

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,  
LONERE – RAIGAD – 402 103**

**Winter Semester Examination – December – 2018**

**Course: M. Tech. (Electronics Engineering)**

**Semester: I**

**Subject with Subject Code: Computational Methods (MTEEC101)**

**Marks: 60**

**Date: 24/12/2018**

**Time: 3 Hrs.**

**Instructions to the Students**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**(Marks)**

**Q.1.** a) Use Euler's method and its modified form to obtain  $y(0.2)$ ,  $y(0.4)$  and  $y(0.6)$  correct to three decimal places. Given that  $\frac{dy}{dt} = y - x^2$  and  $y(0)=1$ . **(06)**

b) What are the types of predictor corrector method? Explain any one in detail. **(06)**

**Q.2.** a) Discuss the various errors caused in performing numerical calculations. **(06)**

b) Find the value of  $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!}$  with an absolute error smaller than  $0.005$  for  $x=0.2000E_0$  and  $x=0.1276E_2$  using normalized floating point arithmetic with 4 digit mantissa. **(06)**

**Q.3.** a) Fit a curve of the type  $ae^{-bx}$  for the data given below **(06)**

x	0.25	0.5	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5
y	3.1	1.7	1.0	6.8	0.42	0.26	0.14	0.09	0.04	0.03

b) Explain Scatter diagram and fitting of straight line with the help of least squares method. **(06)**

**Q.4.** a) Give the Comparison of various Iterative methods. **(06)**

b) Find the root of equation  $x \sin x + \cos x = 0$  by false position method. **(06)**

**Q.5.** a) What are finite differences? Explain forward, backward and central difference. **(06)**

b) Solve the differential equation  $y' = x+y$  with  $y(0)=1$ ,  $x \in [0,1]$  by Taylor's series expansion to obtain  $y$  for  $x=0.1$ . **(06)**

Q.6. a) Given the following table of values

(06)

X	0.4	0.5	0.7	0.8
F(x)	-0.916	-0.693	-0.357	-0.223

Calculate the value of  $f(0.6)$  using Lagrange's interpolation

b) Evaluate the following equation using Trapezoidal rule, giving the answers to three decimal places

(06)

$$\int_0^1 \frac{2}{1+x^2} dx$$

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Winter Semester Examination – December – 2018**

**Branch: M.Tech. (Electronics Engineering)**  
**Subject with Subject Code:- Microelectronics (MTEEC102)**  
**Marks: 60**

**Semester: I**  
**Date: 27/12/2018**  
**Time: 3 Hrs.**

**Instructions to the Students**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

	(Marks)
<b>Q.1.</b> a) Draw and explain the MOS diffusion capacitance model.	(06)
b) Explain the operation of a tri state inverter.	(06)
<b>Q.2.</b> a) Explain photolithography process in CMOS fabrication.	(06)
b) Explain Gate and Source/Drain in formation in CMOS.	(06)
<b>Q.3.</b> a) What is layout design? What are its approaches? Explain.	(06)
b) Discuss CMOS process enhancements.	(06)
<b>Q.4.</b> a) What is design margin? Explain.	(06)
b) Explain RC delay model.	(06)
<b>Q.5.</b> a) Explain CMOS multiplexers.	(06)
b) Discuss static CMOS family.	(06)
<b>Q.6.</b> a) Explain BiCMOS circuits.	(06)
b) Explain CMOS inverter as an amplifier.	(06)

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,**  
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**Winter Semester Examination – December 2018**

Branch: M. Tech. (Specialization)

Semester: I

Subject with Subject Code: - VLSI System Design (MTEEC103)

