

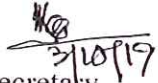


## ODISHA PUBLIC SERVICE COMMISSION

### CORRIGENDUM NOTICE

It is for information all concerned that under the caption of para 2, 4, 5 and para 10(xi) of the long advertisement for recruitment to the post of Assistant Executive Engineer, Electrical under Energy Department pursuant to the advertisement No. 10 of 2019/20, the word "Permanent" is deleted from the words mentioned about PWD category "Whose Permanent Disability is not less than 40%" as per the circular number 4353/SSEPD dt.16.4.2019 and clarification letter number 8212/SSEPD dt.25.9.2019 of the Department of Social Security & Empowerment of persons with Disabilities, Govt. of Odisha.

All other things in the advertisement remain unchanged.

  
Secretary



**ODISHA PUBLIC SERVICE COMMISSION**  
**ADVERTISEMENT NO. 10 OF 2019/20**

**Recruitment to the posts of Asst. Executive Engineer (Electrical) in Group- 'A' of Odisha Engineering Service under the Department of Energy**  
**WEBSITE – <http://opsonline.gov.in> and <http://opsc.gov.in>**

Applications are invited online from the prospective candidates through the proforma application to be made available on WEBSITE (<http://opsonline.gov.in>) from **09.10.2019** to **08.11.2019** (Note: **14.11.2019** is the last date for payment of application fees) for recruitment to the **posts of Assistant Executive Engineer (Electrical) under Department of Energy** in Group-A of Odisha Engineering Service carrying the scale of pay in level 12 of pay matrix under ORSP Rules-2017 with usual dearness allowance and other allowances as may be sanctioned by the Government of Odisha from time to time.

2. **Vacancy Position:** As per requisition filed by the Department of Energy, Government of Odisha the vacancy position are given below:

**A. Assistant Executive Engineer (Electrical)**

Sl. No.	Category	No of vacancies	No of Post reserved for PWD	
a	UR	15(05-W)	OL	01*
b	SEBC	9 (03-W)		
c	SC	5 (02-W)		
d	ST	2(00-W)		
<b>Total</b>		<b>31(10-W)</b>	<b>Total</b>	<b>01</b>

Candidates belonging to PWD (Person With Disability) (Permanent) category shall be adjusted against the categories of which he/she belongs.

\*Note: The physical requirement and functional classification for the above post is specified in G.A. Department Resolution No.34450 dated 03.12.2013 and SSEPD Dept. Resolution No.7140/SSEPD dated 5<sup>th</sup> September 2017. If a suitable candidate from OH category is not available, candidate from HI category may be taken for consideration as per Rule 4.1 of Resolution No.34450/Gen dated.03.12.2013.

**NOTE:**

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

**3. EDUCATIONAL QUALIFICATION:** A candidate must hold a **Degree in Electrical Engineering** or an equivalent qualification from any University or Institutions recognized by the Government or he/she must be an Associated Member of the Institution of Engineers of India in Electrical Engineering.

(Contd...)



4. **AGE:** A candidate must have attained the age of 21 (twenty one) years and must not be above the age of 32 (thirty two) years on the 1<sup>st</sup> day of January 2019. However, as per the Energy Department letter No. 2090/EN, dt. 02.3.2019, those who are within the prescribed age limit as on 1<sup>st</sup> day of January 2016, 1<sup>st</sup> day of January 2017 and 1<sup>st</sup> day of January 2018 shall also be eligible to apply for one time age relaxation i.e. he/she must have been born not earlier than 2<sup>nd</sup> January 1984 and not later than 1<sup>st</sup> January 1998. Age relaxation for candidates in different categories shall be as per Government Rules prescribed for the purpose. The upper age limit is relax-able by 5 (five) years for candidates belonging to the categories of Scheduled Castes (S.C.), Scheduled Tribes (S.T.), Socially & Educationally Backward Classes (S.E.B.C.), Ex-servicemen, Women, and by 10 (ten) years for candidates belonging to Persons with Disability (Permanent) category, whose Permanent disability is not less than 40%. As per G.A Department notification No. 17376/GAD-SC-Rules-008/2016/Gen, dated 10.8.2016 the Persons with Disabilities shall be entitled to cumulative age relaxation of 10 years over and above the normal age relaxation.

