F 9244 **(Pages : 3)** **Reg. No.** CS

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science/ Information Technology

ENGINEERING MATHEMATICS—II (R, T)

(2009 Admissions – Improvement
2004 – 2009 Admissions – Supplementary)

Time : Three Hours **Maximum : 100 marks**

Answer any **one** *full question from each module.*
Each full question carries 20 *marks.*

Module 1

1. (a) Let p be "He is tall" and let q be "He is handsome". Write each of the following statements in symbolic form using p and q : (Assume that "He is short" means "He is not tall", i.e., $\sim p$)

   (i) He is tall and handsome.

   (ii) He is tall but not handsome.

   (iii) He is neither tall nor handsome.

   (iv) It is false that he is short or handsome.

   (b) Find the truth tables of the following :

   (i) $p \wedge (q \vee r)$

   (ii) $(p \wedge q) \vee (p \wedge r)$.

Or

(c) Prove that disjunction distributes over conjunction ; i.e., prove the distribution law :

$p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$.

(d) Determine the truth value of each of the following statements and also negate each of them.

(i) $\forall x, |x| = x$. (ii) $\exists x, x^2 = x$.

(iii) $\forall x, x + 1 > x$. (iv) $\exists x, x + 2 = x$.

Turn over

Module 2

2. (a) Let R and S be the relations on $A = \{1, 2, 3, 4\}$ defined by

$R = \{(1,1), (3,1), (3,4), (4,2), (4,3)\}$

$S = \{(1,3), (2,1), (3,1), (3,2), (4,4)\}$. Find the

(i) Composition relation R o S.

(ii) Composition $R^2 = R \circ R$ for the relation R.

Or

(b) Let $f : A \to B$ and $g : B \to C$ are one-to-one functions. Show that $gof : A \to C$ is one-to-one.

(c) Let R be a reflexive relation on a set A. Show that R is an equivalence relation if and only if (a, b) and (a, c) are in R implies that (b, c) is in R.

Module 3

3. (a) Let $S = \{2, 3, 4, 5, 12, 16, 24, 36, 48\}$ be ordered by divisibility. Find

(i) the predecessors and immediate predecessors of 12

(ii) the successors and immediate successors of 12.

(b) Define the dual of a statement in lattice L. Why does the principle of duality apply to L ?

Or

(c) Let $\lesssim$ S be a partial ordering of a set S. Define the dual order on S. How is the dual order related to the inverse of the relation $\lesssim$?

(d) Show why each element of a linearly ordered set can have at most one immediate predecessor.

Module 4

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

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

(b) Obtain the particular solution for $a_r - 5a_{r-1} - 6a_{r-2} = 1$.

Or

(c) Given that $a_0 = 0, a_1 = 1, a_2 = 4$ and $a_3 = 12$ satisfy the recurrence relation $a_r + C_1 a_{r-1} + C_2 a_{r-2} = 0$. Determine a_r.

Module 5

5. (a) Find the sum m of the degrees of the vertices of G where $V(G) = \{A, B, C, D\}$ and

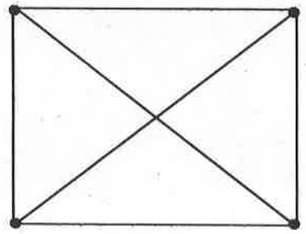
(i) $E(G) = [\{A, B\}, \{A, C\}, \{B, D\}, \{C, D\}]$.

(ii) $E(G) = [\{A, B\}, \{A, C\}, \{A, D\}, \{B, A\}, \{B, B\}, \{C, B\}, \{C, D\}]$.

(b) Find the connected components of G where $V(G) = \{A, B, C, X, Y, Z\}$ and $E(G) = [\{A, X\}, \{C, X\}]$.

Or

(c) Find all the spanning trees of the graph shown in figure below 1.



(5 × 20 = 100 marks)

F 9249 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering

MICROPROCESSOR SYSTEMS (R)

(2009 admissions—Improvement ; 2004—2009 admissions—Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What are the roles of various flags in 8085 ?
2. How is the stack pointer initialised during the beginning of a program ? Explain its purpose.
3. What are the functions of :
   (i) TRAP. (ii) SOD.
   (iii) $\overline{\text{INTA}}$. (iv) READY.
4. In the following instructions sequence, find (i) carry flag status ; (ii) contents of accumulator.
   The sequence is : STC
   MVI A, 01
   RAR
   RAR
5. If [HL] = 2005 and [A] = 03, then what are the contents of location 2005 after execution of MOVM, A and STA 2005 instructions ?
6. What operation can be performed using the instruction XRA A ? Specify the status of Z and CY.
7. When the microprocessor reads an input port, the instruction IN does not set any flag. If the input reading is zero, what logic instruction can be used to set the zero flag without affecting the contents of the accumulator ?
8. What is an interrupt ? How data is transferred between CPU and I/O devices using interrupts ?
9. What is handshaking ? How it is used in data transfer ?
10. What are the diffeernt interrupt modes of 8259 ? Explain any *one* of them.

