Roads & Buildings)	14
2.	Junior Engineer in Sub-Divisions (Public Health Engineering)	9
3.	Junior Engineer in Circle Offices	2
4.	Junior Engineer in Division Offices	5
	Total	30
	Leave Reserve @ 30%	9
	Total	39
	Degree holder (direct)	28
	Diploma-holder (promotion)	11

Electrical Engineering Branch

1.	Junior Engineer in Sub-Divisions (R&B)	22
2.	Junior Engineer in Circle Offices	1
3.	Junior Engineer in Division Offices	2
4.	Junior Electrical Inspector	1
	Total	26
	Leave Reserve @ 30%	8
	Total	34
	Degree holder (direct)	24
	Diploma-holder (promotion)	10
	Total Grade –V(A)	641

TRIPURA ENGINEERING SERVICE GRADE-V (B)

Civil Engineering Branch

Sl. No.	Name of the duty post	Strength
1.	Junior Engineer in Sub-Divisions (Roads & Buildings)	67
2.	Junior Engineer in Sub-Divisions (Water Resources)	36
3.	Junior Engineer in Sub-Divisions (Public Health Engineering)	30
4.	Junior Engineer in Circle Offices	18
5.	Junior Engineer in Division Offices	35
6.	Junior Engineer in Estate Office	1
7.	Junior Engineer in Soil Testing Laboratory	1
	Total	188
	Leave Reserve @ 30%	56
	Total	244
	Diploma holder	244

Mechanical Engineering Branch

1.	Junior Engineer in Sub-Divisions (R&B)	6
2.	Junior Engineer in Sub-Divisions (PHE)	6
3.	Junior Engineer in Circle Offices	0
4.	Junior Engineer in Division Offices	1
	Total	13
	Leave Reserve @ 30%	4
	Total	17
	Diploma holder	17

Electrical Engineering Branch

1.	Junior Engineer in Sub-Divisions (PWD)	8
2.	Junior Engineer in Circle Offices	0
3.	Junior Engineer in Division Offices	2
4.	Junior Electrical Inspector	1
	Total	11
	Leave Reserve @ 30%	3
	Total	14
	Diploma holder	14
	Total Grade – V(B)	275
	GRAND TOTAL OF ALL GRADES :-	1532]*

(N.K. Sinha)
Secretary to the
Government of Tripura
Public Works Department

* Note :- Substituted by the TES (3rd Amendment) Rules, 2007

GOVERNMENT OF TRIPURA

GENERAL ADMINISTRATION (PERSONNEL & TRAINING) DEPARTMENT.

TRIPURA ENGINEERING SERVICE

(4th Amendment),

RULES, 2007.

PUBLISHED IN THE
EXTRAORDINARY ISSUE OF TRIPURA GAZETTE

Agartala, Friday, August 17, 2007 A. D. Sravana 26, 1929 S. E.

GOVERNMENT OF TRIPURA
GENERAL ADMINISTRATION (P&T) DEPARTMENT

No.F.20 (4)-GA (P&T)/ 05 **Dated, Agartala, the 7th August, 2007**

NOTIFICATION

In exercises of the powers conferred by article 309 of the constitution of India and all other powers enabling him in this behalf, the Governor, Tripura is pleased to make the followings rules further to amendment the Tripura Engineering Service Rules, 1987, namely

1. Short title & Commencement

(1) These Rules may be called the **"Tripura Engineering Service (4th amendment), Rules, 2007"**

(2). They shall come into force on and from the date of their publication in the official gazettee.

2. Amendment of Sub- Rule 1 of Rule 4 of Principal Rules.

For **Sub-Rule (1)** of **Rule 4** the following shall be substituted, namely-

In the **Sub –Rule (1)** of **Rule 4** the word **"first scheduled "**shall be inserted in place of "schedule" after the word " specified in the " and before the word "to these rules" mentioned at line-2 of **Sub- Rules (1).**

3. **Amendment of Rule 7 of Principal Rules**

For Rule 7 of the principal Rules, the following shall be substituted, namely-

7. **Competitive Examination**

A Competitive Examination for direct recruitment to the service shall be held at such intervals in the manner laid down in the **Second Schedule** to these rules to be conducted by the commission from time to time. The dates on which and the place at which the examination shall be held shall be fixed by the commission.

4. **Amendment of Rule 33 of the Principal Rules**

Rule 33 of the principal Rules shall be **deleted.**

M. L. Das
Under Secretary to the
Government of Tripura

Second schedule

(Rule-7)

COMPITATIVE EXAMINATION

1. Competitive examination for direct recruitment

(1) As provided in **Part –IV** of the Rules, selection of candidates for direct recruitment to the service shall be made by the Commission on the basis of a competitive examination to be conducted by it.

(2) Every year, ordinarily by April, the Public Works Department of the Government will send to the Commission a requisition for selection of candidates to fill vacancies against the direct recruitment quota of Grade – IV, Grade – V (A) or Grade –V(B) of the Tripura Engineering Service. Having regard to the number of vacancies mentioned in the requisition, the Commission shall conduct a competitive examination for direct recruitment to of the service in the manner as provided in **Part-IV** of these regulations. The Commission will complete the process of selection of the candidates through the examination ordinarily within a period of 6 months and recommend to the Government a list of selected candidates.

(3) Before holding the examination, the Commission shall issue an advertisement notifying, inter alia, the vacancies with the break up of the posts earmarked for the unreserved and reserved category of candidates and inviting applications from the candidates willing to appear in the examination. The advertisement shall also indicate that the number of vacancies so notified may increase or decrease according to necessity.

(4) In case a communication is received by the Commission from the employer of a candidate withholding permission to appear at the examination, his application shall be rejected/ candidature shall be cancelled by the Commission;

Provided that a candidate who gets appointment to any post after submission of his application for admission to the examination must furnish forthwith evidence to show that his employer has no objection to his being selected for a post on the results of the examination.

2. Number of Chances shall allowed to a candidate

1) No candidate who does not belong to Scheduled Castes or Scheduled Tribes shall be permitted to compete more than 3 times in the examination.

2) A candidate shall be deemed to have competed in the examination, if he has actually appeared in any of the subjects/papers.

3. Admission Certificate

1) A candidate who has paid application fees as prescribed and fulfilled the terms of advertisement will receive an Admit Card and a time table for the examination. The admission will be deemed to be provisional subject to determination of his eligibility in all respects;

2) No candidate shall be admitted to the examination unless he holds an Admit Card. If at any stage after issue of the Admit Card, a candidate is found to be ineligible for admission in terms of the regulations of the examination; his candidature shall be cancelled without further reference to him.

4. Consequences of violation of rules, regulations, instructions etc.

A candidate who violates the rules, regulations and instructions issued by the Commission, Supervisor or Invigilator on duty in the Examination Hall, be liable to expulsion from the Examination Hall and/or other penalties as provided in regulation 13.

5. Matters for which no specific provision has been made in the regulations shall be decided by the Commission.

PART-I

Nature and syllabus of the examination

6. The examination shall have the following two parts, namely –

(i) a written part carrying 500 marks ; and

(ii) an interview –cum- personality test carrying 50 marks.

7. Written part of the examination

(1) The written part of the examination shall consist of the following 3(three) compulsory subjects/papers:-

Subject/paper	Full marks	Duration of the examination
i) General Studies	100	1 hour
ii) two of the following papers a) Civil Engineering paper –I b) Civil Engineering paper – II c) Mechanical Engineering paper –I d) Mechanical Engineering paper –II e) Electrical Engineering paper –I f) Electrical Engineering Paper -II	200 each paper	2 hours

(2) As shown in the above table General Studies is compulsory for candidates of all Grades i.e. Grade-IV, Grade-V(A) and Grade-V(B) of the Service. Civil Engineering papers are compulsory for candidates who apply for posts in civil Engineering Branch, Mechanical Engineering papers are compulsory for candidates who apply for posts in Mechanical Engineering Branch and Electrical Engineering papers are compulsory for candidates who apply for posts in Electrical Engineering Branch.

(3) Detailed syllabus and group-wise break up of marks for each of the above-mentioned subjects/papers for Grade-IV, Grade-V(A) and Grade-V(B) have been given in **Schedule-I, Schedule-II, Schedule-III** and **Schedule-IV** respectively to these regulations.

(4) Qualifying marks for unreserved category shall be minimum40% in each subject and that of reserve category shall be minimum 30% each subject.

(5) In exception circumstances categories the Commission, at its discretion, shall fix the minimum qualifying marks for a paper and the minimum qualifying aggregate marks for all the papers otherwise;

Provided that in case a candidate fails to secure the qualifying marks, so fixed in any paper compulsory or optional, marks in that paper shall not be considered for calculating the aggregate.

(6) Questions in all the papers shall be answered only in English and in no other language.

Interview-cum-personality test

(1) The Commission shall conduct an Interview-cum-personality test of those didates who have obtained qualifying marks in the written part of the mination. The pattern of the Interview-cum-personality test shall be decided by Commissio in accordance with the requirement of the service and the post for ch the examination is conducted.

(2) The personality test shall be to assess the personal qualities of a didate e.g., his intellectual ability, social traits, interest in current affairs, critical ver of judgment, variety and depth of interest, ability for leadership, moral egrity etc.

(3) In no case shall a candidate be called for personality test unless he pears in all the papers of the examination.

Final Selection and validity of the Select List

Final selection shall be made in order of merit on the basis of the marks tained by a candidate in aggregate in the written examination and the marks tained by him in the personality test. If a candidate remains absent in the rsonality test, his candidature shall not be considered for final selection.

) The Select List recommended by the Commission shall remain valid for a period 6 months from the date of recommendation and in no case for more than a riod of one year, if so extended by the Government in consultation with the mmission.

SCHEDULE – I

GENERAL STUDIES (COMPULSORY FOR ALL GRAD BRANCHES)

TOTAL MARKS – 100
Duration of examination – 1 hour

The break up of marks on various topics will be as follows:-

Topic	Marks
i) Comprehension of a given passage	20
ii) Usage (corrections)	10
iii) Vocabulary (synonyms & antonyms, idioms & phrases	10
iv) General knowledge (Questions will include knowledge of Indian and geography of such a nature which the candidates should be able to answer without any special study. Questions on Tripura, its historian topography will also be included.)	20
v) Current Affairs (The questions will include knowledge of Indian current events and of such matters of every day observation and experience in their scientific aspects as may be expected of an educated person who has not made a special study of any scientific subject.)	20
vi) Mental Ability.	20

ENGINEERINGS SUBJECT PAPER – I & II (OPTIONAL FOR ALL GRADES / BRANCHES)

TOTAL MARKS – 200(each paper)
Duration of examination – 2 hour

The break up of marks will be as follows:

Topic	Marks
i) 20 questions of 6 marks each	120
ii) 40 questions of 2 marks each	80

SCHEDULE-II

SYLLABUS FOR GRADE IV
CIVIL ENGINEERING
PAPER - I

TOTAL MARKS – 200
DURATION OF EXAMINATION – 2 HOURS

1. BUILDING MATERIALS

Timber : Different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet rots, codal provisions for design, Plywood.

Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength.

Cement: Compounds of, 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, elasticity, non-destructive testing, mix design methods.

2. SOLID MECHANICS

Elastic constants, stress, plane stress, Mohr's circle of stress, strains, plane strain, Mohr's circle of strain, combined stress; Elastic theories of failure; Simple bending, shear; Torsion of circular and rectangular sections and simple members.

3. DESIGN OF STEEL STRUCTURES

Principles of working stress method. Design of connections, simple members, Built-up sections and frames, Design of Industrial roofs. Principles of ultimate load design. Design of simple members and frames.

