



**DELHI TECHNOLOGICAL UNIVERSITY**  
**(Formerly Delhi College of Engineering: Delhi)**  
Established By the Govt. of NCT of Delhi, vide Delhi Act 6 of 2009

**Bulletin of Information**  
**B. Tech. (Evening) Entrance Examination – 2015**

Delhi Technological University (Formerly Delhi College of Engineering) is one of the premier Engineering Institution in India. It has a chequered history spanning over 68 years. Established as Delhi Polytechnic in 1941 by the then Government of India, it became Delhi College of Engineering (DCE) in 1963 which has now been reconstituted as Delhi Technological University (DTU) vide Delhi Technological University Act 6 of 2009.

As per the DTU Act, Delhi Act 6 of 2009, the DTU is a non-affiliating teaching and research University focusing on “growth with quality”, offering new programs in emerging areas of engineering and technology, ensuring synergy between science and engineering, will attract the very best and qualified faculty in its fold and contribute effectively to cutting edge technology development and foster world class innovations. The DTU thus aspires to be a leading World Class Technology University, a key node in National and Global Knowledge Network thus empowering India with the Wings of Knowledge and Power of Innovations as per its vision.

Delhi Technological University (Formerly Delhi College of Engineering) imparts education and training in 15 branches of engineering at under graduate level during morning session, 4 B.Tech (Evening) programs is being offered in evening session with an intake of 182. Full time and Part time postgraduate programs are offered in 22 specialized fields of engineering and science. Ph.D. programs are offered in all the branches of engineering, applied sciences and management. Further, MBA program with focus on Technology Management and Supply Chain Management is also offered under Delhi School of Management (DSM) of DTU.

### **1. B.Tech. (Evening) Programs**

B.Tech. (Evening) programs are of four years duration. The classes are held six days a week in the evening from 6.00 p.m. to 9.00 p.m. Some of the classes may be scheduled to be held on holidays, including Sundays, during the day time. Admissions to these programs are made on the basis of the merit of the candidates in an Entrance Examination. This examination will consist of two papers. The first paper will be common to all programs and the second paper will be specific for each program.

### **2. Programs Offered**

The following B.Tech. (Evening) programs are offered by the University, leading to the B.Tech. (Evening) Degree of Delhi Technological University.

<b>Programmes</b>	<b>Branch Code</b>	<b>No. of Seats</b>
Civil Engineering	CECE	45
Mechanical Engineering	CEME	46
Electrical Engineering	CEEE	46
Electronics & Communication Engineering	CEEC	45
	<b>Total</b>	<b>182</b>

### 3. Reservation

- (a) The reservation in admission for all the B. Tech. (Evening) Programs for SC/ST/OBC shall be provided as per the policy of Govt. of Delhi approved by the Board of Management of DTU. 15%, 7.5%, and 27% of the total seats in each program were reserved for SC, ST and OBC category respectively during session 2015-16. **Candidates seeking admission under these categories must produce the SC/ST/OBC certificate issued by Govt. of NCT of Delhi.** A list of approved authorities is given below:
- (i) District Magistrate/ Additional District Magistrate/ Deputy Commissioner/ Collector/Additional Deputy Commissioner/Deputy Collector/I Class Stipendiary Magistrate/City Magistrate (Not below the rank of I Class Stipendiary Magistrate)/Sub-Divisional Magistrate/Taluka Magistrate/ Executive Magistrate/Extra Assistant Commissioner.
  - (ii) Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate.
  - (iii) Revenue Officer not below the rank of Tehsildar.
  - (iv) Sub-divisional Officer of the area where candidate and/or his/her family normally reside.
  - (v) Administrator/Secretary to administrator/Development Officer (Lakshadweep).
- (b) One seat in each program is reserved for employees of Delhi Technological University/Netaji Subhash Institute of Technology/ ITIs / Polytechnics under the direct control of Department of Technical Education, Govt. of NCT of Delhi. Such candidates shall also appear in the Entrance Examination and compete amongst themselves for a seat in each branch. Candidates applying for staff seat should route their applications through the Registrar, DTU/Directorate of Technical Education, Govt. of NCT of Delhi in the case of Polytechnics / ITIs.
- (c) 3% of the total seats in each program are reserved for person with disabilities candidates. These 3% reservations may be allocated as follows: 1% for persons with low vision of blindness, 1% for hearing impaired and 1% for those with locomotor disabilities and/or cerebral palsy. Candidates seeking admission in PWD category shall have to appear before a medical board to be constituted by DTU.
- (d) **DISTRIBUTION OF SEATS:**  
The distribution of seats in Open/SC/ST/OBC/PWD/Staff shall be displayed before the commencement of admission.
- (e) **General seats will be filled as per open rank in the merit list.**

