

# Institute of Petroleum Engineers

An initiative run by alumni of IIT Madras

**Admissions open**

**PETRO MASTER TEST SERIES**

Brochure (2021-22)

**READY FOR  
GATE 2022?**



**Contact Us:**

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INSTITUTE OF PETROLEUM ENGINEERS (IPE) is an initiative by alumni of IIT, Madras for providing a conceptual learning platform for PETROLEUM GATE exam. I-PE represents becoming one with the very core of petroleum engineering. Our aim is to provide students with the crude knowledge that one requires to understand all the concepts (basic to advance) and implement them to become a better Petroleum Engineer. IPE services present a holistic background and explains concepts involved in GATE PE topics in an insightful way to reach the solution.

Our premier Online Test Series “**I-PE**” curtails two sub-divided series which gauge a student's potential based on their current batch of study.

1. **PETRO MASTER**

2. **PETRO PRACTICE ONLINE SERIES**

[CLICK HERE TO GET MORE INFORMATION ABOUT IT](#)

**PETRO MASTER:** Both quantity as well as quality of questions attempted during prep-phase decide the final outcome of your preparation. I-PE PETRO MASTER test series leave no stone unturned in ensuring that all areas of GATE syllabus are covered.

Petro Master covers each technical subject and subdivides it in two levels:

1. **SECTIONAL TESTS**
2. **COMPLETE SYLLABUS TEST**

1. **SECTIONAL TESTS:** Our technical team designed it to cover each subject in **3 level** of difficulty:

- 1.1 Diagenesis
- 1.2 Catagenesis
- 1.3 Metagenesis

This sub-division ensures that student's concept understanding and problem solving evolves from basic to advanced level in a phased manner.

Total number of tests in above 3 level are 35.

‘Break up: 29 tests of 10 technical subjects as per GATE PE syllabus, 3 tests of Engineering Mathematics and 3 tests of General Aptitude’

## 2. COMPLETE SYLLABUS TEST

Once you've mastered the sectional tests, you're ready to take on the 15 complete syllabus tests designed to give you a simulated experience of what the actual exam will look like. All real GATE-2022 exam features and test pattern are at your aid. The ticking clock will help you keep track of time and improve your speed. Our simulated GATE calculator will help you master the actual calculator you're going to encounter.

**REGISTRATION FEE: 1599 INR**

**TERMS & CONDITIONS:**

- 1. Validity of this package will be upto 31<sup>st</sup> March 2022.**
- 2. Once payment is made, no refund will be made.**

- ◆ **Linear Algebra:** Matrix algebra, Systems of linear equations, Eigen values and eigenvectors.
- ◆ **Calculus:** Functions of single variable, Limit, continuity and differentiability, Taylor series, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.
- ◆ **Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, Initial and boundary value problems, Laplace transforms, Solutions of one dimensional heat and wave equations and Laplace equation.
- ◆ **Complex variables:** Complex number, polar form of complex number, triangle inequality.
- ◆ **Probability and Statistics:** Definitions of probability and sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions, Linear regression analysis.
- ◆ **Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations. Integration by trapezoidal and Simpson's rule. Single and multi-step methods for numerical solution of differential equations.
- ◆ **Petroleum Exploration:** Classification and description of some common rocks with special reference to clastic and nonclastic reservoir rocks. Origin, migration and accumulation of Petroleum. Petroleum exploration methods.

- ◆ **Oil and Gas Well Drilling Technology:** Well planning. Drilling method. Drilling rigs Rig operating systems. Drilling fluid function and properties. Drilling fluid maintenance equipment. Oil & gas well cementing operations. Drill bit types and their applications. Drill string & Casing string function, operations, selection & design. Drilling problems, their control & remedies. Directional drilling tools. Directional survey. Application of horizontal, multilateral, extended reach, slim wells.
  
- ◆ **Reservoir Engineering:** Petrophysical properties of reservoir rocks. Coring and core analysis. Reservoir fluid properties. Phase behavior of hydrocarbon system. Flow of fluids through porous media. Water and gas coning. Reservoir pressure measurements. Reservoir drives, drive mechanics and recovery factors. Reserve estimation & techniques.
  