4. DESIGN OF CONCRETE AND MASONRY STRUCTURES

Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members.

Principles of prestressed concrete design, materials, methods of pre stressing, losses. Design of simple members and determinate structures. Introductions to prestressing of indeterminate structures.

Design of brick masonry as per I.S. Codes.

5. CONSTRUCTION PRACTICES, PLANNING AND MANAGEMENT

Concreting Equipment: Weight Batcher, Mixer, vibrator, batching plant, concrete pump. Cranes, hoists, lifting equipment.

Earthwork Equipment: Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheep foot rollers, pumps.

Construction, Planning and Management: Bar chart, linked bar chart, work-break down structures, Activity-on - arrow diagrams. Critical path, probabilistic activity durations; Event-based networks.

PERT network: Time-cost study, crashing; Resource allocation.

PAPER - II

TOTAL MARKS - 200
Duration of Examination – 2 Hours

1. (a) FLUID MECHANICS, OPEN CHANNEL FLOW, PIPE FLOW:

Fluid Properties, Pressure, Thrust, Buoyancy; Flow Kinematics; Integration of flow equations; Flow measurement; Relative motion; Moment of momentum; Viscosity, Boundary layer and Control, Drag, Lift; dimensional Analysis, Modeling; Cavitation; Flow oscillations; Momentum and Energy principles in Open channel flow, Flow controls, Hydraulic jump, Flow sections and properties; Normal flow, Gradually varied flow; Surges; Flow development and losses in pipe flows, Measurements; Siphons; Surges and Water hammer; Delivery of Power Pipe networks.

(b) HYDRAULIC MACHINES AND HYDROPOWER:

Centrifugal pumps, types, performance parameters, scaling, pumps in parallel; Reciprocating pumps, air vessels, performance parameters; Hydraulic ram; Hydraulic turbines, types, performance parameters, controls, choice; Power house, classification and layout, storage, pondage, control of supply.

2. (a) HYDROLOGY:

Hydrological cycle, precipitation and related data analyses, PMP, unit and synthetic hydrographs; Evaporation and transpiration; Floods and their management, PMF; Streams and their gauging; River morphology; Routing of floods; Capacity of Reservoirs.

(b) WATER RESOURCES ENGINEERING:

Multipurpose uses of Water: Soil-Plant-Water relationships, irrigation systems, water demand assessment; Storages and their yields, ground water yield and well hydraulics; Water logging, drainage design; Irrigation revenue; Design of rigid boundary canals, lining of canals; Sediment transport in canals; Non-Overflow and overflow sections of gravity dams and their design, Energy dissipaters and tail water rating; Design of head works, distribution works, falls, cross-drainage works, outlets; River training.

3. ENVIRONMENTAL ENGINEERING

(a) WATER SUPPLY ENGINEERING:

Sources of supply, yields, design of intakes and conductors; Estimation of demand; Water quality standards; Control of Water-borne diseases; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance and distribution systems of treated water, leakages and control; Rural water supply; Institutional and industrial water supply.

(b) WASTE WATER ENGINEERING:

Urban rain water disposal; Systems of sewage collection and disposal; Design of sewers and sewerage systems; pumping; Characteristics of sewage and

its treatment, Disposal of products of sewage treatment, stream flow . Plumbing Systems, Rural and semi-urban sanitation.

(c) SOLID WASTE MANAGEMENT:

Sources, classification, collection and disposal; Design and Management of landfills

4 (a) SOIL MECHANICS:

Properties of soils, classification and interrelationship; Compaction behavior, methods of compaction and their choice; Permeability and seepage, flow nets, Inverted filters; Compressibility and consolidation; Shearing resistance, stresses and failure; soil testing in laboratory and in-situ; Stress path and applications; Earth pressure theories, stress distribution in soil; soil exploration, samplers, load tests, penetration tests.

(b) FOUNDATION ENGINEERING:

Types of foundations, Selection criteria, bearing capacity, settlement, laboratory and field tests; Types of piles and their design and layout, Foundations on expansive soils, swelling and its prevention, foundation on swelling soils.

5. (a) SURVEYING:

Classification of surveys, scales, accuracy; Measurement of distances - direct and indirect methods; optical and electronic devices; Measurement of directions, prismatic compass, local attraction; Theodolites - types; Measurement of elevations - Spirit and trigonometric leveling; Relief representation; Contours; Digital elevation modeling concept; Establishment of control by triangulations and traversing - measurements and adjustment of observations, computation of coordinates; Field astronomy, Concept of global positioning system; Map preparation by plane tabling and by photogrammetry; Remote sensing concepts, map substitutes.

(b) TRANSPORTATION ENGINEERING:

Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation; Materials and construction methods for different surfaces and maintenance: Principles of pavement design; Drainage.

Traffic surveys, Intersections, signaling: Mass transit systems, accessibility, networking.

MECHANICAL ENGINEERING
PAPER – I

TOTAL MARKS - 200
Duration of Examination – 2 Hours

1. STRENGTH OF MATERIALS:

Stress and strain in two dimensions, Principal stresses and strains, Mohr's construction, linear elastic materials, isotropy and anisotropy, stress-strain relations, uniaxial loading, thermal stresses. Beams: Bending moment and shear force diagram, bending stresses and deflection of beams. Shear stress distribution.

Torsion of shafts, helical springs. Combined stresses, thick-and thin-walled pressure vessels. Struts and columns. Strain energy concepts and theories of failure.

2. FLUID MECHANICS.

Properties and classification of fluids, Manometer, forces on immersed surfaces, Center of pressure, Buoyancy, Elements of stability of floating bodies. Kinematics and Dynamics. Irrotational and incompressible. Inviscid flow. Velocity potential, Pressure field and Forces on immersed bodies. Bernoulli's equation, fully developed flow through pipes, Pressure drop calculations, Measurement of flow rate and Pressure drop. Integral approach, Laminar and tubulent flows, Separations. Flow over weirs and notches. Open channel flow, Hydraulic jump. Dimensionless numbers, Similitude and modelling. One-dimensional isentropic flow, Normal shock wave, Flow through convergent - divergent ducts, Oblique shock-wave.

3. THEORY OF MACHINES:

Cams. Gears and gear trains. Flywheels. Governors. Balancing of rigid rotors and field balancing. Balancing of single and multicylinder engines. Critical speeds and whirling of shafts Automatic controls.

4. MACHINE DESIGN :

Design of Joints: Cotters, keys, Splines, Welded joints, Threaded fasteners, joints formed by interference fits. Design of friction drives: couplings and clutches, belt and chain drives, power screws.
Design of Power transmission Systems: gears and gear drives shaft and axle, wire ropes.
Design of Bearings: hydrodynamics bearings and rolling element bearings.

5. FLUID MACHINERY AND STEAM GENERATORS:

Performance, Operation and control of hydraulic Pump, impulse and reaction Turbines, Specific speed, Classification. Energy transfer, Coupling, Power transmission, Steam generators, Fire-tube and water-tube boilers. Flow of steam through Nozzles and Diffusers, Wetness and condensation. Various types of steam and gas Turbines. Partial admission. Reciprocating, Centrifugal and axial flow Compressors, Multistage compression, role of Mach Number, Reheat, Regeneration, Efficiency, Governance.

MECHANICAL ENGINEERING

PAPER –II

TOTAL MARKS –200
Duration of Examination – 2 Hours

1. THERMODYNAMICS:

Cycles and IC Engines, Basic concepts, Open and Closed systems. Heat and work. Zeroth, First and Second Law, Application to non-Flow and Flow processes. Entropy, Availability. Properties of ideal gases and vapours. Standard vapour, Gas power and Refrigeration cycles. Two stage compressor. C-I and S.I. Engines. Pre-ignition, Detonation and Diesel-knock, Fuel injection and Carburetion, Supercharging. Turbo-prop and Rocket engines, Engine Cooling, Emission & Control. Measurement of Calorific values. Conventional and Nuclear fuels, Elements of Nuclear power production.

2. HEAT TRANSFER, REFRIGERATION AND AIR-CONDITIONING:

Modes of heat transfer. One dimensional steady and unsteady conduction. Composite slab and Equivalent Resistance. Heat dissipation from extended surfaces, Heat exchangers, Overall heat transfer coefficient, Empirical correlations for heat transfer in laminar and turbulent flows and for free and forced Convection, Thermal boundary layer over a flat plate. Fundamentals of diffusive and connective mass transfer, Black body and basic concepts in Radiation, Enclosure theory, Shape factor.. Heat pump and Refrigeration cycles and systems, Refrigerants. Condensers, Evaporates and Expansion devices, Psychrometry, Charts and application to air conditioning, Sensible heating and cooling, Effective temperature, comfort indices, Load calculations, Solar refrigeration, controls, Duct design.

3. ENGINEERING MATERIALS:

Basic concepts on structure of solids. Crystalline materials. Detects in crystalline materials. Alloys and binary phase diagrams. Structure and properties of common engineering materials. Heat treatment of steels. Plastics, Ceramics and composite materials. Common applications of various materials.

4. INDUSTRIAL ENGINEERING:

Production Planning and Control: Forecasting - Moving average, exponential smoothing, Operations, scheduling; assembly line balancing, Product development, Break-even analysis, Capacity planning, PERT and CPM.

Control Operations: Inventory control ABC analysis, EOQ model, Materials requirement planning. Job design, Job standards, Work measurement, Quality Management - Quality analysis and control.

Operations Research: Linear Programming - Graphical and Simplex methods, Transportation and assignment models.

Value Engineering: Value analysis for cost/value.

ELECTRICAL ENGINEERING
PAPER – I

TOTAL MARKS – 200

Duration of Examination – 2 Hours

1. NET THEORY:

Electric and magnetic fields. Gauss's Law and Amperes Law. Fields in dielectrics, conductors and magnetic materials. Time varying fields. Plane-Wave propagating in dielectric and conducting media. Transmission lines.

2. ELECTRICAL MATERIALS:

Conductors; Semi-conductors and Insulators. Super-conductivity. Insulators for electrical and electronic applications. Magnetic materials. Ferro and ferri magnetism. Ceramics, Properties and applications. Hall effect and its applications. Special semi conductors.

3. ELECTRICAL CIRCUITS

Circuits elements. Kirchoff's Laws. Mesh and nodal analysis. Network Theorems and applications. Natural response and forced response. Transient response and steady state response for arbitrary inputs. Properties of networks in terms of poles and zeros. Transfer function. Resonant circuits. Threephase circuits. Two-port networks. Elements of two-element network synthesis.

4. MEASUREMENTS AND INSTRUMENTATION

Units and Standards. Measurement of current, Voltage, power, Power-factor and energy. Indicating instruments. Measurement of resistance, inductance, Capacitance and frequency. Bridge measurements. Electronic measuring instruments. Digital Voltmeter and frequency counter. Transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, flow-rate displacement, acceleration, noise level etc. Data acquisition systems. A/D and D/A converters.

5. CONTROL SYSTEMS.

Block diagrams and signal flow graphs and their reduction. Errors for different type of inputs and stability criteria for feedback systems. Stability analysis using Routh-Hurwitz array, Nyquist plot and Bode plot. Root locus and Nicols chart and the estimation of gain and phase margin. Basic concepts of compensator design. State variable matrix and its use in system modelling and design. Sampled data system and performance of such a system with the samples in the error channel. Stability of sampled data system. Elements of non-linear control analysis. Control system components, electromechanical, hydraulic, pneumatic components.

ELECTRICAL ENGINEERING
PAPER – II

TOTAL MARKS - 200

Duration of Examination – 2 Hours

1. ELECTRICAL MACHINES AND POWER TRANSFORMERS.

Magnetic Circuits. Construction and testing. Equivalent circuits. Losses and efficiency. Regulation. Auto-transformer, 3-phase transformer. Parallel operation.

