

ANNEXURE-III**AUTOMOBILE ENGINEERING AND MECHANICAL ENGINEERING**
(DIPLOMA STANDARD) **SUBJECT CODE: 310****(a) AUTOMOBILE ENGINEERING****UNIT - I: MECHANICS OF MATERIALS:**

Structure of metals - Ferrous alloys Non ferrous metals and alloys - Heat Treatment of steel and surface heat treatment or case hardening - Toughening - Normalising – refining-Mechanical properties of materials - Simple Stress and strain – Modulus of elasticity- Shear force, Twist, Theory of simple bending, deflection.

UNIT – II: PRODUCTION TECHNOLOGY:

Foundry - Patterns - Casting Techniques - Welding - Drilling - boring and Jig boring machines – Milling machines - Grinding machine - Cylinder Boring and honing machines. Lathes - Gas welding - Arc welding Brazing and soldering.

UNIT – III: ELECTRICAL AND ELECTRONICS ENGINEERING:

Units and symbols - AC and DC - Electro magnetisms - EMF - DC Circuits - Battery types Dry, Wet - DC Generators - DC Motors and Starters - Transistor - Capacitor - Diodes - Rectifiers - circuit breakers, Electronic components - symbols.

UNIT – IV: BASICS OF MECHANICAL ENGINEERING:

Fluid mechanics : Properties of fluids - flow of fluids - Flow of fluids in closed conduits - Reciprocating pumps - Centrifugal pump – Gear pumps and vane pumps - Hydraulic systems – Thermal Engineering - Properties of Gases - Expansion of Gases - Air cycles – Fuels- Fuel characteristics – Octane number and Cetane number – Lubricants Viscosity, Flash point, Fire point and Pour point - Air compressors performance - IC Engine performance.

UNIT – V: AUTOMOBILE ENGINES:

Principles of 2 stroke and 4 stroke engines - Engines Valve timing, - port timing - Valve arrangements - Engine blocks - cylinder heads - Wet and dry liner - Pistons - connecting rod - Crank shaft - Camshaft - timing gears - valve/ports - Firing order - Static balance - Dynamic balance - cooling systems - Radiators - Lubricating system - Lubricating oil characteristics Crank case ventilation - Engine testing/Fault finding, equipments - Carburation and Carburetors – MPFI - Diesel Engine for Automobile purpose - Combustion process of Diesel engines - Diesel knock – Diesel - combustion chamber types – CRDI - Injectors types - Feed pumps - - Fuel Injection Pumps - Phasing and Calibration - Governors' - Super charges and Turbo Chargers – EGR - Emissions Control system in engines - Maintenance and servicing.

UNIT – VI: AUTOTRONICS:

Battery lead acid - types - capacity - coil ignition system - Magneto ignition system and transistorised ignition system - ignition timing - spark plugs - starter motors - Alternators - voltage and current regulator - cutout unit. Flasher unit - wiring looms - circuits lighting - Auto cable - symbols –

UNIT – VII: TRANSMISSION AND CONTROLS:

Friction and Transmission of motion - Clutches - Gearboxes - Epicyclic gear box - Pre selector gear box - universal joints - Differential - Floating axles. Constant velocity joints - suspension system - independent front suspension systems - steering types - caster - camber - toe in – toe out

– power steering – types - wheel balancing - brakes - Testing its efficiency – Anti-lock braking systems - Tyres - tubes - Types and maintenance- Trouble shooting - Preventive Maintenance and servicing.

UNIT – VIII: INDUSTRIAL MANAGEMENT AND ROAD TRANSPORT ORGANIZATION:

Leadership - Morale – Motivation - Production planning and control - Personnel - Materials - Financial Management – Depreciation calculation using straight line method and sinking fund method – ABC analysis. Goods Transport, Passenger transport, Operational Layout of service station and garages - Bus stand - Classification - passenger transport organization and Administrative set up. Motor Vehicle act - Road signals - Traffic signals - Permit - Registering vehicle - Fitness certificate - Ticket system. Study to improve services, Accident claim. Market research - costing in Road transport Running cost.

UNIT – IX: BODY BUILDING TECHNOLOGY:

Terminology - classification of motor vehicle body - passenger transport - goods Transport - Cars - Chassis - frame principle - Aerodynamic body considerations. Body shape – NVH – definition - NVH elimination - Bus body construction. Goods vehicle construction - Tanker, Tipper Constructions - Ergonomics of Driver seat design - Painting - Body repairing - maintenance and safety on painting.

