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F 3435 **(Pages : 3)** **Reg. No.** CS Dept

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Branch—Computer Science/Information Technology

ENGINEERING MATHEMATICS—II (R, T)

(Regular/Improvement/Supplementary)

Time : Three Hours **Maximum : 100 Marks**

Answer **one** *full question from each module.*
All questions carry equal marks.

Module 1

1. (a) Rewrite each of the following expressions using A and N instead of $\wedge$ and $\sim$:

(i) $p \wedge \sim q$

(ii) $\sim(\sim p \wedge q)$

(iii) $\sim p \wedge (\sim q \wedge r)$.

(b) Determine the truth value of each of the following statements :

(i) It is false that $2 + 2 = 4$ and $1 + 1 = 5$.

(ii) It is false that $2 + 2 = 4$ or London is in France.

Or

(c) Verify that the proposition $p \quad \sim(p \wedge q)$ is a tautology.

(d) Let A = {1, 2, 3, 4, 5}. Determine the truth value of each of the following statements and also negate each of the statements :

(i) $(\exists x \in A)\ (x + 3 = 10)$.

(ii) $(\exists x \in A)\ (x + 3 < 5)$.

(iii) $(\forall x \in A)\ (x + 3 < 10)$.

(iv) $(\forall x \in A)\ (x + 3 \leq 7)$.

Turn over

Module 2

2. (a) Let S = $\{n / n \in N$ and $n > 1\}$ If $a, b \in s$ define $a \sim b$ to mean that a and b have the same number of positive prime factors (distinct or identical). Show that ~ is an equivalence relation.

(b) Let T be the set of triangles in the Euclidean plane. Show that the relation R of similarity is an equivalence relation on T.

Or

(c) Suppose $f : A \to B$ and $g : B \to C$ are onto functions. show that $g \circ f : A \to C$ is an onto function.

(d) Let R be a binary relation. Let $S = \{(a, b) | (a, c) \in R$ and $(c, b) \in R$ for some C$\}$. Show that if R is an equivalence relation, the S is also an equivalence relation.

Module 3

3. (a) Let A = {2, 3, 6, 8, 9, 18} is ordered by divisibility. Identify the linearly ordered subsets of A with three or more elements.

(b) Write the dual of each statements :

(i) $(a \wedge b) \vee c = (b \vee c) \wedge (c \vee a)$

(ii) $(a \wedge b) \vee a = a \wedge (b \vee a)$.

Or

(c) Show that the positive integers N is a lattice with respect to the operations :

(i) $a \vee b = lcm\ (a, b)$

(ii) $a \wedge b = \gcd\ (a, b)$.

Module 4

4. (a) Obtain the discrete numeric function corresponding to the generating function :

$$A(z) = \frac{1 + z^2}{4 - 4z - z^2}.$$

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

Or

(c) Find the simple expression for the generating function of each of the following discrete numeric functions :

(i) 1, 1, 2, 2, 3, 3, 4, 4, ...

(ii) 1, – 2, 3, – 4, 5, – 6, ...

Module 5

5. (a) Determine whether or not each of the following multigraphs G(V, E) is a graph where V = {A, B, C, D} and :

(i) E = [{A, B}, {A, C}, {A, D}, {B, C}, {C, D}]

(ii) E = [{A, B}, {B, B}, {A, D}]

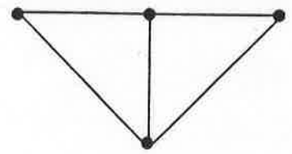
(iii) E = [{A, B}, {C, D}, {A, B}, {B, D}]

(iv) E = [{A, B}, {B, C}, {C, B}, {B, B}]

(b) Find the connected components of G where V(G) = {A, B, C, P, Q} and E(G) = [{A, C}, {B, Q}, {P, C}, {Q, A}].

