B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

CS 010 706 L06 – CLIENT SERVER ARCHITECTURE AND APPLICATIONS (Elective – II) [CS]

(New Scheme – Regular)

Time : Three Hours   Maximum : 100 Marks

*Answer **all** questions.*

Part A

Each question carries 3 marks.

1. Explain the benefits of Client Server Computing.

2. Why do we need communication protocols?

3. How threads differ from processes?

4. What do you mean process synchronization?

5. What is Phishing? Explain.

(5 × 3 = 15 marks)

Part B

Each question carries 5 marks.

6. With a diagram, explain the three tier client server database system.

7. With an example, explain the asynchronous mode of interaction between client and server.

8. What is meant by symmetric multiprocessing?

9. What do you mean by pre-emptive multitasking? Explain.

10. What do mean by portable client server application? Give example.

(5 × 5 = 25 marks)

Part C

Each full question carries 12 marks.

11. (a) Explain the challenges and opportunities of heterogeneous computing.

    (b) In a distributed system, how are the processors and other devices interconnected?

(7 + 5 = 12 marks)

Or

12. (a) Explain the approaches to cross platform computing.

    (b) Explain the main challenges to the cross platform development.

(6 + 6 = 12 marks)

Turn over

13. (a) In an office environment, compare advantages and disadvantages of implementing a client server model over decentralized approach.

    (b) Compare between client server model and peer to peer model.

                                                       (8 + 4 = 12 marks)

Or

14. (a) Explain the method of exchanging messages through transport protocol.

    (b) Explain the acceptance and dispatching policies for client server model.

                                                         (6 + 6 = 12 marks)

15. (a) Clearly explain the differences between multiprogramming, multitasking and multithreading.

    (b) With examples, explain the differences between multicore and multiprocessor systems.

                                                         (6 + 6 = 12 marks)

Or

16. (a) Explain the major features of Windows NT.

    (b) With a neat diagram, explain the architecture of Windows NT Operating System.

                                                         (6 + 6 = 12 marks)

17. (a) How does thread switching differ from process switching? Explain with an example.

    (b) Explain one context switching techniques for non-pre-emptive scheduling.

                                                         (6 + 6 = 12 marks)

Or

18. (a) Context switching times are a major source of overhead in medium to fine grain process scheduling. Justify this statement with examples.

    (b) With an example, explain how can we use semaphore as a synchronization tool?

                                                         (6 + 6 = 12 marks)

19. (a) Explain the following interprocess mechanisms :

        (i) Pipes.   (ii) Signals.

        (iii) Sockets.

    (b) Write a simple program for message passing using pipes.

                                                        (9 + 3 = 12 marks)

Or

20. Write short note on following :

        (a) Cyberforensics.   (b) Secure communication.

        (c) Secure coding.   (d) Encryption and Authentication.

                                                                                  (12 marks)

                                                                                  [5 × 12 = 60 marks]

F 6709

(Pages : 3)

Reg. No..................................

Name..................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering Information Technology

CS 010 706 L 03 / IT 010 706 L 05—OPERATING SYSTEM KERNEL DESIGN

(Elective II) (CS, IT)

[New Scheme—Regular]

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer **all** questions briefly.*
Each question carries 3 marks.

1. Which are the three major areas in which the operating system divides its services ? Give examples.

2. What is meant by process priority ? What are the different types of priorities ?

3. Name the different memory management schemes.

4. Explain unix H/W interaction in view of the two modes of execution.

5. What is the problem of Cache consistency ?

(5 × 3 = 15 marks)

Part B

*Answer **all** questions.*
Each question carries 5 marks.

6. What is a system call ? How is it different from a subroutine or a subprogram ?

7. What are different process scheduling levels ? How do they interact with each other ?

8. Explain the Address Translation mechanism in Paging. Why is the page size normally some power of 2 ?

9. Show how files are created in Ext 2 system.

10. Explain the storage hierarchy in operating system.

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 marks.

Module I

11. What are the different system calls ? How they are used ? How does an application program use these calls during execution ? How is all this related to the compilation process ?

Or

12. What is Kernel ? Describe the approaches of designing operating systems.

Module II

13. Explain the system calls related to the process state diagrams. Write algorithms in the pseudocode for the following :

   Timeup (Running   → Ready)

   Block (Running   → Blocked)

   Dispatch (Ready   → Running)

   Suspend (Ready   → Suspendready)

   Resume (Suspendblocked → Blocked)

Or

14. What is meant by heuristic scheduling policy ? Is it good in all the circumstances ? How does the operating system implement this policy ? Explain with example.