UNIT- X: COMPUTER INTEGRATED MANUFACTURING:

CAD – Definition – geometric modeling – wireframe, surface and solid modeling – graphic standards – GKS, IGES, PHIGS and DXF. CAM – definition – group technology – part families – parts classification and coding – CAPP – types. CNC – definition – components of CNC – ATC – CNC EDM. Part program – format – coordinate system – types of motion control – types of interpolation – G and M codes – sub program – canned cycles.

(b) MECHANICAL ENGINEERING

UNIT - I: INDUSTRIAL MANAGEMENT:

X and Y theories of Management, Contributions of Henry Fayol and F.W. Taylor for Management - job evaluation by Ranking method and factor comparison method - motivating techniques - fixing selling price of a product - break even analysis for make or buy decision - sinking fund method and straight line method of calculating depreciation - ABC analysis – determination of economic order quantity – TQM – ISO standards - certification

UNIT - II: INDUSTRIAL ENGINEERING:

Factors influencing plant location - principles of layout - techniques used to improve layout - primary and secondary causes of an accident - personal protective devices - method study procedure - flow diagram, string diagram and two handed process chart - principles of motion economy-procedure for conducting stopwatch time study, production study and ratio delay study - objectives of preplanning, routing, scheduling, despatching and controlling - difference between inspection and quality control - types of plant maintenance - TPM

UNIT - III: PRODUCTION TECHNOLOGY:

Foundry - patterns - special casting techniques - welding - hot and cold working – drawing, rolling and forging - powder metallurgy - plastics - rubber - ceramics - refractories - lathe work - planner - shaper - slotter - drilling machine - milling machines - grinding machines - broaching - boring and jig boring - Gears manufacturing practice - Heat treatment and metal finishing - press work

UNIT - IV: ELECTRICAL AND ELECTRONICS ENGINEERING:

Units, Ohm's law, Kirchoff's law, Faraday's law - D.C. Circuits, batteries - electro magnetism - single phase and three phase A.C. circuits - Induction motors – Electronics – diodes – resistors – capacitors – transistors – logic gates.

UNIT - V: MECHANICS OF MATERIALS:

Mechanical properties of metals - simple stresses and strains – modulus of elasticity - geometrical properties of sections - thin cylinders bending moment and shear force - theory of simple bending - torsion and springs - transmission of motion – gear drives and belt drives.

UNIT - VI: HEAT POWER ENGINEERING:

Working principle and comparison of otto and diesel cycles - construction and working of two stroke and four stroke engines - Heat balance test on I.C. engine - working principle of single and multistage compressors - Comparison of reciprocating and rotary compressors - classification of steam boilers - construction and working of steam turbines - working principle of steam power plant - Main elements of a nuclear power plant - Vapour compression cycle - factors affecting human comfort - working principle of a window air conditioner and central air conditioning system.

UNIT - VII: COMPUTER APPLICATIONS:

Working principle and constructional details of computer - classification of computer – Input / Output devices - flow charting – MS Office & Star Office – creating documents – presentations – sending emails.

UNIT - VIII: FLUID MECHANICS AND MACHINERY:

Working of differential manometer - use of venturimeter and orifice classification of mouth pieces meter - working of pelton wheel, francis turbine and kaplan turbine - construction and working principle of reciprocating pump, centrifugal pump and gear pump - quick return mechanism of shaping machine - table movement in a milling machine.

UNIT - IX: COMPUTER INTEGRATED MANUFACTURING:

CAD – Definition – geometric modeling – wireframe, surface and solid modeling – graphic standards – GKS, IGES, PHIGS and DXF. CAM – definition – group technology – part families – parts classification and coding – CAPP – types. CNC – definition – components of CNC – ATC – CNC EDM. Part program – format – coordinate system – types of motion control – types of interpolation – G and M codes – sub program – canned cycles.