(10 × 4 = 40 marks)

Part B

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

Module 1

11. Draw the internal architecture of 8085 and describe how addition of two 8-bit numbers takes place.

Or

12. (a) Describe a suitable memory organisation if 4K ROM, 8K RAM and 16 K EPROM are required. Indicate the address ranges for your memories.

(8 marks)

(b) What are the different types of buses used in 8085 ? Give their important features.

(4 marks)

Module 2

13. (a) The 8085 adds 15H and ABH. Specify the contents of the accumulator and status of various flags.

(b) Explain the operation of the LIFO stack illustrating with a suitable example.

Or

14. (a) Explain any *four* data transfer statements describing their T states and machine cycles.

(b) Describe immediate addressing procedure with necessary examples.

Module 3

15. What is stack and stack pointer ? Explain how they are affected by instructions such as CALL, RET, PUSH and POP. Describe with suitable examples.

Or

16. (a) Define instruction cycle, machine cycle and T-state and show these in the timing diagram drawn.

(b) Draw and explain the timing diagram to execute the instruction NNI A, data.

Module 4

17. Draw and explain interrupt structure of 8085. Show clearly the priority input triggering, masking and vector locations. Explain maskable and nonmaskable interrupts.

Or

18. Draw and explain the functional block diagram of 8257. How it is interfaced with 8085 ?

Module 5

19. With an appropriate diagram, show how a keyboard and 7 segment display can be simultaneously interfaced to a 8085 system.

Or

20. Explain clearly the following data transfer schemes :—

(i) DMA data transfer.

(ii) Programmed data transfer.

(iii) Interrupt driven data transfer.

(iv) Asynchronous data transfer.

(5 × 12 = 60 marks)

F 9258 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering/Information Technology

SOLID STATE ELECTRONICS (R, T)

(2009 admissions—Improvement ; 2004—2009 admissions—Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What is thermal runaway ? Why it does not occur in CB configuration ?
2. State and explain two different applications of emitter follower.
3. Distinguish between JFET and BJT amplifiers.
4. Draw the small signal equivalent circuit model of JFET and explain its parameters.
5. In a Colpitt's oscillator C_1 = 0.2 μF, C_2 = 0.02 μF. Calculate the value of inductor required to generate sine waves at 70 kHz.
6. Explain the principle of a tank circuit useful in an LC oscillator.
7. With the help of waveforms, show how the bistable multivibrator can be used as a frequency divider.
8. Explain the basic principle of linear sweep voltage generator.
9. What is the working principle and applications of an opto coupler ?
10. Draw the block diagram of a series regulator and discuss the importance of the control element.

(10 × 4 = 40 marks)

Part B

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

Module I

11. (a) (i) What is operating point of an amplifier circuit ? How can we decide it for different types of operations ?

(6 marks)

(ii) Explain a self biased circuit and compare its performance with the fixed biased circuit.

(6 marks)

Or

Turn over

(b) Calculate the voltage gain, current gain, input resistance and output resistance of the following cascaded circuit. Take h_{ie} = 1K, h_{fe} = 100. (Fig. 1)

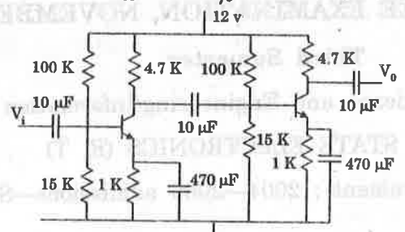


Fig.1

Module II

12. (a) Draw a neat constructional diagram of an enhancement MOSFET. Explain its working with the help of drain and transfer characteristics.

Or

(b) For the FET amplifier shown in Fig. 2, determine (i) V_G ; (ii) V_{DSQ} ; (iii) V_D and V_S ; (iv) I_{DQ} and V_{DSQ}.

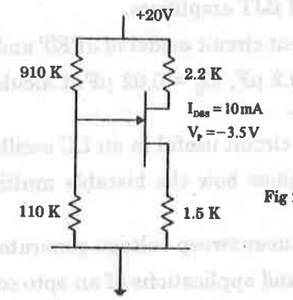


Fig 2

Module III

13. (a) Explain how the following circuit (Fig.3) generates sine wave oscillations. Calculate the frequency of the oscillation.