Or

(c) Find all t he spanning trees of the graph shown in figure below :



(5 × 20 = 100 marks)

F 3440 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Computer Science and Engineering

MICROPROCESSOR SYSTEMS (R)

(Regular / Improvement / Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. What are the different types of buses and their specialities in 8085?
2. List and explain the different registers in 8085.
3. What is the use of stack pointer? Why it is always decremented when each data is pushed into the stack?
4. What are the merits and demerits of direct and indirect addressing? Illustrate with an example.
5. Describe the call-return procedure sequence.
6. Write single 8085 instructions to perform each of the following tasks :
   (i) Exchange HL with top of the stack.
   (ii) Load the contents of XX10 and XX11 into HL register.
   (iii) Clear CY and AC flags.
   (iv) Initialise SP with the contents of HL register.
7. Define and distinguish between hardware and software interrupts giving suitable examples.
8. How an 8259 can be added to 8085? Explain.
9. Describe and distinguish between synchronous and asynchronous data transfer.
10. Explain the function of handshake signals with a suitable example.

(10 × 4 = 40 marks)

Part B

Answer **either** *Section (a)* **or** *(b) from each module.*

Each full question carries 12 *marks.*

Module 1

11. (a) With a neat block diagram, explain the internal architecture of 8085. Describe how the program execution is carrying out when an interrupt service is being done.

Or

(b) Draw a neat block diagram of micro computer system using 8085 microprocessor. Explain clearly all the essential units used to interface a keyboard and seven-segment display and necessary memory.

(12 marks)

MODULE 2

12. (a) (i) Describe the operation of PUSH and POP operations and their applications.

(ii) What are the machine control instructions? Explain with suitable examples.

(6 + 6 = 12 marks)

Or

(b) What is the significance of addressing modes? With the help of examples, describe register, indirect and immediate addressing mode instructions.

(12 marks)

MODULE 3

13. (a) With necessary timing diagrams, explain the memory read and write operations. Sketch and explain all the associated control signals.

Or

(b) Write an assembly language program to search an element in an array of bytes.

(12 marks)

MODULE 4

14. (a) With neat block diagram, explain the architecture of 8259 programmable interrupt controller and its features.

Or

(b) (i) Distinguish between the maskable and non-maskable interrupts in 8085.

(ii) What is meant by polling? Explain a scheme for recognising multiple interrupts using priority encoder?

(6 + 6 = 12 marks)

MODULE 5

15. (a) Describe how the address space is partitioned in the 8085 system. Show where the monitor program, RAM and ROM locations, giving their address ranges and how the respective chips are selected by the microprocessor.

Or

(b) (i) Explain I/O mapped I/O and memory mapped I/O with appropriate examples and their merits and demerits.

(ii) Show how 8257 is initialised.

(8 + 4 = 12 marks)

[5 × 12 = 60 marks]

F 3448 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Branch : Computer Science/Information Technology

SOLID STATE ELECTRONICS (RT)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What is thermal runaway ? How it is prevented in a high power transistor ?
2. What are the advantages of Darlington pair ? What are its limitations ?
3. Explain FET as an amplifier.
4. Explain the formation of inversion layer in MOSFET.
5. Explain briefly, what do you mean by an electronic oscillator ? Give two applications of an oscillator.
6. Why we need three RC networks for a phase-shift oscillator ? Can it be two or four ?
7. What is the purpose of a clamping circuit ?
8. With a neat sketch, explain the working of an astable multivibrator.
9. Explain the principle of operation of LED.
10. What are the advantages and disadvantages of an SCR switch over mechanical switch ?

(10 × 4 = 40 marks)

Part B

Answer **either** (a) **or** (b) *section of each module.*
Each full question carries 12 *marks.*

11. (a) Draw the output characteristics of a CE amplifier and explain, in detail the reason for the three different regions.

Or

(b) With the help of a suitable circuit diagram, explain the working of a RC coupled amplifier. Derive the expression for voltage gain of the amplifier.

12. (a) (i) Differentiate BJT and FET.

(ii) Derive an expression for pinch-off voltage for FET.

Or

(b) Write short notes on :

(i) Handling precautions for MOSFET.

(ii) Mode of operation of FET.

13. (a) What is Barkhausen Criterion of oscillation ? What are the practical considerations for getting oscillations ?

Or

(b) Determine the operating frequency of a transistor Hartley oscillator, if $L_1 = 100\ \mu H$, $L_2 = 1\ mH$; $m = 20\ \mu H$ and $C = 20\ pF$.

14. (a) (i) Discuss the necessary criteria for a good differentiating circuit.

(ii) Enumerate the conditions under which an RC circuit behaves as an integrator.