UNIT - X: DESIGN OF MACHINE ELEMENTS:

Factors affecting selection of material – classification of bearings – sliding contact and rolling contact bearings – radial and thrust bearings – limits – fits – tolerance – classification of fits – cams and followers – types

ANNEXURE – IV

List of copies of documents to be submitted by the candidate

- I. S.S.L.C
- II. H.S.C
- III. Diploma in Automobile Engineering (3 years course) or Mechanical Engineering (3 years course) awarded by the State Board of Technical Education and Training, Tamil Nadu.
- IV. Practical (workshop) Experience Certificate in the prescribed format.
- V. Valid Driving Licence to drive Motor Cycle, Heavy Goods Vehicles and Heavy Passenger Motor Vehicles.
- VI. Driving Experience Certificate (Heavy Transport Vehicles).
- VII. Community Certificate obtained from the competent authority (viz. from a Revenue Divisional Officer or Assistant Collector or Sub Collector or P.A.(G) to the Collector of Chennai or District Adi-Dravidar welfare Officer or a Tahsildar or Head Quarters Deputy Tahsildar or Special Deputy Tahsildar (Certificates) or Additional Head Quarters Deputy Tahsildar or Zonal Deputy Tahsildar, as the case may be.
- VIII. In case the community certificate already in his/her possession does not conform to the specifications as laid down in para.15(f) of the Commission's 'Instructions to Applicants', a fresh community certificate should be obtained from the competent authority in whose jurisdiction the candidate claims to have permanent residence specifying clearly the name of the candidate's father and the community to which the candidate actually belong to, issued after proper verification and personal enquiry.
- IX. Evidence for religion (community certificate / TC)
- X. A conduct certificate obtained not earlier than 01.02.2018 from a Government officer belonging to Group A or Group B duly mentioning the candidate's name, father's name, address and the period during which he/she is known to the Government officer (Minimum 2 years).
- XI. Certificate of character and the conduct obtained from the head of the institution in which he/she last studied/studying. In case the candidate has lastly studied a course through correspondence (i.e. other than the one prescribed in the Commission's notification), this fact should be stated along with necessary evidence. Such candidate should, however, produce a character and conduct certificate obtained from the institution where he/she had undergone the regular course of study prior to the correspondence studies. (Candidates producing bonafide certificates should ensure that a certificate regarding their conduct and character is included in the said certificate)
- XII. The candidate who had claimed in his / her online application as Differently Abled candidate should produce a certificate of physical disability obtained from the Medical Board in the relevant speciality specifying the nature and degree of disability with a certificate that his / her disability would not render him / her incapable of efficiently discharging his / her official duties for the post of Motor Vehicle Inspector Grade-II.

- XIII. Evidence of Qualification in Tamil: S.S.L.C/P.U.C/H.S.C/Degree in the case of candidates who have passed the said examinations with Tamil as one of the languages (or) Evidence for having passed the Second Class Language Test (Full Test) in Tamil.
- XIV. Persons studied in Tamil Medium (PSTM) have to produce the evidence, such as Transfer Certificate, Provisional Certificate / Convocation Certificate / Degree Certificate / Certificate if needed mark sheets after received from the Board or University or from the Institution, with a recording that he / she studied prescribed educational qualification in Tamil Medium. If no evidence for 'Persons studied in Tamil Medium' is available as said, then a certificate from the Head of the Institution as given in the model format in para 27 (xix) of the 'Instructions to Applicants'
- XV. In respect of destitute widow candidates, destitute widow certificate obtained from the Revenue Divisional Officer of the district concerned.
- XVI. If employed, "No Objection Certificate" from the appointing authority in the format prescribed in para 15(g) of the Commission's 'Instruction to Applicants'.
- XVII. Three copies of recent passport size photographs.
- XVIII. Copy of order of approval of workshop by MVMD for the period for which the experience certificate is produced.
- XIX. Third gender ID card, community certificate

Note: Applications submitted without enclosing copies of documents along with print out of online application and uploading of experience certificate will be liable for rejection

ANNEXURE V



Abstract

Social Welfare and Nutritious Meal Programme Department – Third Gender Welfare – Determination of the Community and Reservation in Employment for Third Gender – Orders – Issued.

Social Welfare and Nutritious Meal Programme [SW8 (2)] Department

G.O.(Ms) No.90

001384

Dated 22.12.2017

வேலிளம்பி, மார்கழி 7

திருவள்ளூர் ஆண்டு 2048

Read:

1. G.O. (Ms) No.127, Labour and Employment Department, dated 27.10.2014
2. G.O. (Ms) No.28, Backward Classes, Most Backward Class and Minorities Welfare Department, Dated 06.04.2015
3. G.O. (Ms) No.71, Social Welfare and Nutritious Meal Programme Department, Dated 06.11.2015

Read also:

4. From the Secretary, Tamil Nadu Public Service Commission, D.O.Letter No.4471/RND-D2/2013, dated 12.07.2016
5. From the Director of Social Welfare, Letter Roc.No.21096/WW.1(3)/2017, dated 31.07.2017

ORDER:-

In the Government Order first read above, orders were issued that Third Gender may register their names in Employment Exchange offices based on the certificate identifying them as Transgender issued by the Tamil Nadu Transgender Welfare Board (TGWB) and to sponsor their names for appointment in the vacancies reserved for women category namely 30% and as well as vacancies reserved for General Category (both Men and Women) namely 70%.