**Note:**

1. **In case of seats reserved for SC candidates mentioned at (a) are not filled due to non availability of the candidates, the seats will be transferred to ST\* candidates. Similarly the ST\* seats will be transferred to SC candidates, if ST\* candidates are not available for admission. However, even after interchanging the seats if neither SC nor ST\* candidates are available for some reserved seats, then the seats will be treated as unreserved and will be filled by the open rank candidates. In case of seats reserved for OBC candidates mentioned at (a) are not filled due to non availability of the candidates, then the seats will be treated as unreserved and will be filled by the open rank candidates.**

**\*Reservation as per the policy of Govt. of Delhi shall be applicable.**

2. **In case sufficient number of eligible candidates from the categories mentioned at (b) and (c) above are not available, then the seats will be treated as unreserved in the respective branches.**

#### 4. Eligibility Conditions

- (a) The candidates seeking admission to B. Tech.(Evening) Programs, must have passed a State Diploma Examination of three years duration in the corresponding branch or any other examination, recognized equivalent there to by the Delhi Technological University with a minimum aggregate (aggregate of all six semesters / three years) of 55% (45% for SC/ST candidate). Note: "Passing the said examination" will be construed to imply the date of last examination (Annual or otherwise taken by the candidate leading to Complete Fulfillment of the requirements for the award of three years State Board Diploma.)

**Note:** In case the candidate is not having Diploma in the corresponding branch, their candidature shall be examined by the Equivalence Committee constituted by Vice-Chancellor, DTU.

1. However in case of Mechanical Engineering following diploma's are to be considered equivalent to Diploma in Mechanical Engineering awarded/recognized by State Board of Technical Education.

- (i) Diploma in Mechanical Engineering with Specialization in any subject.
  - (ii) Diploma in Production, Automobile, Aeronautical and Industrial Engg.
  - (iii) Diploma from Tool Room and Training centre
  - (iv) Lateral entry courses of the above specializations
- (b) (i) After passing the said examination, a candidate must have an experience of **not less than One year as on 1<sup>st</sup> September 2015**, in full-time employment, training or apprenticeship in installation, operation and maintenance or some other recognized field of work in an approved engineering work/organization and should be presently working in the organization located in the **National Capital Territory of Delhi and contiguous industrial areas** i.e. Bahadurgarh, Ghaziabad, Faridabad, Sonapat, Gautam Buddha Nagar (Noida and Greater Noida) and Gurgaon.
- (ii) Candidate must produce a '**No Objection Certificate**' in original in the prescribed form (available with the application form) from the employer, **The 'No Objection Certificate' issued by the employer should be renewed annually.**

**Note: Please attach attested copies (by Gazetted Officer) of all original certificates and work experience certificates from the present and previous employers which fulfill your eligibility criteria. Applications without attested copies shall be summarily rejected without any intimation to applicants.**

- (c) Candidate should be **19** years of age as on **01-09-2015**. Relaxation in age up to one year only is permissible with the approval of the Vice- Chancellor. Such candidates should apply for relaxation at the time of admission.
- (d) Discrepancy in fulfillment of eligibility criteria found at any stage may lead to cancellation of admission.
- (e) The candidate should be an Indian national.

