UNIVERSITY OF DELHI
DEPARTMENT OF COMPUTER SCIENCE
MCA/M.Sc. (COMPUTER SCIENCE) ADMISSIONS 2014-2015

Important Dates and Timings

M.Sc. Computer Science	
Centralized registration	Available on the websites http://www.du.ac.in w.e.f. March 10, 2014 to April 18, 2014
Entrance Test Date	**Saturday**, June 14th 2014
Reporting Time for Entrance Test (Part-I)	9:30 AM
Time for Entrance Test (Part-I)	10:00 AM
Reporting Time for Entrance Test (Part-II)	1:30 PM
Time for Entrance Test (Part-II)	2 to 5 PM
Submission of result of qualifying examination (Bachelor's level) (Tentative)	July 7th 2014
1st Admission List (Tentative)	July 14th 2014
2nd Admission List (Tentative)	July 17th 2014

Master of Computer Applications (MCA)	
Centralized registration	Available on the websites http://www.du.ac.in w.e.f. March 10, 2014 to April 18, 2014
Entrance Test Date	**Sunday**, June 15th 2014
Reporting Time for Entrance Test	1:30 PM
Time for Entrance Test	2 to 5 PM
Interview Schedule (Tentative)	July 2nd to 5th 2014
Submission of result of qualifying examination (Bachelor's Level) (Tentative)	July 7th 2014
1st Admission List (Tentative)	July 14th 2014
2nd Admission List (Tentative)	July 17th 2014

UNIVERSITYOFDELHI Department
ofComputerScience

Bulletin of Information
2014- 2015

M.Sc. (Computer Science)

MCA(Master ofComputer Applications)

Dr. Sunil Kumar Muttoo
HeadoftheDepartment

FACULTY MEMBERS

1.	Mr. PradyotKantiHazra		AssociateProfessor
2.	Dr. Sunil KumarMuttoo		AssociateProfessor
3.	Dr. NaveenKumar		AssociateProfessor
4.	Dr. PunamBedi		AssociateProfessor
5.	Dr. Neelima Gupta	(On Leave)	AssociateProfessor
6.	Dr. VasudhaBhatnagar	(On Leave)	AssociateProfessor

ADMINISTRATIVESTAFF

1.	Mr.RamRaiSinghBedi	Office In-charge
2.	Mr.RajbirGiri	Office Attendant

TECHNICALSTAFF

1.	Ms. DevkiRawat	Technical Assistant
2.	Mr.BanshrajRam	LaboratoryAttendant
3.	Mr.Anand Singh	LaboratoryAttendant

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1. Introduction

Established in the year 1922, University of Delhi is one of the most prestigious institutionsin India.Sinceitsinceptionithas beenacentre ofacademic excellence.The DepartmentofComputerSciencewasestablishedinUniversity ofDelhiintheyear1981, with theobjective ofimpartingqualityeducationin thefield ofComputerScience.

The department runs two postgraduate courses MCA & M.Sc. (Computer Science) and also offers full time Ph.D. Program.

The department also monitorsfour year Program B.Tech. (Computer Science) offered by constituent colleges of University of Delhi.

Masterof ComputerApplications (MCA)

Three-yearMasterofComputerApplications(MCA)programmeatthe departmentwas startedin 1982 and was amongthefirstsuchprogrammes in India.Sincethen,it hasbeen immensely popular and one of the most sought after MCA courses in India. The departmentisproudofitsmore than800alumniatimportantpositionsininformation technology industryand academia in India and abroad.

M.Sc. (ComputerScience)

Two-yearM.Sc.(ComputerScience)courseintroducedintheyear2004in thedepartment aims to developcorecompetence in ComputerScience and preparethe students to carry out researchanddevelopment work,aswell as takeupacareer in theITindustry.

DoctorofPhilosophy(Ph.D.)

The Departmenthas strongresearch interestsin diverse branches ofComputerScience andoffersaDoctorofPhilosophy (Ph.D.)programmeaimedatproducingquality researchers.

2. ImportantDates and Timings: Candidates are advised to note the date & timing mentioned in the tables given below:

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3. Eligibilityconditions

(a) **Master of Computer Applications (MCA)**

Examination Passed

Any bachelor degree from the University of Delhi with at least one paper in Mathematical Sciences (Mathematics, Computer Science, Statistics, Operational Research) under annual mode/at least two papers in Mathematical Sciences (Mathematics, Computer Science, Statistics, Operational Research) in semester mode or an equivalent degree.

Minimum Percentage Required:

60% marks in aggregate.

The candidates who are appearing in the final year examinations of the degree on the basis of which admission is sought are also eligible to apply.

(b) M.Sc. (Computer Science)

Examination Passed

i. B.Sc. (Honours) Computer Science (10+2+3 scheme) from University of Delhi or any other University whose examination is recognized as equivalent to University of Delhi.

Minimum Percentage Required:

60% marks in aggregate

ii. B.Sc. Applied Physical Sciences with Mathematics and Computer Science/B.Sc.(General) Mathematical Sciences, (10+2+3 scheme) with Mathematics and Computer Science from University of Delhi.

Minimum Percentage Required:

60% marks in the aggregate with 60% marks in Computer Science and Mathematics separately.

iii. Any Bachelor's Degree (10+2+3) of University of Delhi with at least six papers in Computer Science and two papers in Mathematics under Semester system / at least three papers in Computer Science and one paper in Mathematics under Annual Examination System or any other University whose examination is recognized as equivalent to University of Delhi.

Minimum Percentage Required:

60% marks in the aggregate with 60% marks in Computer Science and Mathematics separately.

Note: The candidates who are appearing in the final year examinations of the degree on the basis of which admission is sought are also eligible to apply in all category mentioned above.

4. Relaxations

(a) ScheduledCaste/Scheduled Tribe

Theminimumeligibility requirement for theScheduledCaste/Scheduled Tribecandidates willbethattheymusthavepassedthequalifyingdegreeexamination. Providedthatthe minimumeligibility foradmissiontopost-graduate coursesbetheminimumpassmarks of the qualifyingexaminationconcernedof theUniversityofDelhi.In thecaseofScheduled Castes/ ScheduledTribescandidateswhohad passed thelastqualifyingexaminationfrom otheruniversities,theyshouldhavesecuredatleastthesamepercentageofpassmarks at the qualifyingexaminationasprescribed fortheequivalentexaminationofDelhi Universityforpurposesofadmission tothe Post-graduatecoursesof thisUniversity.

Thatwhere the admission isbased on screening/writtentest,post-graduate courses, the ScheduledCastes/ScheduledTribescandidateswouldberequiredtotakethetestbut their merit list bedrawn separatelyand permittedas per thereservationquota.

(b) Other BackwardClasses

TheOBCcandidatesshallbegivenarelaxationintheminimumeligibilityinthe qualifying examinationandintheminimumeligibility (ifany)intheadmissionentrancetestto the extent of 10% of theminimum eligibility marks prescribed for the General Category candidates.Forexample,ifthe minimumeligibilityforadmission toacourseis60%forthe GeneralCategorycandidates,theminimumeligibilityfortheOBCswouldbe54%i.e. (60%less10%of60%)andiftheminimumeligibilityinentrancetestis 40% forGeneral Categorycandidates,the minimumeligibilityforOBCswouldbe36%i.e.(40%less10%of40%).