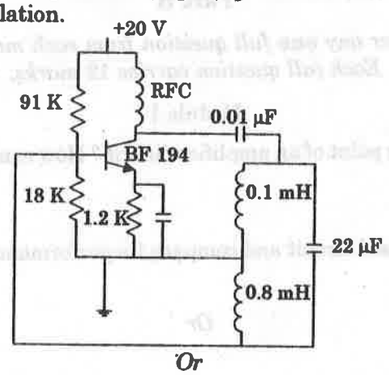


Fig 3

Or

(b) With a neat circuit diagram (using BJT) describe how a Wien bridge oscillator generates an audio frequency signal ? Give the conditions for oscillation.

Module IV

14. (a) With a neat circuit diagram, describe how a monostable multivibrator can produce a delay gating pulse. Derive the expression for the pulse width.

Or

(b) (i) Using diode circuit, explain a clipper to pass voltage from – 2 V to – 5 volt only. (6 marks)

(ii) Draw an RC integrator and prove that the output is integral of the input. (6 marks)

Module V

15. (a) (i) With a circuit diagram, describe how can you design a ± 5 V dual power supply. (8 marks)

(ii) Explain the applications of TRIAC. (4 marks)

Or

(b) (i) Describe the working of a seven segment display, showing the connection diagram. (4 marks)

(ii) With the constructional diagram and emitter characteristics, describe the working of UJT. (8 marks)

[5 × 12 = 60 marks]

F 9267 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science/Information Technology

PROBLEM SOLVING AND COMPUTER PROGRAMMING (RT)

(2009 admissions—Improvement ; 2004—2009 admissions—Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What are the differences between source and object programs ? Give examples.
2. List and explain the steps that a programmer follows in writing a C program.
3. How will you enter the data (show the format) for the following scanf statements : $a = 5$, $b = 7$, $c = 9$?
   (i) Scanf ("%d? %d? %d", & a, & b, &c) ;
   (ii) Scanf ("%da %da %d" &a, &b, &c) ;
4. What are the basic data types available in C ? Explain with examples.
5. Consider $x = (j + k > 5)\ ?\ (j + k) : 5$; what will happen when this statement is executed if :
   (a) $j = 5$ and $k = 3$.
   (b) $j = 1$ and $k = -3$.
6. Write one or more C statements to do the following :—
   If J has a value zero, then transfer control to statement 10. Otherwise add the value of J to the value of S and return to statement 20. Draw the flow chart for the above.
7. Explain one-dimensional and two-dimensional arrays, along with their syntax.
8. How can an entire structure be passed to a function ?
9. What happens when a pointer to a structure is incremented ?
10. What are the two approaches to updata a data file ? Which one is better ? Why ?

(10 × 4 = 40 marks)

Part B

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

Module 1

11. (a) What is an algorithm ? Describe the boxes used in a flowchart representation and mention each symbol purpose ?
    (b) Give the significance of high level and low level language ?

Or

12. With neat flow diagram, explain the various steps involved in the process of creating, compiling and naming C program.

Module 2

13. (a) Describe the format specifiers in scanf( ) function with appropriate meaning.

(b) List out sequence of rules applied for evaluating expressions.

Or

14. (a) What is a constant ? Explain the categories of constants with syntax and examples. (5 marks)

(b) What is the significance of declaring a constant unsigned ? (2 marks)

(c) What are the different ways to declare a C constant ? Give examples. (5 marks)

Module 3

15. (a) What is recursion ? Explain in detail, with examples, two types of parameter passing in functions. (8 marks)

(b) Explain any *two* string library functions with appropriate examples. (4 marks)

Or

16. Write a function to convert inches into centimeters. Then write a program that prompts the user to input a measure in inches, calls the conversion function, and prints out the measurement in centimeters.

Module 4

17. Write a function that copies a one-dimensional array of n elements into a two-dimensional array of k rows and j columns. The rows and columns must be a valid factor of the number of elements in the one-dimensional array : that is, $k * j = n$.

Or

18. Write a program that uses an array of student structures to answer inquiries. Using a menu driven interface, provide inquiries that report a student's scores, average or grade. A fourth option menu provides all data for a requested student, and a fifth one prints list of student IDs and names.

Module 5

19. (a) Write a C program to read N integers and find the sum of all these elements using pointer. (8 marks)

(b) Describe the operation that you can and that you cannot do with pointer variables. (4 marks)

Or

20. Write a C program to copy a file, inserting two space characters at the beginning of each line. (In other words, each line will be shifted two characters to the right).

