



ARPAN SIR ACADEMY

FOR MECHANICAL ENGINEERING

G.P.S.C. R.T.O. Class – 3 Online Test Series Syllabus

PART-A (TECHNICAL)

1) Engineering Mechanics

- ✍ Centroid & Centre of Gravity
- ✍ Coplanar Concurrent Forces
- ✍ Coplanar Parallel And Non-Concurrent Forces
- ✍ Friction
- ✍ Rectilinear Motion,
- ✍ Curvilinear Motion- Centripetal Force
- ✍ Work-Power-Energy
- ✍ Simple Machines

2) Strength of Material

- ✍ Fundamental Units
- ✍ Derived Units
- ✍ Stress & Strain
- ✍ Bearing Stress
- ✍ Torsional & Bending Stress

3) Theory of Machine

- ✍ Power Transmission
- ✍ Flywheel
- ✍ Governor
- ✍ Balancing
- ✍ Vibration

4) Machine Design

- ✍ General Consideration In Machine Design
- ✍ Frictional Clutches
- ✍ Brakes
- ✍ Gears
- ✍ Bearings



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5) Manufacturing Engineering

- ✍ Metal Casting Processes
- ✍ Metal Joining Processes
- ✍ Metal Working Processes
- ✍ Basic Machine Tools
- ✍ Conventional Manufacturing Processes Like Turning, Welding, Shaping, Molding, Foundry Technology, Drilling etc.
- ✍ CAD Work Station, Graphic Packages-Types And Features, Geometric Modeling, Various CAD Softwares
- ✍ Introduction to CNC Machines- Constructional Features And Working.
- ✍ Automatic Tool Changer (ATC) and Automatic Pallet Changer (APC).
- ✍ CNC Part Programming.

6) Engineering Materials

- ✍ Engineering Materials
- ✍ Heat treatment processes

7) Thermodynamics

- ✍ Basic concepts of Thermodynamics
- ✍ First law of thermodynamics
- ✍ Second law of thermodynamics
- ✍ Thermodynamic cycles

8) I.C. Engine

- ✍ Part And Their Functions
- ✍ Types And Classification
- ✍ Types Of Fuels Used In I C Engines And Their Properties
- ✍ Working Of Petrol Engines
- ✍ Working Of Diesel Engines
- ✍ Fuel Injection Systems – For Petrol, Diesel, LPG and CNG
- ✍ MPFI
- ✍ Cooling & Lubricating System
- ✍ Combustion Process
- ✍ Performance Test On IC Engine
- ✍ Eco Friendly Fuels-Conventional, LPG, CNG, Bio fuel



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9) Automobile

- ✍ Anatomy Of Vehicles
- ✍ Necessity Of Clutch, Types Of Clutch, Constructional And Functional Details Of Clutch
- ✍ Necessity Of Transmission, Types Of Transmission System
- ✍ Brake And Suspension Systems
- ✍ Control Systems Conventional Steering And Power Steering
- ✍ Electrical Systems- For Starting, Ignition And Lighting
- ✍ Repairs And Maintenance Of Automobiles
- ✍ Exhaust Gasses Emission Control Systems
- ✍ CNG Conversion
- ✍ Vehicle Noise And Its Control
- ✍ National And International Standard Norms For Exhaust Gas Pollution Control
- ✍ PUC Certification
- ✍ Licensing, Regulations Of Motor Vehicles, Motor Vehicle Insurance
- ✍ Testing Of Various Elements Of The Vehicle Systems-Battery, Clutch, Brakes, Wheels and Tyres (Wheel Alignment, Wheel Balancing), etc. Performance Test

10) Heat Transfer

- ✍ Modes Of Heat Transfer
 1. Conduction
 2. Convection
 3. Radiation
 4. Heat Exchangers

11) Refrigeration and Air Conditioning

- ✍ Fundamentals Of Refrigeration And Air Conditioning
 1. Reverse Carnot Cycle
 2. Vapour Compression Refrigeration System
 3. Vapour Absorption Refrigeration System
 4. Reverse Brayton Cycle
 5. Air Conditioning System



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12) Non Conventional Energy Sources :