All thoseOBCcandidateswhomeettheminimumeligibility marksinthe qualifying examinationandtheminimumeligibilitymarks(ifany)intheentrancetestshallbeeligibleforad missionintheorderoftheirmerit,keepinginviewtheavailabilityofseatsreserved forthem.

The OBCcandidateswhobelongtothe'**Non-CreamyLayer'**andwhosecastesappearinthe**CentralList**oftheOBCsonlyshallbeeligibleto beconsideredforadmissionunder theOBC Category.

(c) PersonswithDifferent Ability (PWD)

ThePWD candidates withnotlessthan 40%disabilityshallbegivenarelaxationinthe minimumeligibilityinthequalifyingexaminationandintheminimumeligibility(ifany)in theadmissionentrancetest totheextentof5%.

(d) Children/WidowsoftheeligibleArmed Forces Personnel (CW)

A concessionof 5% marks in the minimum eligibility requirements in the qualifying examinations.

5. Reservations

(a) ScheduledCaste/Scheduled Tribe/Other BackwardClasses

Reservation of seatsinadmissionstovarious post-graduate coursesshallbe in thefollowingmanner:

Schedule Caste =15%oftotal intakein
eachcourse Schedule Tribe =7½%of totalintake ineach
course OtherBackwardClasses =27%of totalintake ineach course

Theseatsreservedfor the SC/STshall befilledbytheSC/STcandidatesonly.However,

inthecaseofnon-availabilityoftheeligiblecandidatesthereservedseats may be interchangedbetweentheSC&ST.Ifstillany seatremainsunfilled, thesameshallbeleft vacant.

Theseatsreserved fortheOBCs,shallbe filledwiththeOBCstudentsonly.OnlyifOBC candidates possessingthe minimumeligibilitymarksare notavailable in the OBC category thenthevacantOBCseatsshallbeconvertedintoGeneralCategory seatsinaccordance with theadmissionschedulenotifiedbytheUniversity.

(b) SupernumerarySeats

(i) **Personswith DifferentAbility (PWD)**

3%oftotalintake(1% eachforthepersonswithlowvisionorblindness,hearing impairedandlocomotordisability orcerebralpalsy)(interchangeableincaseofnon-availabilityofcandidatesin thesub-categories).

(ii) **Children/WidowsoftheeligibleArmed Forces Personnel (CWCategory)**

5%of theseats in eachcourse.

Asperthe guidelinesapprovedby theAcademicCouncil,admissionsofcandidates belonging toCWcategories have to bemadein thefollowingorder ofpriorities:

I. Widows/Wards ofDefencepersonnelkilledin action;
II.Wards of servingpersonnel and ex-servicemen disabledin action;
III.Widows/WardsofDefence personnelwhodiedin peacetimewith death attributabletomilitaryservice;
IV.WardsofDefence personnel disabledinpeace timewith disabilityattributable tothemilitaryservice;and
V.WardsofEx-servicemenpersonnel andserving personnel includingpersonnelofpoliceforceswhoareinreceipt ofGallantry Awards;

Category-V(Gallantry Awards)include:ParamVirChakra,AshokChakra,SarvottamYudhSevaMedal,Maha VirChakra,KirtiChakra,UttamYudhSevaMedal,VirChakra,ShauryaChakra,YudhSev aMedal,Sena,NauSena,VayusenaMedal, Mention-in-Despatches, President'sPoliceMedalforGallantry,PoliceMedalfor Gallantry.

Authorities Competent toissuecertificates underCWcategory:

- Secretary,Kendriya,SainikBoard, Delhi

- Secretary,RajyaZilaSainikBoard
- Office-in-Charge, RecordsOffice
- 1st Class StipendiaryMagistrate
- MinistryofHomeAffairs(for Police personnel in receiptof Gallantry Awards)

(iii) **Foreign Nationals** =5%seatsinfirstyearofeachcourse.

Theforeignnationalsseekingadmissionin theUniversity/itscollegesshallhaveto getthemselvesregisteredwiththeForeignStudentsRegistry incompliancewiththe Schedulenotifiedby the FSR.NoForeignstudentswillbeadmitteddirectlybythe Department/Colleges.

(iv) **Sports/ECAPersons**=upto5%oftotal intakein eachcourse.

Admissionunder these categoriesshall bemade in accordance with theguidelines issued bytheUniversityfromtimetotime.

6. ConcessioninApplicationFee

Thecandidatesbelongingto theScheduledCaste,Scheduled Tribes,andPersonswith different abilityshallbecharged theadmission form/entranceexaminationfeeat concessional rates.

7. Merit List

Themeritlist forthe generalcategory seatswillcompriseofall thecandidatesintheorder ofmerit.It willalsoinclude SC/ST/OBCcandidatesiftheycomeinthe generalmerit.Admissiontogeneral category seatswillbestrictly intheorderofmerit withoutexcludingSC/ST/OBCcandidates.

8. Certificate Requirement

At the time of admission all certificate are to be produced in original and one set photocopy of self-attested.

9. Certificates Required for ReservedCategories

Acandidateapplyingforanyreservedseatmentionedinthepreviussectionisrequired to submit thefollowingcertificate asthecasemaybe:

(a)**SC/ST/OBCCertificate:** For admissiontoaseat reservedfor 'Scheduled Caste/ Scheduled Tribes /OtherBackwardClasses,attested copy ofcertificateshouldbe submitted fromanapproveddistrictauthoritystatingtheScheduledCaste/Schedule Tribe/OBCtowhichthecandidatebelongs.Alistofapprovedauthoritiesisgiven below:

(1) District Magistrate/Additional DistrictMagistrate/Collector/Deputy Collector/Deputy Commissioner/AdditionalDeputy Commissioner/FirstClass StipendiaryMagistrate/CityMagistrate,notbelow therankofFirstClass StipendiaryMagistrate/Sub-DivisionalMagistrate/TalukaMagistrate/Executive Magistrate/ExtraAssistantCommissioner.

(2) ChiefPresidencyMagistrate/AdditionalChiefPresidencyMagistrate/ PresidencyMagistrate.

(3) RevenueOfficernotbelowthe rankof Tehsildar.

(4) SubDivisionalOfficerofthe areawherethecandidateand/orhis/her familyresides.

(5) Administrator/Secretary to Administration/Development Officer (Lacadive and MinicoyIslands).

(b) EntitlementCard/Certificate:ThecandidatesunderCWcategorywillberequiredto provide attested photocopy of Entitlement Card/Certificate from the competent authority.

(c)Certificatefor Differently abled (PWD)Candidates:Foradmissiontoaseatreserved for physicallyhandicappedcandidate, thecandidatesshouldsubmit amedical certificate fromcompetentmedicalauthorities inaformatasperGovt.ofIndia guidelinesalongwith theirapplicationform forEntranceTest.However,theadmission ofthephysically handicappedcandidatesshallbesubject totheir medicalexamination andappropriaterecommendationsoftheChiefMedicalOfficer, WUSHealthCentre, UniversityofDelhi (MainCampus).The recommendationsoftheabove mentioned authorityshall befinalfor all purposes.Pleasenote that:

(1)Thecertificateshould notbemorethan 5yearsold.

(2)Itshouldbesignedbyaboardofthreedoctorswithlegiblestampindicatingthe name &designationof the doctors.

(3)The certificate should be countersigned by CMO/Medical Superintendent with stampunder the signatures.Certificate shouldhave photograph of thecandidate.

(4)Diagnosisshould bewrittenclearly in thecertificate.