2. In the Government Order second read above, orders were issued classifying the "Transgender of Eunuch (Thirunangal or Aravani)" as Most Backward Class by including at Sl.No.36-C in the list of Most Backward Classes.

3. In the Government Order third read above, among other things orders were issued, that Transgender will be identified as 'Third Gender' apart from the Binary Gender System and they have the right to decide their self-identified gender as male or female or as the third gender.

4. The Secretary, Tamil Nadu Public Service Commission in the D.O. letter fourth read above has sought for following clarifications in this matter with regard to:-

- (i) Considering the Transgender under 30% reservation for Women

- (ii) Treating the Transgender candidates who have claimed communal status under Scheduled Caste/ Scheduled Caste (A)/ Scheduled Tribe by producing respective Community Certificate confirming their claim.

5. After careful examination, in consultation with the concerned departments and the Director of Social Welfare, the Government hereby issue the following order regarding the determination of community and reservation in employment for the Third Gender in order to streamline the procedures to be followed by the recruiting agencies like Tamil Nadu Public Service Commission, Teachers Recruitment Board, Uniformed Services Recruitment Board, Medical Recruitment Board, etc., and Employment Exchange offices / appointing authorities, in sponsoring / recruiting / selecting the Third Gender candidates for appointment in Government Service:-

Determination of the Community:-

- (i) The Third Gender candidates, who do not possess any community certificate may be considered under Most Backward Class as per G.O.(Ms).No.28, Backward Classes, Most Backward Class and Minorities Welfare Department, dated 06.04.2015.
- (ii) The Third Gender candidates who belong to Scheduled Caste/Scheduled Caste (A)/Scheduled Tribe communities, and possess community certificate as such, may be considered as per their respective community.
- (iii) The Third Gender candidates who belong to the communities other than Scheduled Caste/Scheduled Caste (A)/Scheduled Tribe and possess community certificate as such (not covered under point (i) above) may be considered as per their own community or as Most Backward Class whichever is advantageous to them as per their option and once the individual exercises option for community selection it should be crystallized and this option should not be changed in future.

Reservation in Employment:-

- (i) The Third Gender candidates who identify themselves as "Female" by self-declaration supported by the certificate (ID card) issued by the Tamil Nadu Third Gender Welfare Board (TNTGWB) may be considered against both 30% reservation for women as well as 70% reservation for the General category (both Men & Women).
- (ii) The Third Gender candidates, who identify themselves as "Male" or "Third Gender", may be considered against the 70% reservation for General category (both Men & Women) as the case may be.

The above concessions may be granted subject to production of certificate identifying them as Third Gender or Third Gender (Male) or Third Gender (Female) issued by the Tamil Nadu Third Gender Welfare Board (TNTGWB), as the case may be.

(By Order of the Governor)

K. Manivasan,
Principal Secretary to Government

To
The Director of Social Welfare, Chennai-15
The Commissioner of Social Defence, Chennai-10

The Director, Integrated Child Development Services Scheme, Chennai-113
 ✓The Secretary, Tamil Nadu Public Service
 Commission, Chennai-3
 All District Collectors
 All Departments of the Secretariat, Chennai-9
 The Commissioner of Backward Classes and Minorities Welfare, Chennai-5
 The Director of Most Backward Class and Denotified Communities, Chennai-5
 The Director of Adi Dravidar Welfare, Chennai-5
 The Director of Tribal Welfare, Chennai-5
 The Member Secretary, Tamil Nadu Backward Classes Commission, Chennai-4
 The Teacher Recruitment Board, Chennai-6
 The Tamil Nadu Uniformed Services Recruitment
 Board, Chennai-8
 The Medical Services Recruitment Board, Chennai -6
 The Director of Employment and Training, Chennai-32
 The Secretary to Government of India, Ministry of Social
 Justice and Empowerment, New Delhi

Copy to:

The Hon'ble Chief Minister's Office, Chennai-9
 The Senior Personal Assistant to the Minister for Social Welfare and Nutritious Meal
 Programme, Chennai-9
 All Sections in Social Welfare and Nutritious Meal Programme Department, Chennai-9
 Stock file/Spare copy

// Forwarded by Order //

V. T. Karthi
 Section Officer

27.12.17

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