[5 × 12 = 60 marks]

F 9275 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science/ Information Technology

HUMANITIES (R, T)

(2009 Admissions-Improvement
2004-2009 Admissions-Supplementary)

Time : Three Hours Maximum : 100 Marks

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

Part A (Principles of Management)

Answer **either** *(a)* **or** *(b) section of each full question.*

Module 1

1. (a) (i) What is strategic planning ? What are the steps involved in strategic planning process ?

(ii) Explain the steps involved in control process.

Or

(b) (i) Elaborate the different organisation structures and give examples for each and explain the importance of delegation.

(ii) Explain the different job evaluation methods for evaluating newly appointed programmers in a software industry.

Module 2

2. (a) (i) Explain the different ISO procedures required for a process industry.

(ii) How TQM can be a useful tool for a software oganisation ? Explain.

Or

(b) (i) What are the merits and limitations of statistical quality control ? Explain.

(ii) With the help of neat diagrams, explain the control charts for variables.

Part B (Engineering Economics)

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

Module 3

3. (a) (i) Discuss the various functions of Commercial banks.

(ii) "Banks are not merely traders in money but also in an important sense manufacturers of money". Comment.

Or **Turn over**

(b) (i) What role can the Central Bank play in promoting economic growth with stability ? Illustrate your answer with reference to India.

(ii) "The Bank does not create money out of thin air ; it transmutes other forms of wealth into money". Discuss.

Module 4

4. (a) Discuss the need for industrialisation. Critically evaluate the development of various industries since independence of India. What is the future ?

Or

(b) (i) What are the reasons for industrial sickness ? What are the remedies ?

(ii) "Trade Unions can raise wages in a particular industry but the result will be less employment". Comment.

Module 5

5. (a) (i) Explain the meaning of incidence of tax. Distinguish it from the effect of tax.

(ii) Distinguish between progressive tax and proportional tax. Which of the two is better and why ?

Or

(b) (i) What are the differences between direct and indirect taxes ? Which would you prefer for raising Government revenues in an under-developed country and why ?

(ii) Distinguish between private and public finance. Account for the growing importance of public finance in recent times.

F 9283 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering

LOGIC SYSTEM DESIGN (R)

[2009 admissions—Improvement
2004 – 2009 admissions—Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Perform the following :
   (a) $(101101.10101)_2 \rightarrow (?)_{10}$
   (b) $48_{10} - 29_{10} \rightarrow (?)_2$.
   Convert the numbers into binary and subtract using 2's complement method.
2. What is BCD ? What are its advantages and disadvantages ?
3. Using Boolean theorems, prove
   $(A + C)(A + D)(B + C)(B + D) = AB + CD$.
4. Obtain the complements of the following expressions :
   (i) $A + BC + AB$. (ii) $A(B + C)(\overline{C} + \overline{D})$.
5. Explain the function of a D flip-flop using a suitable diagram and slow how it works as a latch.
6. What factors determine whether a counter operates as a count-up or count-down type ? Explain with necessary diagrams.
7. Show how a full adder can be converted to a full subtractor with the inclusion of an inverter circuit.
8. Design a half subtractor using only basic gates.
9. Why are shift registers considered to be basic memory devices ? What are the different types of shift registers ?
10. What are the differences between Johnson counter and ring counter ? What are their applications ?

($10 \times 4 = 40$ marks)

Turn over

Part B

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

Module 1

11. (a) Express the following as Excess-3 codes :

(i) 1947. (ii) 2011.

(iii) 2000. (iv) 649.

(b) What are weighted and non-weighted codes ? Explain with suitable examples.

Or

12. (a) Encode the following binary numbers into 7 bit even parity Hamming code :

(i) 0101. (ii) 1000.

(iii) 1011. (iv) 1010.

(b) Convert the following decimals to Gray codes :

(i) 369. (ii) 105.

(iii) 69. (iv) 90.

Module 2

13. (a) Convert $f = ABCD + \bar{A}BC + \bar{B}\bar{C}$ into a sum of minterms by algebraic method. (5 marks)

(b) Using K-map, simplify the following function, and obtain minimum product of sums form and draw the circuit.

(7 marks)

Or

14. A corporation having 100 shares entitles the owner of each share to cast one vote at the shareholder's meeting. Assume that A has 40 shares, B has 30 shares, C has 20 shares and D has 10 shares. A two-third majority is required to pass a resolution in a shareholder's meeting. Each of these four men has a switch which he closes to vote YES and opens to vote NO for his percentage of shares. When the resolution is passed the output, LED must be ON. Derive a truth-table for the output function and give the sum of product equation for it. Draw the minimal logic circuit diagram.