Theoriginalcertificateasmentionedabovein(a),(b)and(c)wouldberequiredtobe producedforverificationat thetimeofadmission.

10. EnrolmentinSeveral Courses

AsperA.C.Resolution 40dated24/04/1997,nostudentoftheUniversityshallbe permittedto pursuetwodegreecoursessimultaneouslyeitherfromtheUniversityof DelhiorfromotherUniversity exceptthepart-timediplomas/certificatesoftheUniversity ofDelhi.

11. ApplicationForm and Fee

(Linkto be provided by the University of Delhi)

MCA/M.Sc.(Computer Science) Rs.500/-for General/OBC Category

Rs.250/-forSC/ST/PWDCategory

Mode ofPayment: On-Line Payment

12. AdmissionTicketforMCA/M.Sc.(Computer Science)

Admission Ticket will be issued at the time of filling on line application.

13. AgeRequirement

AsperOrdinanceIoftheUniversity,thereisno minimumagebar for admission to the under-graduateand post-graduatecoursesinthe Universityanditscollegesexceptinthe courses where the respective regulatorybodies (suchas MCI,AICTE)have prescribedthe minimumagerequirementintheir regulations.

14.**AdmissionofForeignNationals**

1. Foreign nationals shall be exempted from appearing in Admission Entrance Test conducted by the College/Department for admission to various Under-Graduate and Post-Graduate Courses including Professional Courses. Foreign nationals who are stationed in India have passed last examination from Board/University in India shall also be exempted from appearing in entrance test conducted by the College/Department in all Courses.

2. All the Categories of foreign students shall come under the same category of 5% quota for foreign nationals for admission to Under-Graduate, Post-Graduate and other Course. This shall include foreign nationals with qualifications attained either from Indian Board/University or Foreign Board/University.

3. All admission in Foreign Students category shall be done on individual merit and a single merit list of foreign students, both with India and foreign qualifications shall be prepared for admission in various courses.

4. At least one seat shall be reserved for foreign nationals in all Post-Graduate courses wherever the total numbers of seats for admission is less than 20.

Foreign students are advised to submit TOFEL/IELTS Score.

15. **AdmissionProcedure**

Master of Computer Applications (MCA)

Admission to MCA course is based on Entrance Test and Interview. For preparing the final merit list, 85% weightage will be given to the score in the Entrance test and 15% weightage will be given to the score of the Interview.

Entrance Test shall consist of objective type questions from the following three components:

1. Mathematical Ability
2. Computer Science
3. Logical Reasoning and English Comprehension.

Syllabus:

Mathematics: Mathematics at the level of B.Sc. Program of the University of Delhi.

Computer Science: Introduction to Computer organization including data representation, Boolean circuits and their simplification, basics of combinational circuits; C-programming: Data types, constants and variables, operators and expressions, control structures. Modularity: use of functions, scope, arrays.

Logical ability & English Comprehension: Problem-solving using basic concepts of arithmetic, algebra, geometry and data analysis. Reading comprehension and correct usage of English language

M.Sc.(ComputerScience)

i. 50% of the seats are filled on the basis of merit in the B.Sc.(H) Computer Science Examination of the University of Delhi. Students with gap year will be considered. Only those students who have filled the Application form will be considered under this category.

Only Delhi University students are eligible for admissions on the basis of merit.

ii. The admission for the remaining 50% seats in the M.Sc. Computer Science course is based on Admission entrance Test which will consist of two parts:

Part I : Objective type questions.

Part II: Comprehensive questions.

Qualifying criteria for Part II of entrance test General 40% or more, SC/ST 35% or more and OBC 36% or more marks of Part I examination.

For preparing the final merit list 60% weightage will be given to the score in the admission test **(Part II)** and 40% weightage will be given to the score of the qualifying examination (i.e. Bachelors level). The last date for submission of final year result for the purpose of merit list preparation will be specified in the bulletin of information.

In the event of any short fall of admission through Entrance Test the remaining seats will not be filled from the merit list of the candidates seeking admission through direct quota reserved for B.Sc. (Honours) Computer Science students of the University of Delhi. If a candidate is shortlisted in both the categories, he/she will be admitted through the direct admission .If any, seat remain vacant against direct admission category due to non-availability of eligible candidates, the same shall be transferred and filled through admission entrance test. Future withdrawals will not change the category of a candidate already admitted.

16. ProgramStructureDetailsofprogramstructure areavailable here:
MCA (http://du.ac.in/fileadmin/DU/Academics/courses/mca_syl_09.pdf),

M.Sc.(Computer Science) http://du.ac.in/fileadmin/DU/Academics/courses/msc_syl_09.pdf).

17. ProgramFeefor MCA/M.Sc. (Computer Science)

Aprogramfee(coursefee)ofRs.7,000/-persemestershallbechargedoverand above thenormal Universityfee.

18. Number ofSeatsforMCA/M.Sc. (Computer Science)

Thenumberofsanctionedseatsin each oftheprogramsMCA/M.Sc.(ComputerScience)is46.

i. Master of Computer Applications (MCA)
(Gen. 24, SC-7, ST-3, OBC-12, Supernumery seats: 7(PWD-1, CW-2, FS-2, Sports/ECA-2))

ii. M.Sc. Computer Science, Supernumery seats-8, Foreign Students-2

Category	**Entrance Test**	**Merit Basis**
GEN	12	12
SC	3	3
ST	2	2
OBC	6	6
PWD	1	1
CW	1	1
Sport/ECA	1	1

Foreign Nationals =2

19. Hostel Accommodation: http://www.du.ac.in/index.php?id=557

20. Library

The University has a rich and up-to-date collection of books for use by the students and the faculty members.

21. ComputingFacilities

Studentsandfaculty members makeactiveuseofthe computersystemsatDepartmentof ComputerScienceandDelhiUniversity ComputerCentre. Thedepartmentalsohasup-to-date digital andmicroprocessor labs.

22. PlacementCell

The department has a Placement Cell which invites leading companies from the ITindustryforthecampusrecruitment.Thedepartmenthashad anexcellenttrackrecordof100 % placement forseveral years.

23. ImportantPoints

(i) Roundingofffractionsofamarkisnotpermissiblefordeterminingthe eligibilityrequirementofa candidate.

(ii) AlladmissionsmadetotheMCA/M.Sc.(ComputerScience)coursewillbe provisionalsubject toverificationof their eligibility by the Mathematical Sciences Course AdmissionCommitteeand confirmation bytheUniversity.

(iii) Disputes, if any, arising out of or relating to any matter whatsoever, concerningthe processofadmissionshallbesubjecttothe exclusive jurisdictionof thecompetentcourt only in Delhi.

(iv) There is no direct admission to the second or third year of the MCA/SecondYear ofM.Sc. (Computer Science)course.

24.Instructionsfor Entrance TestforMCA/M.Sc.(Computer Science)

(i) Allcandidateswilltaketheirseataspertimeschedulementionedin item No. 2 of Page No. 2 (Important Dates&Timing)givenin theschedule.

(ii) Candidateswillwriteparticularsonthecoverpageofthebookletusingball pen,withoutbreaking the seal of thetest booklet.

(iii) BreakingopenthesealoftheQuestion/Test booklet:Oninstructionfromtheinvigilator, thecandidateswilltakeoutthe OMR-answer-sheet without breaking the seal of Test booklet. They willwritetheirparticularsandputtheirsignaturesusing ballpoint/fountainpen.They willalsoencoderollnumber,category (e.g. GEN/SC/ST/CW/PH/ OBC)paperseriesandserialnumberofthe test booklet,in HB Pencilonly.Specimen isgiven ahead.Candidates are advisedtobecarefulinfillingupthesepartic ularssinceanywrongentry is likelyto render theanswersheet rejectedbytheOptical Marks Scanner.