Basic concepts in rotating machines. EMF, torque, basic machine types. Construction and operation, leakage losses and efficiency.

B.C. Machines. Construction, Excitation methods. Circuit models. Armature reaction and commutation. Generators and motors. Starting and speed control.Testing, Losses and efficiency.

Synchronous Machines. Construction. Circuit model. Operating characteristics.Synchronous reactance. Efficiency. Voltage regulation. Salient-pole machine, Parallel operation.Hunting. Short circuit transients.

Induction Machines. Construction. Principle of operation. Rotating fields. Characteristics and performance analysis. Determination of circuit model. Circle diagram. Starting and speed control. Fractional KW motors. Single-phase synchronous and induction motors.

2. POWER SYSTEMS

Types of Power Stations, Hydro, Thermal and Nuclear Stations. Pumped storage plants. Economics and operating factors. Power transmission

lines. Modeling and performance characteristics. Voltage control. Load flow studies. Optimal power system operation. Load frequency control. Symmetrical Components. Per Unit representation. Fault analysis. Transient and steady-state stability of power systems. Equal area criterion. Power system Transients. Power system Protection Circuit breakers. Relays. HVDC transmission.

3. ANALOG AND DIGITAL ELECTRONICS AND CIRCUITS

Semiconductor device physics, PN junctions and transistors, circuit models and parameters, FET, Zener, tunnel, Schottky, photo diodes and their applications, rectifier circuits, voltage regulators and multipliers, switching behavior of diodes and transistors. Small signal amplifiers, biasing circuits, frequency response and improvement, multistage amplifiers and feed-back amplifiers, D.C. amplifiers, Oscillators. Large signal amplifiers, coupling methods, push pull amplifiers, operational amplifiers, wave shaping circuits. Multivibrators and flip-flops and their applications. Digital logic gate families, universal gates-combination circuits for arithmetic and logic operational, sequential logic circuits. Counters, registers, RAM and ROMs.

4. MICROPROCESSORS

Microprocessor architecture-Instruction set and simple assembly language programming. Interfacing for memory and I/O. Applications of Micro-processors in power system.

5. COMMUNICATION SYSTEMS

Types of modulation; AM, FM and PM. Demodulators. Noise and bandwidth considerations. Digital communication systems. Pulse code modulation and demodulation. Elements of sound and vision broadcasting. Carrier communication. Frequency division and time division multiplexing, Telemetry system in power engineering.

6. POWER ELECTRONICS

Power Semiconductor devices. Thyristor. Power transistor, GTOs and MOSFETS. Characteristics and operation. AC to DC Converters; 1-phase and 3-phase DC to DC Converters; AC regulators. Thyristor controlled reactors; switched capacitor networks. Inverters; single-phase and 3-phase. Pulse width modulation. Sinusoidal modulation with uniform sampling. Switched mode power supplies.

SCHEDULE - III
SYLLABUS FOR GRADE V (A)
CIVIL ENGINEERING
PAPER – I

TOTAL MARKS – 200

Duration of Examination – 2 Hours

1. BUILDING MATERIALS

Timber: Different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet rots, codal provisions for design, Plywood.

Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength.

Cement: Compounds of, 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, elasticity, non-destructive testing, mix design methods

2. SOLID MECHANICS:

Elastic constants, stress, plane stress, Mohr's circle of stress, strains, plane strain, Mohr's circle of strain, combined stress; Elastic theories of failure; Simple bending, shear; Torsion of circular and rectangular sections and simple members.

3. DESIGN OF STEEL STRUCTURES:

Principles of working stress method. Design of connections, simple members, Built-up sections and frames, Design of Industrial roofs. Principles of ultimate load design.

4. DESIGN OF CONCRETE AND MASONRY STRUCTURES:

Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members.

Principles of prestressed concrete design, materials, methods of prestressing, losses. Design of simple members and determinate structures.

5. CONSTRUCTION PRACTICES, PLANNING AND MANAGEMENT:

Concreting Equipment: Weight Batcher, Mixer, vibrator, batching plant, concrete pump. Cranes, hoists, lifting equipment.

Earthwork Equipment: Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheep foot rollers, pumps.

Construction, Planning and Management: Bar chart, linked bar chart, work-break down structures, Activity - on - arrow diagrams. Critical path, probabilistic activity durations; Event-based networks.

CIVIL ENGINEERING
PAPER – II

TOTAL MARKS – 200
Duration of Examination – 2 Hours

1. (a) FLUID MECHANICS, OPEN CHANNEL FLOW, PIPE FLOW:

Fluid Properties, Pressure, Thrust, Buoyancy; Flow Kinematics; Integration of flow equations; Flow measurement; Relative motion; Moment of momentum; Viscosity, Boundary layer and Control, Drag, Lift; dimensional

Analysis, Modeling; Cavitation; Flow oscillations; Momentum and Energy principles in Open channel flow, Flow controls, Hydraulic jump, Flow sections and properties; Normal flow, Gradually varied flow; Surges; Flow development and losses in pipe flows, Measurements; Siphons; Surges and Water hammer.

(b) **HYDRAULIC MACHINES AND HYDROPOWER:**

Centrifugal pumps, types, performance parameters, scaling, pumps in parallel; Reciprocating pumps, air vessels, performance parameters; Hydraulic ram; Hydraulic turbines, types, performance parameters, controls, choice; Power house, classification and layout, storage, pondage, control of supply.

2. (a) **HYDROLOGY :**

Hydrological cycle, precipitation and related data analyses, PMP, unit and synthetic hydrographs; Evaporation and transpiration; Floods and their management, PMF; Streams and their gauging.

(b) **WATER RESOURCES ENGINEERING :**

Multipurpose uses of Water: Soil-Plant-Water relationships, irrigation systems, water demand assessment; Storages and their yields, ground water yield and well hydraulics; Water logging, drainage design; Irrigation revenue.

3. **ENVIRONMENTAL ENGINEERING**

(a) **WATER SUPPLY ENGINEERING :**

Sources of supply, yields, design of intakes and conductors; Estimation of demand; Water quality standards; Control of Water-borne diseases; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance and distribution systems of treated water, leakages and control; Rural water supply; Institutional and industrial water supply.

(b) **WASTE WATER ENGINEERING:**

Urban rain water disposal; Systems of sewage collection and disposal; Design of sewers and sewerage systems; pumping; Characteristics of sewage and its treatment, Disposal of products of sewage treatment, stream flow . Plumbing Systems, Rural and semi-urban sanitation.

(c) **SOLID WASTE MANAGEMENT:**

Sources, classification, collection and disposal; Design and Management of landfills.

4 (a) **SOIL MECHANICS:**

Properties of soils, classification and interrelationship; Compaction behaviour, methods of compaction and their choice; Permeability and seepage, flow nets, Inverted filters; Compressibility and consolidation; Shearing resistance, stresses and failure; soil testing in laboratory and in-situ; Stress path and applications; Earth pressure theories, stress distribution in soil; soil exploration, samplers, load tests, penetration tests.

(b) **FOUNDATION ENGINEERING:**

Types of foundations, Selection criteria, bearing capacity, settlement, laboratory and field tests; Types of piles and their design and layout, Foundations on expansive soils, swelling and its prevention, foundation on swelling soils.

5. (a) **SURVEYING:**

Classification of surveys, scales, accuracy; Measurement of distances - direct and indirect methods; optical and electronic devices; Measurement of directions, prismatic compass, local attraction; Theodolites - types; Measurement of elevations - Spirit and trigonometric leveling; Relief representation; Contours; Digital elevation modelling concept; Establishment of control by triangulations and traversing - measurements and adjustment of observations, computation of coordinates; Field astronomy, Concept of global positioning system.

(b) **TRANSPORTATION ENGINEERING:**

Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation; Materials and construction methods for different surfaces and maintenance: Principles of pavement design; Drainage.

MECHANICAL ENGINEERING
PAPER – I

TOTAL MARKS – 200
Duration of Examination – 2 Hours

1. **STRENGTH OF MATERIALS:**

Stress and strain in two dimensions, Principal stresses and strains, Mohr's construction, linear elastic materials, isotropy and anisotropy, stress-strain relations, uniaxial loading, thermal stresses. Beams : Bending moment and shear force diagram, bending stresses and deflection of beams. Shear stress distribution. Torsion of shafts, helical springs. Combined stresses, thick-and thin-walled pressure vessels. Struts and columns.

2. **Fluid Mechanics:**

Properties and classification of fluids, Manometer, forces on immersed surfaces, Center of pressure, Buoyancy, Elements of stability of floating bodies. Kinematics and Dynamics. Irrotational and incompressible. Inviscid flow. Velocity potential, Pressure field and Forces on immersed bodies. Bernoulli's equation, fully developed flow through pipes, Pressure drop calculations, Measurement of flow rate and Pressure drop. Integral approach, Laminar and tubulent flows, Separations. Flow over weirs and notches. Open channel flow, Hydraulic jump. Dimensionless numbers, Similitude and modelling.

3. THEORY OF MACHINES:

Cams. Gears and gear trains. Flywheels. Governors. Balancing of rigid rotors and field balancing. Balancing of single and multicylinder engines. Critical speeds and whirling of shafts Automatic controls.

4. MACHINE DESIGN:

Design of Joints: cotters, keys, splines, welded joints, threaded fasteners, joints formed by interference fits. Design of friction drives: couplings and clutches, belt and chain drives, power screws.

Design of Power transmission systems: gears and gear drives shaft and axle, wire ropes.

Design of bearings: hydrodynamics bearings and rolling element bearings.

5. FLUID MACHINERY AND STEAM GENERATORS:

Performance, Operation and control of hydraulic Pump, impulse and reaction Turbines, Specific speed, Classification. Energy transfer, Coupling, Power transmission, Steam generators, Fire-tube and water-tube boilers. Flow of steam through Nozzles and Diffusers, Wetness and condensation. Various types of steam and gas Turbines. Partial admission. Reciprocating, Centrifugal and axial flow Compressors, Multistage compression, role of Mach Number, Reheat, Regeneration, Efficiency, Governance.

MECHANICAL ENGINEERING
PAPER – II

TOTAL MARKS – 200
Duration of Examination – 2 Hours

1. THERMODYNAMICS:

Cycles and IC Engines, Basic concepts, Open and Closed systems.Heat and work. Zeroth, First and Second Law, Application to non-Flow and Flow processes. Entropy, Availability. Properties of ideal gases and vapours. Standard vapour, Gas power and Refrigeration cycles. Two stage compressor. C-I and S.I. Engines. Pre-ignition, Detonation and Diesel-knock, Fuel injection and Carburation, Supercharging. Turbo-prop and Rocket engines, Engine Cooling, Emission & Control. Measurement of Calorific values.

2. HEAT TRANSFER, REFRIGERATION AND AIRCONDITIONING:

Modes of heat transfer. One dimensional steady and unsteady conduction. Composite slab and Equivalent Resistance. Heat dissipation from extended surfaces, Heat exchangers, Overall heat transfer coefficient, Empirical correlations for heat transfer in laminar and turbulent flows and for free and forced Convection, Thermal boundary layer over a flat plate. Fundamentals of diffusive and connective mass transfer, Black body and basic concepts in Radiation, Enclosure theory, Shape factor.. Heat pump and Refrigeration cycles and systems, Refrigerants. Condensers, Evaporates and Expansion devices, Psychrometry, Charts and application to air conditioning, Sensible heating and cooling, Effective temperature, comfort indices, Load calculations, Solar refrigeration, controls, Duct design.

3. ENGINEERING MATERIALS:

Basic concepts on structure of solids. Crystalline materials. Detects in crystalline materials. Alloys and binary phase diagrams. Structure and properties of common engineering materials.

