

F 3651

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Information Technology

IT 010 503—DATA COMMUNICATION (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What is the concept of Wireless LAN ? Explain.
2. What is the principle and need for multiplexing ? Mention the type of multiplexing.
3. Explain the difference between synchronous and asynchronous data transmission.
4. Name a transmission line that can be used in VHF range. Justify your answer.
5. What is the concept of CDMA ? Explain in detail.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain the principle of FDDI with a neat diagram.
7. State and prove Shannon's theorem.
8. Define and explain any three types of noise.
9. Draw a fiber pair cable and explain its construction and applications.
10. Discuss the security issues in Data communication.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. (i) Explain the components of Data communication in detail.
(ii) Explain the layers OSI model with a neat diagram.

Or

Turn over

12. (i) Explain the network topologies in data communication.
(ii) Give an account on "Token ring and Token Bus".
13. (i) Draw a neat block diagram of FDM and explain its principle in detail.
(ii) Define and explain Channel capacity. Derive an expression for Channel capacity.

Or

14. (i) What is DPSK modulation? Explain with neat diagrams.
(ii) Compare and contrast ASK and PSK.
15. (i) Explain the concept of Half duplex and Full duplex with neat diagrams.
(ii) Give an account on "Characteristics of coaxial line".

Or

16. Discuss the components of computer communication with diagrams.
17. (i) Discuss the serial, parallel and isochronous data transmission with diagrams.
(ii) Differentiate circuit switching from message switching.

Or

18. (i) Explain the characteristics of Twisted pair cable in detail.
(ii) Write a technical note on "Cable TV networks".
19. (i) Explain the concept of SDMA with a neat diagram.
(ii) Explain the architecture of GSM with diagrams.

Or

20. (i) Draw and explain CDMA frame structure in detail.
(ii) Write a technical note on "Localization, Handover and Frequency allocation".

(5 × 12 = 60 marks)

F 3628

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Information Technology

IT 010 502—MICROPROCESSORS AND MICRO CONTROLLERS (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

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

1. Define : Register.
2. What is instruction set ?
3. What is DMA controller ?
4. What are the I/O ports ?
5. What are the limitations of memory organization ?

(5 × 3 = 15 marks)

Part B

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

6. Write the operating modes of 8086 microprocessor.
7. Write the 8086 interrupts and its types.
8. State the microprocessor interfacing.
9. Write the importance of the microcontroller.
10. What are the advantages of using assembly language programming ?

(5 × 5 = 25 marks)

Part C

*Answer all questions.
Each full question carries 12 marks.*

11. (a) Explain in detail about the 8086 microprocessor architecture with neat sketch.

Or

- (b) Write the concept of segmentation and physical address calculation.

Turn over

12. (a) Explain in detail about the addressing modes of 8086 and its types.

Or

(b) Write in detail about the instruction set for 8086 microprocessor.

13. (a) Write the programmable peripheral interface 8255 in detail with neat sketch.

Or

(b) Briefly explains the hard disk interface and state the limitations.

14. (a) Explain in detail about the features of 8051 microcontroller and draw the pin diagram of it.

Or

(b) Write in detail about the addressing modes of 8051 microcontroller and its types.

15. (a) Explain the memory organization and its types in detail.

Or

(b) Write the ALP for interfacing 8051 with seven segment display.

(5 × 12 = 60 marks)

F 3635

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 503 / IT 010 506 – DATABASE MANAGEMENT SYSTEMS (CS, IT)

(New Scheme – 2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. List the importance of database management systems.
2. State the entity integrity.
3. State the merits of Oracle tools in DBMS.
4. Define : Super key.
5. What are the distributed databases?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain the entity types with an example.
7. Explain DIVISION operation in relational algebra with an example.
8. State the storage organization in Oracle.
9. State the limitations associated with DBMS design.
10. State the issues associated with database recovery.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. (a) Explain in detail about the components of DBMS.

Or

- (b) Write in detail about the database systems and its limitations.

Turn over

12. (a) Explain in detail about the relational model concepts and its merits.

Or

(b) Explain the importance of using SQL.

