



M 20009

Reg. No. :

Name :

Third Semester B.Tech. (Reg./Suppl./Imp.) (Including Part-Time) Degree
Examination, November 2011
(2007 Admn.)

PT 2K6/2K6 CE/ME/EE/EC/AEI/CS/IT 301 : ENGINEERING MATHEMATICS – II

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

- I. a) If a positive term series $\sum a_n$ converges, show that $\lim_{n \rightarrow \infty} a_n = 0$. Give an example to show that the converse is not true.
- b) Find the 8th derivative of $x^3 \sin 5x$.

c) Find the rank of $A = \begin{bmatrix} 4 & 2 & 1 & 3 \\ 6 & 3 & 4 & 7 \\ 2 & 1 & 0 & 1 \end{bmatrix}$

d) Find the characteristic equation of $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ and hence find the inverse of A.

e) If $\vec{F} = 3xy\hat{i} - y^2\hat{j}$ evaluate $\int_C \vec{F} \cdot d\vec{r}$ where $C : y = x^2$ from $(0, 0)$ to $(1, 2)$.

f) Apply Greens theorem to prove that the area enclosed by a plane curve is $\frac{1}{2} \oint_C xdy - ydx$.

g) Check for linear independence of $\{ (1, 2, 4) (2, 2, 8) (1, 0, 4) \}$.

h) $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$ is given by $T(x_1, x_2, x_3) = (x_1 + x_2 + x_3, x_1)$ and $S : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is given by $S(x_1, x_2) = (x_2, x_1)$ find $S \circ T$. (8×5=40)

P.T.O.



2. a) i) Test the convergence of the series $\sum \frac{\sqrt{n}}{\sqrt{n^2+1}} x^n$.

ii) Find the n^{th} derivative of $e^x (2x+5)^3$. (8+7)

OR

b) i) Discuss the behavior of the geometric series $1 + x + x^2 e \dots$ to ∞ .

ii) Expand $e^x \sin x$ into MacLurian's series upto x^4 term. (8+7)

3. a) i) Find the values of λ for which

$$(\lambda-1)x + (3\lambda+1)y + 2\lambda z = 0$$

$$(\lambda-1)x + (4\lambda-2)y + (\lambda+3)z = 0$$

$$2x + (3\lambda+1)y + 3(\lambda-1)z = 0$$

are consistent.

ii) Solve using matrix inversion method

$$3x + y + 2z = 3; 2x - 3y - z = -3; x + 2y + z = 4 \quad (8+7)$$

OR

b) i) Check the consistency and solve the following system of equations using Gauss elimination. $x + y + z = 4$; $2x + y - z = 1$; $x - y + 2z = 2$.

ii) Verify Cayley Hamilton theorem for $\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$. (8+7)

4. a) i) Verify Green's theorem for $\int_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the boundary of the region enclosed by the lines $x = 0$, $y = 0$, $x+y = 1$.

ii) Using divergence theorem evaluate \int_C finds where $\vec{F} = 4xz\hat{i} - y^2\hat{j} + yzk$.

S is the surface of the cube bounded by $x = 0$, $x = 1$, $y = 0$, $y = 1$, $z = 0$, $z = 1$. (8+7)

OR



b) i) Using Green's theorem evaluate $\int_C (2x^2 - y^2)dx + (x^2 + y^2)dy$. C is the boundary of the region in the xy plane enclosed by the x-axis and upper half of the circle $x^2 + y^2 = a^2$.

ii) Show that $\vec{F} = (x^2 - y^2 + x)\hat{i} - (2xy + y)\hat{j}$ is conservative and find the scalar potential. (8+7)

5. a) i) Show that $\{(1, 0, 0) (1, 1, 0) (1, 1, 1)\}$ forms a basis for R^3 .

ii) If $T : R^2 \rightarrow R^2$ is a mapping defined by $T(x, y) = (x+y, y)$ show that T is a linear transformation. (8+7)

OR

b) i) Show that a set of vectors $a_1, \dots, a_m \in E^n$ are linearly dependent iff some of the vectors is a linear combination of remaining vectors.

ii) If $T : R^2 \rightarrow R^2$ is a mapping defined by $T(x, y) = (3x + 2y, 3x - 4y)$. Show that T is a linear transformation. (8+7)

M 20550



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**Third Semester B.Tech. (Reg./Sup./Imp. – Including Part-time) Degree
Examination, November 2011
(2007 Admn.)**

PT2K6/2K6 EE/EC/AEI/CS/IT 302 : HUMANITIES

Time : 3 Hours

Max. Marks : 100

PART – A

All questions are compulsory.