(iv) LateEntry:TheentryintheExaminationHallwillnotbeallowedafterthe startofthe test i.e.9.30 A.M. Thereafteralldoorswillbeclosedandno candidatewillbe permittedentryintheExaminationHall.Candidatesareadvisedtoreach theCentre well beforethe reporting time.

(v) Pens/BallPens/PencilErasers:Thecandidatesarerequiredtobringtheir ownink/ballpointpens, HBpencils(any otherpencilHH,HHH,etc.,should notbeused).Incaseany pencilotherthanHBpencilisused,theanswer sheet mayberejectedbythe Optical MarkScanner.

(vi) AnswerSheetandCheckingofSerialNumber:TheOMR-answersheetcarriesaserialnumberwhichshouldtallywiththe serialnumberonthe TestBooklet.Thecandidateshouldimmediatelybring tothenoticeoftheinvigilatoranydiscrepancyintheserialnumberon the testbookletandthe serialnumberon theOMR- answersheet.In suchanevent,thecandidate willbegivena newTest booklet. In anycase, thecandidate mustnotuseanOMR-answersheetwhich hasa serial number differentfrom the onegivenonthetest booklet.

(vii) RoughWork:Allroughworkistobedoneinthespaceprovidedintest bookletonly.RoughworkMUSTNOTbe done in the OMR-answersheet or any other material.The candidate will notbring anyloose sheet forroughwork. Use of any calculating device is not allowed.

(viii) Test booklet should be unsealed by the Candidate only after the announcement bytheInvigilator.

(ix) TheOMR-AnswerSheet will becollectedfrom thecandidate after theTestisover.

(x) The answersare tobegiveninthefirst one hundred slots of the OMR-answer-sheetonlyandNOTin theTest Booklet.

(xi) Do not start writinganswersuntil youareaskedto doso. Mark the answer immediately on

solving the question.

(xii) Eachmultiplechoicequestioncarries4marks.Foreachcorrectresponse thecandidatewillget4marks.Foreachincorrectresponseshowninthe answer-sheet, onemarkwillbededucted. No markwill, however, be deductedfornotattemptingaquestion.Morethanoneresponseindicated against aquestion intheanswersheetwill beconsideredasincorrect response andwill benegativelymarked.

(xiii) Ifyoudonotunderstandaparticularquestiongotothenextquestion.If youhave time you maycomebackto itlater.Youshould notaskanything aboutaquestiontothe Invigilator.

(xiv) Useofanycalculatingdevicelikecalculatorormathematicaltablesisnot allowed.

(xv) Nocandidatewillbeallowed to take the question booklet and carbon copy of the OMR sheet before the examination is over.

(xvi) Eatables/smokingare not allowedin theExamination Hall/Room.

(xvii) Sample Questions supplied to candidates only indicate the type ofquestionsthatmay beaskedanddonotcovertheentiresyllabus.The degreeofdifficultyof questions intheEntranceTest mayalso vary.

(xviii) Don't bring your Mobile Phonesin theExamination Hall.

25. Conduct Rulesfor EntranceTestforMCA/M.Sc.(Computer Science)

(a) Duringtheexaminationtime,theinvigilatorwillcheckadmissionticketsofthe candidatestosatisfyhimself/herselfaboutthe identityofeachcandidate.The Invigilator will also check that the candidates have filled in the particulars correctly.The invigilatorwillalsoputhis/hersignaturein theBoxprovidedinthe answersheet.Eachcandidatemustshow ondemandhis/herAdmission Ticket bearing his/herRoll Number foradmissiontotheExamination Hall.

(b) Aseatwiththe roll numberwillbeallottedtoeachcandidate.Candidatesmustoccupy theirallottedseats.

(c) No candidate, without the special permission of the Superintendent or the Invigilatorconcerned,isallowedtoleavehis/herseatortheExaminationHall untilhe/she finisheshis/herexamination. Thecandidatesshouldnotleavethe Examination Hall without handing over their Test Booklets and the Answer Sheetsto theInvigilatoronduty.

(d) The candidates should not take any article in the Examination Hall except admissionticket,pens,pencils,anderasers for useduring theexamination.All books, notes mobile phone, calculation device etc.,should bekept outside the Examination Hall.

(e) Thecandidatesmaybringwiththemacardboardoraclipboard onwhichnothingshouldbewrittenso that they havenodifficulty inmarking responsesin theAnswerSheet.

(f) Tea, Coffee, Cold Drink, Snacks and Smoking etc. are notallowed to be taken inside theExamination Hall duringexamination hours.

(g) Thecandidatesmustkeepperfectsilenceduringtheexaminationandmustnot indulge inanyconversationorgesticulation.

(h) Useofanycalculating device like, logtables,calculatorisnot allowed.

(i) Thecandidatesmustnotbringmobilephones,pagersoranyotherelectronic device to theExamination Hall.

(j) Thecandidatesmustsubmittheanswersheettotheinvigilator after the test is over.Thecase of the defaulterwillbereported tothepoliceandtheresultofsuchcandidates will bewithheld.

(k) No clarification regarding any discrepancy in the question paper will be entertained while the examination is in progress. However, arepresentation either to the Superintendentofthe Centre/ControllerofExaminations can be made bythecandidate immediatelyaftertheexamination.

(l) Nocandidate willbe allowedtoleaveforany reasonduringthe firstthirty minutesorlastfifteenminutesofthedurationofthe test.

26. Syllabus for theEntrance Test**Master of Computer Applications (MCA)**

The test will comprise one hundred question of the objective type from the following syllabus.

EntranceTest shall have thefollowingcomponents:Mathematical Ability,ComputerScience,LogicalReasoning and English Comprehension.Syllabusforentrance testisgivenbelow:

Mathematics: Mathematicsat thelevel ofB. Sc.programof theUniversityofDelhi. **ComputerScience:**Introduction to Computerorganizationincludingdata representation, Boolean circuits and their simplification, basics of combinational circuits; C - programming:Datatypesincluding userdefineddatatypes,constantsandvariables, operatorsandexpressions, controlstructures, modularity:useof functions,scope, arrays.

Logical ability&EnglishComprehension:Problem-solving usingbasicconceptsof arithmetic,algebra,geometryanddataanalysis.

English Comprehension: CorrectusageofEnglishLanguage andReadingcomprehension.

M.Sc. (Computer Science) Thesyllabus for the M.Sc. (Computer Science)EntranceTest would beasfollows:

Computer Science

DiscreteStructures:Sets, functions,relations,counting; generatingfunctions,recurrence relations and theirsolutions;algorithmic complexity, growth of functionsand asymptotic notations.

Programming,DataStructuresand Algorithms:Data types,controlstructures, functions/modules,object-oriented programmingconcepts:sub-typing,inheritance, classesandsubclasses,etc.Basicdata structureslike stacks,linked list,queues,trees, binary searchtree,AVLandB+trees;sorting,searching,orderstatistics,graph algorithms, greedyalgorithmsand dynamicprogramming

Computer System Architecture: Booleanalgebraand computer arithmetic,flip-flops, designofcombinationalandsequentialcircuits,instructionformats,addressingmodes,interfacingperipheraldevices,typesofmemoryand theirorganization,interruptsand exceptions.