Module 3

15. (a) Draw the circuit diagram of a master-slave JK flip-flop and show how the race around condition is eliminated in it ?

(b) What are the differences in the operation of master-slave and edge-triggered flip-flops ? Compare and contract their performances.

Or

16. Design a synchronous counter using K-maps following sequence : 000, 010, 101, 110 and repeat. The undesired states 001, 011, 100 and 111 must always go to 000 on the next clock pulse. Draw the circuit diagram.

Module 4

17. Design and draw the logic diagram of a circuit for addition/subtraction. Use a control variable W and a circuit that functions as a full-adder when W = 0, as a full-subtractor when W = 1.

Or

18. With a neat circuit diagram, explain the working of a carry save adder. What are its merits and limitations ?

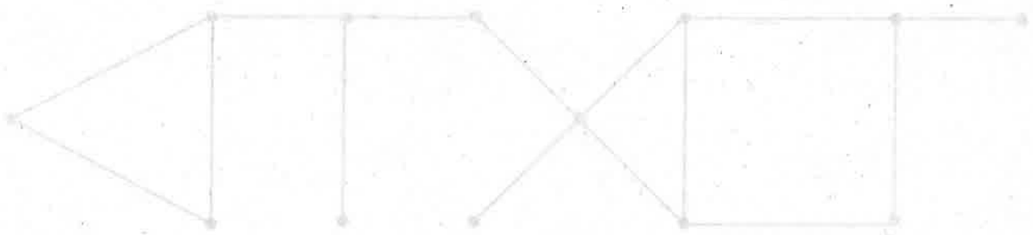
Module 5

19. Using K-map, design a 4-bit self correcting ring counter, assuming 0000 as initial state. Draw the circuit diagram.

Or

20. Draw the logic diagram for a divide-by-18 Johnson counter. Sketch the timing diagram and write the sequence in tabular form.

(5 × 12 = 60 marks)



F 9288 **(Pages : 3)** **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch—Computer Science/Information Technology

ENO 10 301 B—ENGINEERING MATHEMATICS—II (CS, IT)

(Regular)

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

Part A

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

1. Write in symbolic form :
   (a) Some girls are not white.
   (b) It is true that all roads lead to Kollam
   (c) Some cones are not good.
2. Using Euclidean algorithm, find gcd of 15276 and 2055.
3. Give examples of two functions $f: \mathrm{N} \to \mathrm{Z}$ and $g: \mathrm{Z} \to \mathrm{Z}$ such that $g \circ f$ is injective but g is not injective.
4. Define a Bounded lattice and a Sublattice.
5. Define
   (a) Hamiltonian cycle.
   (b) Spanning tree.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions, each question carries* 5 *marks.*

6. Construct truth table for $\mathrm{P} \vee \neg(\mathrm{P} \wedge \mathrm{Q})$.
7. If $a \equiv b (\mathrm{mod}\, n)$ then show that $a^k = b^k (\mathrm{mod}\, n)$ for every positive integer k.
8. I denotes the set of all integers and m is an integer. Show $\mathrm{R} = \{ < x, y > / x - y$ is divisible by $m\}$ is an equivalence relation.
9. Define chain and subchains and show that every chain is a distribution lattice.
10. Give an example of a graph in which the length of the longest cycle is 9 and the length of the shortest cycle is 4.

(5 × 5 = 25 marks)

Turn over

Part C

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

Module 1

11. Show that :

(a) $(\exists x)(F(x) \wedge S(x)) \rightarrow (y)(M(y) \rightarrow W(y))$. (6 marks)

(b) $(\exists x)(M(y) \wedge \neg W(y))$ if $(x)(F(x) \rightarrow \neg S(x))$ follows. (6 marks)

Or

12. (a) Show that $(\forall x)(P(x) \wedge Q(x)) \rightleftarrows ((\forall x)P(x)) \wedge ((\forall x)Q(x))$ is a logically valid statement. (6 marks)

(b) Show the following implications without constructing truth tables.