4. INDUSTRIAL ENGINEERING:

Production Planning and Control: Forecasting - Moving average, exponential smoothing, Operations, scheduling; assembly line balancing, Product development, Break-even analysis, Capacity planning, PERT and CPM. Control Operations: Inventory control ABC analysis, EOQ model, Materials requirement planning. Job design, Job standards, Work measurement

ELECTRICAL ENGINEERING
PAPER – I

TOTAL MARKS – 200
Duration of Examination – 2 Hours

1. EM THEORY:

Electric and magnetic fields. Gauss's Law and Amperes Law. Fields in dielectrics, conductors and magnetic materials. Time varying fields. Plane-Wave propagating in dielectric and conducting media. Transmission lines.

2. ELECTRICAL MATERIALS:

Conductors, Semi-conductors and Insulators. Super-conductivity. Insulators for electrical and electronic applications. Magnetic materials. Ferro and ferri magnetism. Ceramics, Properties and applications. Hall effect and its applications. Special semi conductors.

3. ELECTRICAL CIRCUITS

Circuits elements. Kirchoff's Laws. Mesh and nodal analysis. Network Theorems and applications. Natural response and forced response. Transient response and steady state response for arbitrary inputs. Properties of networks in terms of poles and zeros. Transfer function. Resonant circuits. Threephase circuits. Two-port networks. Elements of two-element network synthesis.

4. MEASUREMENTS AND INSTRUMENTATION

Units and Standards. Measurement of current, Voltage, power, Power-factor and energy. Indicating instruments. Measurement of resistance, inductance, Capacitance and frequency. Bridge measurements. Electronic measuring instruments. Digital Voltmeter and frequency counter. Transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, flow-rate displacement, acceleration, noise level etc. Data acquisition systems. A/D and D/A converters.

5. CONTROL SYSTEMS.

Block diagrams and signal flow graphs and their reduction. Errors for different type of inputs and stability criteria for feedback systems. Stability analysis using Routh-Hurwitz array, Nyquist plot and Bode plot. Root locus and Nicols chart and the estimation of gain and phase margin. Basic concepts of compensator design. State variable matrix and its use in system modelling and design. Sampled data system and performance of such a system with the samples in the error channel. Stability of sampled data system. Elements of non-linear control analysis. Control system components, electromechanical, hydraulic, pneumatic components.

ELECTRICAL ENGINEERING
PAPER – II

TOTAL MARKS – 200

Duration of Examination – 2 Hours

1. ELECTRICAL MACHINES AND POWER TRANSFORMERS.

Magnetic Circuits . Construction and testing. Equivalent circuits. Losses and efficiency. Regulation. Auto-transformer, 3-phase transformer. Parallel operation.

Basic concepts in rotating machines. EMF, torque, basic machine types. Construction and operation, leakage losses and efficiency.

B.C. Machines. Construction, Excitation methods. Circuit models. Armature reaction and commutation. Generators and motors. Starting and speed control,Testing, Losses and efficiency.

Synchronous Machines. Construction. Circuit model. Operating characteristics.Synchronous reactance. Efficiency. Voltage regulation. Salient-pole machine, Parallel operation.Hunting. Short circuit transients.

Induction Machines. Construction. Principle of operation. Rotating fields. Characteristics and performance analysis. Determination of circuit model. Circle diagram. Starting and speed control. Fractional KW motors. Single-phase synchronous and induction motors.

2. POWER SYSTEMS

Types of Power Stations, Hydro, Thermal and Nuclear Stations. Pumped storage plants. Economics and operating factors. Power transmission lines. Modeling and performance characteristics. Voltage control. Load flow studies. Optimal power system operation. Load frequency control. Symmetrical Components. Per Unit representation. Fault analysis. Transient and steady-state stability of power systems. Equal area criterion. Power system Transients. Power system Protection Circuit breakers. Relays. HVDC transmission.

3. ANALOG AND DIGITAL ELECTRONICS AND CIRCUITS

Semiconductor device physics, PN junctions and transistors, circuit models and parameters, FET, Zener, tunnel, Schottky, photo diodes and their applications, rectifier circuits, voltage regulators and multipliers, switching behavior of diodes and transistors. Small signal amplifiers, biasing circuits, frequency response and improvement, multistage amplifiers and feed-back amplifiers, D.C. amplifiers, Oscillators. Large signal amplifiers, coupling methods, push pull amplifiers, operational amplifiers, wave shaping circuits. Multivibrators

and flip-flops and their applications. Digital logic gate families, universal gates-combination circuits for arithmetic and logic operational, sequential logic circuits. Counters, registers, RAM and ROMs.

4. MICROPROCESSORS

Microprocessor architecture-Instruction set and simple assembly language programming. Interfacing for memory and I/O. Applications of Micro-processors in power system.

5. COMMUNICATION SYSTEMS

Types of modulation; AM, FM and PM. Demodulators. Noise and bandwidth considerations. Digital communication systems. Pulse code modulation and demodulation. Elements of sound and vision broadcasting. Carrier communication. Frequency division and time division multiplexing, Telemetry system in power engineering.

6. POWER ELECTRONICS

Power Semiconductor devices. Thyristor. Power transistor, GTOs and MOSFETS. Characteristics and operation. AC to DC Converters; 1-phase and 3-phase DC to DC Converters; AC regulators. Thyristor controlled reactors; switched capacitor networks. Inverters; single-phase and 3-phase. Pulse width modulation. Sinusoidal modulation with uniform sampling. Switched mode power supplies.

SCHEDULE - IV

SYLLABUS FOR GRADE V (B)

CIVIL ENGINEERING

PAPER – I

TOTAL MARKS – 200

Duration of Examination – 2 Hours

1. BUILDING MATERIALS & CONSTRUCTION:

BRICKS AND TILE
STONES, SAND
CEMENT
MORTAR
CONCRETE
TIMBER
METALS AND OTHER ENGINEERING MATERIALS
PAINTS AND VARNISHES
BUILDING CONSTRUCTION
CONSTRUCTION PLANNING AND STORAGE OF MATERIAL
FOUNDATION
BRICKS AND STONE MASONRY
DAMP PROOFING
LINTEL AND ARCHES
ROOFS AND ROOF COVERINGS
DOORS AND WINDOWS
SCAFFOLDING
STAIR AND STAIRCASES
FLOORING
WALL FINISH

2. STRENGTH OF MATERIALS & THEORY OF STRUCTURE:

STRENGTH OF MATERIALS
BENDING MOMENT & SHARE FORCE IN BEAMS
BENDING STRESS IN BEAMS
SHEARING STRESSES IN BEAMS
COLUMNS & STRUTS
COMBINED BENDING & DIRECT STRESS
COMPOUND & COMPLEX STRESS
STRAIN ENERGY & IMPACT LOADING

THEORY OF STRUCTURES

DEFINITIONS & GENERAL PRINCIPLES
PRIMARY STRESS ANALYSIS FOR STATICALLY DETERMINATE PIN JOINTED STRUCTURES
FIXED & CONTINUOUS BEAMS, PROPPED CANTILEVER
MOMENT DISTRIBUTION METHOD
RETAINING WALLS (EARTH RETAINING STRUCTURES)

3. FOUNDATION ENGINEERING:

GENERAL CONSIDERATIONS FOR DESIGN OF FOUNDATIONS
TYPES OF FOUNDATION
BEARING CAPACITY OF SOILS
SETTLEMENT OF FOUNDATION
PILE FOUNDATION
SOIL STABILISATION
SOIL EXPLORATION
STRESS DISTRIBUTION IN SOILS
EARTH PRESSURE

4. CONCRETE TECHNOLOGY:

MATERIALS FOR CEMENT CONCRETE
PREPARATION OF CONCRETE
CONCRETE MIX DESIGN
QUALITY CONTROL
SPECIAL CONCRETE
DETERIORATION AND RESTORATION OF CONCRETE

5. QUANTITY SURVEYING

DEFINITION OF AN ESTIMATE AND TYPES
SYMMETRICAL & UNSYMMETRICAL BOUNDARY WALL (USING MODULAR & TRADITIONAL BRICKS)
CENTRE LINE, LONG WALL & SHORT WALL METHOD WITH EXAMPLE
DEFINITION OF FLOOR AREA, CARPET AREA, PLINTH AREA, FAR
ESTIMATE OF DIFFERENT ITEMS OF WORKS INVOLVED IN A SINGLE STOREY RESIDENTIAL BUILDING
ESTIMATE OF R.C.C. BEAMS, CHUJIA, LINTEL AND SLAB (ONE WAY & TWO WAY REINFORCEMENT) SHOWING BAR BENDING SCHEDULE)
CALCULATION OF QUANTITY OF MATERIALS OF DIFFERENT ITEMS OF WORKS
CALCULATION OF VOLUME OF EARTH WORK OF DIFFERENT WORKS
QUANTITY & COST ESTIMATE
CONTRACTS
PWD ACCOUNTS
ARBITRATION
VALUATION

CIVIL ENGINEERING
PAPER – II

TOTAL MARKS – 200

Duration of Examination – 2 Hours

1. HYDRAULICS

INTRODUCTION
FLUID STATIC
FLUID FLOW
FLUID MEASUREMENT
FLOW THROUGH PIPES
OPEN CHANNEL FLOW

2. IRRIGATION

HYDROLOGY
WATER REQUIREMENT OF CROPS
CANAL IRRIGATION
WELL IRRIGATION
CANAL HEAD WORKS
FLOOD CONTROL
WATER LOGGING
LAND RECLAMATION
MAJOR IRRIGATION PROJECTS IN INDIA

3. ENVIRONMENTAL ENGINEERING

AIR POLLUTION
AIR POLLUTION CONTROL MEASURES & EQUIPMENT
METHODS & APPROACH OF AIR POLLUTION CONTROL
DIFFERENT SOURCES OF WATER POLLUTION
WATER POLLUTION & ITS CONTROL
SOLID WASTE DISPOSAL

4. SURVEYING

LINEAR MEASUREMENTS
CHAIN SURVEYING
COMPASS SURVEYING
LEVELLING
CONTOURING
THEODOLITE SURVEYING
EARTH WORK CALCULATION
PLANE TABLE SURVEYING
COMPUTATION OF AREAS
COMPUTATION OF VOLUME

5. TRANSPORTATION ENGINEERING

PROJECTS & PROFILES
PERMANENT WAY
TRACK GEOMETRICS
POINTS & CROSSINGS
STATIONS & YARDS
PERMANENT WAY MAINTENANCE
ROAD DRAINAGE
TRAFFIC ENGINEERING
HIGHWAY MAINTENANCE

MECHANICAL ENGINEERING
PAPER – I

TOTAL MARKS - 200
Duration of Examination – 2 Hours

1. ENVIRONMENTAL ENGINEERING:

AIR POLLUTION
ANALYSIS OF AIR POLLUTANTS
AIR POLLUTION CONTROL MEASURES & EQUIPMENT
METHODS & APPROACH OF AIR POLLUTION CONTROL

WATER & ENVIRONMENT

WATER SOURCES
DIFFERENT SOURCES OF WATER POLLUTION
WATER POLLUTION & ITS CONTROL
NOISE & ENVIRONMENTAL MANAGEMENT SYSTEM
NOISE POLLUTION & CONTROL
ENVIRONMENTAL LEGISLATIONS, AUTHORITIES & SYSTEMS

2. MECHANICS OF MATERIALS

Stress and strain
Thin cylinder and spherical shells
Deflections of beams
Torsion of solid and hollow circular shafts
Springs
Riveted joints