OperatingSystems: Basicfunctionalities, multiprogramming,multiprocessing, multithreading, timesharing, real-time operating system; processor management, processsynchronization, memory management,devicemanagement,filemanagement, securityand protection; casestudy: Linux.

SoftwareEngineering: Softwareprocessmodels,requirementanalysis,software specification,softwaretesting,softwareprojectmanagementtechniques, quality assurance.

DBMS and File Structures:File organization techniques,database approach,data models,DBMSarchitecture;dataindependence,E-Rmodel,relationaldatamodels, SQL, normalization andfunctional dependencies.

ComputerNetworks:ISO-OSIand TCP/IPmodels,basicconceptsliketransmission media,signalencoding,modulation techniques, multiplexing,error detectionand correction;overviewofLAN/MAN/ WAN;datalink,MAC,network,transportand application layerprotocolfeatures;networksecurity.

Mathematics

Algebra:Groups,subgroups,normalsubgroups,cosets,Lagrange's theorem,rings and theirproperties,commutativerings,integraldomainsandfields,subrings,idealsand theirelementary properties.Vectorspace,subspaceanditsproperties,linear independenceanddependenceof vectors,matrices, rank of amatrix, reduction to normal forms,linearhomogeneousandnon-homogenousequations,Cayley-Hamilton theorem,characteristic rootsandvectors.DeMoivre'stheorem, relation betweenroots andcoefficientofnth degreeequation,solutiontocubicandbiquadraticequation, transformationofequations.

Calculus:Limitandcontinuity,differentiability offunctions,successivedifferentiation, Leibnitz'stheorem,partialdifferentiation,Eider'stheoremon homogenousfunctions, tangents andnormal,asymptotes,singularpoints,curvetracing, reduction formulae, integration and properties of definite integrals, quadrature, rectification of curves, volumesand surfacesof solids ofrevolution.

Geometry:Systemofcircles,parabola,ellipseandhyperbola,classificationandtracing ofcurves ofseconddegree,sphere, cones,cylindersandtheir properties.

VectorCalculus:Differentiationandpartialdifferentiationofavectorfunction,derivative ofsum, dotproduct andcrossproduct,gradient,divergence andcurl.

DifferentialEquations:Linear,homogenousand bi-homogenousequations,separable equations,firstorder higherdegreeequations,algebraic propertiesofsolutions, Wronskian-itsproperties andapplications,linearhomogenousequations withconstant coefficients,solutionof secondorderdifferential equations.Linearnon-homogenous differential equations,the methodofundeterminedcoefficients,Euler'sequations, simultaneous differentialequationsandtotal differential equations.

Real Analysis: Neighborhoods, open and closed sets, limit points and Bolzano Weiestrasstheorem, continuous functions, sequences and their; properties, limit superiorandlimitinferiorofasequence,infiniteseriesandtheirconvergence.Rolle's

theorem,meanvaluetheorem,Taylor'stheorem,Taylor'sseries,Maclaurin'sseries, maxima andminima, indeterminateforms.

Probability andStatistics:Measuresofdispersionandtheirproperties,skewnessand kurtosis,introduction toprobability,theoremsoftotal andcompoundprobability,Bayes theoremrandomvariables,andprobabilitydistributionsanddensity functions, mathematicalexpectation,momentgeneratingfunctions,cumulantsandtheirrelation with moments, binomial Poisson and normal distributions and their properties, correlationand regression,methodofleastsquares,introductionto samplingand samplingdistributionslikeChi-square,tandFdistributions,testofsignificancebasedon t, Chi-squareand Fdistributions.

English Comprehension

Correct usageofEnglishlanguageandreadingcomprehension.

Selected References:

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C.L. Liu, ElementsofDiscreteMathematics,McGraw-Hill.

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A. Silberschatz, P.B. and GregGargne, Galvin. Operating SystemConcepts, John Wiley.

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J.H.Cormen,C.E.Leiserson,R.L.Rivest,IntroductiontoAlgorithms,PrenticeHallof India.

M.T.Goodrich,R. Tamassia and D.Mount,DataStructuresand Algorithmsin C++,John Wiley&Sons.

27. JurisdictionofStatutoryAuthorities**:**Informationcontainedinthisbulletinis subjectto anysubsequentdirectives ofthestatutoryauthorities.

28. SampleQuestions

Master of Computer Applications (MCA)

1. Thepoints1+i,1–i,–1,–iare
   (1) Collinear.
   (2) Withinacircleof radius1.
   (3) Verticesof
   anequilateraltriangle. (4)
   noneof theabove.

2. Theasymptotesof thecurve–
   $(y–x)(y–2x)^2+(y+3x)(y–2x)+2x+2y–1=0$are
   (1) $y=x+4, y=2x–2, y=2x–3$ (2)
   $y=x, y=x+1, y=x/2$
   (3) $y=–3x, y=x, y=x/2$
   (4) $y=x–4, y=2x+2, y=2x+3$

3. IfQdenotesthefieldofrationalnumbersandCdenotesthefieldofcomplex numbersthenCas avectorspaceoverQhasdimension

(1) 2

(2) even

(3) odd

(4) infinity

4. Ifeverycross-sectionofaboundedsurfaceinthreedimensionsisacirclethen surface

(1) mustbeasphere

(2) mustbeacylinder

(3) mustbeacone

(4) mustbeathird-degreesurface

5. Traceof asquarematrixisthesumof its diagonalelements.SupposeAis amatrix withcomplexentries.LetA'representthetransposeof A.Then

(1) A=0if trace(A^TA)=0

(2) A=0if Ahasrealentriesandtrace(ATA)=0 (3)
A=0if trace(A^2)=0

(4) Trace(A^2)hasnon-negativerealpart.

6. If astatistict hasStudent'sdistributionwith1d.f.thenthedistributionof $t^2$is

(1) $\square_2$(1,1)

(2) $\square^2$with1d.f.

(3) Fwith(1,1)d.f

(4) noneof theabove

7. Thetermsoftwodivergentseries $\sum a_n$, $\sum b_n$ decreasetozero.Thentheseries $\sum \min(a_n,b_n)$

(1) diverges

(2) mayconverge

(3) alwaysoscillates

(4) noneof theabove

8. TworandomvariablesX andY aresuchthatY = X^2.Thenthecorrelation coefficientbetweenX andY

(1) is1

(2) ispositive

(3) iszero

(4) neednotexist.

9. Afunction$f(x)$definedinaninterval[a,b]attainsamaximumvalueat$x=b$.Then

(1) $f(b)=0$

(2) $f(b)$neednotexist.

(3) $f(x)$is monotonicallyincreasingin[a,b].

(4) $f(b)<0$.

10. Let$f(x)=|x|,\times\square[-1,1]$.Considerthefollowingstatements:
(i)$f(x)$iscontinuous everywhere,(ii)$f(x)$isdifferentiableeverywhere.
(iii)$f(x)$isnotdifferentiableat$x=0$.Then

(1) Allthestatementsarefalse.

(2) Only(iii)isfalse.

(3) Only(iii)istrue.

(4) Only(ii)is false.