13. (a) Explain the basic structure of Oracle systems.

Or

(b) Explain in detail about the indexing and hashing concepts.

14. (a) Explain in detail about the relational database system.

Or

(b) Write in detail about the Boyce codd normal form.

15. (a) Explain the ACID properties of transaction.

Or

(b) Explain the functions DDBMS.

(5 × 12 = 60 marks)

F 3193

(Pages : 2)

Reg.No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Information Technology

MICROPROCESSORS (T)

(Old Scheme—Supplementary/Mercy Chance)

(Prior to 2010 Admissions)

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions briefly.
Each question carries 4 marks.*

1. What happens when MOVSW instruction is executed with D flag is set ? Explain.
2. Explain stack memory addressing modes of 8086.
3. Explain different machine language instruction formats of 8086.
4. Calculate the physical memory address pointed by data memory in the following two instructions pointed by arrow (→) (assume DS = 4005)
→ MOV CL, [2101]
MOV BX, 2001
→ MOV DL, [BX].
5. Give the logical circuit for memory read, write and IO read, write signal-derived from the 8086.
6. Explain address decoding and the steps to be followed in interfacing a memory with 8086.
7. Illustrate the format of a segment selector of 80286 ?
8. What is the purpose of debug and test registers of 80386 ?
9. Explain a status word format of 8279.
10. Explain different methods of data communication and architectural features of 8251.

(10 × 4 = 40 marks)

Part B

*Answer all questions.
Each full question carries 12 marks.*

11. Explain the various addressing modes used in 8086, with suitable examples. Bring out the important feature of each type.

Or

Turn over

12. (a) Explain memory segmentation and its advantages ? (6 marks)
- (b) Explain the 20-bit address generation process in 8086. Identify the 20-bit address of the memory operand in the instruction given below :

Assume [BX] = 2040H, [SI] = 4060H, [DS] = 1020 H.

(i) MOV AL, 2010 H [BX].

(ii) MOV [BX] [SI], AL.

(6 marks)

13. How the instruction set of 8086 is divided ? Explain each type with an example and instruction format.

Or

14. Explain in detail the arithmetical, logical and loop instructions of 8086 in detail, with appropriate examples.

15. (a) Draw and explain the read and write cycle timing diagrams for 8086 in minimum mode.

(6 marks)

- (b) Draw and explain the fully buffered 8086 system using demultiplexing of system bus.

(6 marks)

Or

16. Interface two 4 K × 8 EPROM and two 4 K × 8 RAM chips with 8086. Select suitable map and indicate the address decoding clearly.

17. Discuss the real and protected modes of operations in Pentium IV. How memory paging is done in virtual mode ?

Or

18. (a) How physical address is translated in protected virtual address modes of 80286 ? Explain with block diagram.

(6 marks)

- (b) Explain the pipeline approach of execution of instructions in 80486 ? (6 marks)

19. (a) Give the details of mode word, command word and status word format of 8251. (6 marks)

- (b) With the help of neat block diagram explain the architecture of 8237 and its functions.

(6 marks)

Or

20. With neat block circuit diagram, describe how a stepper motor is interfaced with 8086 ? Indicate how the control signals are used, with the help of approximate peripherals.

[5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**Fifth Semester**

Branch : Computer Science and Engineering/Information Technology

ENGINEERING MATHEMATICS—IV (R, T)

(Old Scheme—Supplementary/Mercy Chance)

[Prior to 2010 Admissions]