Or

(b) Draw the circuit of an emitter coupled transistor monostable multivibrator and explain its operation. Show how this multivibrator can be modified to control the width of the output pulse.

15. (a) (i) Explain two transistor analogy of SCR.

(ii) Explain the construction and working of a DIAC.

Or

(b) (i) Why UJT is called a current controlled negative resistance device ?

(ii) Elaborate, with neat sketches the working principle of the two types of LCD.

(5 × 12 = 60 marks)

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F 3456 **(Pages : 2)** **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Branch : Computer Science/Information Technology

PROBLEM SOLVING AND COMPUTER PROGRAMMING (R, T)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Write neat and efficient C programs wherever necessary.

Part A

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

1. Distinguish between Top-down and Bottom-up approaches with examples.
2. Write an algorithm to determine the number of vowels in a given word.
3. List out the rules to be followed while declaring variables. Give valid and invalid examples.
4. Explain the precedence and associativity of arithmetic operators with examples.
5. Explain jumps in loops with an example.
6. Which are the two types f parameter passing used in functions ? Explain.
7. With syntax and suitable examples, explain the C declaration and initialization of 2 D arrays.
8. Distinguish between arrays, structures and unions.
9. Explain the I/O operation on a file using the standard library of C.
10. Write two different approaches to update a data file. Which one is better ? Why ?

(10 × 4 = 40 marks)

Part B

Answer **either** *Sections (a)* **or** *(b) of each module.*
Each full question carries 12 marks.

MODULE 1

11. (a) Explain modular, procedure-oriented and object orient programming methods. Compare and contrast them with reference to the programming approach and applications.

Or

(b) Write on algorithm to find the mean and standard deviation of n given numbers. Draw a neat flow-chart for the same.

(12 marks)

Turn over

MODULE 2

12. (a) Explain with suitable examples, the logical, relational, arithmetic and bitwise operators showing their precedence and associativity.

Or

(b) Write a C-program to generate all the three digit prime numbers. Also draw the flow chart for the same.

(12 marks)

MODULE 3

13. (a) (i) What is recursion ? Explain with an example. (4 marks)

(ii) Write a function in C to accept 10 characters and to display whether each input character is a digit, or a lowercase alphabet or an upper-case alphabet ?

(8 marks)

Or

(b) (i) Compare and contrast function and macro ? (4 marks)

(ii) Write a C program using "switch-case", for checking the corresponding colour for the input character and print the name of the colour, using case statements (Use R for Red, B for blue etc. Assume there are 7 possible colours).

(8 marks)

MODULE 4

14. (a) (i) Bring out the meaning of array of structures.

(4 marks)

(ii) Write a C program to read the following information of 120 students : Student name, roll number and marks in 8 subjects. Print the roll numbers and name of the students who have secured more than 60 % marks in total ?

(8 marks)

Or

(b) Define a structure called "students" whose members are name, register number and average marks. Write a program to print the name of students of a particular branch who have passed and display the number of students passed in that branch. Also list the name and total number of students who have failed. Assume 50 % average marks considered as pass.

(12 marks)

MODULE 5

15. (a) Write a program in C to perform file copy and file update. Assume a structure with data members author name, book title and price. Consider that the price of the book is to be updated.

Or

(b) Write a program in C to read a file and print it on the console 80 by 80 characters at a time. Write also a function to write it into another file with the same format.

(12 marks)

[5 × 12 = 60 marks]

F 3463 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Branch : Computer Science, Information Technology

HUMANITIES (R, T)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer Part A and Part B in **separate** *answer-books.*
Part A and Part B each carries 50 marks.
All full questions carry equal marks.

Part A (Principles of Management)

Answer **either** *Section (a)* **or** *(b) of each module.*

MODULE 1

1. (a) (i) Explain the organisational structure of a government department.

(ii) What are the advantages of line and staff organisation ? Discuss the functional relationship.

Or

(b) (i) Define scientific management and explain the functions of management.

(ii) Explain the different methods of job evaluation.

MODULE 2

2. (a) (i) Describe the procedure of ISI certification.

(ii) Explain the role of leadership in TQM.

Or

(b) (i) Explain the various steps in quality improvement.

(ii) What is Big "Q" concept of quality ? What is the importance of feedback in this approach.