11. If $\vec{a}$ and $\vec{b}$areunitvectorssuchthatthelength($\vec{a}+\vec{b}$)is $\sqrt{2}$then anglebetween $\vec{a}$and$\vec{b}$ is:

(1) 90°

(2) 60°

(3) 45°

(4) 30°

12. Theorderanddegreeof thedifferentialequation

$[1-(dy/dx)^2]^{3/2}=(d^2y/dx^2)^{2/3}$are respectively

(1) 2and4

(2) 2and9

(3) 1and18

(4) 2and18

13. Thesequence$<a_n>$definedby

$a_n=2+(-1)^n/n$

(1) isconvergentandconvergesto2

(2) isnotconvergent

(3) oscillatesbetween0and2

(4) oscillatesinfinitely

14. FindthevalueofKforwhichtheequation,$x^3+3x+K=0$hastwodistinctroots in[0,1].

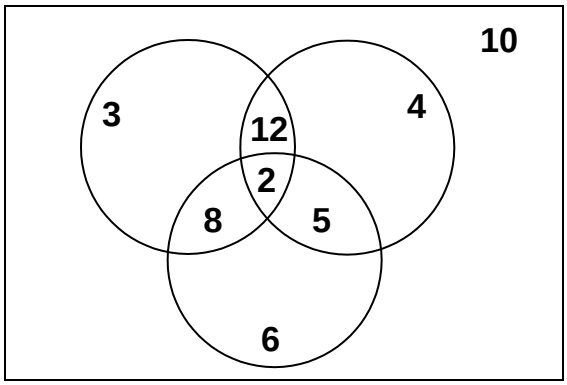
(1) 0

(2) 1

(3) 1/2

(4) None

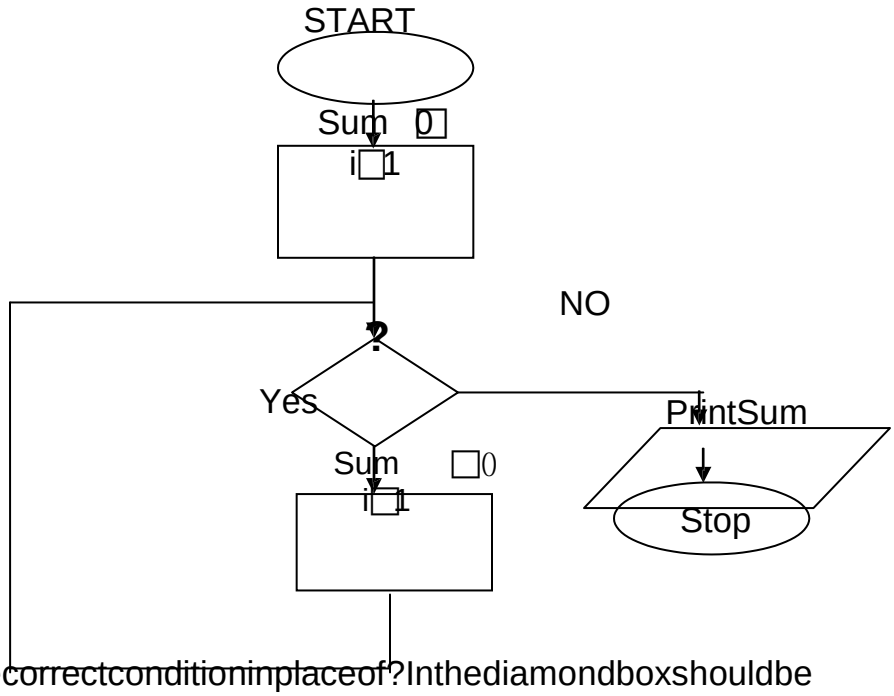
15. ConsiderthefollowingVennDiagram:



ThenumberintheVenndiagramindicatesthenumberofpersonsreadingthe newspapers.Thediagramisdrawnaftersurveying50persons.Inapopulationof 5000,how manycouldbeexpectedtoreadat leasttwonewspapers?

(1) 250
(2) 270
(3) 300
(4) 106

16. Theflowchartshownbelowdescribesanalgorithmto evaluatethesumof first100 oddnumbers.



Thecorrectconditioninplaceof?Inthediamondboxshouldbe

(1) i<100

(2) i<101

(3) i<199

(4) Noneof theabove

17. Agamblerplayedthefollowinggamewithafriend.Hebethalfthemoneyinhis pocketonthetossofacoin;hewononheadsandlostontails.Thecoinwas tossedandthemoney held bythegambler.Attheend,thenumberoftimesthe gamblerlostwasequaltothenumberof timeshewon.Then:

(1) hegained

(2) helost

(3) hebrokeeven

(4) allthesearepossible

18. Thenumberof zeroesinthebinaryrepresentationof

$8^5+8^3+5*8^2+7*8+7$is:

(1) 7

(2) 8

(3) 9

(4) noneof theabove.

19. Considerthefollowingtruthtable:

p	*q*	*f(p,q)*
T	T	
	TT	F
	T F	T
	F F	F
	F	

Then*f*(*p*,*q*)canbewrittenas

(1) *p*and*q*

(2) *p*or*q*

(3) *p*

(4) *q*

20. A,B,C,D,arefourpersonswithpairwise distinctwealth suchthatatleastoneof {A,B}isricherthanatleastoneof{C,D),atleastoneof{A,D}isricherthanat leastoneof {B,C}.Then:

(1) Aistherichest

(2) Bisnotttherichest

(3) Aisnotthepoorest

(4) noneof theabove.

21. Considerthefollowingfivestatementsof whichexactlyoneisfalse:

(1) AistallerthanB.

(2) BistallerthanD.

(3) CistallerthanD.

(4) BistallerthanC.

(5) AistallerthanC.

Then

(1)thefalsestatementis(4)

(2)thefalsestatementis(1)

(3)thefalsestatementis(5)

(4)thefalsestatementis(2)

Forquestions22and23

Givenbelowarethedataof theexaminationresult:

Totalappeared	6300
Passed	1430
Passedin History	3630
Passedin Geography	3660
Passedin Civics	3510
Passedin Economics	3570
Passedinatleastthreesubjects	2630

22. Howmanycandidatespassedin Geography,butfailedinone or moresubjects?

(1) 1200

(2) 1820

(3) 2230

(4) 3670

23. Howmanycandidatesfailedbecauseofhavingfailedintwoor moresubjects?

(1) 790
(2) 182
(3) 223
(4) 367

Read thefollowingparagraph andanswerthequestion thatfollow:

TheAsianRhinoisfacingextinctionas therampanthuntingdownoftheanimal foritshide, purportedlyhavingmedicinalproperties,ison therise.Recentnewsfromthe twostrongholds of theAsianRhino, theKazirangaNationalParkinAssamand the ChitwanNationalParkinNepal presentsan intriguingscenario.ForKaziranga,theyear2007wasoneoftheworstinadecade as faras rhinopoachingwasconcerned.Atleasttwentyoftheseanimalswerepoached,mainly shot,inand around theseextensivegrasslands onthebanksofthe mightyBrahmaputra.In Nepal,in comparison, 2007 turneduplookingdistinctlygoodfortherhino;onlytwo animals,one eachinChitwanandBardiaNationalParks,werepoachedinthe entirecalendaryear.Compare thiswiththeprecedingtwelve monthsandthe contrastisconspicuous.2006wasthecomplete opposite of2007and drasticallyso.Kaziranga lostonlysixrhinosin 2006 to poachers,while the number forNepalwasatleasttwentywithfourteenbeinginandaroundChitwanalone.The turnaroundinNepalisremarkableconsideringthe factthatalmostthirty rhinosonanaverage hadbeenpoached here annually inthelast fewyears.Mostobserverspoint to thepolitical resolutionthathastakenplaceinthecountry andthepeace thathasreturnedwiththe establishmentofademocratic regimeendingyearsofturmoilandarmed resistanceduringthe monarchy.