Provided that the maximum age limit shall be relaxed to 45 years in respect of the candidates who have entered the Diploma Engineers' Service as Junior Engineers whether promoted to the post of Asst. Engineer or not within the prescribed age limit without the qualification prescribed under clause (b) of rule 6 and have subsequently acquired the same while serving as such or have acquired such qualification prior to entering the State Government Service as Junior Engineers subject to availing of not more than 5 chances.

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

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

Date of birth entered in the high school certificate or equivalent certificate issued by the concerned board/council will only be accepted by the Commission.

**NOTE:-1:** Candidates should also note that once the date of birth has been entered in the records of the commission for the purpose of admission to examination, no change will be allowed subsequently on any ground whatsoever.

**NOTE:-2:** The candidates should exercise due care while entering the date of birth under the respective box of the online application form. If, on verification at any subsequent stage, any variation is found in the date of birth from the one entered in their High School Certificate or equivalent certificate, the candidature of the candidate will be rejected.

5. **APPLICATION FEE:** A candidate is required to pay a non-refundable and non-adjustable fee of Rs. 500/- (Rupees five hundred) only. Candidates belonging to Scheduled Caste/ Scheduled Tribe of Odisha only and Persons With Disability (Permanent) (whose disability is not less than 40%) are exempted from payment of this fee. **Deposit of application fees by way of any other mode, except SBI challan generated through the computer, shall not be accepted.**

6. **METHOD OF SELECTION:** The selection of candidates for recruitment to the above posts shall be made on the basis of **objective type written test** and **viva voce test**. There shall be **90% (ninety percent)** weightage on objective type written test and **10%(ten percent)** on viva voce test. Total marks of examination shall be **400**. The written test shall consist of **2(two) papers** i.e. **Paper-I and Paper-II** and each paper shall carry **180marks with 180 questions of 1 mark each**. Viva voce test shall be for 40marks. Each correct answer will carry one mark and there shall be a deduction of 0.25 mark for every wrong answer. The duration of each paper shall be of 3 hours. The Commission shall prepare a common list of selected candidates arranged in order of merit equal to the number of advertised vacancy on the basis of marks secured in objective type written test and viva voce test in respect of Assistant Executive Engineer (Electrical).

The broad outlines of the syllabi for the said examination are available in **Annexure-A (Electrical)**.



7. PLACE OF EXAMINATION

The written examination for the post of Assistant Executive Engineer Electrical will be held at Cuttack. It may also be held at Bhubaneswar, Balasore, Sambalpur, Berhampur (all the 5 zones) subject to number of applications received from candidates for recruitment to the aforesaid post.

8. OTHER ELIGIBILITY CONDITIONS:

- (i) The candidate must be a citizen of India;
- (ii) The candidate must be of (a) good moral character, and (b) good mental condition and sound bodily health, good physique and active habits and free from organic defects or bodily infirmity so as not to create an impairment in the due discharge of duties;
- (iii) The candidate must have Knowledge in Odia: he/she must be able to read, write and speak Odia and have:-
  - (a) Passed Middle School Examination with Odia as a Language subject; or
  - (b) Passed Matriculation or equivalent Examination with Odia as medium of examination in non- language subjects; or
  - (c) Passed in Odia as language subject in the final examination of Class-VII from a School or Educational Institution recognized by the Government of Odisha or the Central Government; or
  - (d) Passed a test in Odia in Middle English School Standard conducted by the School and Mass Education Department/Board of Secondary Education, Odisha
- (iv) A candidate, who has more than one spouse living, will not be eligible for appointment unless the State Government has exempted his/her case from operation of this limitation for any good and sufficient reasons;
- (v) Government servants, whether temporary or permanent, are eligible to apply provided that they possess the requisite qualification and are within the prescribed age-limit as provided under Para-3 & 4 of the Advertisement. They must inform their respective Heads of Offices/Departments in writing regarding submission of their applications for this recruitment and obtain "No Objection Certificate".
- (vi) If a candidate has at any time, been debarred for a certain period/chance(s) by the Odisha Public Service Commission or other State Public Service Commission or U.P.S.C. from appearing at any examination/viva voce test, he/she will not be eligible for such recruitment for that specified period/chance(s).
- (vii) **Only those candidates, who possess the requisite qualifications, are within the prescribed age limit and fulfill other eligibility conditions etc. by the closing date for submission of online application form, will be considered eligible.**
- (viii) A candidate who claims change in his/her name after having passed the H.S.C. examination, is required to furnish copy of publication of the changed name in the local leading daily news paper as well as copy of notification in the Odisha Gazette in support of his/her change of name.
- (ix) Every candidate selected for appointment shall be examined by the medical board. A candidate, who does not satisfy the requirement after medical examination, shall not be appointed;

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**9. OTHER CONDITIONS:**

(i) The provisions of the Odisha Conduct of Examination Act 1988 (Odisha Act-2 of 1988) are applicable to the examination conducted by the Odisha Public Service Commission.