3. MACHINE TOOL

GENERAL INTRODUCTION
METAL CUTTING
LATHE AND LATHE WORKS
DRILLING MACHINE

BORING MACHINE SHAPER & PLANNER

MILLING MACHINE
GRINDING MACHINE

4. FLUID MECHANICS

PHYSICAL PROPERTIES OF FLUIDS
FLUID STATICS
FLUID KINEMATICS
FLUID MEASUREMENTS
IMPACT OF JET
PUMPS
HYDRAULIC TURBINE

MECHANICAL ENGINEERING

PAPER – II

TOTAL MARKS – 200
Duration of Examination – 2 Hours

1. AUTOMOBILE ENGINEERING

CONSTRUCTIONAL FEATURES
FUEL SUPPLY SYSTEM
COOLING SYSTEM
LUBRICATION SYSTEM
INTAKE & EXHAUST SYSTEM
FUELS
COMBUSTION IN ENGINE
AUTOMOBILE EMISSION & ITS CONTROL
ELECTRICAL SYSTEM
CHASSIS & BODY
TRANSMISSION SYSTEM
GEAR BOX
PROPELLER SHAFT & FINAL DRIVE
SUSPENSION SYSTEM
STEERING SYSTEM
BRAKING SYSTEM
WHEEL & TYRE
GARAGE AND SERVICE STATION

2. NON CONVENTIONAL ENERGY SOURCES

SOLAR POWER PLANTS
SOLAR ENERGY
SOLAR RADIATION
WIND POWER PLANTS
WIND ENERGY
ENERGY FROM BIO-MASS

3. REFRIGERATION & AIR-CONDITIONING

AIR REFRIGERATION SYSTEM
VAPOUR COMPRESSION REFRIGERATION SYSTEM
VAPOUR ABSORPTION SYSTEM
REFRIGERANTS
REFRIGERATION COMPONENTS, CONTROL AND SAFETY DEVICES
APPLICATION OF REFRIGERATION

ELECTRICAL ENGINEERING

PAPER – I

TOTAL MARKS - 200
Duration of Examination – 2 Hours

1. POWER PLANT ENGINEERING

Conventional sources of Energy – Fossil fuels, Hydroelectric and nuclear.
Thermal Power Station:
Hydro-electric Power Stations:
Nuclear Power Plants:
Diesel Power Plant & Gas-turbine Plants:
Elementary idea about Major Electrical Equipments used in Power Stations:

PAPER – II

TOTAL MARKS - 200
Duration of Examination – 2 Hours

1. BASIC ELECTRONICS

Passive & Active Circuit Elements
Familiarity with the following components: —
RESISTORS, FUSES, CAPACITORS, INDUCTOR,
Voltage source and current source
AC and DC signals, Transformer

RELAYS, SWITCHES, CABLES AND CONNECTORS
ZENER DIODE
BIPOLAR TRANSISTOR
FIELD EFFECT TRANSISTOR
UNIJUNCTION TRANSISTOR
THYRISTOR
OPTOELECTRONICS
INTEGRATED CIRCUITS

2. ELECTRICAL MEASUREMENT & MEASURINGINSTRUMENTS

Definition & brief explanations of:
Range, sensitivity, true & indicated value, Errors (including limiting errors),
Resolutions, Accuracy, Precision and instrument efficiency.
Classification of instruments:
Basic Requirements for measurements:
Different types of instruments:
voltmeter, ammeter, multimeter, energy-meter.
Multi-range ammeter and voltmeter
Methods of measuring diff. Electrical quantities:
1-phase Induction type energy meter.
Errors adjustments
Phantom loading
Testing of energy meters.
lassifications of resistances
Description of Meggar.
Measurement of capacitance:
Magnetic measurements:
Instrument Transformers:
CT
PT or VT
Diff. Types of faults

3. CIRCUIT THEORY

NETWORKS & A.C. FUNDAMENTALS

Single-phase A.C. Circuits:
R-L-C Series Circuit:
Parallel Circuit:

RESONANCE & SELECTIVITY

SERIES RESONANCE:
PARALLEL RESONANCE:

TRANSIENTS (FOR ELECTRICAL ENGINEERING ONLY)
Steady State & Transient Response.
POLYPHASE CIRCUITS:
COUPLED CIRCUITS:
LAPLACE TRANSFORMATIONS:
FILTERS:
LAPLACE TRANSFORMATIONS

4. ELECTRICAL MEASUREMENT & CONTROL

Measurement of Power/Energy & Industrial Metering:
Digital energy-meter
Operation & Utility of Tri-vector meter.
Digital frequency meter
(i) Mech. Resonance type (ii) Electrical resonance type Frequency meter
Power manager.
Synchroscope:
Phase-sequence meter
Digital multimeter
C.R.O.—block diagram representation & operation, applications
Use of dual trace oscilloscope.
Function generator—
Frequency Counter—
Elements of Servomechanism:
Stepper Motor—

Measurement of Non-electrical quantities:
Study of the following transducers:

Piezo-electric crystal.
Thermistor.
Strainguage.
Proximity switch.
Thermocouple.
LVDT.
Tachogenerator(a.c.& d.c.)
Capacitive transducers—
Seismic transducers.

CONTROL SYSTEM:

Brief descriptions with physical example (alongwith schematic diagram) of:

On-off controller.
Proportional controller.
Proportional plus derivative controller.
P+I controller.
P + D + I controller.

5. ELECTRICAL INSTALLATION, MAINTENANCE AND TESTING

General guidelines for Installation:
Loading & unloading of heavy electrical m/c:
Electrical Installation requirements:
Earthing Installation:
General requirement of electric installation according to I.E. Rules:
Motor generator set for battery charging and to supply various loads.
Synchronization of two alternators.

Maintenance of electrical installations
Insulation:
Troubleshooting:
Repair & Maintenance with Maintenance Schedule of:
D.C. machine
Transformer
Induction motor
Switchgear & Substation:
Relays
Brief account of maintenance of contactors.
Storage Batteries-
OH lines and Cables:
Testing
Electric Safety Regulations:

GOVERNMENT OF TRIPURA

PUBLIC WORKS DEPARTMENT

TRIPURA ENGINEERING SERVICE
(5th Amendment), [Rules, 2009.]

GOVERNMENT OF TRIPURA
PUBLIC WORKS DEPARTMENT
CIVIL SECRETARIAT: AGARTALA

No. F. 6(14)-PWD(E)/2002 **Dated, Agartala, the May 30, 2009**

NOTIFICATION

In exercise of the powers conferred by Article 309 of the Constitution of India and all other powers enabling him in this behalf, the Governor, Tripura is pleased to make the following rules further to amend the Tripura Engineering Service Rules, 1987, namely–

1. Short Title and Commencement

1). These rules may be called the **Tripura Engineering Service (5th amendment) Rules, 2009.**

2). They shall come into force on and **from the date of their publication in the official gazette.**

2. Amendment of Rule - 1

(1). For sub rule (b) of Rule -1 of the Principal Rules, the following shall be substituted, namely -

(b). They shall apply to the Engineers of the following Wings of the Public Works Department, Government of Tripura:-

i). Roads & Buildings Wing (R&B)

ii). Water Resources Wing (WR)

iii). Drinking Water & Sanitation Wing (DWS), and

iv). Pradhan Mantri Gram Sadak Yojana/Bharat Nirman Wing (PMGSY/BN)

v) Any other wing or wings or unit or units which are placed or may be placed under the Public Works Department from time to time

3. For Sub-rule (2) of Rule 3, the following shall be substituted-

(2). The service shall have the following 6(six) Grades, namely -

i). Grade I - Group – A, gazetted

ii). Grade II - Group – A, gazetted

iii) Grade III - Group – A, gazetted

iv). Grade IV - Group – A, gazetted

v) Grade III - Group – C, Non gazetted

3. Sub-rule (1) of Rule 4, the following shall be substituted, namely:-

The authorized permanent strength of the service and the duty posts included therein shall be as specified in the Schedule to these rules.

4. **For Sub-rule (1) (a) of Rule 5, the following shall be substituted**, namely:-

(a) 20% of the posts in the authorized permanent strength of Grade IV of the service shall be filled by direct recruitment from candidates who have at least a degree in appropriate branch of engineering from a recognized university or its equivalent academic qualification and at least 2(two) years experience of service in the respective field of engineering under the Govt. or Govt undertaking in the manner as specified in part IV of these rules.

Provided that the candidates having a post graduate degree in engineering shall be given preference.

6. **For Rule 7 of the Principal Rules , the following shall be substituted**, namely –

7. The competitive examination for direct recruitment to the service shall be held in the manner laid down in the Rules and syllabus for combined competitive examination for all Engineering posts in various Departments to be conducted by the Commission from time to time. The dates on which and the place at which the examination shall be held shall be fixed by the Commission.

7. **For Rule 8 of the Principal Rules, the following shall be substituted,** namely -

8. The qualification for admission to the examination and the conduct thereof shall be in accordance with such Rules and Syllabus as the Govt, may from time to time, issue in this behalf in consultation with the Commission.

8 **For Sub Rule (1) of rule 14 of the service, the following shall be substituted**, namely –

(1). Recruitment to Grade I , Grade II , Grade III & Grade IV of the service under Sub-Rule(2) of Rule 5 shall be made on the recommendation of a Selection Committee consisting of :-

i). Chairman of the Commission	**Chairman**
ii). One senior Secretary to the Government to be nominated by the Chief Secretary	**Member**
iii). Secretary, Public works Department	**Member**
iv). Secretary, Tribal Welfare Department	**Member**
v). Secretary, SC, OBC & Minority Welfare Department	**Member**

9. **For Sub rule (1) and (2) of Rule 15, the following shall be substituted** namely -

(1). Grade I posts shall be filled by officers who hold Grade II posts and have rendered not less than 5 years regular service.

10. **Sub-rule 3, 4, 5 & 6 of Rule 15 shall be re numbered as 2,3,4 and 5.**

11. **For Sub-rule (c) of Rule 21 , the following shall be substituted**, namely -

(c) No officer except officers in grade V(B) who has not passed departmental examination prescribed by the Government for the respective posts shall be eligible for selection to a higher grade of the service.

12. **For Rule 30 of the Rules, the following shall be substituted**, namely -

30. Pay, other benefits, Dearness and other allowances shall be paid to persons holding duty posts in respective grades at such rates as may be determined by the Government from time to time.

13. **The phrase first schedule is substituted by the word schedule as appended.**

14. **The phrase Second schedule is deleted**

By order of the Governor of Tripura

Enclo: Schedule as stated

(T.K.Bhowmik)
Deputy Secretary
Public Works Department
Govt. of Tripura.