$(P \rightarrow Q) \vee (R \Leftrightarrow P) \wedge (Q \vee R)$. (6 marks)

Module 2

13. (a) If a/c and b/c then prove that $gcd\ (a, b)/c$. (5 marks)

(b) If p is a prime, then prove that $a^p \equiv a (\text{mod } p)$. (7 marks)

Or

14. (a) Show that the functions f and g which both are from N × N to N given by $f(x, y) = x + y$ and $g(x, y) = x\,y$ are onto but not one-to-one. (6 marks)

(b) Check whether the following functions are invertible. If so, compute the inverse :

(i) $f : \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = |x|, \forall x \in \mathbb{R}$. (3 marks)

(ii) $g : \mathbb{R} \rightarrow \mathbb{R}$ is defined by $g(x) = 2x - 1, \ \forall x \in \mathbb{R}$. (3 marks)

Module 3

15. (a) Show that the "set inclusiong $\subseteq$" is a partial ordering on power set of A for any set A. (6 marks)

(b) If relations R and S are reflexive, symmetric and transitive, show that $R \cap S$ is also reflextive, symmetric and transitive. (6 marks)

Or

16. (a) Define an equivalence relation. If ~ is an equivalence relation of a set X, show that the corresponding equivalence classes form a portion of X. (6 marks)

(b) Define partial order and total order relations. Give an example of a partial order which is not a total order and also *vice versa*. (6 marks)

Module 4

17. (a) If $< L, * \oplus >$ is a distributive lattice, then prove for any $a, b, c \in L$,

$(a * b = a * c) \wedge (a \oplus b = a \oplus c) \Rightarrow b = c$. (6 marks)

(b) Define a complete lattice and complemented lattice. Draw the Hasse diagram for D_{40}, the lattice of all positive divisors of 40. (6 marks)

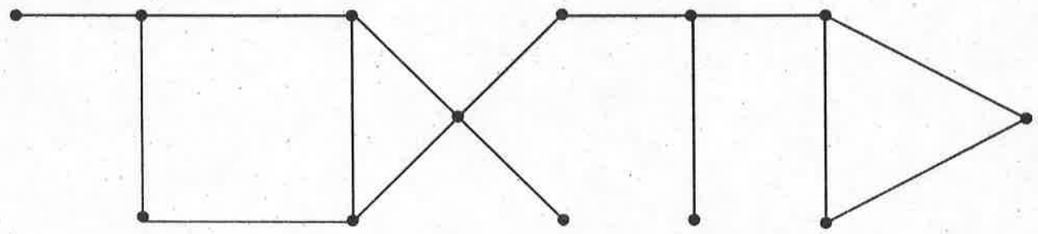
Or

18. (a) In a lattice $< L, \leq >$ with $a, b, c \in L$, show that $a \leq c \Rightarrow a \oplus (b * c) \leq (a \oplus b) * c$. (6 marks)

(b) Which of the two lattices $< S_n, D >$ for $n = 30$ and $n = 45$ are complemented ? Prove whether they are distributive. (6 marks)

Module 5

19. Let G be the graph shown below :



(a) Find a closed walk of length 6. Is your walk a trial ? (2 marks)

(b) Find an open walk of length 12. Is your walk a path ? (2 marks)

(c) Find a closed trial of length 6. Is your trial a cycle ? (2 marks)

(d) What is the length of the longest cycle in G ? (2 marks)

(e) What is the length of a longest path in G ? How many paths are there of this length ? (4 marks)

Or

20. (a) Draw all non-label-isomorphic graphs with three vertices using the label set V = {a, b, c}. (6 marks)

(b) If G be a connected graph which is not a tree and let C be a cycle in G. Prove that the complement of any spanning tree of G contains at least one edge of C. (6 marks)

[5 × 12 = 60 marks]

F 9289 (Pages : 2) Reg. No.....12 copies

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

EN 010 302—ECONOMICS AND COMMUNICATION SKILLS (AI, AN, AU, CE, CS, EC, EE, EI, IC, IT, ME, PE and PO)

(Regular)

[Common to all Branches]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Name three Commercial banks. Describe their main functions.
2. Explain the meaning of Globalisation.
3. What is incidence of tax ? Explain.
4. What are the causes of inflation ?
5. List any *six* arguments in support of protectionism.

(5 × 3 = 15 marks)

Part B

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

6. Explain how Commercial banks aid Economic Development of a country.
7. Discuss the various effects and defects of privatisation.
8. What is meant by direct and indirect taxes ? Give *four* examples each with your reasons.
9. Define National Income and per capita income and account for the low level of per capita income in under-developed countries.
10. Why is international trade distinguished from domestic or inter-regional trade ?

(5 × 5 = 25 marks)

Part C

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

Module I

11. State and explain the major financial institutions in India providing financial assistance to industries.

Or

Turn over

12. Explain the various credit control methods ? What are the methods used by the RBI to control the creation of credit by Commercial banks.