(ii) A candidate found guilty of seeking support for his/her candidature by offering illegal gratification or applying pressure on any person connected with the conduct of the recruitment process or found indulging in any type of malpractice in course of the selection or otherwise, shall, in addition to rendering himself/herself liable to criminal prosecution, be disqualified not only for the recruitment for which he/she is a candidate, but also may be debarred, either permanently or for a specified period, from any recruitment or selection to be conducted by the Commission.

(iii) **Online applications submitted to OPSC if found to be incomplete in any respect are liable for rejection without entertaining any correspondence with the applicants on that score;**

(iv) This advertisement should not be construed as binding on the Government to make appointment;

(v) Concessions meant for **S.C., S.T. & SEBC by Birth** are admissible to the Scheduled Caste, Scheduled Tribe and Socially & Educationally Backward Classes of **Odisha State only**;

(vi) All persons appointed under the Government of Odisha on or after 1<sup>st</sup> January, 2005 shall not be eligible for pension as defined under sub-rule(1) of Rule-3 of the Odisha Civil Service (Pension) Rules, 1992; but shall be covered by the new structured defined Contribution Pension Scheme in accordance with the Odisha Civil Services (Pension) Amendment Rules, 2005;

(vii) **Any misrepresentation or suppression of information by the candidate in the online application will result in cancellation of his/her candidature or penalty be imposed on the candidate as decided by the Commission;**

(viii) **Mere empanelment in the select list shall not confer any right for appointment unless the Government is satisfied after making such enquiry as may be deemed necessary that the candidate is suitable in all respects for appointment to the service.**

**10. CERTIFICATES/DOCUMENTS TO BE ATTACHED:**

Only those, who are called for the viva voce test, will be required to submit the printout/hard copy of online applications, true copies of the following documents duly self attested by the candidates with full signature and date on the same, original certificates, mark-sheets etc. for verification on the date fixed by the Commission.

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

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

**NOTE 1:**

- (a) Candidates who have not been awarded percentage of marks, but only “**grade marks**”, should produce, along with their applications, the Conversion Certificate from the concerned University indicating the actual equivalent percentage of marks and the conversion formula, failing which, their applications are liable to be rejected.
- (b) While filling up the relevant box of the online application form, the candidate has to mention the marks secured (**excepting marks secured in the Extra Optional/4<sup>th</sup> Optional Subject**) in each examination passed (i.e. H.S.C. to Degree/Diploma).
- (v) The candidates must take utmost care in filling up the marks secured and maximum marks for each year. Any mistake in filling up the marks will be at the risk of the candidates.
- (vi) A “No Objection Certificate” from the Head of Office/Head of the Department in case of Government servant.
- (vii) Two recent passport size photographs (unsigned and unattested) with the printout/hard copy of online application form which has been uploaded.
- (viii) Certificates of character and conduct from the Principal/Proctor/Dean or Professor in charge of teaching department of the College or University in which he/she last studied;
- (ix) **Caste Certificate by birth in support of claim as SC/ST/SEBC, wherever applicable;**

**NOTE 2:**

Candidates claiming to be belonging to S.C. /S.T./ S.E.B.C Category by birth are required to submit copy of the relevant Caste Certificate issued by the competent authority in the prescribed form. Candidates of SEBC category (other than Creamy Layer) must submit copy of Caste Certificate issued by the competent authority within the last three years from the date of advertisement in the prescribed form.