Part B (Engineering Economics)

Answer **either** *Section (a)* **or** *(b) of each module.*

MODULE 3

13. (a) (i) What are the functions of nationalised commercial banks in a mixed economy ?

(ii) Explain the methods by which the central bank controls the volume and creation of credit.

Or

(b) (i) Explain how SIDBI functions as a financial system.

(ii) Describe the functions of reserve bank with reference to economic development of a country.

Turn over

MODULE 4

14. (a) (i) Discuss the favourable factors existing in India for the industrialisation, after independence.

(ii) Explain the policy of the Government of India towards industrial sickness.

Or

(b) (i) Explain the problems of unorganized labour in Indian industries.

(ii) Explain the revolutionary changes happening in the industrial policy of the Government of India in recent years.

MODULE 5

15. (a) (i) What are the factors on which incidence of tax depends ? Trace the incidence of estate duty and inheritance tax.

(ii) Outline a tax policy designed to promote the economic development of an under-developed country.

Or

(b) (i) Discuss the effects of public debt on (1) money supply ; (2) price level and (3) rate of interest.

(ii) What is fiscal policy ? Examine its objectives with reference to a developing economy.

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(Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Third Semester

Branch : Computer Science and Engineering

LOGIC SYSTEM DESIGN (R)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. Perform the following subtractions using 2's complement method :
   (a) 01100 – 00011.
   (b) 0011.1001 – 0001.111.
2. What are haming codes ? Explain their applications.
3. For the logic equation $f = ABC + B\bar{C}D + \bar{A}BC$, construct the truth table and simplify using K-map.
4. Find the dual of the following functions :
   (a) $f_1 = xyz + x'y\,z'$.
   (b) $f_2 = (x + y')z + x'yz'$.
5. Give the excitation tables of JK and D flip-flops.
6. Draw a logic diagram of a clocked D flip-flop using AND and NOR gates.
7. Implement a full adder using two half adders and draw the diagram.
8. Compare and contrast between serial and parallel adders.
9. Draw and explain the application of the ring counter, with its timing diagram.
10. Explain the working of a 3-bit serial-in, serial-out shift register, with logic diagram.

(10 × 4 = 40 marks)

Turn over

Part B

Answer **either** *Section (a)* **or** *(b) from each Module.*
Each full question carries 12 *marks.*

MODULE 1

11. (a) (i) Encode the following decimal numbers to BCD code :
(1) 640 ; (2) 372.98 ; (3) 20.301.
(6 marks)

(ii) Encode the above numbers to Gray codes. (6 marks)

Or

(b) (i) Convert the following decimal numbers into hexadecimal numbers :
(1) 9527 ; (2) 675.231 ; (3) 0.728.
(6 marks)

(ii) Explain error detection and correction codes with the help of suitable examples.
(6 marks)

MODULE 2

12. (a) Minimize the four variable function using K-map and realise the minimal SOP and POS forms : $f = \Sigma m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$.
(12 marks)

Or

(b) A stair-case light is controlled by two switches, one at the top of the stairs and another at the bottom of the stairs
(i) make a truth table for this system.
(ii) write the logic equation in SOP form.
(iii) realise the circuit using AND-OR-gates ;
(iv) realise the circuit using only NOR gates.
(12 marks)

MODULE 3

13. (a) Design a mod-6 synchronous counter using clocked JK flip-flop, from the fundamentals. Draw the circuit and timing waveforms.
(12 marks)

Or

(b) (i) Draw the circuit diagram of a clocked SR flip-flop using only NAND gates and explain its truth table.
(8 marks)

(ii) What are the merits and demerits of master slave JK flip-flop ? Explain. (4 marks)

MODULE 4

14. (a) Design a one-digit BCD adder and draw its circuit diagram.

Or

(b) With neat circuit diagrams, explain the principles of (i) carry look ahead adder ; (ii) carry save adder and compare their performances.
(12 marks)

MODULE 5

15. (a) Design a 4-stage ring counter. What is the need of self correction circuit ? Give a self correction circuit for the above counter.

Or

(b) Draw the logic diagram for a four-bit parallel input/parallel output register. Indicate inputs, outputs and a negative edge-triggered clock and describe its working.
(12 marks)

[5 × 12 = 60 marks]