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**PhD Entrance Test – 2026**  
**SECTION-II: Pharmacology - 35 Marks**

<b>Section II</b>	
<b>1</b>	<b>Regulation of experiments on animals like CPCSEA guidelines and OECD guidelines.</b>
<b>2</b>	<b>Recent drug evaluation techniques</b> such as, transgenic, microdialysis, high-throughput screening, radioligand binding assay, patch clamp technique, immunohistochemistry
<b>3</b>	<b>Clinical Pharmacology of drugs acting on Central Nervous System:</b> a) Antidepressants, b) Antipsychotics, c) Antiepileptics, d) Antiparkinsonism, e) Analgesics
<b>4</b>	<b>Intercellular and intracellular signaling pathways.</b> Classification of receptor family and molecular structure ligand gated ion channels; G-protein coupled receptors, tyrosine kinase receptors and nuclear receptors. Secondary messengers: cyclic AMP, cyclic GMP, calcium ion, inositol 1,4,5-trisphosphate, (IP3), NO, and diacylglycerol. Detailed study of following intracellular signaling pathways: cyclic AMP signaling pathway, mitogen-activated protein kinase (MAPK) signaling, Janus kinase (JAK)/signal transducer and activator of transcription (STAT) signaling pathway
<b>5</b>	<b>Recent Advances in Treatment:</b> Alzheimer 's disease, Parkinson's disease, Cancer, Diabetes mellitus, Hypertension, Asthma
<b>6</b>	<b>Recent trends on different classes of receptors and drugs acting on them</b> a) Angiotensin receptors b) Adrenoceptors c) Cholinergic receptors d) Dopamine receptors e) Serotonin receptors f) Hormone receptors g) GABA and benzodiazepine receptors
<b>7</b>	<b>Concept of gene therapy and recent development</b> in the treatment of various hereditary diseases. Transgenic mouse and its applications. Human genome mapping and its potential in drug research.
<b>8</b>	<b>Alternatives to animal studies:</b> Preclinical models using <i>C. elegans</i> , <i>Drosophila melanogaster</i> and Zebrafish

**Reference:**

1. Thomson E.B.; Drug Bioscreening: Drug evaluation techniques in pharmacology, VCH publishes USA, 1990.
2. Goodman and Gilman's; The pharmacological basis of therapeutics Ed. BruntonL., Chamber B., Knollman B., 12th edition, McGraw Hill, New York, 2011.

3. Katzung B.G., Masters S.B. and Trevor A.J.; Basic and Clinical pharmacology, 11th edition, Lange Tata McGraw Hill edition, 2009.
4. Rang and Dale's Pharmacology, Churchill Livingstone, 6th edition, 2007.
5. Sheth U.K., Dadkar N.K. and Kamat U.G.; Selected topics in experimental pharmacology, Kothari Book Depot, Mumbai.
6. Lawrence D.R. and Bacharch A.L.; Evaluation of Drug Activities, Pharmacometrics, Academic Press.
7. Kulkarni S.K.; Handbook of experimental pharmacology, Vallabh Prakashan, New Delhi.
8. Turner R.A.; Screening methods in pharmacology, 2011, Academic press, London
9. Vogel H.G. and Vogel W.H.; Drug discovery and evaluation, Pharmacological Assays, 3rd edition, Springer, New York.
10. Oxford Textbook of Medicine, 3rd edition, Vol. I, II, III. Ed. Weatherall D. J. Ledingham G.G., Warrell D.A., Oxford medical publications, 1996.
11. Walker R., Edward C.; Clinical pharmacy and therapeutics, 3rd edition, Churchill, Livingstone, London, 2003
12. Laurence D.R., Bennett P.N.; Clinical Pharmacology, 6th edition, Churchill, Livingstone, 1987.

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