- (i) Women candidates belonging to S.C. /S.T. /S.E.B.C Categories are required to submit Caste Certificates by birth showing “daughter of .....”. Caste Certificates by virtue of marriage (i.e. showing “wife of .....”) is not acceptable.
- (ii) **O.B.C. CERTIFICATE WILL NOT BE ACCEPTED.**
- (iii) **Community (Caste status) once mentioned by the candidates shall not be changed under any Circumstances.**

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

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- (x) Required Odia Pass Certificate from the Board of Secondary Education, Odisha indicating Odia as a language subject equivalent to M.E. School Standard or a certificate from the Principal/Headmaster of the recognized school indicating that the candidate has passed Odia upto M.E. standard; if not passed Odia as a subject in the High School certificate examination or equivalent examination;
- (xi) Disability Certificate (indicating the percentage of Permanent disability to be not less than 40%) issued by the concerned Medical Board, wherever applicable;
- (xii) Discharge Certificates of Ex-Serviceman issued by the Commanding Officer of the Unit last served wherever applicable; A Court Affidavit regarding not holding any civil post after retirement from military service.
- (xiii) Ex-Servicemen candidates must submit an undertaking that he/she has not been appointed against a civil post after retirement from military service.
- (xiv) If a candidate claims to possess qualification, equivalent to the prescribed qualification, the rule/authority (with number and date) under which it is so treated, must be furnished with the print out/hardcopy of online application form.

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

#### 11. “GROUNDS OF REJECTION OF APPLICATIONS”

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

- (a) In complete online application form.
- (b) Declaration not signed (full signature) by the candidate in the hard copy of online application form.
- (c) Age limit of candidate not coming under para-4 of the advertisement (Overage relaxation shall not be allowed to PWD candidates having less than 40% disability).
- (d) Required educational qualification as provided under para-3 of the advertisement.
- (e) Not furnishing copies of certificates/documents etc. as provided under para-10 of the advertisement.
- (f) Odia test (M.E. standard) not passed/Odia test pass evidence not furnished as required under para-8 (iii) of the advertisement (**certificate/document showing had Odia/Studied Odia/learned Odia/ taken Odia will not be accepted**).
- (g) Submission of wrong information /false information about qualification/ age/Date of birth/Odia test pass evidence/category status (SC/ST /PWD/Woman etc).
- (h) Suppression of facts/ information about eligibility, if any.
- (i) Application submitted by the candidate to OPSC, if found to be incomplete in any respect and at any stage.
- (j) If a candidate fails to furnish any of the original certificates and documents for verification on the date fixed by the Commission.
- (k) Application received through any other mode (except online through the proforma application to be made available on the **WEBSITE of OPSC**).
- (l) Any other grounds as per decision of the Commission.

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

(Contd..)



12. **HOW TO APPLY:**

- (a) Candidate must go through details of this advertisement available in website of the OPSC before filling up online application.
- (b) Candidates must apply online through the website of OPSC <http://opsconline.gov.in>. Applications received through any other mode would not be accepted and summarily rejected.
- (c) Before filling up the online application form, the candidates must go through the following documents available at OPSC portal.
- (i) Instruction to fill up the online application form.
- (ii) Guideline for scanning and Uploading of Photograph, Full Signature & Left Hand Thumb Impression.
- (d) Candidates are required to upload the scanned image of latest passport size photograph along with scanned image of his/her full signature and scanned image of Left hand Thumb Impression(LTI) in the online application form. **The uploaded photograph, full signature and LTI must be clearly identifiable / visible, otherwise the application of the candidate is liable to be rejected** by the Commission and no representation from the candidate will be entertained.
- (e) Candidates are required to take a printout of the finally submitted Online Application Form for future use and take a printout of Online Challan (Pay-in- Slip) for payment of requisite fee at any branch of State Bank of India (SBI). The Fee(s) paid shall not be refunded under any circumstances nor can the fee(s) be adjusted or held in reserve for any other examination or recruitment.
- (f) Candidates should keep at least 2 copies of latest passport size photograph which is uploaded on the online application form for future use.
- (g) While filling up the relevant box of the online application form, the candidate has to mention details of marks (minus extra optional) secured in annual examination leading to award of degree.
- (h) **On successful submission of the online application form, an Unique Registration ID will be displayed on the screen as well as top of the application form. Candidates are required to note down the unique Registration ID and use it in future correspondence.**
- (i) At present, only the online applications are invited from the candidates for admission to the written examination. Candidates who qualify in the written examination will be required to produce the Printout/Hard copy of the filled in online application duly signed under the declaration along with copies of required certificates and documents etc., as provided under para- 10 of this advertisement and the OPSC copy of Challan showing payment of application fee, as and when directed.
- (j) The candidates are advised to submit the online application well in advance without waiting for the closing date to avoid last hour rush.
- (k) Intimation letters to the eligible candidates and "Attestation Form" will be uploaded in the website of the OPSC prior to the date of viva voce test which will be published in the website and news paper. The candidates are required to download their "Intimation letters" and "Attestation Form" from the website of the Commission and produce the same for admission of the Examination or viva voce test. No separate correspondence will be made on this score.
- (l) **The applicants are advised to submit only single application; however if due to any unavoidable situation, if he/she submits another/multiple applications, then he/she must ensure that application with the higher RID(Registration ID)is complete in all respects like applicants' details, photograph, signature etc. The applicants who are submitting multiple applications should note that only the applications with higher RID(Registration ID)shall be entertained by the commission.**