1. Insert articles where necessary :
 - a) Do not look gift horse in mouth.
 - b) How blue sky looks !
2. Fill in the blanks with appropriate prepositions :
 - a) Human sacrifices were practised _____ the Nagas.
 - b) He has spent his life _____ Calcutta.
3. Correct the following sentences :
 - a) This hardly won liberty was not to be lightly abandoned.
 - b) I never remember to have seen a more excited foot ball match.
4. Rewrite to indirect speech :

“You have all done it very badly !” remarked the teacher.
5. Insert the correct tense of the verb in the following :
 - a) He speaks as one who _____ (to know)
 - b) So long as the rain _____ , I stayed at home. (to continue)
6. Combine to complex sentence :

That is the man. He gave me a dog. It went mad.

P.T.O.



7. Combine to complex sentence containing an adverb clause :

A gentle man may call. Please ask him to wait.

8. Add question tags :

a) You like him, _____ ?

b) He will never give up _____ ?

9. Punctuate the following :

Nothing is so easy and inviting as the retort of abuse and sarcasm but it is a paltry and an unprofitable contest.

10. Rewrite by improving arrangement :

For sale, a Piano, the property of a Musician, with carved legs.

(10×2=20)

PART – B

Answer **any seven**.

11. Define a technical report. Mention its attributes.

12. What are the importance of visual aids and oral communication ?

13. Explain the different styles of note-making.

14. What are the barriers that lead to miscommunication in an organisation ?

15. What is the role of professional ethics in engineering ?

16. What is the role of science and technology in the world of communication ?

17. How IPR is important for an organisation ?

18. What are the contribution of Arabs to science and technology ?

19. Briefly point out the steps involved in obtaining a patent.

20. What is the impact of science and technology to Indian culture ?

(7×5=35)



PART – C

Answer **all**.

21. a) “All innovations are not patentable” – Comment.

OR

b) Explain the flow of communication in an educational organization. **15**

22. a) Explain the different types of technical report.

OR

b) What are the barriers to be overcome for the good performance on an interview ? **15**

23. a) “Internet and social networking influencing Indian youth” – Comment.

OR

b) What are the recent advances in Indian space researches ? **15**

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**Third Semester B.Tech. (Reg./Sup./Imp.) (Including Part-Time) Degree
Examination, November 2011
(2007 Admn.)**

2K6 CS 303 : DISCRETE COMPUTATIONAL STRUCTURES

Time : 3 Hours

Max. Marks: 100

Instruction: Answer all questions.

PART – A

1. a) Compute the truth table of the statement $(P \Rightarrow q) \Leftrightarrow (\sim q \Rightarrow \sim p)$
- b) Show by mathematical induction,

$$1^2 + 3^2 + 5^2 + \dots + (2n - 1)^2 = \frac{n(2n + 1)(2n - 1)}{3}$$
- c) Explain one-to-one and onto functions.
- d) Define Lattice. Give one example.
- e) Write a note on Homomorphism theorems.
- f) What is syndrome decoding ? Explain.
- g) Define Rings and Fields.
- h) Write a note on Unique Factorization. (8×5=40)

PART – B

2. a) i) Let M and n be integers. Prove that $n^2 = m^2$ if and only if n is m or n is -m. 10
 - ii) Write a note on Predicate logic. 5
- OR
- b) i) Define conditional and Biconditional statements. Explain. 6
 - ii) Write a note on Unification Algorithm. 9

P.T.O.