Module III

15. Discuss all the memory management schemes with respect to the following considerations :

   (i)   Relocation and Address Translation.

   (ii) Protection.

   (iii) Sharing.

   (iv) Wasted memory.

Or

16. Give all the steps involved and all the Data structures maintained for page fault processing.

Module IV

17. With a neat block diagram, explain Kernel of UNIX and its features.

Or

18. Explain UNIX Kernel support for files with neat Data structure and its features.

Module V

19. Explain the file associating methods with I/O devices, and its advantages and disadvantages.

Or

20. What is Dirty page and Dirty bit ? How are they used ? Explain the procedure of writing Dirty Buffers to Disk.

(5 × 12 = 60 marks)

F 6455

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering/Information Technology

COMPUTER GRAPHICS (R,T)

(Old Scheme—Supplementary/Mercy Chance)

Maximum : 100 Marks

Time : Three Hours

Part A

Answer **all** *questions.*

Each question carries 4 marks.

1. List some applications of Computer Graphics.

2. Explain the working of plasma panels.

3. Derive the transformation matrix for rotating an object about an arbitrary point.

4. What is windowing ? Explain.

5. Prepare notes on polygon meshes.

6. Explain the properties of B-Spline curves.

7. Explain viewport clipping.

8. Explain Gamma correction of intensity.

9. What are fractals ? Explain.

10. Explain general computer animation functions.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. (a) With proper figures explain different types of graphical input devices.

Or

(b) Explain Rasterscan system with diagram.

12. (a) With an example describe the Bresenham's circle drawing algorithm.

Or

(b) Explain the Cohen-Sutherland line clipping algorithm.

Turn over

13. (a) Explain the geometric transformation in 3D.

Or

(b) Briefly explain any *two* types of spline representation.

14. (a) Explain Gouraud shading.

Or

(b) Explain basic Roy-tracing algorithm.

15. (a) Briefly explain the Morphing methods in graphics.

Or

(b) Describe the Geometric construction of deterministic self-similar fractals.

(5 × 12 = 60 marks)

F 6475

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Reg. No..............................

Name................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

ADVANCED SOFTWARE ENVIRONMENTS (R)

(Old Scheme – Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. List and explain the characteristics of windows programming.

2. What is a message loop? Explain.

3. Explain the features of MFC.

4. Explain the procedure for handling mouse.

5. What is CORBA IDL? Explain its functions.

6. What are the functions of ORB in CORBA?

7. Explain CORBA factories.

8. How do you manage references of CORBA server?

9. Distinguish between Client and Servers.

10. Explain the steps for creating child windows.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. (a) Describe the features of event driven programming.

Or

(b) With examples, explain WinMain functions.

12. (a) Describe in detail the MFC classes available.

Or

(b) Briefly explain the steps for drawing on MFC windows.

Turn over

13. (a) Briefly explain the fundamental concepts on distributed objects.

Or

(b) Discuss the various steps in implementing a CORBA client with C++.

14. (a) With example, explain object creation in C++.

Or

(b) Draw DCOM architecture and explain.

15. (a) Explain the command line options and resources.

Or

(b) With examples, explain X windows programming.

(5 × 12 = 60 marks)

F 6487

(Pages : 2)

Reg. No....................................

Name......................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering / Information Technology

WEB TECHNOLOGIES (R T)

(Old Scheme – Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 4 marks.

1. Explain the concept of XML.

2. Briefly explain attributes of Tags.

3. Explain the element type declaration.

4. How will you display XML data in HTML?

5. Explain the constrained properties of JAVA beans.

6. Explain GUI interfaces.

7. What is templating? Explain.

8. What are scriptlets? Explain how can access beans via scriptlets.

9. Explain the types of Beans.

10. Explain the basics of developing and using entity beans.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Describe in detail the views of an XML document.

Or

12. Write notes on : (a) CDATA section ; (b) SGML.

(6 + 6 = 12 marks)

Turn over

F 6487

13. With examples, explain attribute types and defaults.

Or

14. Explain the steps for the converting XML to HTML with XSL minimalist.

15. Describe the designing of Java Beans.

Or

16. Explain about creating and using BeanInfo clauses.

17. With an example, explain how JSP pages are created.

Or

18. Explain execution handling in JSPs with scriptlets.

19. Explain steps for creating and implementing interfaces.

Or

20. How do you develop stateful session bean? Explain.

(5 × 12 = 60 marks)

F 6516

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Reg. No...............................

