# Ph.DEntranceExam(PharmaceuticalScience)

## Branch Name: Pharmaceutical Science

**DetailContent:**

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| **Sr.****No.** | **Topic** |
|  | **PartI** |
| 1. | **BasicsofResearch**Definitionofresearch,Objectiveofresearch,Scientificresearch,Socialscienceresearch,Ethicsinresearch,Plagiarism,Howtowriteresearchproposal**TypesandMethodsofResearch**ClassificationofResearch,PureandAppliedResearch,ExploringorFormulativeResearch,DescriptiveResearch,DiagnosticResearch/Study,EvaluationResearch/Studies,ActionResearch,ExperimentalResearch,Analytical Study ofStatistical Method, Historical Research,Surveys,CaseStudy,Field Studies**ThePlanningProcessofResearch**SelectionofaProblemforResearch,FormulationoftheSelectedProblems,HypothesisFormation,Measurement,ResearchDesign/Plan,Researchprocess |
| 2. | **ReviewofLiterature**NeedforReviewingLiterature,WhattoReviewandforWhatPurpose,LiteratureSearch, Procedure, Sources of Literature**Sampling**SamplingTechniquesorMethods,ChoiceofSamplingTechniques,SampleSize,Sampling and Non-Sampling Errors**MethodsofDataCollection**MeaningandImportanceofData,SourcesofData,UseofSecondaryData,Methodsof Collecting Primary Data |
| 3. | **ReportWriting**TypesofReports,PlanningofReportWriting,ResearchReportFormat,PrinciplesofWriting,Documentation,DataandDataAnalysisinThesis,Writing of Report, Typing of Report, Briefing, Preparation of Manuscript forPublicationofResearchPaper,PicturesandGraphs,Citationstyles,WritingaReviewof Paper,Bibliography, WritingSynopsis& Thesis. |
|  | **PartII** |
| 4. | **Pharmaceutics:**Development,manufacturingstandardsQ.C.limits,labeling,asperthepharmacopoeial requirements. Storage of different dosage forms (solid dosageforms, liquid dosage forms, semi-solid dosage forms) and aerosols and newdrugdeliverysystems.Adetailsstudyofbuffersandisotonicsolutions,solubilityofpharmaceuticals,interfacialphenomena,colloids,stabilityof |

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|  | colloids, rheology, thixotropy and its applications, micro meritics. Advanceddrug delivery systems. Biopharmaceutical aspects of dosage form design, openonecompartment,twocompartment&threecompartmentmodels&theirlimitations,factorsinfluencingbioavailability,evaluationofbioavailability,bio-equivalence, dosage regimens, repetitive dosing and dose adjustments inrenal and hepatic failure, individualization of dosage regimen. Formulation andpreparation of cosmetics - lipstick, shampoo, creams, nail preparations anddentifrices.**PharmaceuticalJurisprudence:**Drugs and cosmetics Act and rules with respect to manufacture, sales andstorage.PharmacyAct.Pharmaceuticalethics,NarcoticDrugsandPsychotropicSubstancesAct,andRulesthereunder,AnIntroductiontoStandard Institutions and Regulatory Authorities such as BIS, ASTM, ISO,TGA,USFDA, MHRA,ICH, WHO.**PharmaceuticalManagement**Introductiontomanagement,GATT, Worldtrade organization(WTO) andtraderelated intellectualproperty rights(TRIPS) |
| 5. | **PharmaceuticalAnalysis:**Principles,instrumentationandapplicationsofthefollowing:Absorptionspectroscopy(UV,visible&IR).Fluorimetry,Flamephotometry,Potentiometry.ConductometryandPlarography.Pharmacopoeialassays.Principles of NMR (1H & 13C), Mass spectroscopy. X-ray diffraction analysisanddifferentchromatographicmethods(TLC,Column,Paper, HPLC&GC).**Pharmaceutical&MedicinalChemistry:**General pathways of drug metabolism. Structure, nomenclature, classification,synthesis, SAR and metabolism of the following category of drugs, which areofficial in Indian Pharmacopoeia and British Pharmacopoeia. Hypnotics andSedatives, Analgesics, NSAIDS, Neuroleptics, Antidepressants, Anxiolytics,Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular drugs –Antianginal agents Vasodilators, Adrenergic & Cholinergic drugs, Cardiotonicagents, Diuretics, Antijypertensive drugs, Hypoglycemic agents, Antilipedmicagents,Coagulants,Anticoagulants,Antiplateletagents.Chemotherapeuticagents–Antibiotics,Antibacterials,Sulphadrugs.Antiproliozoaldrugs,Antiviral,Antitubercular,Antimalarial,Anticancer,Antiamoebicdrugs.Diagnosticagents.PreparationandstorageandusesofofficialRadiopharmaceuticals,VitaminsandHormones.Eicosonoidsandtheirapplication.**Biochemistry:**Biochemical role of hormones, Vitamins, Enzymes, Nucleic acids,Bioenergetics.Metabolismofcarbohydrate,lipidsandproteins.Methodstodetermine,kidney&liverfunction.Lipidprofiles. |