Time : Three Hours

Maximum : 100 Marks

*Answer all full questions.**Each full question carries 20 marks.*

1. (a) Explain any *five* operating parameters of a queuing system.
(b) The arrival rate of customers in a super market is 10 per hour. The average time taken at the bill and cash desk is 4.5 minutes; this time is exponentially distributed.
 - (i) How long will the customer expect to wait for service at the cash desk ?
 - (ii) What is the chance that the queue length will exceed 5 ?
 - (iii) What is the probability that the cashier is working ?
- Or*
2. The arrival rate of telephone calls at a telephone booth are according to Poisson distribution, with an average time of 9 minutes between two consecutive arrivals. The length of telephone call is assumed to be 3 minutes.
 - (a) Determine the probability that a person arriving at the booth will have to wait.
 - (b) Find the average queue length that is formed from time to time.
 - (c) The telephone company will install a second booth when convinced that arrival would expect to have to wait at least four minutes for the phone. Find the increase in flow rate of arrivals which will justify a second booth.
 - (d) What is the probability that an arrival will have to wait for more than 10 minutes before the phone is free ?
 - (e) What is the probability that he will have to wait for more than 10 minutes before the phone is available and the call is also complete ?
 - (f) Find the fraction of a day that the phone will be in use ?
 3. (a) Using Falsi method, find the root of $\cos x = 3x - 1$ that lies between 0.5 and 1.0. carry out 3 iterations.

Turn over

- (b) Solve the following system of linear equations by Gauss-Seidel iteration method :

$$\begin{aligned} 10x_1 - 2x_2 - x_3 - x_4 &= 3 \\ -2x_1 + 10x_2 - x_3 - x_4 &= 15 \\ -x_1 - x_2 + 10x_3 - 2x_4 &= 27 \\ -x_1 - x_2 - 2x_3 + 10x_4 &= -9 \end{aligned}$$

Carry out 4 iterations.

Or

4. (a) Find the smallest positive root of $x^2 | \sin \sqrt{x} | = 5$ using Bisection method. Carry out 4 iterations.
 (b) Solve the system of equations by Jacobi's method :

$$\begin{aligned} 5x + 2y + z &= 12 \\ x + 4y + 2z &= 15 \\ x + 2y + 5z &= 20. \end{aligned}$$

5. (a) Given the following table of values. Find $f(9)$ using Newton's divided difference formula :

x	: 5	7	11	13	17
$f(x)$: 150	393	1454	2366	5203

- (b) Apply Lagrange's interpolation. Find the value of x corresponding to $f(x) = 15$ from the following table :

x	: 5	6	9	11
$f(x)$: 12	13	14	16.

Or

6. (a) Evaluate $\int_0^{0.3} (1 - 8x^3)^{3/2} dx$ using Simpson's 1/3 rule taking 6 equal parts.

- (b) Find the missing value using backward difference formula :

x	: 0	1	2	3	4
y	: 1	3	9	-	81.

Explain why the result differs from $3^3 = 27$?

7. (a) Maximize $Z = 5x_1 + 4x_2 + x_3$
 subject to $6x_1 + x_2 + 2x_3 \leq 12$
 $8x_1 + 2x_2 + x_3 \leq 30$
 $4x_1 + x_2 - 2x_3 \leq 16, x_1, x_2, x_3 \geq 0.$

(b) Using graphical method, solve the LPP :

$$\text{Maximize } Z = 2x_1 + 3x_2$$

$$\text{subject to } x_1 - x_2 \leq 2$$

$$x_1 + x_2 \geq 4, x_1, x_2 \geq 0.$$

Or

8. (a) Use the dual simplex method to solve the LPP :

$$\text{Minimize } Z = 3x_1 + x_2$$

$$\text{subject to } x_1 + x_2 \geq 1$$

$$2x_1 + 3x_2 \geq 2, x_1, x_2 \geq 0.$$

(b) Solve by using Big-M method, the LPP :

$$\text{Maximize } Z = -2x_1 - x_2$$

$$\text{subject to } 3x_1 + x_2 = 3$$

$$4x_1 + 3x_2 \geq 6$$

$$x_1 + 2x_2 \leq 4, x_1, x_2 \geq 0$$

9. (a) Solve the following transportation problem :

	D ₁	D ₂	D ₃	D ₄	D ₅	Available
O ₁	1	2	1	4	5	30
O ₂	3	3	2	1	4	40
O ₃	4	2	5	9	6	70
O ₄	3	1	7	3	4	20
Requirement	25	40	30	15	50	

(b) Solve the following Assignment Problem :

(4 workers and 4 machines)

		Machines			
		A	B	C	D
Workers	1	10	25	15	20
	2	15	30	5	15
	3	35	20	12	24
	4	17	25	24	20

Or

Turn over

10. (a) Solve the following transportation problem by Vogel's approximation method :

	W_1	W_2	W_3	W_4	W_5	Availability
F_1	4	3	1	2	6	40
F_2	5	2	3	4	5	30
F_3	3	5	6	3	2	20
F_4	2	4	4	5	3	10
Requirement	30	30	15	20	5	

(b) The cost matrix of transporting one unit of a product from the sources P, Q and R to the destinations X, Y and Z. Compute the optimum allocations and minimum cost of transportation using MODI method.