Name...............................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

LAN TECHNOLOGY (Elective I) (R)

(Old Scheme—Supplementary/Mercy Chance)

Maximum : 100 Marks

Time : Three Hours

Answer all questions.

Part A

Each question carries 4 marks.

1. Explain FDDI.

2. Explain TCP/IP model.

3. Briefly discuss protocol evaluation factors.

4. Explain IBM token ring.

5. Compare bridge and switch.

6. Explain the principle of hub.

7. Comment on Banyan VINES.

8. Explain the running of Network printing.

9. Explain LAN security.

10. Discuss on the printing opportunities in printing environment.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. Explain the life cycle of LAN.

Or

12. Discuss the classification of LAN.

13. Explain CSMA/CA and CSMA/CD mechanism.

Or

14. Explain :

    (a) Ethernet. (6 marks)

    (b) IBM/PC network. (6 marks)

Turn over

15. Explain :

    (a)   Repeaters and Routers.

    (b)   NIC architecture.

                                                 (6 marks)

                                               (6 marks)

Or

16. Explain Port Switching and Segment Switching.

17. Briefly explain the function and responsibility of peer to peer network.

Or

18. (a)   Explain logical and physical printing.

    (b)   Comment on LAN tastic.

                                               (6 marks)

19. (a)   Write note on printer driver in printing environment.

    (b)   Discuss the factors deciding security level.

                                               (6 marks)

                                             (6 marks)

Or

20. (a)   Explain logical security.

    (b)   Discuss the printing queue.

                                               (6 marks)

                                             (6 marks)

                                           [5 × 12 = 60 marks]

F 6517   (Pages : 2)   Reg. No.................................

Name....................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering/Information Technology

WINDOWS PROGRAMMING (Elective – I) [RT]

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 marks.

1. Explain the concept of event driven programming.

2. Distinguish between message boxes and text boxes.

3. Explain the functions of Timer and scrollbar.

4. What are frames ? Explain.

5. Explain print Dialogs in detail.

6. Discuss the functions of list view controls.

7. Write the steps for printing graphics and texts.

8. What is stretching ? Explain.

9. How do you play sound with API functions ?

10. Discuss the steps for making an 'always on top' window.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. With examples explain the control statements in visual basic programming.

Or

12. Explain the following :—

    (a) Event handling procedures.

    (b) Windows programming.

(6 + 6 = 12 marks)

Turn over

13. Explain the uses of check boxes and option boxes with examples.

Or

14. What is SDI ? Explain how reading and writing is done.

15. With examples explain how to create events in Active X control.

Or

16. With examples explain the following :—

    (a) Tree-view control.

    (b) Common dialog controls.

(6 + 6 = 12 marks,

17. Write the steps for drawing ellipse and circles. Also explain how to set colours in it.

Or

18. Explain using clipboards how to transfer images between applications printing graphics and text.

19. Describe how database accessing is done using RDO.

Or

20. Explain the following :—

    (a) Playing sound with API functions.

    (b) DLL procedures in Visual Basic.

(6 + 6 = 12 marks)

[5 × 12 = 60 marks]

F 6518

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Reg. No.................................

Name....................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering/Information Technology

MOBILE COMPUTING (Elective I) (RT)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 marks.

1. Explain the mobile services offered by GSM.

2. With figure explain the MTC in GSM.

3. List out and explain the various mobile and wireless devices currently available ?

4. List out any *four* applications of wireless and mobile communications ?

5. Explain the advantages of WLAN.

6. Compare infrared and radio transmission.

7. With figure explain the basic architecture of HAWAII ?

8. Differentiate flat adhoc routing and hierarchical adhoc routing.

9. Briefly explain the components and interface of the WAP architecture.

10. Explain the basic features of WML.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. What are the characteristics of communication devices ? Briefly explain the research issues associated with wireless devices ?

Or

12. With relevant diagram explain the cellular system.

13. With neat figure illustrate the system architecture of GSM.

Or

14. What are the different satellite orbits ? Bring out its merits and demerits.

Turn over

15. Explain how synchronization and power management is achieved in WLANS.

Or

16. With necessary figures explain the architecture of a bluetooth device.

17. Differentiate IP-in-IP encapsulation and minimal encapsulation.

Or

18. Write a note on snooping TCP ?

19. Illustrate the functionality of WSP in detail.

Or

20. With an example illustrate voice message transfer in WTA.

(5 × 12 = 60 marks)

F 6646

(Pages : 2)

Reg. No.............................