Module II

13. Discuss the impact of multinational companies in Indian economy.

Or

14. Describe the growth and development of Information Technology industries in India.

Module III

15. Explain clearly the characteristics of good tax system.

Or

16. Define tax and explain its features. Distinguish between incidence and shifting of a tax. What are the factors influencing the shifting of a tax ?

Module IV

17. How is National Income estimated ? Bring out the difficulties involved in National Income estimation in under-developed countries.

Or

18. Define inflation and explain the types of inflation. What are the effects of inflation ? How is inflation controlled ?

Module V

19. What is free trade ? What are its advantages ? What is the case against free trade ?

Or

20. Distinguish between Balance of Trade and Balance of Payments. Why must the balance of payments balance in the long run ?

(5 × 12 = 60 marks)

F 9294 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 303 / IT 010 306 PROBLEM SOLVING AND COMPUTER PROGRAMMING (CS AND IT)

(Regular)

Time : Three Hours Maximum : 100 Marks

Write neat and efficient C programs whenever necessary.

Part A

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

1. Write the C equivalents for the following arithmetic expressions :

   (i) $a+\frac{b}{c}-d.$

   (ii) $\frac{a}{cd}-b.$

   (iii) $a+\frac{1}{1+\frac{1}{1+a}}.$

2. Write the syntax and one example to show the declaration and intialisation of a two-dimensional array.
3. What is function prototype ? What is its use ?
4. What happens when a pointer to a structure is incremented ?
5. Describe two bitwise shift operators. What requirements must the operators satisfy ?

($5 \times 3 = 15$ marks)

Part B

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

6. Describe any *five* data types in C with the help of examples.
7. Write a program that accepts a number from 0 to 9 alongwith a string to be displayed a specified number of times. Use "switch-case" construct.
8. What is the null character and what is it used for, in the context of strings ?

Turn over

9. Can structure declarations appear inside functions ? Explain with an example.

10. Explain static memory allocation and dynamic memory allocation.

(5 × 5 = 25 marks)

Part C

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

Module I

11. (a) Explain the various conversion specifications for data I/O in C. (6 marks)

(b) Describe the features of a good program. How the efficiency of a program is expressed and improved ?

(6 marks)

Or

12. With appropriate examples, explain the relational, logical and arithmetic operators in C. Give their precedence.

Module II

13. Write a C progrm to generate prime numbers between the range m and n.

Or

14. A and B are two given one-dimensional arrays. Read them and sort them in ascending order. Then merge them into a single sorted array C in the ascending order.

Module III

15. What is recursion ? Explain in detail, with examples, two types of parameter passing in functions.

Or

16. Develop separate C functions to implement a calculator that performs +, –, *, / and % arithmetic algebraic operations on two input numbers.

Functions names : Read ( ), Calculate ( ), Display ( ).

The main function should contain only function calls.

Module IV

17. Write a C program that reads several different names, addresses, age, qualification, and rearranges the names into alphabetic order and then write out the list in the alphabetic order using structure variation within the program.

Or

18. Write a C program to read N integers and find the sum of squares of all these elements using pointer.

ModuleV

19. Open a data file in write mode. Enter the students list in the file. Copy the data from the first file to another file. Make both files read only files.

Or

20. Discuss the four storage class specifications and list out the comparative details of the four storage classes with respect to their scope, initialisation, life time and their usage with examples.

(5 × 12 = 60 marks)

F 9301 **(Pages : 2)** **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science

CS 010 304—COMPUTER ORGANISATION (CS)

(Regular)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What is a serial adder ?
2. How is a number represented in floating point notation ?
3. What is the function of a control unit ?
4. Why is a Cache memory preferred in a computer ?
5. What is paging ?

(5 × 3 = 15 marks)

Part B

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

6. Draw the circuit of a BCD adder.
7. How is addition performed in a floating point number ?
8. Write a note on hardwired control unit.
9. What is the necessity for memory interleaving techniques ?
10. Write notes on TLBs.

(5 × 5 = 25 marks)

Part C

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

11. (a) Describe with a circuit diagram, that operation of an array multiplier.

Or

(b) Write short notes on restoring and non-restoring division.

12. (a) With clear steps, explain how multiplication is performed in floating point numbers.

Or

(b) Design an ALU that can perform basic operation of 1 bit addition subtraction, load and store operations.

Turn over

13. (a) Write a note on microprogrammed control unit.

Or

(b) Describe the functions of a microprogram sequencer. Explain different methods of its implementation.

14. (a) Write notes on Associative memory.

Or

(b) Write note on parameters that describe the performance of a memory.

15. (a) Write short notes on relocation techniques in memory.

Or

(b) Describe the function and uses of virtual memory.