Date:- 29-12-2018

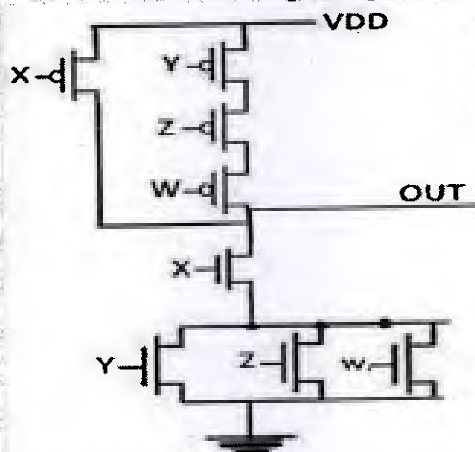
Marks: 60

Time: 3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

- Q.No.1 a) Write scalable design rules and layout design rules. (06)  
 b) Draw layout for NAND gate using CMOS transistors. (06)
- Q.No.2 a) Define noise margin. Explain low noise and high noise margin with transistor characteristics of CMOS inverter. (06)  
 b) What is structure of different cascade voltage switch logic (DCVSL)? Explain it and draw a schematic for two input AND/NAND gate in DCVSL. (06)
- Q.No.3 Explain different types of Latches: dynamic latch, multiplexed dynamic latch and quasi-static latch. (12)
- Q.No.4 a) Write down the out-put equation (OUT) for given stick diagram. (06)



- b) Compare design of 4:1 multiplexer using CMOS logic and switch logic. (06)
- Q.No.5 a) What is the condition to get equal rise and fall times in general (e.g. Inverter, NAND gate). (06)  
 b) Write different floorplanning methods and design process. (06)
- Q.No.6 a) Explain with neat diagram Register Transfer Design. (06)  
 b) Explain in detail memory cell and arrays (06)

**The End**

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**Winter Semester Examination –Dec 2018**

**Branch: M.Tech. (Electronics)**

**Subject: Medical Electronics**

**Date:- 1/1/2019**

**Marks: 60**

**Semester: I**

**Subject Code:- MTEEE114B**

**Time: 3 Hrs.**

**Instructions to the Students**

1. Figures to the right indicate the full marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram, etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**Q.1 Attempt any two**

(12)

- a) List the different diagnostic equipment? Explain any one diagnostic equipment.
- b) With neat sketch, explain diagram of the X –ray image intensifier?
- c) How the therapeutic equipment are classified? Explain any therapeutic equipment in detail?

**Q.2 Attempt any two**

(12)

- a) List the different surface electrodes and explain them in details.
- b) Explain the different electrodes used for ECG measurement?
- c) What are the voltage range ,frequency range used for ECG, EMG, and EEG signals.

**Q.3 Answer the following**

(12)

- a) What are different selection factors for transducers used for biomedical applications?
- b) Draw and explain the different temperature transducers in details?

**Q.4 Answer the following**

(12)

- a) Draw and explain block diagram of man instrument system?
- b) Draw and explain block diagram of EEG machine used for recording and plotting the EEG signals?

**Q.5 Answer the following**

(12)

- a) Draw and explain ECG signal in detail.
- b) Explain the operating principle of ultrasonic blood flow measurement along with neat diagram. Specify the transducer and operating frequency of measuring signal.

**Q.6. Answer the following**

(12)

- a) Comment on Macroshock and Microshock hazards
- b) What are the different electrical accident prevention methods used in medical equipments?

**\*\*\* End \*\*\***

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE - RAIGAD  
Winter Semester Examination - December - 2018

Branch: M.Tech. (Electronics Engineering) Semester: I  
Subject with Subject Code: Elective II (Embedded System Design), MTEEE125A  
Date: 03/01/2019 Marks: 60 Time: 03 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

(Marks)

- Q.1. a) What is the difference between big – endian and little - endian data representation? Explain the difference between Harvard and Von- Neuman architecture. (06)
- b) Write ARM based assembly language program to implement the equation.  $3X+8Y$  (06)
- Q.2. a) What is Bus Protocols? Explain a typical microprocessor bus. (06)
- b) What is switch bouncing? How you can eliminate this? (06)
- Q.3. a) what is compilation process? How you will compile Arithmetic Expression? (06)
- b) How you can control power consumption in embedded system? What are the factors that contribute to the energy consumption of the program. (06)
- Q.4. a) what is scheduling? How priority driven scheduling is carried out? (06)
- b) Explain the interprocessor communication mechanism provided by the operating system. (06)
- Q.5. a) what is performance analysis? Explain single threaded versus multithreaded Control of an accelerator. (06)
- b) What are the different types of interconnection networks for implementation of distributed embedded systems, explain it. (06)
- Q.6. a) Explain successive refinement design methodology for embedded systems. (06)
- b) What is systems – on – silicon? Explain with the help of example. (06)