Name...........................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

CS 010 701—WEB TECHNOLOGIES (CS)

(New Scheme—Regular)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 3 *marks.*

1. What are tags ? Explain.

2. What are the features of XML ? Explain.

3. Explain hashing in Perl.

4. What is coercion ? Explain.

5. List some rails applications.

(5 × 3 = 15 marks)

Part B

Each question carries 5 *marks.*

6. Explain standard XHTML document structure.

7. Explain how to display XML documents with CSS.

8. With examples, explain file input and output in Perl.

9. Explain implode and explode functions with examples.

10. Explain the implementation of document request.

(5 × 5 = 25 marks)

Part C

Each question carries 12 *marks.*

Module 1

11. Explain the evolution of HTML and XHTML.

Or

12. Explain different properties of cascading style sheets.

Turn over

Module 2

13. Briefly explain with examples different XML schemas.

Or

14. Explain different steps for converting XML to HTML.

Module 3

15. Explain scalars and their operations in Perl. Give examples also.

Or

16. Briefly explain with examples pattern matching in Perl.

Module 4

17. Explain primitives operations and expressions in PHP with proper examples.

Or

18. Assume a list of numbers. Write a program in PHP to sort it.

Module 5

19. Explain the database connectivity in Rails.

Or

20. Illustrate with examples the Basics of AJAX.

$(5 \times 12 = 60 \text{ marks})$

F 6670

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Reg. No...................................

Name.....................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

CS 010 703—COMPUTER GRAPHICS (CS)

(New Scheme—Regular)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. List some applications of computer graphics.

2. What is clipping ?

3. What is parallel projection ? Explain with figures.

4. What are quadric surfaces ?

5. What are fractals ? Explain.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. What are physical interactive devices ? Explain.

7. Derive the equation of rotation in 2 D transformation based on a fixed point other than origin.

8. Explain Bezier cunes.

9. Explain back-face detection.

10. Explain Ray tracing in detail.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each question carries 12 marks.

11. Explain Randon Scan processors with diagram.

Or

12. Discuss emissive displays and non-emissive displays of flat panel display.

13. Explain DDA line drawing algorithm with examples.

Or

14. Explain any *one* polygon clipping algorithm with an example.

Turn over

15. Discuss 3-D display methods and 3-D object representations.

Or

16. Explain cubic spline interpolation methods in detail.

17. Discuss with figures different types of projections.

Or

18. Explain Depth-Buffer method with an example.

19. Explain Gouraud shading with examples.

Or

20. Explain surface rendering methods with examples.

(5 × 12 = 60 marks)

F 6681

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Reg. No..................................

Name..................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013
Seventh Semester
Branch : Computer Science and Engineering

CS 010 704—OBJECT ORIENTED MODELLING AND DESIGN (CS)

(New Scheme—Regular)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions briefly.
Each question carries 3 marks.

1. List down the characteristics of objects.
2. What are events and event traces ?
3. What is the need for analysis in object modelling ?
4. What is the importance of documentation in designing ?
5. List the advantages of UML.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain how to define role names and qualification for associations ?
7. Explain the significance of various components in Data Flow Diagrams.
8. Write a note on concurrency handling in software applications.
9. What do you mean by multiple and multilevel inheritance ? Differentiate between them.
10. With an example, explain the use of case model.

(5 × 5 = 25 marks)

Part C

Answer any one full question from each module.
Each full question carries 12 marks.

MODULE 1

11. With the help of graphical representation, explain the concept of generalisation.

Or

12. Explain, in detail, the modelling of single inheritance and its applications.

MODULE 2

13. With neat sketches, explain the advanced modelling concepts. Discuss the relationship between object and dynamic models.

Or

14. With the help of neat DFD, explain function modelling.

Turn over

MODULE 3

15. Consider the ATM application. Discuss the activities for the object oriented analysis of the same.

Or

16. Explain various steps involved in the object Analysis of Railway reservation application.

MODULE 4

17. Discuss about the documentation design decisions. Also compare the different methodologies.

Or

18. Describe the steps to be followed for designing algorithms while developing applications.

MODULE 5

19. Explain the implementation model and test model.

Or

20. With neat diagrams, explain the architecture of Jacobson methodology. Discuss its uses.

(5 × 12 = 60 marks)

F 6691

(Pages : 2)

Reg. No..............................