- ✍ Hydro Energy
- ✍ Solar Energy
- ✍ Wind Energy
- ✍ Bio mass Energy
- ✍ Tidal Energy
- ✍ Geo Thermal Energy

13) Fluid Mechanics :

- ✍ Fluid Statics
- ✍ Fluid Kinematics
- ✍ Fluid Dynamics
- ✍ Flow Measurements
- ✍ Flow Through Orifice
- ✍ Flow Through Pipes
- ✍ Impact Of Jet
- ✍ Working Of Pumps

14) Engineering Drawing :

- ✍ Engineering Curves
- ✍ Orthographic Projections
- ✍ Isometric Projections
- ✍ Fasteners
- ✍ Projection of Points
- ✍ Projection of Lines
- ✍ Projection of Planes
- ✍ Limits Fits and Tolerances



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PART –B (Acts/Rules/Guideline/Institute/Judgements)

1) The Motor Vehicle Act 1988 (with 2019 amendments)

2) The Central Motor Vehicles Rules, 1989 (CMVR)

- Chapter I : Preliminary
- Chapter II : Licensing of Driving of Motor Vehicles
- Chapter III : Registration of Motor Vehicles
- Chapter IV : Control of Transport Vehicles
- Chapter V : Construction Equipment & Maintenance of Motor Vehicle

3) THE GUJARAT MOTOR VEHICLES RULES, 1989

- Chapter I : Preliminary
- Chapter II : Licensing of Drivers of Motor Vehicles
- Chapter III : Licensing of Conductors of Stage Carriages
- Chapter IV : Registration of Motor Vehicles
- Chapter V : Control of Transport Vehicles
- Chapter VII : Construction Equipment & Maintenance of Motor Vehicle

4) Gujarat Road Safety Policy 2016-17

5) Motor Vehicle (Driving) Regulations, 2017

6) Gujarat Road Safety Authority Act 2018

7) Supreme Court Committee on Road Safety guidelines

8) National Green Tribunal

9) Traffic Signs, Road Markings and Road Furniture

10) Latest Technology in Vehicle Manufacturing related to Road Safety & Environment (including Bio Fuels)

11) Electric Vehicles

12) Landmark Judgement of Hon.Supreme Court related Road safety and Road and vehicle organisation:

- i.) in the Supreme Court of India Civil Appeal no. 5826 of 2011

Mukund Dewangan vs the Oriental Insurance Co. Ltd. Etc...

(Regarding No Necessity of obtaining endorsements to drive the transport vehicles when the transport vehicle is class of light motor vehicles (LMV).)



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- ii.) In the Supreme Court of India write petition (Civil) No. 265 of 2011 **Avishek Goenka vs Union of India & Anr.**
(Regarding Restriction of use of Black film on the vehicles)

- iii.) In the Supreme Court of India write petition (Civil) No. 235 of 2012
Save life Foundation & Anr. Vs Union of India & Anr.
(Regarding No harassment to Samaritans i.e. bystanders for helping road accidents victim)

- iv.) In the Supreme Court of India (Civil) appeal No. 11369 of 2018
Prakash Chand Doga vs Savita Sharma & Anr.
(Regarding in accidents cases all the liabilities are of vehicles registered owner)

- v.) In the Supreme Court of India writ petition (Civil) 510 of 2005
Maniderjit Singh Bitta vs Union of India & Anr.
(Regarding Scheme regulating issuance and fixation of High Security Registration Plates (HSRP))

- vi.) In the Supreme Court of India write petition (Civil) No. 243 of 2005
Rajive Raturi vs Union of India & Others
(Regarding For Divyang People safe access to road and transport facilities)



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PART –C (Gujarati)

- **Topic -1** - ગધાર્થગ્રહણ
- **Topic -2** – કહેવતો
- **Topic -3** – રૂઢિપ્રયોગો
- **Topic -4** – સમાનાર્થી શબ્દો
- **Topic -5** - વિરુદ્ધાર્થી શબ્દો
- **Topic -6** - જોડણી
- **Topic -7** – અલંકાર
- **Topic -8** – સમાસ
- **Topic -9** – શબ્દસમૂહો માટે સામાસિક કે પારિભાષેક શબ્દો
- **Topic -10** – સંધિ
- **Topic -11** - છંદ