

Saraswati Education Society's  
**Saraswati College of Engineering, Kharghar**  
**Information Technology Department**  
**Academic Year 2013-14 (Odd Sem)**  
**Unit Test-2**

Class/Sem: Second Year/ III

Subject: Data Structures & Algorithm Analysis

Date: 14/10/2013

Duration: 1 Hrs.

Marks: 20

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Attempt any 5 out of 6

[5\*2] = [10M]

Q1]:

[A] Define Priority queue

[B] Define a Heap Tree and its operations.

[C] Define Red-Black Tree

[D] Define Traversing? What are Graph Traversals

[E] Describe about Asymptotic Notations

[F] Difference between BFS and DFS

Q.2]: Attempt either a) or b).

[5M]

Explain about DFS with an Example

**Or**

Write an algorithm to perform quick sort and explain the steps with following elements

19 27 5 9 86 45

Q.3]: Attempt either a) or b).

[5M]

Explain insertion sort with an example?

**Or**

Explain about Data Structures for Graphs?

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Class/Sem: Second Year/ III

Subject: Applied Mathematics-III

Date: 14/10/2013

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Q.1]: Attempt any 5 out of 6 questions each carrying 2 marks.

[i] State C.R.E. in Polar co-ordinate.

[ii] State Parseval's Identity formula for  $(-\pi, \pi)$ .

[iii] Check whether the given function is harmonic or not.

$$e^{2x}(x \cos 2y - y \sin 2y)$$

[iv] If  $L(y) = \bar{y}$  then  $L(y''') = ?$

[v] Write the formula for  $L^{-1} \left[ \frac{1}{(s-b)^2 + a^2} \right]$

[vi] State formula for  $\nabla \cdot (\bar{f} \times \bar{g})$  and  $\nabla \times (\bar{f} \times \bar{g})$

Q.2]: Attempt any one.

[5M]

[a] Obtain Fourier series for

$$f(x) = x + \frac{\pi}{2}, \quad -\pi < x < 0$$

$$= \frac{\pi}{2} - x, \quad 0 < x < \pi$$

Hence deduce that  $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots$

**OR**

[b] Find  $f(r)$  so that the vector  $f(r) \cdot \bar{r}$  is both solenoidal and irrotational

Q.3]: Attempt any one.

[5M]

[a] Find the analytic function  $f(z) = u + iv$  if

$$u - v = e^x (\cos y - \sin y)$$

**OR**

[b] Solve by using Laplace Transform

$$\frac{d^2 y}{dt^2} + 9y = 18t, \text{ given that } y(0) = 0, y\left(\frac{\pi}{2}\right) = 0$$

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Class/Sem: Second Year/ III

Subject: Analog & Digital Circuits

Date: 15/10/2013

Duration: 1 Hrs.

Marks: 20

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**Note: Q.1 is compulsory & solves 5 out of 6 and Solve any one from Q.2 and any one from Q.3.**

- Q.1]: [a] Why open-loop configuration is not used. [2M]  
[b] Give ideal characteristics of OP-AMP. [2M]  
[c] What is the different between combinational ckt and sequential ckt. [2M]  
[d] Draw OP-AMP as non-inverting AMP & write its output equation. [2M]  
[e] What is Race-around condition. [2M]  
[f] Write truth table & excitation table of J-K flip flop. [2M]
- Q .2]: [a] Explain OP-AMP as integrator. How it is practically implemented. [5M]  
**OR**  
[b] Explain IC-555 timer as monostable multivibrator. [5M]
- Q. 3]: [a] Design 3 bit binary synchronous counter. [5M]  
**OR**  
[b] Design 2bit magnitude comparator [5M]

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Class/Sem: Second Year/ III

Subject: Object Oriented Programming Methodology

Date: 15/10/2013

Duration: 1 Hrs.

Marks: 20

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Q.1]: Write a note on following. (Attempt any 5 )

Marks 2 for each question.

[1] Multiplicity

[2] Interface

[3] Inheritance

[4] Thread properties

[5] Built in packages

[6] Exception Hierarchy

Q.2]: Attempt any one.

[5M]

[a] What are the different Built in Exceptions in java?

[b] How u implement threads in java.

Q.3]: Attempt any one.

[5M]

[a] How applets differ from applications? Also explain the life cycle of applet.

[b] Write a concept of class, constructor, static Members.

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Class/Sem: Second Year/ III

Subject: Database Management System

Date: 17/10/2013

Duration: 1 Hrs.

Marks: 20

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Q.1]: Solve any five from the following.

[10M]

- [1] Define Integrity constraints
- [2] Define foreign key and unique key
- [3] Give ACID properties
- [4] What is deadlock?
- [5] What is a log file?

Q.2]: Solve any one from the following.

- [a] Explain conflict and view serializability with proper example.
- [b] Write a note on security and authorization in SQL.

[5M]

[5M]

Q.3]: Solve any one from the following.

- [a] Explain assertion and trigger with example.
- [b] Explain 2 phase locking protocol.

[5M]

[5M]

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Subject: P.COM

Date: 17/10/2013

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Q.1]: Attempt any 5 out of 6

- [A] Define modulation index [B] What is multiplexing and state the types.  
[C] What is ISI and how to overcome? [D] What is aliasing error. State Nyquist criteria  
[E] State the types of digital band pass modulation techniques  
[F] State the types of frequency modulation and state the Carson's rule to calculate bandwidth.

Q.2]: [A] Explain granular noise and slope overload and [B] Draw the block diagram to generate  
Frequency shift keying and to receive the same. [3M]

Q.3]: [A] Compare AM and FM systems. [5M]  
[B] A single tone FM is given by, [5M]  
 $V_{fm} = 10 \sin(16\pi \times 10^6 t + 20 \sin(2\pi \times 10^3 t))$  volts.  
Find the modulation index, modulating signal, frequency deviation, carrier frequency, and  
Power of FM signal by  $10 \Omega$  resistor.