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**13. FACILITATION COUNTER :-**

For any technical guidance on filling up of online application form, the candidates may contact facilitation counter of O.C.A.C. over Toll Free No.18003456770 or 155335 between 10.30.A.M. to 1.30 P.M. and 2.00 P.M. to 5.00 P.M. on any Odisha Government working day.

Regarding difficulty in payment of fee, if any, the candidates may contact **SBI** over **Telephone No.0671-2368267 and 9437039604.**

In case of any guidance/information on this advertisement and recruitment, candidates may contact the O.P.S.C. Facilitation Counter over telephone No.0671-2304141/2305611 on any working day between 10.30 A.M. to 1.30 P.M. & 2.00 P.M. to 5.00 P.M.

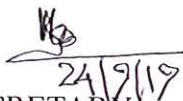
The candidates are required to visit the website of the Commission at <http://opsc.gov.in> for detailed information about the programme of the viva voce test, notice regarding rejection of applications; other important notices etc. and also keep track of publication of various notices to the effect in the leading local daily news papers for information.

**Closing Dates**

- (a) ON LINE APPLICATIONS SHALL BE AVAILABLE IN THE WEBSITE FROM 09.10.2019 TO 08.11.2019 TILL 11.59 P.M.
- (b) LAST DATE FOR RECEIPT OF APPLICATION FEE AT ANY S.B.I. BRANCH IS 14.11.2019.

**NB:-** THE ONLINE APPLICATION FORM IF FOUND DEFECTIVE IN ANY RESPECT IS LIABLE TO BE SUMMARILY REJECTED. THE CANDIDATES ARE ADVISED TO BE CAREFUL WHILE FILING THE ONLINE APPLICATION FORM. ANY MISREPRESENTATION IN THE ONLINE APPLICATION SHALL BE LIABLE FOR REJECTION WITHOUT MAKING ANY CORRESPONDENCE ON THAT SCORE.

CUTTACK  
DATE: 29.09.19

  
29/9/19  
SECRETARY  
ODISHA PUBLIC SERVICE COMMISSION,  
CUTTACK.



## ANNEXURE-A

### **Syllabus for the Recruitment to the post of Assistant Executive Engineer (Electrical) in Group-A.**

#### **Electrical Engineering Paper-I**

##### **1. Electrical Machines:**

Single phase transformer – equivalent circuit, phasor diagram, tests, regulation and efficiency; three phase transformers – connections, parallel operation; auto-transformer & three winding transformer; principles of energy conversion; Windings of rotating Machines; DC Generators & Motors- Characteristics, starting and speed control, Armature Reaction and Commutation; Three phase Induction Motors – performance characteristics, starting and speed control; single phase Induction Motors; Synchronous Generators – performance, regulation, parallel operation; Synchronous Motors – starting, characteristics, applications, synchronous condensers; fractional horse power motors; permanent magnet and stepper motors.

##### **2. Electrical Circuits:**

Network Graph, KCL, KVL, Node/Cut Sets, Mesh/Tie Sets Analysis, Sinusoidal Steady State Analysis; Transient Response of DC and AC Networks; Resonance in Electrical Circuits; Concepts of Ideal voltage and Current Sources; Network Theorems; Driving Point Impedance and Admittance and Transfer Functions of Two Port Network; Elementary concepts filters; three phase circuits; Fourier Series and Laplace Transform Methods for solving Electrical Networks; Two elements Network Synthesis.