24. ThenumberofAsianRhinosisgoingdown because, (1)

Theyarebeingkilledbyamateur hunters
(2) Theyarenotwell-protected insanctuaries
(3) Theyarebeinghunted down bypoachers
(4) Theyarebecomingextinctbecausetheir habitatsare shrinking.

25. TheNational parksmentionedinthepassageare

(1) InIndia
(2) Oneeach inIndia and Nepal
(3) Onein Indiaandtwo inNepal
(4) Two inIndia and onein Nepal

26. Thecomparisonshows that

(1) The situationhas improvedin Nepal butworsened in India
(2) Ithas improvedin India butworsened in Nepal
(3) Ithasworsened in both
(4) Ithas improvedin both

27.Mark thestatementthatisNOT true

(1) TheriverBrahmaputraflowsbyKaziranga
(2) Therhino'shideisbelieved to have medicinalproperties
(3)'Establishment ofdemocracy' refersto Nepal
(4)Morerhinoswerekilledbypoachers in Indiain 2006thanin 2007

28.Question on C Language

```
int sum=0,
int c=I,j:
for (j=i:j<10,j++)
        sum=sum+j:
        printf(i% d , sum)
```

(1) 55
(2) 60
(3) 65
(4) 70

M.Sc.(ComputerScience)

PartI

1. Whichofthefollowingisnotagroupwithrespecttothecomposition'composite offunctions'?

   (1) ThesetGconsistingoffourfunctions f_1,f_2,f_3,f_4,definedby$f_1(x)=x,f_2(x)=-x,f_3(x)=1/x,f_4(x)=-1/x$forallx □ R~{0},

   (2) ThesetG={functionsf_e:R $f_c(x)=x+c$,c □R}

   (3) ThesetGof allfunctionsfromasetAconsistingof fourelementstoitself. (4) ThesetG={functionsf_c: R $f_c(x)=cx$,c □R ~{0}}

2. Whichof thefollowingstatementsisnottrue?

   (1) IfU is aring withunityinwhicheach-non-zeroelementisaunit,theneach non-zeroelementofeachquotientringof Risalsoaunit,

   (2) IfUisright idealandVisaleftidealofaringR,then U□Vseitheraleft orarightor atwosidedidealof aringR.

   (3) Inaringwithunityandwithoutzerodivisors, theonlyidempotentsarethe unityandthezero.

   (4) Everymaximalidealin acommutativeringwithunityis aprimeideal.

3. LetV be thevectorspaceofall4x4matricesoverR.Then,whichofthefollowing failstobeasubspaceof V?

   (1) Thesetof alluppertriangularmatricesin V.

   (2) Thesetof allsymmetricmatricesinV.

   (3) Thesetofalldiagonalmatricesin V.

   (4) Thesetof allsingularmatricesin V.

4. Thesixrootsof theequation$(2+z)^6+(2-z)^6=0$are

   (1) ±itan □/6,±2itan□5/12,±i

   (2) ±2itan □/12,±2itan 5□□/12,±2i

   (3) ±itan □/123±3itan □/24,±i

   (4) ±itan/24,± 3itan /12,±2i

5. Which of thefollowingisfalse?

   (1) $\lim_{x \to \pi/2} (1+\cos x)^{\sec x} = e^3$

   (2) $\lim_{x \to \pi/2} e^{1/x}/(1+e^{1/x}) = 0$

   (3) Thefunction $f(x) = (x-1)/(1/e^{1/(x-1)})$: $x \neq 1$

   0 : $x \neq 0$

   iscontinuousatx=1.

   (4) Fortwofunctionsfandg,iftheproductfgiscontinuousatapoint,thenf andgmayor maynotbecontinuousatthatpoint.

6. Forthecurve$x^2y^2=(a+y)^2(b^2-y^2)$

   (1) (0,–a)isanode,acusporaconjugatepointaccordingasb>a,b=aorb<a respectively.

   (2) (0,–a)isacusp,anodeoraconjugatepointaccordingasb>a,b=aorb<a respectively.

   (3) (0,–a)isanode,conjugatepointoracuspaccordingasb>a,b=aorb<a respectively.

   (4) (0,–a)isaconjugatepoint,acusp,oranodeaccordingasb>a,b=a, orb<a.

7. $\int_0^{\pi/2}$ (sin3 5 sin),/ sin d is equalto

(1) 71/105

(2) 72/105

(3) 73/105

(4) 74/105

8. Findthevolumeof thesolidboundedbytheparaboid$x=x^2+y^2$, cylindery= x^2andtheplanesy=1,z=0

(1) 85/105

(2) 86/106

(3) 87/105

(4) 88/105

9. If$|f(x)–f(y)|<(x-y)^2$,forallrealnumbers xandyandfisdifferentiableover [a, b],then

(1) fisstrictlymonotonicallyincreasingfunctionover[a,b]

(2) fisstrictlymonotonicallydecreasingfunctionover[a,b]

(3) fisaconstantfunctionover[a,b]

(4) Nothingcanbeconcludedaboutthefunctionf.

10. Ifonanaverage,1vesselinevery10iswrecked,then theprobabilitythatoutof5 vesselsexpectedto arrive,atleast4willarrivesafelyis

(1)0.91854 (2)

0.3216

(3) 0.0012

(4) 0.6384

11. If$F=(y^2+z^3,2xy–5z,3xz^2–$ 5y),thenascalarfunction (x) suchthatF=grade. is by

(1) $xy+xz^3–yz+c$

(2) $y+xz^2+2xy+c$

(3) $xy2+xz^3–5yz+c$

(4) $xyz+xz^2+yz+c$

12. Consider acompletebinarytreewithrootatlevel1.Thenumberofnodesatlevel i is

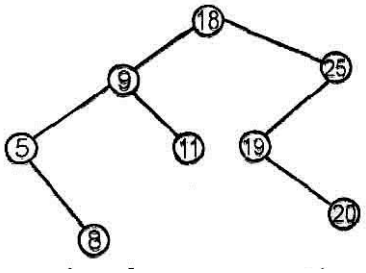
(1) 2i–1

(2) 2i

(3) 2i–1

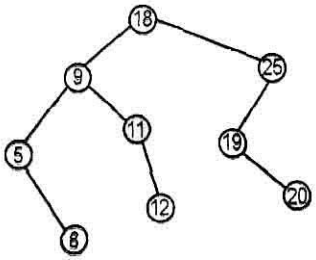
(4) $2^{i-1}-1$

13. ConsiderthefollowingBinarySearchTree

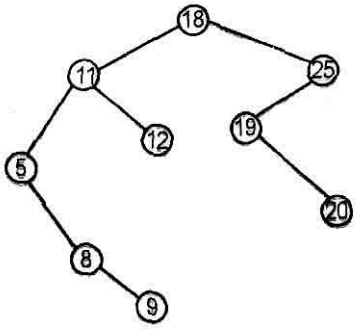


Thetreethatresultsafterinserting12is

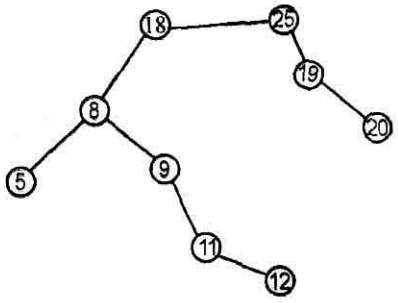
(1)