To

1. **Principal Secretary, PWD, Govt. of Tripura**
2. **Principal Secretary, Finance Department, Govt. of Tripura** in reference to UO No 240- Fin (G)/ 09 Dt. 22.05.09
3. **Commissioner & Secretary, GA (P&T) Department, Govt. of Tripura** in reference to UO No 230/ GA (P&T)/ 09/21.05.09
4. **Secretary, Law Department, Govt. of Tripura** in reference to UO No 188/ SECY/ LAW Dt. 22.05.2009
5. **Secretary, TPSC, Agartala, Tripura** vide their letter [illegible]
6. Manager, Tripura Government Pre[illegible]
   [illegible] in next issue of Tripura Gazette
7. Guard File

SCHEDULE

TRIPURA ENGINEERING SERVICE GRADE I

Name of the duty posts	Strength
Chief Engineer (Civil), Roads & Buildings	1
Chief Engineer (Civil), Water Resources	1
Chief Engineer (Civil), Drinking Water & Sanitation	1
Chief Executive Officer, Tripura Housing & Construction Board	1
Chief Engineer, PMGSY/ Bharat Nirman(BN)	1
Additional Chief Engineer & Sole Arbitrator(Civil), (Roads and Buildings/Water Resources/ Drinking Water & Sanitation/ PMGSY/BN)	4
Total	9
Leave Reserve @ 30%	3
Total (Grade - I)	***12***
Degree Holder	12
TRIPURA ENGINEERING SERVICE GRADE-II	
Name of the duty posts **Civil Engineering Branch**	
Superintending Engineer, Planning Circle (Roads and Buildings/ Water resources/ Drinking Water & Sanitation)	6
Superintending Engineer, Working Circle (Roads and Buildings/ PMGSY(BN)/ Water Resources/ Drinking Water & Sanitation)	17
Superintending Engineer, Monitoring Cell (Roads and Buildings)	1
Superintending Engineer & Ex officio Joint Secretary	4
Total	28
Leave Reserve @ 30%	8
Total(Grade -II)	***36***
Degree Holder	**36**
TRIPURA ENGINEERING SERVICE GRADE-III	
Name of the duty posts Civil Engineering Branch Executive Engineer (Planning) in Circle Offices	31
Executive Engineer in Division Offices	51
[illegible]	
Deputy Secretary (Civil)	6

Executive Engineer (Research, Development, Quality and Promotion Cell)	1
Total	89
Leave Reserve @ 30%	27
Total	116
Degree-holder	**81**
Diploma-holder	**35**
Mechanical Engineering Branch **Name of the duty posts**	
Executive Engineer (Mechanical Division)	1
Executive Engineer (Rig Division)	1
Total	2
Leave Reserve @ 30%	1
Total	3
Degree-holder	**2**
Diploma-holder	**1**
Electrical Engineering Branch **Name of the duty posts**	
Executive Engineer (Internal Electrification Division)	3
Electrical Inspector	1
Total	4
Leave Reserve @ 30%	1
Total	5
Degree holder	**4**
Diploma holder	**1**
Total Grade - III	***124***
TRIPURA ENGINEERING SERVICE GRADE-IV **Name of the duty posts** **Civil Engineering Branch**	
Assistant Engineer in Sub-Divisions	167
Technical Assistant to Superintending Engineer	19
Assistant Engineer, Soil Testing Laboratory	1
Estate Officer	1
Assistant Engineer (Planning) in the office of the Chief Engineer	6
Assistant Engineer (Planning) in Circle Office	1

Assistant Engineer (Planning) in Circle	94
Total	353
Leave Reserve @ 30%	106
Total	459
Degree-holder (promotion)	**184**
Degree holder (direct)	**91**
Diploma holder	**184**
Mechanical Engineering Branch **Name of the duty posts**	
Assistant Engineer in Sub-Divisions	10
Assistant Engineer (Planning) in Circle	2
Assistant Engineer (Planning in Division Offices)	7
Total	19
Leave Reserve @ 30%	6
Total	25
Degree holder (promotion)	10
Degree holder (direct)	5
Diploma-holder (promotion)	10
Electrical Engineering Branch **Name of the duty posts**	
Assistant Engineers in Sub-Divisions	9
Assistant Engineer (Planning) in Circle Office	2
Assistant Engineer Planning in Division office	3
Total	14
Leave Reserve @ 30%	4
Total	18
Degree holder (promotion)	**7**
Degree Holder(direct)	**4**
Diploma holder(promotion)	**7**
Total Grade - IV	**502**
TRIPURA ENGINEERING SERVICE GRADE-V(A)	
Name of the duty posts **Civil Engineering Branch**	
Junior Engineer in Sub-Divisions (Roads & Buildings)	302
[illegible]	[illegible]
[illegible]	[illegible]

Junior Engineer in Sub Divisions (PMGSY)	32
Junior Engineer in Circle Office	2
Junior Engineer in Division Offices	44
Junior Engineer in Estate Office	1
Junior Engineer in Soil Testing Laboratory	2
Total	580
Leave Reserve @ 30%	174
Total	754
Degree holder (direct)	**540**
Diploma-holder (promotion)	**214**
Name of the duty posts **Mechanical Engineering Branch**	
Junior Engineer in Sub-Divisions	32
Junior Engineer in Circle Offices	2
Junior Engineer in Division Offices	5
Total	39
Leave Reserve @ 30%	10
Total	49
Degree-holder (direct)	35
Diploma-holder (promotion)	14
Name of the duty posts **Electrical Engineering Branch**	
Junior Engineer in Sub-Divisions (R&B)	28
Junior Engineer in Sub-Divisions (DWS)	4
Junior Engineer in Circle Offices	1
Junior Engineer in Division Offices	3
Junior Electrical Inspector	1
Total	37
Leave Reserve @ 30%	11
Total	48
Degree-holder (direct)	
Diploma-holder (promotion)	
Total Grade –V (A)	

TRIPURA ENGINEERING SERVICE (TES)	
Name of the duty posts Civil Engineering Branch	
Junior Engineer in Sub-Divisions (Roads & Building)	5
Junior Engineer in Sub-Divisions (Water Resources)	44
Junior Engineer in Sub-Divisions (DWS)	55
Junior Engineer in Circle Offices	18
Junior Engineer in Division Offices	36
Junior Engineer in Estate Office	1
Junior Engineer in Soil Testing Laboratory	1
Total	250
Leave Reserve @ 30%	75
Total	325
Diploma holder	***325***
Name of the duty posts **Mechanical Engineering Branch**	
Junior Engineer in Sub-Divisions	14
Junior Engineer in Circle Offices	0
Junior Engineer in Division Offices	2
Total	16
Leave Reserve @ 40%	5
Total	21
Diploma holder	21
Name of the duty posts **Electrical Engineering Branch**	
Junior Engineer in Sub-Divisions (PWD)	10
Junior Engineer in Sub-Divisions (DWS)	2
Junior Engineer in Circle Offices	0
Junior Engineer in Division Offices	3
Junior Electrical Inspector	0
Total	15
Leave Reserve @ 40%	5
Total	20
Diploma holder	20
Total Grade – V(B)	**366**
Total-Grade- V(A) and (B)	**1217**
GRAND TOTAL OF ALL GRADES	**1891**

(T. K. BHAUMIK)
DEPUTY SECRETARY,
P.H.E. Work Department
Govt. of Tripura

No. 198 Registered No. N. E. 930.

TRIPURA GAZETTE

Published by Authority

EXTRAORDINARY ISSUE

Agartala, Tuesday, June 10, 2014 A. D., Jyaistha 20, 1936 S. E.

PART--I-- Orders and Notifications by the Government of Tripura, The High Court, Government Treasury etc.

No.F.6(14)-PWD(E)/93
GOVERNMENT OF TRIPURA
PUBLIC WORKS DEPARTMENT

Dated, Agartala, The 23rd May ,2014.

NOTIFICATION

In exercise of the powers conferred by the provison to article 309 of the Constitution of India and all other powers enabling him in this behalf, the Governor, in consultation with the Public Service Commission, is pleased to make the following rules namely, ___

1. Short title & Commencement

i) These rules may be called the "Tripura Engineering Service (TES) (6th Amendment, 2014) Rules,1987.

ii) They shall come into force from the date of their publication in the Official Gazette.

The following are added in Rule-21

d) i) Diploma holders Gr-V(B) and above have to pass Accounts and Simple Rules Papers to get promotion to Gr-IV and above.

ii) Degree Engineers Gr-V(A) have to pass Accounts and Simple Rules papers to get promotion to Gr-IV and shall have to pass Law & Arbitration Papers to get promotion to Gr-III and above.

e) Degree Engineers who are appointed directly in Gr-IV also have to pass the Departmental Examination as specified for Grade-V(A) Degree holder to get promotion to the next higher grade, if not yet passed.

f) To get promotion to the next higher grade the existing Engineering officer of TES Gr-V, Gr-IV & Gr-III have to pass their specified papers/subjects viz.Accounts, Simple Rules and Law & Arbitration, if they had not passed earlier in any grade.

g) Engineering officers who have attained the age of 55 years and above are exempted from appearing and passing departmental examinations to get promotion to next higher grades.

By order of the Governor,

23/05/2014

(S K NANDI)
DEPUTY SECRETARY,PWD.

Printed at the Tripura Government Press, Agartala.

GOVERNMENT OF TRIPURA
(PUBLIC WORKS DEPARTMENT)

TRIPURA ENGINEERING SERVICE RULES,1987 (7th Amendment,2014)

(AS COMPILED UPTO 10TH JUNE, 2014)

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TRIPURA ENGINEERING SERVICE RULES, 1987
(As complied upto 10th June,2014.)

No.F.6(14)-PWD(E)/2013
GOVERNMENT OF TRIPURA
PUBLIC WORKS DEPARTMENT

Dated, Agartala, The 10th June, 2014

NOTIFICATION

In exercise of the powers conferred by the provision to article 309 of the Constitution of India and all other powers enabling him in this behalf, the Governor, Tripura, is pleased to make the following rules further to amend the Tripura Engineering Service Rules, 1987 namely,

PART-I
[GENERAL]

1. Short Title and commencement

a) These rules may be called the 'Tripura Engineering Service Rules, 1987 (7th Amendment 2014) .

b) [They shall apply to the Engineers of the following Wings of the Public Works Department, Government of Tripura.

i) Roads & Buildings (R&B)Wing
ii) Water Resources (WR)Wing
iii) Drinking Water & Sanitation Wing (DWS) and
iv) Pradhan Mantri Gram Sadak Yojana/Bharat Nirman Wing (PMGSY/BN)
v) Any other wing or wings or unit or units which are placed or may be placed under the Public Works Department from time to time.]#

c) They shall come into force on and from the date of their publication in the official gazette.

2. Defination

In these rules, under the context otherwise requires :-

a) "Commission" means Tripura Public Service Commission.

[b) 'Duty post' means any post specified in the Schedule appended to these rules and includes a temporary post carrying the same designation as any of the posts specified in the schedule and the scale of pay of which is identical to the attached to any Grade of the Service].**

c) "Government" means the Government of Tripura.

[d) "Member of the Service" means a person appointed in a substantive capacity to any Grade of the Service and includes a person appointed on probation].**

e) "Schedule" means the Schedule [appended]* to these Rules.

f) "Service" means Tripura Engineering Service.

Note- * Substituted by the TES (3rd Amendment) Rules, 2007.
Substituted by the TES (5th Amendment) Rules, 2009
** Inserted by TES (3rd Amendment) Rules, 2007.

PART-II
[CONSTITUTION OF THE SERVICE, ITS CLASSIFICATION AND AUTHORISED STRENGTH]##

3. Constitution of the Service and its classification

1). There shall be constituted a State Civil Service to be known as the Tripura Engineering Service.

2). [The service shall have the following 6(six) Grades, namely –

i) Grade-I - Group – A, gazetted
ii) Grade-II - Group – A, gazetted
iii) Grade-III - Group – A, gazetted
iv) Grade-IV - Group – A, gazetted
v) Grade-V(A) - Group – B, gazette *
vi) Grade-V(B) - Group – C, Non gazette]#

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4. Strength of the Service

1) The authorized permanent strength of the service and the duty posts included therein shall be as specified in the Schedule to these rules.
2) The Government may, be order, create duty posts for such period as may be specified therein.
3) Distribution of posts of Grade-V between Grade V(A) and V(B) shall be 70:30.
4) Distribution of posts between Degree Holder and Diploma Holder in Grade-V [Grade-V(A) and Grade-V(B)] together] shall be 50:50.]##

PART-III
[METHODS OF RECRUITMENT]

[5. Appointment to the service shall be made by the following methods, namely –

1) Direct recruitment

(a) [20% of the posts in the authorized permanent strength of Grade-IV of the service shall be filled by direct recruitment from candidates who have at least a degree in appropriate branch of engineering from a recognized university or its equivalent academic qualification and at least 2(two) years experience of service in the respective field of engineering under the Govt. or Govt. undertaking in the manner as specified in part IV of the rules.]# Provided that the candidates having a post graduate degree in engineering shall be given preference.

