(DCS / DIT 211)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

COMPUTER SCIENCE & IT

Paper - I : Mathematics - III

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is the smallest period of $sin\left(\frac{2n\pi x}{k}\right)$.

b) What is the value of *bn* for the periodic function $f(x)$ with period 2T?

c) Express the Fourier series representing $f(x) = |x|$ in $-\pi < x < \pi$.

d) What is the Kernel of the Fourier transform.

e) What is the Fourier sine transform of $\frac{1}{x}$?

f) If $F(f(x)) = F(S)$, then the value of $F\{f(x-a)\}$ is.

g) Define Root mean square value.

h) Define the operators E and E^{-1}.

i) Write the Gauss' Backward Formula of Interpolation.

j) Define the interpolatory conditions.

k) Define Laplace's equation.

l) Define Cauchy's problem.

m) Write Simpson's 3/8 – Rule.

n) Write stirling's formula.

o) Define Trapezoidal Rule.

UNIT - I

2) a) Obtain the Fourier series for the function.

$$f(x) = \begin{cases} \pi x, & 0 \le x \le 1 \\ \pi(2-x), & 1 \le x \le 2 \end{cases}$$

b) Obtain the Fourier expansion of $x \sin x$ as a cosine series in $(0, \pi)$.

OR

c)

θ° :	0	30	60	90	120	150	180
T :	0	5224	8097	7850	5499	2626	0

Obtain the first four terms in a series of sines to represent T and calculate T for θ = 75°.

UNIT - II

3) a) Find the Fourier transform of

i) $e^{-2(x-3)^2}$ ii) $e^{-x^2}\cos 3x$

b) Using Parseval's identity, prove that

$$\int_0^\infty \frac{dt}{(a^2+t^2)(b^2+t^2)} = \frac{\pi}{2ab(a+b)}$$

OR

c) Evaluate $L^{-1}\left\{\frac{1}{(s-1)(s^2+1)}\right\}$ by the method of residues.

d) Find the Fourier cosine transform of

$$f(x) = \begin{cases} x, & for \quad 0 < x < 1 \\ 2-x, & for \quad 1 < x < 2 \\ 0, & for \quad x > 2 \end{cases}$$

UNIT - III

4) a) Using Newton's forward difference formula, find the sum $S_n = 1^3 + 2^3 + 3^3 + \ldots + n^3$.

b) Using the method of separation of symbols, show that $\Delta^n u_{x-n} = u_x - n u_{x-1} + \frac{n(n-1)}{2} u_{x-2} + \ldots . + (-1)^n u_{x-n}$.

OR

c) x : 1.7 1.8 1.9 2.0 2.1 2.2

$y = e^x$: 5.4739 6.0496 6.6859 7.3891 8.1662 9.0250

Interpolate the value of y when $x = 1.91$.

d) x : 0 1 2 3 4 5 6

y : 6.9897 7.4036 7.7815 8.1291 8.4510 8.7506 9.0309

Find dy/dx and d^2y/dx^2 when $x = 3$.

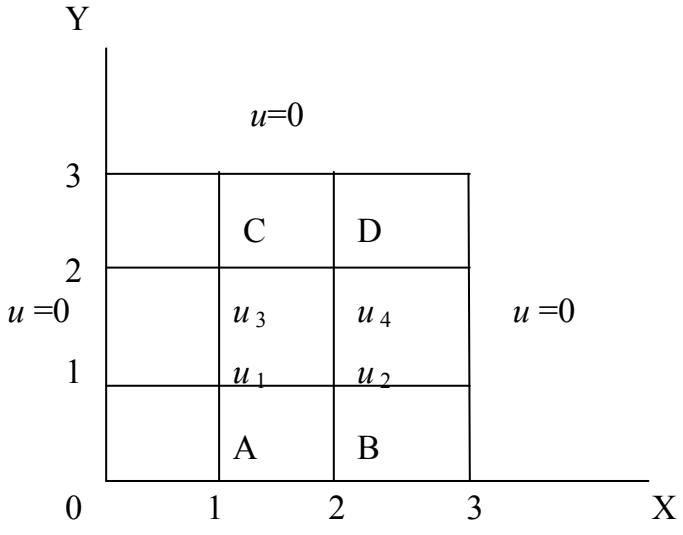
UNIT - IV

5) a) Evaluate $\int_0^{\pi/2} \sqrt{\sin\theta}\, d\theta$. Using Simpson's rule with $h = \pi/12$.

b) Given $dy/dx = 1+y^2$, where $y = 0$ when $x = 0$, find $y(0.2)$, $y(0.4)$.

OR

c) Solve the Poisson equation $u_{xx} + u_{yy} = -10(x^2 + y^2 + 10)$ in the domain of



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B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

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COMPUTER SCIENCE & IT

Paper - II : Basic Electronics

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is a Diode?

b) What is a Transistor?

c) What are the characteristics of JFET's?

d) Explain about unijunction Transistor.

e) Explain application of UJT.

f) Compare LED & LCD.

g) What is a Oscillator Circuit?

h) What are different types of power amplifiers?

i) What is a op-amp?

j) What is a Rectifier?

k) Define operating point.

l) Explain what is meant by voltage Buffer.

m) What is voltage summing?

n) Explain about Linear IC's.

o) Explain about voltage Regulatores.

UNIT - I

2) a) Explain about Half-wave rectification.

b) Explain about clippers & clampers.

OR

3) Explain briefly about Transistor h-parameter model.

UNIT - II

4) Explain working of photo conductive cells.

OR

5) Briefly explain Depletion type MOSET's.

UNIT - III

6) Explain working principle of class C & D Amplifier.

OR

7) Explain the working of Harteley oscillator.

UNIT - IV

8) Explain about voltage summing & voltage buffer.

OR

9) Explain the operation of Timer IC.

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B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

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COMPUTER SCIENCE

Paper - IV : Data Structures

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) Explain the following terms:

a) B - Trees

b) B + Trees

c) Time complexities

d) Doubly linked list

e) ADT

UNIT –I

2) Define a database. Explain about different types of database users.

OR

3) Explain in detail about Linked List ADT

UNIT –II

4) What is relational data model and explain in detail about Relational Constraints.

OR

5) What is Delimiter Matching and how do you match them?

UNIT –III

6) What is normalization and explain the normalization technique in detail.

OR

7) What are the preliminaries in Internal Sorting?

UNIT –IV

8) What is transaction and explain about transaction processing concepts.

OR

9) How do you implement Binary search trees?

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