20PEB304					Well Test Analysis					
Teaching Scheme					**Examination Scheme**					
L	**T**	**P**	**C**	**Hrs/Week**	**Theory**			**Practical**		**Total**
					MS	**ES**	**IA**	**LW**	**LE/Viva**	**Marks**
3	1	0	4	4	25	50	25	--	--	100

COURSE OBJECTIVES
➢ This subject teaches students about the importance of well-testing analysis and its objectives of well testing is; to see if the well will flow or not, to see what fluid a well would produce, to see if the well would flow naturally or to be pumped, to the surface, to see what rates of flow were possible,
➢ To check existence of communication between different wells, to determine reservoir and flowing pressure, to determine reservoir parameters and to detect no flow boundaries if they exist.

10 Hrs.

UNIT 1 Introduction of Well Test Analysis:
Importance and types of pressure tests, Pressure recorder: Measurement instruments used for bottom hole studies-Calibration of pressure recorders, Indicator diagram. Diffusivity equation, linearization and solution under semi steady state, steady state and applications. Constant Terminal Rate Solution, Line source solution.

10 Hrs.

UNIT 2 Oil Well Testing
Pressure Transient Tests: Horner's Plot, Pressure Build-up Test / Draw-down tests, RLT (Reservoir Limit Test), Determination of average reservoir pressure. Skin factor and average reservoir permeability, Drill Stem Testing: Equipment, DST Chart observation, analysis & interpretation, Wire line formation tests, Modular Dynamic Test.

10 Hrs.

UNIT 3 Gas Well Testing
Russel: good rich solution of diffusivity equation. Real gas pseudo pressure function and its use in diffusivity equation. Non-Darcy's effect and evolution. Gas Well testing: Multi rate test of gas well, pressure build-up and draw down in gas reservoir. Flow after flow (Multi-rate Test), isochronal & Modified isochronal tests. Skin factor and average reservoir permeability. Determination of average reservoir pressure

9 Hrs.

UNIT 4 Advanced Pressure Transient Analysis
Interference and pulse tests, Pressure Fall Off test in Injection wells. PBU / PDD in Horizontal wells. Principle of Superposition, Deconvolution of Pressure Data. Type Curves analysis, interpretation & their uses.

Max. 39 Hrs.

COURSE OUTCOMES
On completion of the course, student will be able to
CO-1: Illustrate the principle governing equations of transient well testing and their solutions.
CO-2: Compare various types of transient well testing methods and their requirement for petroleum exploitation activities.
CO-3: Analyse and interpret well test data for determination of petrophysical parameters in dynamic flow conditions around a well.
CO-4: Understand important of safety and precautions against accident at the time of well testing and also understand standard procedure to control of well.
CO-5: Illustrate Advanced Pressure Transient Analysis method.

TEXT/REFERENCE BOOKS
1. Well Test Analysis by John Lee,
2. Modern Well Test Analysis by R.C. Erlougher,
3. Fundamental of Reservoir Engineering by L.P. Dek,
4. Applied Reservoir Engineering by Craft and Hawkins
5. Well Testing Analysis by Mathews and Russell,
6. Gas Well Testing Handbook, Amanat U. Chaudhry

END SEMESTER EXAMINATION QUESTION PAPER PATTERN
Max. Marks: 100   **Exam Duration: 3 Hrs**
Part A/Question: <Short Notes, Problems, Numerical>   <5-7 > Marks (each)
Part B/Question: <Justification, Criticism, Long answers, Interpretation >   <8-10> Marks (each)