- ◆ **Petroleum Production Operations:** Well equipments. Well completion techniques. Well production problems and mitigation. Well servicing & Workover operations. Workover & completion fluids. Formation damage. Well stimulation techniques. Artificial lift techniques. Field processing of oil & gas. Storage and transportation of petroleum and petroleum products. Metering and measurements oil & gas. Production system analysis & optimization. Production testing. Multiphase flow in tubing and flow-lines. Nodal system analysis. Pressure vessels, storage tanks, shell and tube heat exchangers, pumps and compressors, LNG value chain.



- ◆ **Offshore Drilling and Production Practices:** Offshore oil and gas operations & ocean environment. Offshore fixed platforms, Offshore mobile units, Station keeping methods like mooring & dynamic positioning system. Offshore drilling from fixed platform, jack-up, ships and semi submersibles. Use of conductors and risers. Offshore well completion. Deep water applications of subsea technology. Offshore production: Oil processing platforms, water injection platforms, storage, SPM and SBM transportation and utilities. Deep water drilling rig. Deep water production system. Emerging deep water technologies.
- ◆ **Petroleum Formation Evaluation:** Evaluation of petrophysical of sub-surface formations: Principles applications, advantages and disadvantages of SP, resistivity, radioactive, acoustic logs and types of tools used. Evaluation of CBL/VDL, USIT, SFT, RFT. Production logging tools, principles, limitations and applications. Special type of logging tools. Casing inspection tools (principles, applications and limitations), Formations micro scanner (FMS), NMR logging principles. Standard log interpretation methods. Cross-plotting methods.
- ◆ **Oil and Gas Well Testing:** Diffusivity equation, derivation & solutions. Radius of investigation. Principle of superposition. Horner's approximation. Drill Stem Testing. Pressure Transient Tests: Drawdown and build up-test analysis. Wellbore effects. Multilayer reservoirs. Injection well testing. Multiple well testing. Interference testing, Pulse testing, well-test analysis by use of type curves. Gas well testing.

- ◆ **Health Safety and Environment in Petroleum Industry:** Health hazards in Petroleum Industry: Toxicity, Physiological, Asphyxiation, respiratory and skin effect of petroleum hydrocarbons, sour gases. Safety System: Manual & automatic shutdown system, blow down systems. Gas detection system. Fire detection and suppression systems. Personal protection system & measures. HSE Policies. Disaster & crisis management in Petroleum Industry. Environment: Environment concepts, impact on eco-system, air, water and soil. The impact of drilling & production operations on environment, Environmental transport of petroleum wastes. Offshore environmental studies. Offshore oil spill and oil spill control. Waste treatment methods.
- ◆ **Enhanced Oil Recovery Techniques:** Basic principles and mechanism of EOR, Screening of EOR process. Concept of pattern flooding, recovery efficiency, permeability heterogeneity. Macroscopic and microscopic displacement efficiency. EOR methods: Chemical flooding, Miscible flooding, Thermal recoveries (steam stimulation, hot water & steam flooding, in-situ combustion), Microbial EOR.
- ◆ **Latest trends in Petroleum Engineering:** Coal bed methane, shale gas, oil shale, gas hydrate, and heavy oil.
- ◆ **General Aptitude**

1. IPE team posted a **CHALLENGE QUESTION** on its social media handles, and awarded **100% scholarship** to toppers.
2. **50% off on Registration Fee** to students who got rank under 70 in GATE PE 2021. **(Contact us for Voucher Code)**
3. **25% off on Registration Fee to first 30 students.**
4. Combo offer: Petro Master Test Series + Petro Practice Series in just Rs 3999/- only.