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| 6. | **Pharmacology:**General pharmacological principles including Types of receptors, drug receptorinteractionincludingsignaltransductionmechanism,Toxicology.Druginteraction.PharmacologyofdrugsactingonCentralnervoussystem,Cardiovascular system, Autonomic nervous system, Gastro intestinal systemandRespiratorysystem.PharmacologyofAutocoids,Hormones,Hormoneantagonists, chemotherapeutic agents including anticancer drugs. Bioassays,Immuno Pharmacology. Drugs acting on the blood & blood forming organs.Drugs acting on the renal system. Drug – Drug interactions and Drug-Foodinteractions.Adversedrug reactions.**NaturalProducts(Pharmacognosy):**Generalpathwayofbiosyntheticstudiesandbasicmetabolicpathways,Pharmacognosyofcrudedrugsthatcontainthefollowingconstituents.Alkaloids, Glycosides, Terpenoids, Steroids, Bioflavanoids, Purines, volatileoils,resins,seponines.Chemistry,tests,isolation,Characterizationandestimationofphytopharmaceuticalsbelongingtotheabovegroups.Standardization of raw materials and herbal products. Quantitative microscopyincluding modern techniques used for evaluation of crude drugs. Evaluation ofCrudedrugs,AdulterationofCrudedrugsandtheirdetectionbyvariousmethods. |

**Textbooks:**

1. ResearchMethodology:MethodsandTechniquesbyC.R.Kothari,NewAgeInternationalPublishers,ISBN:81-224-1522-9
2. ResearchMethodology-AStep-by-StepGuideforBeginners,Kumar,Ranjit.(2nd.ed),Pearson Education
3. NovalDrugDeliverySystemsbyY.W.ChianEd.JamesSwarbrick,Marcel Dekker.
4. Remington’sPharmaceuticalSciences,MackPublishingCompany,Easton,Pennsylvania.
5. TheTheoryandPracticeofIndustrialPharmacybyLLachman,HLiebermanandJKanig
6. PharmaceuticalDosageFormsandDrugDeliverySystemsbyAnsel&others.
7. Modern Pharmaceutics by Gilbert S. Banker and Christopher T. Rhodes, Marcel Dekker, Inc.,New York.
8. J.N.DelagadoandW.A.R.Remers,11thedn,WilsonandGiswoldsTextbookoforganicmedicinal andpharmaceuticalchemistry,J. LippincottCo.Philadelphia.
9. W.C.Foye,Principlesofmedicinal Chemistry,LeaandFebiger,Philadelphia
10. H.E.Wolff,edn,BurgersMedicinalchemistry,JohnWileyandsons,NewYorkOxfordUniversityPress, Oxfords.
11. Vogel’sTextbookspracticalorganicchemistry,ELBS/Longman,LondonRang,H.P.andDale,M.M. Pharmacology,5th edition,2010. Publisher:Churchil Livingstone.
12. TripathiK.D.,Essentialsofmedicalpharmacology6thed,2010,Jaypeebrothersmedicalpublisherspvt,ltd.
13. GoodmanGilmanA.,RallT.W.,NiesA.I.S.andTaylor,P.GoodmanandGilman’sThePharmacologicalBasisoftherapeutics,12thedition,2011.McGrawHill,PergamonPress.
14. Satoskar, R.S.andBhandarkar, S.D.Pharmacology andPharmacotherapeutics, 20th edition(singlevolume), 2010, Popular, Dubai
15. Pharmacognosy:C.K.Kokate,A.P.Purohit,S.B.Gokhale,NiraliPrakashanPune,42ndedition,2008.
16. TreaseandEvansPharmacognosy.16thEdition,WilliamCharlesEvans,W.Saunders,Edinburg,London, New York,Philadelphia, St.Louis,Sydney, Toronto, 2013.
17. TextbookofIndustrialPharmacognosy,A.N.Kalia,CBSPublishers&DistributorsPvt.Ltd.,1st Rev. Edition, 2011.
18. NaturalProductsasMedicinalAgents,Ed.J.L.BealandE.Reinhard,HippocratosVerlogStuttgart; 1982
19. ChemistryofNaturalproducts.S.V.Bhat,B.A.Nagasampagi,S.Meenakshi,NarosaPublishing House, NewDelhi,2005.
20. Jain,N.K.ATextbookofForensicPharmacy.VallabhPrakashan,NewDelhi.
21. GKJani,TextbookofpharmaceuticalJurisprudence,AtulPrakashan.
22. PrinciplesofInstrumentalAnalysisbySkoog,HollerandNieman,5thedition.
23. IstrumentalMethodsofAnalysis,H.H.Willard,L.L.Meritt,J.A.DeanandF.A.SettleWadsworath, New York.
24. PharmaceuticalAnalysis:ModernmethodsPart A,Part B,JamesW.Munson.
25. QualityAssuranceGuidebyOrganizationofPharmaceuticalProductsofIndia.
26. “GoodLaboratoryPracticeRegulation”DrugsandPharm.Sci.Series,Vol.124,2ndEd.,S.Weinberg,MarcelDekkerInc., N.Y.