	X	Y	Z	Supply
P	16	20	12	200
Q	14	8	18	160
R	26	24	16	90
Demand	180	120	150	

(5 × 20 = 100 marks)

(b) A T.V. repairman finds that the time spent on his job has an exponential distribution with mean 30 minutes. If the repaired set arrive on an average of 10 per 8-hour day with Poisson :

- (i) What is the repairman's idle time each day ?
- (ii) What is the average queue length ?
- (iii) Find average number of jobs in the system.

(5 marks)

[5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**Fifth Semester**

Branch : Computer Science and Engineering/Information Technology

EN 010 501-B—ENGINEERING MATHEMATICS—IV (CS, IT)

(Regular/Improvement/Supplementary)

[New Scheme—2010 Admission onwards]

Maximum : 100 Marks

Time : Three Hours

Part A

Answer all questions.

Each question carries 3 marks.

1. Evaluate $\Delta (\sin 2x \cos 4x)$.
2. Find the Z-transform of $a^n \cos n\theta$.
3. Let a be a numeric function such that $a_r = \begin{cases} 2, & 0 \leq r \leq 3 \\ 2^{-r} + 5, & r \geq 4 \end{cases}$. Determine Δa and ∇a .
4. Evaluate $\int_0^{1+i} (x^2 - iy) dz$ along the path $y = x^2$.
5. Explain the arrival pattern of customers.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Using Newton's divided difference formula, Evaluate $f(8)$ and $f(15)$ given :

$x :$	4	5	7	10	11	13
$y :$	48	100	294	900	1210	2028

7. Use convolution theorem to find the inverse Z-transform of $\frac{8z^2}{(2z-1)(4z+1)}$.
8. Find the particular solution of the difference equation $a_r + 5a_{r-1} + 6a_{r-2} = 3r^2$.
9. If $f(\xi) = \int_C \frac{3z^2 + 7z + 1}{z - \xi} dz$, where C is the circle $|z| = 2$, find the values of $f(3)$, $f'(1-i)$ and $f''(1-i)$.
10. State and explain Little's formula. What are its applications ?

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.
Each full question carries 12 marks.

11. (a) Using Newton's forward interpolation formula, find y at $x = 8$ from the following table :—

x :	0	5	10	15	20	25
y :	7	11	14	18	24	32

(6 marks)

- (b) Evaluate $\int_0^4 e^x dx$ by Simpson's rule, given that $e = 2.72$, $e^2 = 7.39$, $e^3 = 20.09$, $e^4 = 54.6$ and compare it with the actual value.

(6 marks)

Or

12. (a) From the following table, calculate $\frac{dy}{dx}$, $\frac{d^2y}{dx^2}$ and $\frac{d^3y}{dx^3}$ at $x = 1.5$

x :	1.5	2.0	2.5	3.0	3.5	4.0
y :	3.375	7.0	13.625	24.0	38.875	59.0

(6 marks)

- (b) Apply (i) Trapezoidal rule ; and (ii) Simpson's $\frac{1}{3}$ rule, to find an approximate value of $\int_3^8 x^4 dx$ by taking six equal subintervals. Compare it with the exact value.

(6 marks)

13. (a) Find $Z^{-1}\left(\frac{4z}{z-1^3}\right)$ by the long division method.

(6 marks)

- (b) Solve $y_{n+1} + 4y_{n+1}' + 3y_n = 3^n$ with $y_0 = 0, y_1 = 1$.

(6 marks)

Or

14. (a) Find the inverse Z-transform of $\frac{2(z^2 - 5z + 6.5)}{(z-2)(z-3)^2}$ for $2 < |z| < 3$.