(2)



(3)



(4) Noneof these

14. Whichof thefollowingistrue?

(1) $(n+b)^a=O(n^b)$

(2) $(n+b)^a=O(n^a)$

(3) $(n+b)^a=O(a^n)$

(4) $(n+b)^a=O(b^n)$

15. AtreeG=(V,E)has

(1) |V |edges

(2) |V |–1edges

(3) (|V |–1)/2edges

(4) Noneof theabove

16. Whichalgorithmis bestsuitedto sortalistwhichisalmostsorted?

(1) Quicksort

(2) Mergesort

(3) Insertionsort

(4) Heapsort

17. Considerthefollowingalgorithm

```
fori  -1  1ton
    forj      i+1ton
        print(i,j)
```

Thenumberof timesprintstatementisexecutedintheabovealgorithmis

(1) 2n

(2) $\frac{n(n-1)}{2}$

(3) $\frac{n(n-1)}{2}$

(4) $n\log_2 n$

18. Which of the following is true?

(1) $n^k = 0(n^{k+1})$

(2) $n^k = \Omega(n^{k+1})$

(3) $n^{k+1} = O(n^k)$

(4) None of these

19. For any given graph G, the worst case complexity of DFS is

(1) more than that of BFS

(2) same as that of BFS

(3) less than that of BFS

(4) $O(|E|)$ where $|E|$ is the number of edges in G.

20. The process to process delivery of the entire message is the responsibility of the

(1) network layer

(2) transport layer

(3) physical layer

(4) application layer

21. Which logic does the following table represent

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

(1) AND

(2) OR

(3) XOR

(4) None of the above

22. Which of the following application would fall in the category of real-time applications?
    (1) pay-rollapplication
    (2) airline-reservationapplication
    (3) video-conferencingapplication
    (4) process-controlapplicationsof chemicalplant
23. LetR(A3)bearelationalscheme,thenR isnecessarilyin
    (1) firstnormalformonly
    (2) first,andsecondnormalformsonly
    (3) first,secondandthirdnormalformsonly
    (4) first,second,thirdnormalformsaswellasBCNF
24. Keyprocessareasof CMMlevel4arealsosatisfiedbyaprocesswhichis
    (1) CMMlevel2
    (2) CMMlevel3
    (3) CMMlevel5
    (4) Allof theabove.
25. CPUgetstheaddressof thenextinstructionto beprocessedfrom
    (1) Instructionregister
    (2) Memoryaddressregister
    (3) Indexregister
    (4) Programcounter.

26. Read thefollowingparagraph andanswerthequestionsthatfollow:

TheAsianRhinoisfacingextinctionas the rampanthuntingdownoftheanimal forits hide,purportedlyhavingmedicinalproperties,isonthe rise.Recentnewsfrom the two strongholdsoftheAsian Rhino,theKazirangaNationalParkinAssamandtheChitwanNationalParkinNepalpresentsani ntriguingscenario.ForKaziranga,theyear2007 wasoneoftheworstinadecadeasfarasrhinopoachingwasconcerned.Atleast twenty oftheseanimalswerepoached,mainlyshot,inandaround theseextensive grasslandson thebanksofthe mighty Brahmaputra.In Nepal,incomparison,2007 turneduplookingdistinctlygoodfortherhino;onlytwoanimals,oneeachinChitwan andBardiaNationalParks,werepoached inthe entirecalendaryear.Compare thiswith the precedingtwelve months and the contrastis conspicuous.2006 was the complete oppositeof2007anddrastically so.Kazirangalostonly six rhinosin2006topoachers, whilethenumberforNepalwasatleasttwentywithfourteenbeinginandaround

Chitwanalone.The turnaroundinNepalisremarkableconsideringthe fact thatalmost thirty rhinosonanaveragehadbeenpoachedhereannually inthelastfewyears.Most observerspointto the politicalresolutionthathastaken placein thecountryand the peacethathasreturned withtheestablishmentofademocraticregimeendingyearsof turmoil and armedresistance during themonarchy.

27. Thenumber ofAsianRhinosisgoingdown because, (1)

Theyarebeingkilledbyamateur hunters
(2) Theyarenotwell-protected in sanctuaries
(3) Theyarebeinghunted down bypoachers
(4) Theyarebecomingextinctbecausetheir habitatsare shrinking.

28. TheNational parks mentionedinthepassageare

(1) InIndia
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(3) Onein Indiaandtwo inNepal
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29. Thecomparisonshowsthat

(1) The situationhas improvedin Nepalbutworsened in India
(2) Ithas improvedin India butworsened in Nepal
(3) Ithasworsened in both
(4) Ithas improvedin both

30. Markthestatement that isNOT true

(1) TheriverBrahmaputraflowsbyKaziranga
(2) Therhino'shideisbelievedto have medicinalproperties
(3)'Establishment ofdemocracy' refersto Nepal
(4)Morerhinoswerekilledbypoachers in Indiain 2006than in2007

PartII

1. Showfirstthreeiterationsoftheinsertionsortalgorithmforarrangingthe datainascendingorder:

16,7,5,4, 20,36.

2. Givearecursivealgorithmtocomputetheheightof abinarytree.

3. Differentiatebetweenmethodoverloading&methodoverriding.

4. Provethatthesumof theseriesCos $\square$ Sin $\square$ + Cos $2\square$ Sin $2\square$ + Cos $3\square$ Sin $3\square$ +...tonterms,(q $\neq$ 1) is $\frac{\cos(n+1)\theta - \cos n\theta - 1}{2(\cos\theta - 1)}$.

5. If thenormalatoneendof alatusrectumof thehyperbola, $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

isparalleltooneofits asymtotes;thenfindits eccentricity.

6. Readthefollowingparagraphand answer thequestionsthat follow:

TheAsianRhinoisfacingextinctionastherampanthuntingdownoftheanimalfor itshide,purportedlyhavingmedicinalproperties,isontherise.Recentnewsfrom the twostrongholdsof theAsianRhino,theKazirangaNational ParkinAssamand theChitwanNational ParkinNepal presentsan intriguingscenario.ForKaziranga, theyear2007wasoneofthe worstinadecadeasfaras rhinopoachingwas concerned.Atleasttwenty oftheseanimalswerepoached,mainly shot,inand aroundtheseextensivegrasslandson thebanks ofthe mighty Brahmaputra.In Nepal,incomparison,2007turneduplookingdistinctly good forthe rhino;only two animals,oneeachinChitwanandBardiaNationalParks,werepoachedinthe entire calendaryear.Comparethiswith the preceding twelve months and the contrastisconspicuous. 2006was thecompleteopposite of2007and drasticallyso. Kazirangalostonlysixrhinosin2006topoachers,whilethenumberforNepalwas atleasttwenty withfourteenbeinginandaround Chitwan alone.Theturnaroundin Nepalisremarkableconsideringthe factthatalmostthirty rhinosonan averagehad beenpoachedhere annuallyinthelastfew years.Mostobserverspointto the politicalresolutionthathastakenplacein the countryandthe peacethathas returnedwiththeestablishmentofademocratic regimeendingyears ofturmoiland armedresistance during themonarchy.

(i)Whyisthenumberof AsianRhinosis goingdown?

(ii)InwhatsensedoestheNational ParkinNepalpresentanintriguing scenario?