## Timeline for PetroMaster Test

<b>Subject</b>	<b>Test Name</b>	<b>Date</b>
<b>Oil and Gas Well Drilling Technology</b>	Diagenesis	5 July
	Catagenesis	2 August
	Metagenesis	15 August
<b>Petroleum Production Operations</b> (Well equipment+ Well completion techniques+ Well production problems and mitigation+ Well servicing & Workover operations+ Workover & completion fluids+ Formation damage+ Well stimulation techniques.)	Diagenesis	5 July
	Catagenesis	7 August
	Metagenesis	20 August
<b>Petroleum Production Operations</b> (Artificial lift techniques + Multiphase flow in tubing and flow-lines + Nodal system analysis)	Diagenesis	9 July
	Catagenesis	12 August
	Metagenesis	25 August
<b>Petroleum Production Operations</b> (Field processing of oil & gas + Storage and transportation of petroleum and petroleum products. Metering and measurements oil & gas + Production system analysis & optimization. Production testing +Pressure vessels, storage tanks, shell and tube heat exchangers, pumps and compressors, LNG value chain)	Diagenesis	13 July
	Catagenesis	20 August
	Metagenesis	30 August
<b>Reservoir Engineering</b>	Diagenesis	18 July
	Catagenesis	2 September
	Metagenesis	10 September
<b>Petroleum Formation Evaluation</b>	Diagenesis	25 July
	Catagenesis	12 September
	Metagenesis	15 September
<b>Oil and Gas Well Testing</b>	Diagenesis	28 July
	Catagenesis	25 September
	Metagenesis	30 September
<b>Enhanced Oil Recovery Techniques</b>	Diagenesis	30 July
	Catagenesis	5 October
	Metagenesis	10 October
	Diagenesis+ Catagenesis	15 October



<b>Offshore Drilling and Production Practices</b>	Metagenesis	20 October
<b>Health Safety and Environment in Petroleum Industry</b>	Major Test	25 October
<b>Latest trends in Petroleum Engineering</b>	Major Test	30 October
<b>Petroleum Exploration</b>	Major Test	2 November
<b>Maths</b> (Linear Algebra + Calculus)	Major Test	10 July
<b>Maths</b> (Differential equations + Complex variables)	Major Test	7 October
<b>Maths</b> (Probability and Statistics + Numerical Methods)	Major test	25
<b>General Aptitude</b>	Diagenesis	16 September
	Metagenesis	25 September
	Catagenesis	10 October



Test Number	Syllabus	Weightage /Remarks	Date
1.	<p><b>Oil and Gas Well Drilling Technology</b></p> <p>+</p> <p><b>Petroleum Production Operations</b> (Well equipment+ Well completion techniques+ Well production problems and mitigation+ Well servicing &amp; Workover operations+ Workover &amp; completion fluids+ Formation damage+ Well stimulation techniques.)</p> <p>+</p> <p><b>Reservoir Engineering + Petroleum Formation Evaluation + Oil and Gas Well Testing + Enhanced Oil Recovery Techniques + Math</b> (Linear Algebra + Calculus)</p>	Basics Questions of mentioned subjects.	1 August
2.	<p><b>Oil and Gas Well Drilling Technology (complete)</b></p> <p>+</p> <p><b>Petroleum Production Operations (complete)</b></p>	Level of <b>30% Questions</b> based on 1 <sup>st</sup> major test + <b>70% Questions</b> based on Mentioned syllabus	1 September
3.	<p><b>Reservoir Engineering</b></p> <p>+</p> <p><b>Petroleum Formation Evaluation</b></p> <p>+</p> <p><b>Math</b> (Linear Algebra + Calculus)</p> <p>+</p> <p><b>General Aptitude</b></p>	<b>30 % Questions</b> from Major 1 and Major 2 syllabus + <b>70% Questions</b> from Mentioned syllabus	18 September
4.	<p><b>Oil and Gas Well Testing</b></p> <p>+</p> <p><b>Enhanced Oil Recovery Techniques</b></p> <p>+</p> <p><b>Maths</b></p>	<b>50 % Questions</b> from Previous Major test syllabus+ <b>50% Questions</b> from mentioned syllabus	12 October



	(Differential equations + Complex variables) + <b>General Aptitude</b>		
5.	<b>Complete Syllabus of Gate PE</b>	Based on GATE Pattern	1 November
6.		Based on GATE Pattern	10 November
7.		Based on GATE Pattern <b>(Scholarship Test)</b>	25 November
8.		Based on GATE Pattern	1 December
9.		Based on GATE Pattern	7 December
10.		Based on GATE Pattern	14 December
11.		Based on GATE Pattern	21 December
12.		Based on GATE Pattern	28 December
13.		Based on GATE Pattern	5 January
14.		Based on GATE Pattern	15 January
15.		Based on GATE Pattern	25 January



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