**Note: No admission shall be made directly to the second or subsequent years of B.Tech (Evening) program.**

**5. Procedure for obtaining the application form for B.Tech. (Evening) program:**

- a) All candidates seeking admission to B.Tech ( Evening) programme in DTU are required to download application form, available at **www.dtu.ac.in**
- b) Duly filled application form along with a Demand Draft of Rs **1000/-** (Rupee One Thousand Only) drawn in favour of **“The Coordinator, B.Tech. (Evening) entrance Examination – 2015”** payable at Delhi, shall be submitted to the **Dy. Coordinator (Admn.), B. Tech. (Evening) Entrance Examination-2015, B.Tech. (Evening) Office, 1st Floor, FW1-FF4, Electrical Engineering Department, Delhi Technological University (Formerly Delhi College of Engineering), Bawana Road, Delhi-110042 on or before 7.00 P.M. of 04-06-2015 (Thursday)**. Incomplete information may lead to cancellation of candidature. The University will not be responsible for any postal delay or loss in transit. The candidates must ensure that the University receives the application on or before the last date. All applications received after the last date stand rejected automatically.

**Note:** The candidates are advised to ensure that they fulfill all the eligibility conditions before they submit their applications for the Entrance Examination. Attested copies (by Gazetted Officer) of the documents should be arranged in the following order along with the application form: **Acknowledgement Card, Admit Card, Address Slip, Application Form, Date of Birth certificate, Diploma certificate, Mark Sheets, Appointment letter, Experience certificate, No Objection Certificate from present employer, Caste Certificate (in case applicable). Three self addressed envelopes should be attached alongwith the application form.**

- (c) The Admission Tickets will be sent to the candidates at their mailing address about FIFTEEN DAYS before the scheduled date of the Entrance Examination. Those candidates, who do not receive their Admission Tickets by **20<sup>th</sup> June 2015 (Saturday)**, must contact the Dy. Coordinator (Admn.), B.Tech.(Evening) Entrance Examination 2015 at B. Tech. (Evening) office, 1st Floor FW1-FF5, Electrical Engineering Department, latest by **26<sup>th</sup> June 2013 (Friday)** between **11:00 AM. To 4:00 PM** for issuance of a duplicate Admission Ticket. They must bring two copies of their photographs similar to the one affixed on their application forms. **No Duplicate Tickets will be issued after 26<sup>th</sup> June 2013 (Friday).**
- (d) **Unless otherwise notified, the Centre for the Entrance Examination will be Delhi Technological University, Shahbad Daulatpur, Bawana Road, Delhi – 110042.**
- (e) The medium of examination shall be English. The relevant syllabi are given in the Appendix. The entrance test shall comprise of two papers of one and half hour (1½ Hours) duration each. The first paper will be common to all candidates and second paper will be specific for respective programme. The test will comprise of only objective type of questions. Each question will have multiple (four) choices with one correct choice. **Each correct answer will be awarded four marks, whereas one mark will be deducted for each incorrect answer.**

The Entrance Examination will be conducted as per the schedule below:

Date	Time	Paper	Number of Questions	Maximum marks	Subject
28-06-2013 Sunday	9:00 am to 10.30 am	I	90	360	Science (Physics, Chemistry and Mathematics)
28-06-2013 Sunday	11.30 a.m. to 1.00 p.m.	II	90	360	Engineering (Civil, Electrical, Mechanical, Electronics and Communication)

- (e) Instructions to the candidates with regard to the conduct of Examination will be communicated along with the Admission Tickets.
- (f) **Candidates are expected to see their result on their own on the Notice Board of B. Tech. (Evening) office situated at 1<sup>st</sup> floor, FW1-FF4 in Electrical Engg. Block.** Tentative date of declaration of result of Entrance Examination is **10-07-2015 (Friday)**. The result of the Entrance Examination will also be displayed on the website "[www.dtu.ac.in](http://www.dtu.ac.in)". **No separate communication will be sent to the candidates.**
- (g) The candidates, who wish to apply for re-evaluation, should apply to the Coordinator, B.Tech. (Evening) Entrance Examination-2015 in the prescribed form available with the Coordinator up to **13-07-2015 (Monday)**. The result of re-evaluation will be notified by **17-07-2015 (Friday)**. The fee for re-evaluation shall be **Rs. 100/-** which is to be remitted through a Bank Draft drawn in favour of "**The Coordinator, B.Tech. (Evening) Entrance Examination 2015**" payable at **Delhi**.