(b) 71% of the posts in the authorized permanent strength of Grade-V(A) of the service shall be filled by direct recruitment from candidates who have at least a degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification in the manner as specified in PART-IV of these rules.

(c) All the posts in the authorized permanent strength of Grade-V(B) of the service shall be filled by direct recruitment only from candidates who have a diploma in an appropriate branch of engineering or its equivalent academic qualification from a recognized Institution in the manner as specified in Part-IV of these rules.

Note :- # Substituted by the TES(5th Amendment) Rules, 2009
* Substituted by the TES (7th Amendment) Rules, 2014
Substituted by TES (3rd Amendment) Rules,2007.

2. **Recruitment by selection**

The remaining substantive vacancies in the permanent strength of various Grades of the Service shall be filled by selection in the manner as specified in **PART-V** of these rules ;

Provided that –

(a) 70% of the posts in Grade-III of the service shall be filled by Degree holder engineers and the remaining 30% by Diploma holder engineers:
(b) 40% of the posts in Grade-IV of the service shall be filled by Degree holder engineers of Grade-V(A) and remaining 40% of the posts in Grade-IV of the service shall be filled by Diploma holder engineers of Grade-V(A);
(c) 29% of the posts in Grade-V(A) of the service shall be filled by Diploma holder engineers of Grade-V(B).]*

PART-IV
[DIRECT RECRUITMENT]

[6. **Selection to be made by the Commission**

Selection of candidates for direct recruitment to the service shall be made by the Commission.

7. **Competitive Examination**

[The Competitive examination for direct recruitment to the service shall be held in the manner laid down in the Rules and syllabus for combined competitive examination for all Engineering posts in various Departments to be conducted by the Commission from time to time. The dates on which and the place at which the examination shall be held shall be fixed by the Commission.]#

8. **Admission to competitive examination**

[The qualification for admission to the examination and the conduct thereof shall be in accordance with such Rules and Syllabus as the Govt. may from time to time, issue in this behalf in consultation with Commission.]#

9. **Decision of the Commission to be final**

The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the examination shall be final and no candidate to whom a certificate of admission has not been issued by the Commission shall be admitted to the examination.

10. **Commission to forward a list in order of merit**

The Commission shall forward to the Government a list arranged in order to merit of the candidates who have qualified by such standard as the Commission may determine and of the candidates belonging to the Scheduled Castes and the Scheduled Tribe who, though not qualified by that standard, are declared by the Commission to be suitable for appointment to the Service with due regard to the maintenance of efficiency in administration.

Note:- * Substituted by the TES (3rd Amendment) Rules,2007
Substituted by the TES (5th Amendment) Rules, 2009

11. Inclusion in the list not to confer right to appointment

The inclusion of a candidate's name in the list referred to in rule-10 above confers no right to appointment unless the Government is satisfied, after such inquiry as it may consider necessary, that the candidate is suitable in all respects for appointment to the Service and an actual offer of appointment is made.

12. Physical fitness

No candidate shall be appointed to the Service unless he is declared, after such medical examination as the Government may prescribe, to be in good mental and bodily health and free from such mental or physical defect which is likely to interfere with the discharge of the duties of the Service.

13. Appointment of candidates included in the list

Subject to the provision of these rules the caididates will be considered for appointment to the available vacancies in the order in which their names appear in the list referred to in rule -10 above.]*

PART-V
[RECRUITMENT BY SELECTIN]*

[14. Constitution of Selection Committees

1. [Recruitment to Grade-I, Grade-II, Grade-III & Grade-IV of the service under Sub-Rule(2) of Rule-5 shall be made on the recommendation of a Selection Committee consisting of :-

i)	Chairman of the Commission	Chairman
ii)	One senior Secretary to the Government To be nominated by the Chief Secretary	Member
iii)	Secretary, Public Works Department	Member
iv)	Secretary, Tribal Welfare Department	Member
v)	Secretary, SC, OBC & Minority Welfare Department	Member]#

2. Recruitment to Grade-V(A) of the service under sub-rule(2) of rule-5 shall be made on recommendation of a Selection Committee consisting of :-

i)	The Secretary, Public Works Department	-	Member
ii)	The Secretary, Tribal Welfare Department	-	Member
iii)	The Secretary, SC, OBC & Minority Welfare Department	-	Member

*Substituted by the TES (3rd Amendment) Rules,2007
Substituted by the (5th Amendment) Rules,2009

3. The Senior most Secretary shall preside over the meeting of the Selection Committee constituted under sub-rule(2) above.

15. **Conditions of eligibility for selection**

Other than direct recruitment posts, all substantive posts in various Grades of the service shall be filled by selection from officers as shown below:-

[1. Grade-I posts shall be filled by officers who hold Grade II posts and have rendered not less than 5 years regular service.

2. **Grade-II posts** shall be filled by officers who hold Grade-III posts and have rendered not less than 7 years regular service in the Grade and have at least a degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification.

3. **Grade-III posts** shall be filled in the manner as specified in sub-rule(2) of rule-5 by officers who hold Grade-IV posts and have rendered not less than 7 years regular service in the Grade.

4. **Grade-IV posts** shall be filled in the manner as specified in sub-rule(2) of rule-5 by officers who Grade-V(A) posts and have rendered not less than 3 years regular service in the Grade; and

5. **Grade-V(A) posts** shall be filled in the manner as specified in sub-rule(2) of rule-5 by officers who are Diploma holder engineers holding Grade-V(B) posts and have rendered not less than 4 years regular service in the Grade.]*

16. **Procedure for selection**

1. The Committee constituted under sub-rule(1) and sub-rule(2) , as the case may be, of rule-14 shall consider from time to time, cases of those officers who are eligible under rule-15 for promotion to a higher Grade and prepare a list of persons recommended taking into account the actual number of vacancies at the time of selection and those likely to occur during a year. The selection for inclusion in the list shall be based on merit and suitability in all respects for appointment to the Service with due regard to seniority;

   Provided that where a person is considered for such appointment to a higher grade from a lower grade, all persons senior to him in the lower feeder grade, shall slso be considered irrespective of whether or not they fulfill the requirement of the minimum period of regular service in the lower grade as provided in ruloe-15.

2. The names of persons included in the list shall be arranged in the order of merit and be forwarded to the Government.

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* Substituted by the TES (5th Amendment) Rules,2009

17. Consultation with the Commission.

1. The list prepared under sub-rule(2) of rule-16 shall be forwarded by the Government to the Commission along with the relevant records, where consultation with the Commission is necessary or where the Chairman of the Commission desires that reference be made to the Commission.
2. If the Commission considers it necessary to make any change in the list received from the Government, the Commission shall inform the Government of the changes proposed.
3. The list shall finally be approved by the Government after taking into account the changes, if any, proposed by the Commission.
4. The list thus finally approved shall ordinarily be in force until a fresh list is prepared for the purpose in accordance with these rules.

18. Appointment to the Service.

Appointment to the Service shall be made in the order of merit as shown in the list referred to in sub-rule(3) of rule 17.]*

PART-VI
[ELIGIBILITY FOR DIRECT RECRUITMENT]

[19. Candidates for direct recruitment to the Service must fulfill the following conditions :-

1. Common eligibility conditions

For direct recruitment to any Grade of the Service a candidate :-

i) Must be a citizen of India; and
ii) Must not be less than 18 and more than 37 years of age;

Provided that the Scheduled Castes, Scheduled Tribes and Physically Handicapped category of candidates and the Government servants shall get in upper age relaxation of 5(five) years;

Provided further that Government servants of Scheduled Castes, Scheduled Tribes and Physically Handicapped category shall not get the upper age relaxation of 5 years over and above the upper age relaxation of 5 years admissible to them as Scheduled Castes, Scheduled Tribes and Physically Handicapped.

2. Educational qualification

a) For direct recruitment to Grade-IV and Grade-V(A) of the Service a candidate must have at least a Degree in an appropriate branch of engineering from a recognized University or its equivalent academic qualification.

Note:- *Substituted by the TES(3rd Amendment) Rules,2007

b) For direct recruitment of Grade-V(B) of the service a candidate must have a Diploma in an appropriate branch of engineering or its equivalent academic qualification from a recognized Institution.]*

PART-VII

[APPOINTMENT, PROVATION, TRAINING AND CONFIRMATION]

20. Appointment:

All appointments to the Service shall be made to the Grade and not against any specific post included in the Service.

21. Disqualification:

(a) No person who has more than one spouse living or who, having a spouse living marriages in any case in which such marriage is void by reason of its taking place during the life time of such spouse, shall be eligible for appointment to the service; and

(b) No woman marriage is void by reason of the husband having a wife living at the time of such marriage or who has married a person who has a wife living at the time of such marriage, shall be eligible for appointment to the service;

Provided that the State Government may, if satisfied that there are special grounds for so ordering, exempt any person from the operation of this rule.

(c) [No officer except officers in Grade-V(B) who has not passed departmental examination prescribed by the Government for the respective posts shall be eligible for selection to higher grade of the service.]#

[(d) i) Diploma holder Gr-V(B) and above to pass Accounts and Simple Rules papers to get promotion to Gr-IV and above.

ii) Degree Engineers Gr-V(A) have to pass Accounts and Simple Rules papers to get promotion to Gr-IV and shall have to pass Law & Arbitration Papers to get promotion to Gr-III and above.

(e) Degree Engineers who are appointed directly in Gr-IV also have to pass the Departmental Examination as specified for Grade-V(A) Degree holders to get promotion to the next higher grade, if not yet passed.

(f) To get promotion to the next higher grade the existing Engineering officer of TES Gr-V, Gr-IV & Gr-III have to pass their specified papers/subjects viz. Accounts, Simple Rules and Law & Arbitration, if they had not passed earlier in any grade.

(g) Engineering officers who have attained the age of 55 years and above are exempted from appearing and passing departmental examinations to get promotion to next highr grades.]##

22. Special provision for Scheduled Castes and Scheduled Tribes

Appointment to every Grade of the Service made by direct recruitment or by selection or otherwise shall be subject to the laws in force in the State regarding special representation of the Scheduled Castes and Scheduled Castes in the Services under the State.

Note:- * Substituted by the TES (3rd Amendment) Rules,2007
Substituted by the TES(5th Amendment) Rules,2009
Inserted by the TGES (6th Amendment) Rules,2014

23. Period of probation:-

(1) Every person appointed to Grade-IV, under Rule-5(I)(a) Grade-V(A) under Rule-5(I)(b) and to Grade-V(B) if the service under Rule-5(1)(c) shall be on probation for a period of two years.

(2) The State Government may in the case of any person extend the period of probation in consultation with the Commission.

(3) The Government may, in consultation with the Commission, discharge, at any time, a probationer from service without assigning any reason therefore.

(4) A person on probation who holds a lien on any permanent post under the Central or State Government may, if he so desires during the period of probation, has the option to be reverted to his parent Department or Government after giving such notice as may be prescribed by the Government.

24. Training and Departmental Examination :

(1) Every person appointed to the service under Rule-5 shall pas, during the period of probation, such examination and complete successfully such training as may be prescribed.

(2) Every person appointed to the service under Rule-5 shall pass such Departmental Examination as the Government may, from time to time, prescribe.