3. a) i) Define partially ordered relation. Explain the method to construct Hasse diagram. 6
- ii) Define functions. Let $f : A \rightarrow B$ be a function then show that f^{-1} is a function from B to A if and only if f is one to one. Also show that if f^{-1} is a function then f^{-1} is also one to one. 9
- OR
- b) i) State Pigeonhole Principle. Show that if any 11 numbers are chosen from the set $\{1, 2, \dots, 20\}$ then one of them will be a multiple of another. 9
- ii) Define Equivalence relation. Give one example. 6
4. a) i) Write a note on Hamming codes. 8
- ii) Explain Lagranges theorem in detail. 7
- OR
- b) i) Write a note on Abelian Groups and Permutation groups. 8
- ii) Let G be a group and let 'a' and 'b' be elements of G . Then show that,
- $$(\bar{a}^{-1})^{-1} = a \text{ and}$$
- $$(ab)^{-1} = \bar{b}^{-1} \bar{a}^{-1}.$$
- 7
5. a) Write a note on :
- i) Polynomial Rings
- ii) Euclidian Domains. 15
- OR
- b) Write a note on :
- i) Division Algorithm
- ii) Cyclic codes. 15
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M 20010

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**III Semester B.Tech. (Reg./Sup./Imp.) (Including Part-time) Degree
Examination, November 2011
(2007 Admn.)**

PT 2K6/2K6 CE/ME 302/ 2K6 CS/IT 304 : COMPUTER PROGRAMMING

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

1. a) Write a C program to find the sum of digits of a given number.
b) Explain Entry controlled and Exit controlled loop with one example for each.
c) What is a pointer ? How do you assign a pointer to an array ?
d) What is a union ? How is it different from a structure ?
e) Briefly explain the 3 object oriented principles.
f) What is a class ? How do you define a class in Java ? Give one example.
g) What is a constructor ? How do you define it ? Explain with an example.
h) With example program explain how do you read a character and string from the keyboard in Java. (5×8=40)
2. a) Explain the various data types available in C. 8
b) Write a C program to find the roots of a given quadratic equation. 7

OR

3. a) What is recursion ? Write a recursive C program to find the factorial of a number. 7
b) Explain the use of break and goto statements in C. Give example for each. 8
4. a) Write a C program to search a given element in a given array of elements using Binary Search. 7
b) What is a file ? Explain the various functions for the random access in files. 8

OR

5. a) What is dynamic memory allocation ? Explain with an example. 7
b) Write a C program to sort given n numbers in ascending order using Bubble sort technique. 8

P.T.O.



6. a) Define a class called TIME. Declare the instance variables Second, Minute and Hour. Also define the following methods inside the class TIME.
- i) A constructor to initialize the TIME object.
 - ii) ADD method to add 2 TIME objects.
 - iii) DISPLAY method to display the TIME object in Hour : Minute : Second format. 8
- b) Explain the bitwise operators available in Java with example. 7

OR

7. a) Explain the two uses of super keywords in Java with example for each. 8
- b) With an example program explain the multilevel inheritance in Java. 7
8. a) Explain the following string functions in Java with an example for each
- i) char At
 - ii) starts With
 - iii) index Of
 - iv) trim 8
- b) What is Exception Handling ? Explain the try, catch and throw keywords with one example. 7

OR

9. a) What is an interface ? How do you implement multiple inheritance using interface ? Explain with an example. 7
- b) What is an Applet ? Give the Applet skeleton. 8
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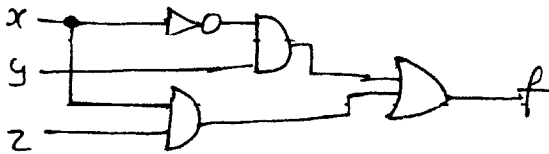
**Third Semester B.Tech. (Reg./Sup./Imp.) (Including Part-Time)
Degree Examination, November 2011
(2007 Admn.)
2k6 CS/IT 305 : SWITCHING THEORY AND LOGIC DESIGN**

Time : 3 Hours

Max. Marks : 100

Instruction : Answer *all* questions.