#### 7. Procedure for Admission:

- (a) The admission to B.Tech. (Evening) Programme shall be done by Delhi Technological University on the basis of the rank secured by the candidates in the entrance examination. In case more than one candidate have equal marks in the entrance examination, the marks obtained in the qualifying examination as stated in the eligibility conditions will form the basis of merit for admission. In the event of marks in the qualifying examination also being equal, the candidate born earlier will be given preference.
- (b) The successful candidates up to the specified rank in each category and branch should present themselves for admission before the admission committee on the dates and time as specified below:

<p><b>Place: B. Tech. (Evening) Office, 1<sup>st</sup> Floor, FW1-FF5</b> Electrical Engineering Department, Delhi Technological University, Delhi-110042</p>
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Date	Branch
27-07-2015 (Monday)	The candidates for B.Tech. (Evening) <b>Civil. Engg.</b>
28-07-2015 (Tuesday)	The candidates for B.Tech. (Evening) <b>Mech. Engg.</b>
29-07-2015 (Wednesday)	The candidates for B.Tech. (Evening) <b>Electrical Engg.</b>
30-07-2015 (Thursday)	The candidates for B.Tech.(Evening) <b>Electronics &amp; Comm. Engg.</b>

***Schedule of Reporting Time Common to all Branches***

10.00 am: **Open Rank** Candidates, Rank 1 to 40

2:00 p.m. : All reserved category candidates, (SC/ST/OBC/PWD/Staff)

The candidates who have reported on the above mentioned dates but could not be admitted due to non availability of seats may report on **31-07-2015 (Friday)** at **10:00 m** in B.Tech.(Evening) Office, Electrical Engineering Department, 1st Floor, FW1-FF4 for admission to seats which may fall vacant due to various reasons. Further they are also advised to report on **14.08.2015 (Friday)** by **2:30 pm** to explore the possibility of getting admission against withdrawals.

(c) The candidates reporting for admission are required to bring the following documents along with one set of attested copies by **Gazetted Officer**.

- i. **Original Class 10<sup>th</sup> certificate (indicating the Date of Birth)**
- ii. **Original Diploma certificate.**
- iii. **Original Mark sheets of each year/semester of Diploma.**
- iv. **Original SC/ST/OBC/PWD certificate.**
- v. **Original Appointment letter.**
- vi. **Employer's Company profile.**
- vii. **Original Experience certificates**

**Note: Item number (vi) is not required for candidates employed in Govt. /Semi. Govt./Public Sector Undertakings.**

(d) The candidate must bring the photocopy of Sale Tax Clearance Certificate/ITCC/Company Registration Certificate/any evidence which shows that the company in which they are working, works for any Government/Public Sector Undertaking/Local Government Bodies.

(e) If the candidate fails to bring the above documents mentioned in (c) and (d), the admission committee reserves the right to cancel his/her claim for admission to B. Tech. (Evening ) Programme.

(f) The decision of the Delhi Technological University regarding the eligibility of admission of any candidate shall be final.

(g) **Fees for B. Tech. (Evening) Programme:**

S.No.	Particulars	Amount Rs.
1.	Tuition Fee	50,000/-
2.	Enrolment Fee payable only at the time of admission	1000/-
3.	Alumni Association (One time) life membership registration fee (Non-Refundable)	1000/-
4.	Security Deposit (Refundable), (Payable only at the time of Admission)	5,000/-

<b>5.</b>	<b>University Fees</b>	
	<b>i. Development Fee (Per Annum)</b>	<b>12000/-</b>
	<b>ii. Examination Fee &amp; other fee</b>	<b>5000/-</b>
	<b>iii. Premium amount for medi-claim of students</b>	<b>500/-</b>
<b>6.</b>	<b>Student Fee (per annum) (Co-curricular activities, Annual Gathering, Student Welfare, Institutional Development, Miscellaneous expenditure On unspecified items)</b>	<b>10000/-</b>
<b>Total Fee payable at the time of admission</b>		<b>84,500/-</b>

“The fee mentioned above is tentative and may change at the time of admission.”