Name..................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

CS 010 705 – PRINCIPLES OF PROGRAMMING LANGUAGES (CS)

(New Scheme – Regular)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 3 marks.

1. Clearly explain the notion of binding and binding time.
2. What is meant by scope of a variable? Give an example from C.
3. With simple example, explain the impact of side effects.
4. What is meant by generic subprograms?
5. What is the difference between activation record instance?

(5 × 3 = 15 marks)

Part B

Each question carries 5 marks.

6. Explain the role of programming languages in technology research and development.
7. What is the purpose of type declaration? Explain with an example.
8. Explain the implementation aspects of operator overloading.
9. In what ways co-routines are different from conventional subprograms?
10. Give an overview of Logic programming.

(5 × 5 = 25 marks)

Part C

Each full question carries 12 marks.

11. (a) Explain the differences between scripting and programming.
    (b) What are the criteria used for language evaluation?
    (c) Explain the differences between compiler and interpreter.

(6 + 4 + 2 = 12 marks)

Or

Turn over

12. (a) List five attributes of C programming language and show their binding time.

    (b) Discuss the language design trade-offs.

    (c) What is meant by implementation of a programming language?

    (6 + 4 + 2 = 12 marks)

13. (a) What is a primitive data type? Explain how primitive data types are specified and implemented in programming languages.

    (b) In a dynamic-scoped language, the referencing environment is the local variables plus all visible variables in all active subprograms . Would you agree with this statement? Justify.

    (6 + 6 = 12 marks)

Or

14. (a) With a neat diagram, explain one language environment and corresponding heap storage model.

    (b) Explain the Pros and Cons of Strong type checking.

    (6 + 6 = 12 marks)

15. (a) Explain narrowing and widening conversions.

    (b) How does operand evaluation order interact with functional side effects?

    (6 + 6 = 12 marks)

Or

16. (a) How does C support relational and Boolean expressions? Explain with examples.

    (b) What mixed mode assignments are allowed in Java?

    (6 + 6 = 12 marks)

17. (a) Explain parameter passing methods used in C.

    (b) Explain the implementation models of parameter passing.

    (6 + 6 = 12 marks)

Or

18. (a) What are the design issues for functions?

    (b) In what ways are coroutines different from conventional subprograms?

    (6 + 6 = 12 marks)

19. (a) Write a simple subprogram structure in C and draw the corresponding activation record.

    (b) Explain the mechanism for implementing non-local references.

    (6 + 6 = 12 marks)

Or

20. Write short notes on the following :

    (a) Functional programming languages.   (b) Exception handling in Java.

    (c) Map Reduce framework.   (d) Scripting languages.

    (12 marks)

    [5 × 12 = 60 marks]

F 6445

Reg. No..............................

Name....................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering/Information Technology

OBJECT ORIENTED MODELLING AND DESIGN (RT)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. What are the features of object oriented development ? Explain.

2. What is Inheritance ? Explain with example.

3. What are events ? Explain.

4. What is meant by concurrency ? Explain.

5. Explain the methods of handling of global resources.

6. Why iterating the analysis is necessary ? Explain.

7. Give an overview of object design.

8. Briefly describe the design of association.

9. What are notations ? Explain.

10. Explain the term concepts in Booch's methodology.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. (a) Explain different types of object modeling.

Or

(b) Write notes on :

    (a) abstract classes.

    (b) Meta data.

Turn over

12. (a) Brief a description about advanced dynamic modeling concepts.

Or

     (b) Describe the uses of Data flow diagrams. With an example draw a DFD.

13. (a) With neat diagrams, describe dynamic and functional modeling.

Or

     (b) What are the steps needed for allocating subsystems to processors ?

14. (a) Give a brief description of design of association and physical packaging.

Or

     (b) Write notes on :

          (i)   Design optimization.

          (ii) Object representation.

15. (a) Briefly explain Jacobson methodology.

Or

     (b) Describe the implementation model and Test Model.

                                                      (5 × 12 = 60 marks)

F 6658

(Pages : 3)

Reg. No..............................

Name..............................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

CS 010 702—COMPILER CONSTRUCTION (CS)

(New Scheme—Regular)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 3 marks.