(5 × 12 = 60 marks)

F 9311 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 305/IT 010 304—SWITCHING THEORY AND LOGIC DESIGN (CS, IT)

(Regular)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 3 *marks.*

1. What is a Decade counter ?
2. Draw the circuit of a JK flip-flop using NAND gates.
3. What is a Multiplexer ?
4. Convert the decimal numbers to the equivalent binary numbers (a) 43 (b) 0.4375 (c) 2048.0625.
5. Write the characteristics of TTL gates.

(5 × 3 = 15 marks)

Part B

Each question carries 5 *marks.*

6. Draw a TTL gate and explain its working as a NAND gate.
7. Explain with a neat figure the master slave JK flip-flop.
8. State and prove De Morgan's theorem.
9. Explain the working of an Asynchronous Decode counter.
10. What are Universal gates ? Explain.

(5 × 5 = 25 marks)

Part C

11. (a) Design a binary to Gray code converter. (12 marks)

Or

(b) Simplify using Quine Mccluskey method $f = \sum (1,7,11,12,13,15)$. (12 marks)

12. (a) Explain with a neat figure a carry propagate adder. (12 marks)

Or

(b) Explain the working of a comparator circuit. Design a comparator circuit to compare two 2 bit numbers.

(12 marks)

Turn over

13. (a) With neat figures explain :

(i) D flip-flop using NAND gates. (4 marks)

(ii) T flip-flop using NAND gates. (4 marks)

(iii) Race around condition. (4 marks)

Or

(b) A sequential circuit has 4 flip-flops A, B, C, D and input x. It is described by the following state equations :

$A(t+1)(CD'+C'D)x+(CD+C'D')x'$

$B(t+1)=A$

$C(t+1)=B$

$D(t+1)=C$

(i) Obtain the sequence of states when $x = 1$ starting from state ABCD = 0001. (6 marks)

(ii) Obtain the sequence of states when $x = 0$ starting from state ABCD = 0000. (6 marks)

14. (a) Design a 4 bit binary synchronous up counter. (12 marks)

Or

(b) Explain with neat figures Ring counter and Johnson counter. (12 marks)

15. (a) Explain the Boolean difference method for fault detection. (12 marks)

Or

(b) Write short notes on the following logic families :

(i) RTL. (ii) ECL. (12 marks)

(5 × 12 = 60 marks)

F 9320 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Third Semester

Branch : Computer Science and Engineering

CS 010 306—ELECTRONICS DEVICES AND CIRCUITS (CS)

(Regular)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 3 *marks.*

1. What are the merits and demerits of bridge rectifier ?
2. Explain the significance of Q-point.
3. Draw the circuit of a voltage follower using OPAMP. What are its applications ?
4. What are the effects of negative feedback ?
5. Draw and explain an RC integrator circuit. What are its limitations ?

(5 × 3 = 15 marks)

Part B

Each question carries 5 *marks.*

6. Explain with circuit diagram the principle of a π filter. What are its advantages ?
7. Explain with diagrams how a BJT is operated as a switch.
8. What are the characteristics of a practical OPAMP ?
9. Discuss the conditions for a circuit to produce sustained oscillations.
10. Draw and explain the responses of an RC high pass filter to (i) step input and (ii) side input.

(5 × 5 = 25 marks)

Part C

Each question carries 12 *marks.*

11. Explain with necessary diagrams the principle of operation of a transistor shunt voltage regulator. What are its advantages ?

Or

12. Write a note on 79 XX series of voltage regulator ICs.
13. What is biasing ? Explain with circuit diagrams the different biasing schemes used for BJT circuits.

Or

14. What is meant by small signal operation ? Obtain a small signal model of BJT amplifier.

Turn over

15. Draw the circuit of a summation amplifier using OPAMP to produce the output $y = (V_1 + V_2 + V_3) - (V_4 + V_5 + V_6 + V_7)$ where is are the inputs. Using the drawn circuit, show that the output $y = (V_1 + V_2 + V_3) - (V_4 + V_5 + V_6 + V_7)$.

Or

16. Explain with the help of a circuit diagram the working principle of an instrumentation amplifier. What are its uses ?

17. Draw the circuit of an RC phase shift oscillator. Explain its principle of operation. Derive an expression for its frequency of oscillation.

Or

18. Explain with a circuit diagram the principle of operation of a Wein-bridge oscillator.

19. Draw and explain the circuit of an astable multivibrator using OPAMP.

Or

20. Draw and explain the circuit of a Schmitt trigger. What are its applications ?

(5 × 12 = 60 marks)