The fee is to be paid through Demand Draft drawn in favour of “Registrar, Delhi Technological University, Delhi” payable at Delhi. No part payment will be accepted. No other mode of payment is acceptable.

- (h) The university prospectus can be obtained at the time of admission on payment basis from the Stores Office.
- (i) **If a candidate does not report for admission on the scheduled date, at the specified time either in person or through his/her nominee or if he/she does not pay the fee on the day of admission, his/her name will be deleted and he/she will cease to be a candidate and henceforth will not have any subsequent claim to a seat in B.Tech. (Evening) Programme, academic session 2015-16.**
- (j) The original certificates will be returned to the candidate after one year or on withdrawal of the admission, whichever is earlier.
- (k) **The last date for closing of admission is August 14, 2015 (Friday).**
- (l) **Refund Rules:**  
The candidates who withdrew admission during **27.07.2015 to 13.08.2015** may take the refund of Admission Fee & Security Deposit from the Chairman, B. Tech. (Evening) Admission Committee after paying Rs. 1,000/- in cash as processing fee provided the seats vacated by them get filled. However in case a candidate withdrew his admission on **14.08.2015** and seat vacated by him / her remained unfilled he / she will be refunded the refundable security of Rs 5,000/- only.

Those applying for withdrawal of admission after 14.08.2015 only the refundable security i.e. Rs. 5000/- will be refunded.

#### **SEAT MATRIX FOR B. TECH. (EVENING) ADMMISSIONS 2015 – 2016:**

<b>BRANCH</b>	<b>GEN.</b>	<b>SC</b>	<b>ST</b>	<b>OBC</b>	<b>TOTAL</b>
<b>CIVIL</b>	23	6	4	12	45
<b>MECH</b>	23	7	3	13	46
<b>ELECTRICAL</b>	23	7	4	12	46
<b>ELECTRONICS</b>	23	7	3	12	45
<b>TOTAL</b>	<b>92*</b>	<b>27</b>	<b>14</b>	<b>49</b>	<b>182</b>

\* 6 seats (3% of total seats) are reserved for PWD category (3-Gen, 1-SC, 1- ST, 1-OBC)



# APPENDIX

## Syllabi for B. Tech. (Evening) Entrance Examination

### Paper-I

#### Physics, Chemistry & Mathematics (Common to All Branches)

##### Physics

**Units and Dimensions:** SI units, Dimensions of physical quantities, Principle of homogeneity and its applications.

**Vibrations:** Simple harmonic motion and its examples; energy considerations. Elementary discussions on free forced and resonant vibrations.

**Temperature and its Measurement:** Basic Principles of measurements of temperature, bimetallic thermometer, thermocouple thermometer; resistance thermometer, pyrometer, criteria for selection of thermometers.

**Waves:** Progressive waves, principles of superposition, interference, beats and stationary waves.

**Optics:** Nature of light reflection and refraction on the basis of Huygen's principle, optical instruments like overhead projector and epidiascope.

**Nuclear Physics:** Radioactivity, elementary ideas about nuclear fission and reactors.

##### Chemistry

**Periodic properties of Elements:** Periodic law, Periodic table, Periodicity properties like atomic radii and volume, ionic radii, ionization energy and electron affinity. Division of elements into s,p,d and f blocks.

**Chemical Bonds:** Electrovalent, covalent and coordinate bonds and their properties. Metallic bonding (electron cloud model) and properties (like texture, conductance, luster, ductility, and malleability).

**Fuels and their Classification:** Definition, characteristics, classification into solid, liquid and gaseous fuel, Petroleum and brief idea of its refining into various fractions, their characteristics and use. Calorific value of fuel, gaseous fuels, preparations, properties, composition and use of producer gas, water and oil gas.

**Water:** Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method.

**Metals:** Cast iron and its properties, effects of Sulphur, Silicon and Phosphorus as impurities in cast iron. Elementary knowledge of heat treatment of steels, hardening.

**Alloys:** Definition, classification and necessity for making alloys, Composition, properties and uses of following alloys: Brass, Bronze, Gun metal and Duralumin. Effect of carbon, nickel, chromium, manganese on steel.