1. Explain the three differences between DFA and NFA.

2. Write very brief note on YACC.

3. What is meant by synthesized attributes ?

4. Explain the differences between machine dependent and independent optimization techniques.

5. What is meant by cross compilers ?

(5 × 3 = 15 marks)

Part B

Each question carries 5 marks.

6. Construct one NFA from the regular expression $(ab+)(a\,|\,b*).abb.$ Explain all the steps.

7. Write one unambiguous grammar for handling expressions in C programming language.

8. Write a syntax directed translation scheme to evaluate a simple expression.

9. Convert the given infix expression into prefix from

    $(5*3)*5+45*(12-2)/23.$

10. Draw a structure of symbol table and explain the need for a symbol table.

(5 × 5 = 25 marks)

Part C

Each full question carries 12 marks.

11. (a) Describe the languages denoted by the following regular expressions.

    (i) $a(a\,|\,b+)a.$

    (ii) $a*ba*ba*ba*.$

(6 marks)

Turn over

(b) State four identifier naming rules in C.   (2 marks)

(c) Write regular expression to recognize all the valid identifiers in C based on the above definition.

     (4 marks)

Or

12. (a) Directly convert the regular expression $(WB)(A*B^+W)^+$ into DFA. Clearly show all the steps of the construction.

     (8 marks)

(b) Compare the simulation algorithms of NFA and DFA in terms of space and time complexities.

     (4 marks)

13. (a) Consider the context-free grammar $S \rightarrow SAS + |ASS^*| a^*, A \rightarrow {}^*A|S|a$ and the string

$aa * a *** aa *$.

     (i)   Give a leftmost derivation for the string.

     (ii)   Give a rightmost derivation for the string.

     (iii)   Give a parse tree for the string.

     (6 marks)

(b) Construct LR (0) automation for the grammar $P \rightarrow P + A|A, A \rightarrow {}^*A|d$.   (6 marks)

Or

14. (a) Explain the role of syntax analyzer in compilation process.   (6 marks)

(b) What are the error recovery strategies used during the syntax analysis ?   (6 marks)

15. (a) How do we write semantic rules with controlled side effects ?   (6 marks)

(b) Explain memory allocation strategies used in block structured languages.   (6 marks)

Or

16. (a) Design an S-attributed SDD for the grammar and translation given below :

$S \rightarrow L. L | L, \ L \rightarrow LB | B, B \dashrightarrow 0|1$.

     (6 marks)

(b) With examples, explain the differences between static and dynamic type checking.   (6 marks)

17. (a) Draw a directed acyclic graph (DAG) for the expression $a*(a-b)+c*d$ and write the corresponding 3-address code.

     (6 marks)

(b) Discuss the issues in the design of a code generator.   (6 marks)

Or

18. (a) Explain different optimization techniques used in compiler design.   (6 marks)

(b) Explain the relation between commuter architecture and compiler.   (6 marks)

19. (a) Discuss the basic issues in code generation.   (6 marks)

(b) Explain the significance of graph coloring problem in compiler design.   (6 marks)

Or

20. Write note of the following :—

     (a)   Incremental compilers.

     (b)   Basic blocks and Flow graphs.

     (c)   Register allocation.

     (12 marks)

$[5 \times 12 = 60 \text{ marks}]$

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Reg. No..................................

Name..................................

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Computer Science and Engineering

THEORY OF COMPUTATION (R)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Explain the term uncountability.
2. Write the properties of sets ?
3. Define automata.
4. Briefly explain the use of regular expression ?
5. What is parsing ?
6. Explain deterministic PDA.
7. What is universal Turing machine ?
8. Explain the representation of Turing machine by instantaneous descriptions.
9. What is meant by interactable problem ?
10. Briefly explain NP-hard problem.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Explain Chomskey classification of languages.

Or

12. Differentiate between computable and non-computable functions ?

13. What is pumping lemma ? Write the pumping lemma regular sets ?

Or

14. Prove that for every NFA there is an equivalent DFA.

Turn over

15. Write the applications of PDA ?

Or

16. Explain top-down parsing with example.

17. Explain the halting problem of turing machine.

Or

18. Explain the representation of Turing machine using :

    1 → Transition Table

    2 → Transition diagram.

19. Explain the different classification of problems based on their complexity.

Or

20. Prove that the satisfiability problem is NP complete.

(5 × 12 = 60 marks)