1. a) Compute the switching function represented by the gate network of the following fig. Also compute the truth table of the network. (5×8=40)



- b) Prove DeMorgan's theorems.
- c) Realize AND, OR, NOT gate by using only NAND gate.
- d) Write a note on multiplexer and demultiplexer.
- e) What is programmable logic arrays ? What are its applications ?
- f) What is fault diagnosis and testing ? Define test vector (TV) and test set.
- g) Write a note on D and T flipflops with truth table.
- h) What is synchronous counter ? How it differs from asynchronous counter ?
2. A) i) Plot the following on the Karnaugh map (2 1/2×2=5)
- a) $f_1(abcd) = ab' + a'bc$
- b) $f_2(abcd) = c'd' + a'bd$

P.T.O.



- ii) What are different electronic gates ? Explain with appropriate symbols and define following : 10
- Make contact
 - Break contact
 - Change over contact

OR

- B) i) What do you mean by sum of product and product of sum ?

		CD			
		00	01	11	10
AB	00	1	0		1
	01	1	0	0	1
	11	1	0	0	1
	10	1			1

Represent SOP and POS using giving K-map. 10

- ii) Write a note on prime cube. Also give binary designation of eight vertices of a 3-D cube. 5
3. A i) What do you mean by comparator ? Give a comparator circuit. 5
- ii) Differentiate between MUX and DMUX. Give circuit for both with its function. 10

OR

- B) i) What do you mean by universal gate ? Give all basic gate using these universal gates. 10
- ii) Write a note on parallel adder ? With neat diagram explain 4-bit parallel adder. 5



4. A) i) Explain how testing process is useful in LSI and VLSI circuits. 5
ii) Find a simple column folding of the PLA shown in below table. Draw the folded PLA. 10

	x_1	x_2	x_3	x_4	x_5	x_6	z_1	z_2
1	1	1	2	2	2	2	2	1
2	0	2	1	2	0	2	1	2
3	2	2	0	0	0	2	1	2
4	2	2	2	1	1	2	1	2
5	2	0	1	2	2	2	2	1
6	2	2	0	2	2	2	1	2
7	2	2	2	1	2	1	2	1
8	2	2	2	2	0	0	1	2
9	2	2	2	1	0	1	1	2

OR

- B) i) Write a note on PLA folding with example. 5

ii) Show AND-OR network realizing $f = x_1x_2 + x_1x_3'x_4' + x_2x_4$

Give its a-tests derivation and b-tests derivation. 10

5. A) i) What do you mean by counters ? Explain any counter design with JK flipflop. 10

ii) Write a note on clock mode sequential machine. 5

OR

- B) i) Explain with the help of truth table, the functions of SR and JK flipflop. 5

ii) What are various steps that are to be followed in synthesis of a clock-mode sequential machine ? 10





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**Third Semester B.Tech. (Reg./Sup./Imp.) (Including Part-Time) Degree
Examination, November 2011
2K6 CS/IT 306 : ELECTRONIC CIRCUITS AND SYSTEMS
(2007 Admn.)**

Time : 3 Hours

Max. Marks : 100

Instructions: 1) Answer *all* questions.
2) Assume *any* missing data.

1. a) Explain positive clamping with circuit.
b) Sketch and explain Schmitt trigger with waveform.
c) Write a short note an application of VLSI.
d) Explain briefly the difference between various logic families.
e) Explain the working of Sample and Hold circuit.
f) Explain static and dynamic RAM.
g) Explain the need for modulation.
h) Derive the expression for modulation index of FM. (8x5=40)
 2. a) Explain the working principle of astable multivibrator using 2-NOR gates with waveforms. 15

OR

 - b) i) Explain the working principle of boot-strap sweep generator with necessary waveforms. 9
ii) Explain transistor as switch. 6
 3. a) Sketch and explain the working of 2-input NOR gate CMOS circuit. 15

OR

 - b) Briefly discuss the concept of TTL and MOS flip flops. 15
 4. a) i) Sketch and explain D/A circuit. 9
ii) Write a note on ROM and PROM. 6

OR

 - b) i) Sketch and explain A/D converter circuit. 9
ii) Write a note on CD-ROM and DVD-ROM. 6
 5. a) i) Explain the principle of amplitude modulation and demodulation with necessary waveforms. 10
ii) Compare AM and FM. 5

OR

 - b) i) Draw the block diagram of superheterodyne receiver and explain each block. 8
ii) Explain the principle of FM with necessary waveforms. 7
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