## Mathematics

**Algebra:** Complex numbers, partial fractions, Binomial theorem. Approximations, matrices and their application in solving linear equations.

**Trigonometry:** Sum and difference formulae. Napier's analogy, Solution of triangles, Trigonometric equations.

**Coordinate Geometry:** Straight line, circle, parabola, ellipse and hyperbola (simple problems).

**Vectors:** Their applications to work done, moment of forces, relative velocity.

**Mensuration:** Volume and surface of sphere, cone, pyramid and their frusta.

**Differential Calculus :** Functions, limits, differentiation, successive differentiation, use of Leibnitz's theorem, maxima and minima, tangents and normals, Maclaurin's and Taylor's theorems.

**Integration:** By substitution, by parts, by partial fractions, applications to area, surface and volume of simple solids revolution.

**Differential Equations:** Variables separable, homogeneous and linear equations of first order and first degree.

## PAPER II

### One of the following subjects:

- (a) Civil Engineering
- (b) Electrical Engineering
- (c) Electronics & Communication Engineering
- (d) Mechanical Engineering

### (a) CIVIL ENGINEERING

**Building Materials:** Physical and chemical properties, classification, standard tests, uses and manufacture/quarrying of materials, e.g. building stones, silicate based materials, cement (Portland), Asbestos products, Timber and Wood based products, laminates, bituminous materials, paints, varnishes.

**Concrete Technology:** Properties, Advantages and uses of concrete, cement aggregates, importance of water quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing and curing of concrete, quality control of concrete, hot weather and cold weather concreting, repair and maintenance of concrete structure.

**Surveying:** Principles of surveying, working of prismatic compass and bearings, plane table surveying, theodolite traverse, adjustment of theodolite, levelling and contouring, curvature, refraction correction, permanent adjustment of dumpy level, methods of contouring and uses of a contour map, tachometric survey.

**Soil Mechanics:** Origin of soil phase diagram, definitions of void ratio, porosity, degree of saturation, water content, specific gravity of soil grains and unit weights, grain size distribution curves for different solids and their uses. Atterberg's limits, ISI soil classification, plasticity chart, coefficient of permeability; effective stress, consolidation of soils.

Calculation, shear strength of soils, direct shear test, vane shear test, triaxial test, soil compaction, Lab. Compaction test, moisture content and bearing capacity of soils, place load test, standard penetration test.

**Theory of Structures:** Elasticity constants, Types of beams, determinate and indeterminate. Bending moment and shear force diagrams of simply supported, cantilever and over hanging beams. Moment of area and moment of inertia for rect. and circular section. Bending moment and shear stress for tee, channel and compound sections, chimneys, dams and retaining walls, eccentric loads, slope deflection of simply supported and cantilever beams, critical load and columns, torsion of circular section.

**RCC & Steel Design:** RCC beams: flexural strength, shear strength, bond strength, design of single reinforced beams, lintels, cantilever beams, double reinforced beams, one way slabs, two way slabs, reinforced brick work, T-beams, columns, staircases, retaining walls water tanks steel design, welded connections, riveted joints, design and construction of steel columns, beams roof trusses plate girders.

**Hydraulics:** Fluid properties, hydrostatics, measurements of flow. Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.

**Public Health Engineering** : Quality of water, source of water supply, purification of water, distribution of water, need of sanitation sewerage system, circular sewers, oval sewers, sewer appurtenances, surface water drainage, sewage treatments.

**(b) ELECTRICAL ENGINEERING**

**Basic Electrical Engg. and Elect. Measurements**: Concepts of current, voltage, resistance, power and energy, their units, Ohm's law.

**Circuit Laws**: Kirchhoff's law, solution of simple network problems, Network theorems and their applications, Electromagnetism, concept of flux, emf, reluctance, magnetic circuits.

Electro-magnetic induction , self and mutual inductance.

A.C. fundamentals, instantaneous, peak, r.m.s. and average values of alternating waves, Equations of sinusoidal wave form, simple series and parallel a.c. circuits consisting of R,L and C Resonance.

**Measurement and measuring instruments**: Moving coil and moving iron ammeters and voltmeters, Extension of range. Wattmeters, Multimeters, Megger. Basic Electronics.