25. Confirmation in Service:

A person appointed to the service under Rule-5 may be confirmed in the service on the basis of general assessment of his performance during the period of probation and his performance in the training and the examinations as provided in Rule-24.]*

PART-VIII
[MISCELLANEOUS]*

[26. Posting of members of the Service

Every member of the service shall, unless he is appointed to an ex-cadre post, or is otherwise not available for holding a duty post owing to the exigencies of service, be posted against a duty post under the Government.

27. Deputation

A member of the Service may, on deputation, be transferred to any post or be allowed deputation to any post outside the service under the Central or State Government, any company or organization

28. Private practice

No member of the service shall undertake private practice of any kind in any form or manner without previous permission of the competent authority.

Note:- *Substituted by the TES (3rd Amendment) Rules,2007

29. Seniority –

The State Government shall prepare a list of members of the service arranged in order of seniority as determined in the manner specified below:-

(i) Seniority of officers in each grade of the service shall be determined separately.

(ii) Seniority of Degree-holder engineers and Diploma-holder engineers shall be determined separately and not clubbed together.

(iii) In the case of persons appointed on the results of a competitive examination, under rule-5(1) or by selection under Rule-5(2) seniority in the service shall be determined by the order is which appointments are made to the Service.

Provided that-

(a) Persons recruited on the results of a competitive examination in any year shall be ranked inter se in the order of merit in which they are placed at the competitive examination on the result of which they are recruited, those recruited on the basis of an earlier examination being ranked senior to those recruited on the basis of later examination.

(b) The relative seniority inter se of persons recruited by selection shall be determined on the basis of the order in which their names are arranged in the list prepared under Rule-16.

(iv) [The seniority of direct recruits and of promotes shall be determined according to the rotation of vacancies filled in a recruitment year between the direct recruits and the promotes or the promotes and the direct recruits as the case may be in a calendar year.

For example -

(a) It may be 1:2 if appointment to the service were made on the basis of direct recruitment first.

(b) It may be 1:2 if appointment to the service were made on the basis of promotion firs.]*]#

[30. Pay and allowances:

[Pay and other benefits, Dearness and other allowances shall be paid to persons holding duty posts in respective grades at such rates as may be determined by the Government from time to time.]**

a) [Engineers recruited in TES Gr-V(B) shall move to the pay scale of Rs.9570/- to Rs.30000/- G.P. Rs. 3500/- under PB-3 on completion of 10 years of continuous and satisfactory service]##

31. Transitional arrangement :

Transitional arrangement for adjustment of existing members of the service, wherever found in excess, shall considered in the following manner :-

(1) Degree-holder found in excess in Grade-IV, if any, shall immediately be adjusted against both the direct recruitment and promotion posts for Degree holders. These shall be adjusted finally as amended rules hereby on availability of future vacancies.

Note- * Substituted by the TES(7th Amendment) Rules, 2014
Substituted by the TES(3rd Amendment) Rules,2007
** Substituted by the TES (5th Amendment) Rules,2009
Inserted by the TES (7th Amendment) Rules,2014

(2) Diploma-holders, found in excess in Grade-IV, if any, shall immediately be adjusted against the vacancies of direct recruitment posts for Degree holders in Grade-IV. The same shall be adjusted finally as per amended rules hereby on availability of future vacancies.

(3) Degree-holders found in excess, in Grade-V(A), if any shall immediately be adjusted against the vacancies in Grade-V(A) for Diploma holders and shall be adjusted finally as per amended rules hereby on availability of future vacancies.

(4) Diploma-holders found in excess, in Grade-V(A), if any shall immediately be adjusted against the vacancies in Grade-V(B) for Diploma holders and the same shall be adjusted finally as per amended rules hereby on availability of future vacancies.

30. Any occupied posts not possible to be adjusted in this service in accordance with the provisions of these rules as per transitional arrangement provided in Rule-31 may continue to be held by the officer(s) who are holding such posts before introduction of these amendments as if these amendments had not come into force.

31. Power to make regulations :

The Government may make regulations not inconsistent with these rules to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to these rules.

32. Residuary matters :

In regard to matters not specifically covered by these rules or by regulations or orders issued thereunder or by special orders, the members of the service shall be governed by the rules, regulation and orders applicable to the officers of the same status serving in connection with the affairs of the State Government.

33. Interpretation:

If any question arises as to the interpretation of these rules, the same shall be decided by the Government.]*

PART-IX
[RELAXATION]*

[36. Power to Rules

Where the Government is of the opinion that it is necessary or expedient so to do, it may, by order, for reasons to be recorded in writing and in consultation with the Commission, relax any of the provisions of these rules with respect to any class or category of persons or posts.]*

Note :- *Substituted by the TES(3rd Amendment) Rules, 2007.

SCHEDULE

Grade & Duty Posts	Strength
TES Grade - I	
TES Grade I (Civil)	
CE (Civil) Roads & Building	1
CE (Civil) Water Resource	1
CE (Civil) DWS	1
CEO, TH & C Board	1
CE, PMGSY (Bharat Nirman)	1
Empowered Officer(PMGSY)	1
Addl. C.E & Sole Arbitrator (Civil), Roads & Building ,Water Resource ,DWS, PMGSY (BN)	19
Total	25
Deputation, Training,Higher Study& Leave reserve @30%	8
Total Gr-I (Civil)	33
TES Grade – II	
TES Grade – II (Civil)	
SE to ACE , Planning & Design in Roads&Building, WR, DWS&PMGSY (BN)	12
SE, Working Circle, Roads&Building, WR,DWS &PMGSY(BN)	17
SE, Monitoring Cell Roads & Building, WR&DWS	3
SE & Ex Officio Joint Secretary	4
Director WSSO	1
SQC (PMGSY)	1
SE Vigilance (Technical) Roads& Building,WR&DWS	3
Total	41
Deputation, Training,Higher Study & Leave reserve 30%	12
Total Grade-II (Civil)	53
TES Grade-II (Mechanical)	
SE (Mechanical)	1
Deputation, Training,Higher Study& Leave reserve @30%	0
Total TES Gr II(Mechanical)	1
TES Grade-II (Electrical)	
SE (Electrical)	1
Deputation, Training,Higher Study& Leave reserve @30%	0
Total TES Gr II(Electrical)	1
Total inTES Gr II(Civil, Mechanical&Electrical)	55

Grade & Duty Posts	
TES Grade - III	Strength
TES Grade – III (Civil)	
EE in Circle office	34
EE in Division office	55
EO to CE & Deputy Secretary	8
EE RDQP	1
EE in ACE Planning & Design	17
Addl. EE in Division office	55
Executive Engineer State Quality Control (Soil testing Lab)	1
EE & Member Secretary, DWS	8
State Coordinator, IEC&I IRD	2
State Coordinator, IMIS & e-Procurement	1
EE, Monitoring, Roads & Buildings,DWS,WR	3
EE, Vigilance (Tech),Roads & Buildings, DWS, WR	3
TA to ACE/SE	21
Estate Officer	1
Total	210
Deputation, Training,Higher Study& Leave reserve @30%	63
Total TES Grade -III (Civil)	273
Degree 70%	191
Diploma 30%	82
TES Gr-III (Mechanical)	
EE in Circle	3
EE in Mechanical Division	1
EE Rig Division	1
Addl. EE Mechanical	3
TA to SE	1
Total	9
Deputation, Training,Higher Study& Leave reserve @30%	3
Total Grade -III (Mechanical)	12
Degree 70%	8
Diploma 30%	4
TES Gr-III (Electrical)	
EE IE Division	3
Electrical Inspector	1
Total	4
Deputation, Training,Higher Study& Leave reserve @ 30%	1
Total Grade --III,Electrical	5
Degree 70%	4
Diploma 30%	1
Grand total in TES Gr-III (Civil, Mech.& Elect.)	290

Grade & Duty Posts	Strength
TES Grade - IV	
TES Grade-IV(Civil)	
AE in sub division	188
AE in the Office of the Chief Engineer	35
Assistant Engineer (P) in working & planning division	151
AE Soil testing lab	4
Assistant Engineer (P) in Circle Office	65
Asstt. State Coordinator, IEC&HRD	1
Asstt. State Coordinator, IMIS&e-Procurement.	1
AE & Nodal Officer(IT,Disaster, Legal)	4
IT Nodal(PMGSY)	1
Sr Manager Pragna Bhawan	1
AE & Ex officio Under Secretary	10
Total	461
Deputation, Training,Higher Study& Leave reserve @30%	138
Total Grade-IV(civil)	599
Degree 40%	240
Diploma 40%	240
Degree Direct Recruitment 20%	119
TES Grade IV (Mechanical)	
SDO in SubDivn	11
Assistant Engineer in Circle	15
Assistant Engineer in Division	26
Total	52
Deputation, Training,Higher Study& Leave reserve @30%	21
Total Grade -IV (mechanical)	73
Degree 40%	29
Diploma 40%	29
Degree Direct Recruitment 20%	15
TES Grade IV (Electrical)	
S.D.O. in SubDivn	9
Assistant Engineer in Circle	7
Assistant Engineer in Division	12
Total	28
Deputation, Training,Higher Study& Leave reserve @30%	8
Total Grade -IV(Electrical)	36
Degree 40%	14
Diploma 40%	14
Degree Direct Recruitment 20%	8
Grand total in TES Gr-IV(Civil,Mech, Elect)	**708**

Grade & Duty Posts	Strength
TES Grade - V(A)	
TES Grade-V(A),Civil	
JE in Sub Divisions(Road & Buildings)	302
JE in Sub Divisions (WR)	78
JE in Sub Divisions (DWS)	99
JE in Sub Divisions (PMGSY)	32
JE in ACE office/Circle offices	22
JE in Division offices	44
JE in Estate offices	1
JE in Soil Testing Laboratory	2
Total	580
Deputation, Training,Higher Study& Leave reserve @30%	174
Total	754
Degree	540
Diploma	214
TES Grade-V(A),Mechanical	
JE in Sub Divisions	32
JE in ACE office/Circle offices	2
JE in Division offices	5
Total	39
Deputation, Training,Higher Study& Leave reserve @30%	10
Total TES Grade-V(A),Mechanical	49
Degree	35
Diploma	14
TES Grade-V(A),Electrical	
JE in Sub Divisions (Road & Buildings)	28
JE in Sub Divisions (DWS)	4
JE in Sub Divisions in ACE office/Circle offices	1
JE in Division offices	3
Junior Electrical Inspector	1
Total	37
Deputation, Training,Higher Study& Leave reserve @30%	11
Total TES Grade-V(A),Electrical	48
Degree	34
Diploma	14
Total Grade V(A)	851

Grade & Duty Posts	Strength
TES Grade V(B)	
TES Grade V(B)Civil	
JE in sub division Roads & Buildings	95
JE in sub division (WR)	44
JE in sub division DWS	55
JE in Circle office	18
JE in division office	36
JE in Estate office	1
JE in Soil testing Lab.	1
Total	250
Deputation, Training,Higher Study& Leave reserve @30%	75
Total Grade --V(B) Civil	325
Diploma	325
TES Grade V(B)Mechanical	
JE in sub division	14
JE in Circle office	0
JE in Division Office	2
Total	16
Deputation, Training,Higher Study& Leave reserve @30%	5
Total Grade --V(B) (Mechanical)	21
Diploma	21
Grade V(B) (Electrical)	
JE in Sub-Division	10
JE in sub division DWS	2
JE in Circle Office	0
JE in Division Office	3
Junior Electrical Inspector	0
Total	15
Deputation, Training,Higher Study& Leave reserve @30%	5
Total Grade --V(B) (Electrical)	20
Diploma	20
Grand total in TES Gr-V(B)	366
Total-Gr-V(A) and Gr-V(B)	**1217**
GRAND TOTAL OF ALL GRADES	**2303**

(S K NANDI)
Deputy Secretary,P.W.D.