##### **3. Control Systems:**

Mathematical Modelling of Physical Systems; Block Diagram and Signal flow graphs and their reduction; Time domain and frequency domain analysis of linear dynamical systems; Error for different types of inputs and stability criteria for feedback systems; Stability analysis using Routh-Hurwitz array, Nyquist Plot and Bode Plot, Root Locus and Nichols Chart and the Estimation of Gain and Phase margin; Basic Concepts of Compensator Design; State variable Matrix and its uses in System Modelling and Design; Sample 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.

##### **4. Measurement & Instrumentation:**

Bridges and potentiometer, PMMC, Moving Iron, Dynamometer and Induction Type Instruments; Measurement of Voltage, Current, Power; Energy and Power factor; Instrument Transformers; Digital Voltmeter and Multimeter; Phase, Time and Frequency Measurements; Q-Meter, Oscilloscope, Potentiometric Recorders, Error Analysis; transducers and their applications to the measurement of non-electrical quantities like; temperature, pressure, flow-rate, displacement, acceleration, noise level etc., Data Acquisition system; A/D and D/A converters.

##### **5. Electromagnetic Theory:**

Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane, and spherical charge distribution, Effects of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.

(Contd...)



## Electrical Engineering Paper-II

### **1. Power Systems:**

Electric Power Generation – Thermal, Hydro, Nuclear – Economics and operating Factors; Transmission line parameters; Steady state performance of overhead Transmission line and Cables and Surge propagation; Distribution System; Insulators, Bundle Conductors, Corona and Radio Interference Effects; Per Unit quantities; Bus Admittance and Impedance matrices; Load Flows; Voltage Control and Power factor corrections; Economic Operation; Symmetrical Components; Analysis of symmetrical and Unsymmetrical faults; principle of over current, differential and distance protection; concept of solid state relays and digital protection; Circuit Breakers; Concept of Stability – swing Curves and Equal Area criterion; Basic concept of HDVC transmission and FACTS Devices.

### **2. Power Electronics & Electric Drivers:**

Semiconductor Power Devices – Diodes, Transistors, Thyristors, Triacs, GTOs, MOSFETs and IGBTs – Static Characteristics and principle of operations; Triggering DC-DC Converters– Single Buck Phase Converters, and Three Phase half controlled and full controlled Bridge Rectifier's, Boost Converter, Buck-Boost Converter, Single phase and three phase Inverters, Pulse Width Modulation Techniques; basic Concept of adjustable DC and AC Drivers.

### **3. Engineering Mathematics:**

Matrix theory, Eigen values & Eigen vectors, system of linear equations, Numerical methods for solution of non-linear algebraic equations and differential equations, integral calculus, partial derivatives, maxima, and minima, Line, Surface and Volume Integrals, Fourier series, linear, non-linear and partial differential equations, initial and boundary value problems, complex variables, Taylor's and Laurent's series, residue theorem, probability and statistics fundamentals, Sampling theorem, random variables, Normal and poisson distributions, correlation and regression analysis.

### **4. Analog and Digital Electronic Circuits:**

Semiconductor Device Physics, P-N junctions and transistors- circuit models and parameters; FET, Zener, Tunnel, Schottky, Photo Diodes and their applications; Rectifier circuits; voltage regulators and multipliers; switching behaviour of diodes and transistors; small signal amplifiers-biasing circuits, frequency response and improvement; multistage amplifiers and feedback amplifiers; DC amplifiers; Wave shaping circuits; Multivibrators and Flip Flops and their applications; Digital logic gate families, Universal Gates; Combination circuits for arithmetic and logic operations; Sequential logic circuits; Counter and registers; RAM and ROMs.

### **5. Signal and Systems:**

Representation of continuous and discrete-time signals, shifting and scaling operations, Linear Time Invariant and Casual systems, Fourier Series representation of continuous periodic signals, Sampling theorem, Applications of fourier Transform, Laplace Transform and z-Transform.

#### **A. Electrical Engineering Paper-I**

1. Electrical Machines	40
2. Electrical Circuits	40
3. Control Systems	40
4. Measurement & Instrumentation	30
5. Electromagnetic Theory	30
<b>Total No. of Questions</b>	<b>180</b>

#### **B. Electrical Engineering Paper-II**

1. Power Systems	40
2. Power Electronic & Electric Drivers	40
3. Engineering Mathematics	40
4. Analog & Digital Electronic Circuits	30
5. Signal and Systems	30
<b>Total No. of Questions</b>	<b>180</b>