**Electrical machines**: Basic principles D.C. motors, generators, their characteristics. Speed control and starting of D.C.C. motors , losses and efficiency of D.C. machines.

1-phase Transformers, principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. tests, efficiency, auto transformers.

Synchronous machines, generation of three phase emf, armature reaction. Voltage regulation. Parallel operation of two alternators, synchronizing. Starting and applications of synchronous motors.

3-phase Induction motor, rotating magnetic field, principle of operation, equivalent circuit, torque speed characteristics, starting and speed control of 3-phase induction motors, Fractional kW motors, 1-phase induction motors, a.c. series motor, reluctance motor.

**Generation, Transmission and Distribution** : Different types of power stations, Load factor, diversity factor, demand factor, simple problems thereon, cost of generation, inter connection of power stations.

Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults.

Switchgear-rating of circuit breakers. Principles of arc extinction by oil and air, H.R.C. fuses. Protection earth leakage, over current Buchholz relay. Merz-Price system of protection of generators & transformers. Protection of feeders and bus bars.

*Lightning arresters.*

Various transmission and distribution systems. Comparison of conductor material, efficiency for different systems.

**Utilization of Electrical Energy** : Illumination, electric heating, Electric welding, electroplating, electric drivers and traction.

(c) **ELECTRONICS & COMMUNICATION ENGG.**

**Communication Engineering**: Amplitude, frequency and phase modulation transmitters, antennas. Propagation of radio waves, microwaves, Radar systems, Electroacoustic transducers, sound recording and reproduction, radio receiver. TV and Video, Telegraphy telemetry, Broad band communications.

**Digital Electronics and Instrumentation** : Logic gates and logic families, number system, Decoder, multiplexer, flip-flop latches, counters, shift registers, D/A and A/D converters, Digital multimeter, semiconductor memories, Microprocessor.

**Electronics Devices and Circuits**: Voltage & current sources, semiconductor physics, diode, transistors (bipolar & FET) biasing. Single and multistage amplifier, DC amplifier, power amplifier. Wave shaping circuits, Multi-vibrators, Integrated electronics, operational amplifier, regulated power supply, optoelectronic device, C.R.O. and time base circuits.

**Network Filters & Transmission Lines**: Network theorems, symmetrical & asymmetrical network attenuators, prototype filter section, active filter transmission lines. Introduction to transformer, A.C. and D.C. machines.

(d) **MECHANICAL ENGINEERING**

**Flow of Liquids**: Laminar & turbulent flow, equation of continuity, Bernoulli's theorem; measurement of discharge; flow through pipes, friction losses. Forces of jet impinging on vanes, blades; work done and efficiency; classification of turbines & pumps.

**Thermal Engineering** : Laws of thermodynamics, change in entropy in various processes; properties of steam, uses of steam table & charts; Construction & Working of Cochran, Lancashire, Locomotive and Babcock & Wilcox boilers, working of steam engine, steam turbine, Otto & Diesel Cycles, working of IC engines, Carburation, Solex Carburettor, Diesel fuel pump & injector; Cooling & lubrication.

**Production Engineering**: Foundry-Different casting processes, concept of patterns; type of mould making, pouring, defect in castings, causes & remedies. Welding-classification and types of welding; Testing and defects in welds. Lathes-Working of a lathe ; various tools, operation on lathes, types of lathes, Drilling operations performed on drilling machines.

Description, Principles of working and various operations on machine tools, Milling machine, Shaper, Grinder, Boring and Slotting machines.

**Strength of Materials** : Stresses in composite bars, Relations between elastic constants, Resilience under different types of loads, SF and BM diagrams; Stresses in beams-combined direct and bending stresses, Struts and columns – Euler's and Rankine's theories, and Torsion of circular shafts.

***Theory of Machines:*** Simple Mechanisms – Four bar chain, Slider crank chain, double slider crank chain. Flywheel-Turning moment diagrams. Fluctuation of energy, Friction-in collar and pivots, Plate clutch, conical clutch, journal bearing, Transmission of power through flat and V belts, Gears, profile of gears, Governors-Watt, and Hartnell Governors.