(6 marks)

- (b) Solve $y_{n+2} - 2y_{n+1} + y_n = 3n + 5$.

(6 marks)

15. (a) Determine the generating function of the numeric function a_r ,

$$\text{where } a_r = \begin{cases} 2^r, & \text{if } r \text{ is even} \\ 2^{-r}, & \text{if } r \text{ is odd} \end{cases}$$

(6 marks)

- (b) Solve the difference equation $a_r - 5a_{r-1} + 6a_{r-2} = 2^r + r$.

(6 marks)

Or

16. (a) Determine the discrete numeric function corresponding to the generating function $A(z) = (1+z)^n + (1-z)^n$.

(6 marks)

- (b) Determine the particular solution for the difference equation $a_r - 3a_{r-1} + 2a_{r-2} = 2^r$.

(6 marks)

17. (a) Expand $\frac{1}{z^2 - 3z + 2}$ in the region (i) $|z| < 1$; (ii) $1 < |z| < 2$; (iii) $|z| > 2$; (iv) $0 < |z-1| < 1$.

(9 marks)

- (b) Determine the poles of the function $f(z) = \frac{z^2}{(z-1)^2(z+2)}$ and the residue at each pole.

(3 marks)

Or

18. (a) Evaluate by contour integration $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$

(9 marks)

- (b) Expand the function $\frac{1}{z+1}$, about $z = 1$ in Taylor's series.

(3 marks)

19. (a) In a supermarket, the average arrival rate of customers is 10/hr. The average time taken at the bill and cash desk is 4.5 min. This time is exponentially distributed :

(i) How long will be customer expect to wait for service at the cash desk ?

(ii) What is the chance that the queue length will exceed 5 ?

(iii) What is the probability that the cashier is working ?

(7 marks)

- (b) Explain the different service disciplines in the case of a queuing system.

(5 marks)

Or

20. (a) In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the servicetime distribution is also exponential with an average 36 minutes. Calculate the following :—

(i) The mean queue size.

(ii) The probability that the queue size exceeds 10.

(iii) If the input of trains increases to an average 33 per day, what will be the change in (i) and (ii).

(7 marks)

Turn over

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**Fifth Semester**

Branch : Information Technology

IT 010 505—LANGUAGE TRANSLATORS (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A*Answer all questions.**Each question carries 3 marks.*

1. Define macro processors.
2. Distinguish top down and bottom up parsing.
3. Define dependency graph ? Give an example.
4. Define intermediate code generator.
5. What are the advantages of code optimization ?

(5 × 3 = 15 marks)

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

6. Explain briefly about the difficulties in lexical analysis.
7. Differentiate LR (0) and SLR (1).
8. Distinguish L and S attributed definitions.
9. Write a short note on register allocation.
10. Explain the necessity of loops in flow graphs.

(5 × 5 = 25 marks)

Part C*Answer all questions.**Each full question carries 12 marks.*

11. (a) Explain specification and recognition of tokens in detail.

Or

(b) Explain :

- (i) Design of interpreters ;
- (ii) Incremental compilers.

Turn over

12. (a) Construct the LL(1) items for the grammar :

$$S \rightarrow CC; C \rightarrow cC/D$$

Or

- (b) Explain compile time error handling in detail.

13. (a) Write a note on :

- (i) Storage organization ;
(ii) Dynamic storage allocation.

Or

- (b) Explain in detail about overloaded functions and operator.

14. (a) Define peephole optimization? Explain its characteristics in detail.

Or

- (b) Explain basic blocks in detail.

15. (a) Explain in detail about global data flow analysis.

Or

- (b) Explain optimization of basic blocks.

(5 × 12 = 60 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain briefly about the difficulties in lexical analysis.

7. Differentiate LR (0) and SLR (1).

8. Distinguish L and S attributed definitions.

9. Write a short note on register allocation.

10. Explain the necessity of loops in flow graphs.

Part C

Answer all questions.

Each full question carries 12 marks.

11. (a) Explain specification and recognition of tokens in detail.

Or

(b) Explain :

(i) Design of interpreters ;

(ii) Incremental compilers.

Turn over