

ADAMAS UNIVERSITY  
END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech

Semester: VI

Stream: ECE

Course Name: Computer Architecture & OS

Course Code: ECS43120

Maximum Marks: 40

Time duration: 3 Hours

Total No of questions: 08

Total No of Pages: 02

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

**Instruction to the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

**Answer all the Groups**

**Group A**

Answer all the questions of the following

**5 × 1 = 5**

1. a) What is a process?  
b) What is context switching?  
c) What is bounded waiting time?  
d) How many address bits are required for 512×4 memory?  
e) How many memory locations can be accessed with a 6-bit address bus?

**GROUP –B**

**(Short Answer Type Questions)**

Answer any three of the following

**3 × 5 = 15**

2. Explain “The Producer-Consumer Problem (Model)”? 5
3. Discuss about Unix architecture? 5
4. Using Booth’s multiplication algorithm multiply to number -4 and 6. 5
5. What is floating point arithmetic operation? Explain addition and subtraction operations with examples. 1+2+2=5

**GROUP –C**

**(Long Answer Type Questions)**

Answer any two of the following

**2 × 10 = 20**

6. a. Draw Gantt chart for non-preemptive shortest job first (SJF) scheduling the following processes.

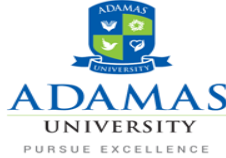
Process	Arrival Time	Burst Time
P1	1	7
P2	1	4
P3	1	3
P4	1	2

Calculate Average waiting time and turnaround time.

- b. Explain Critical Section Problem?

6+4=10

7. a. What are logical address and physical address?  
Represent 19 and -113 in an (i) 8 bit sign-magnitude and (ii) 8-bit 2's complement number representation system  
b. Which parameter decides the size of the Cache memory? 2+3+5=10
8. Write down the short note on (any two)
- a. Program Controlled I/O  
b. Interrupt Controlled Transfer  
c. Memory Segmentation 5+5=10
-



# ADAMAS UNIVERSITY

## SCHOOL OF ENGINEERING AND TECHNOLOGY

END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech.

SEMESTER-VI

Stream: ECE

PAPER NAME: VLSI SYSTEM DESIGN

PAPER CODE: EEC43102

Maximum Marks: 40

Time: 3 Hours

Total No of questions:08

Total No of Pages: 02

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### Instruction for the Candidate:

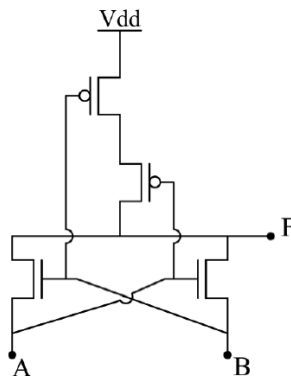
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
  2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
  3. Assumptions made if any, should be stated clearly at the beginning of your answer.
- 

### Answer all the Groups

#### Group – A

Answer all the questions of the following

1.  $5 \times 1 = 5$
- (a) In which process the gate oxide in a CMOS process is preferably is grown?
- (b) Which DRAM input buffer has the lowest power consumption and fastest in operation?
- (c) What are the main advantages of precharge-evaluate dynamic logic?
- (d) Why silicon is used for the wide spread in VLSI technology?
- (e) In the circuit shown A and B are the inputs and F is the output. What is the functionality of the circuit?



**Group – B**  
**(Short Answer Type Questions)**  
Answer *any three* of the following.

$3 \times 5 = 15$

2. Design and explain the operation of the following using Transmission gates:
- a) Half adder
  - b) 2 input XOR gate
- [3+2]
3. Find out an expression for dynamic power dissipation in CMOS.
- [5]
4. Describe the following in MOS structure
- a) Plasma induced gate oxide damage
  - b) Channel length modulation
- [3+2]
5. Describe the following in VLSI design
- a) flash memory
  - b) SRAM cell
- [2.5+2.5]

**Group – C**  
**(Long Answer Type Questions)**  
Answer *any two* of the following

$2 \times 10 = 20$

6. a) Draw and explain the operation of the SR latch circuit using CMOS.  
b) What do you mean by  $\lambda$ -Rule and  $\mu$ -Rule?
- [7+3]
7. a) Describe the charge sharing of CMOS circuits.  
b) Write down the working principle of 4 transistors DRAM cell.
- [5+5]
8. a) Design the AND/NAND gate using Differential Cascode Voltage Switch Logic (DCVSL).  
b) Design a domino logic which implement  $f=ABC+DEF$ .
- [5+5]



**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: B. Tech

Semester: VI

Stream: ECE

PAPER TITLE: Elective II (Mobile Communication)

PAPER CODE: EEC 43108

Maximum Marks: 40

Time duration: 3 Hours

Total No of questions: 08

Total No of Pages: 02

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**Instruction to the Candidate:**

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  3. Assumptions made if any, should be stated clearly at the beginning of your answer.
- 

***Answer all the Groups***

**Group A**

Answer all the questions of the following

**5 × 1 = 5**

1.
  - a) What is the necessity of IMEI and IMSI number in cellular communication system?
  - b) In US AMPS, 416 channels are allocated to various operators with 10 kHz guard band and channel between them is 30 kHz. What is the spectrum allocation given to each operator?
  - c) What is Grade of Service? Write down the expression of GOS.
  - d) Which of the following channel provides paging signals from base station to all mobiles in the cell?
  - e) What is the maximum data rate for the 802.11g standard?

**GROUP –B**

**(Short Answer Type Questions)**

Answer *any three* of the following

**3 × 5 = 15**

2.
  - a) What are the various types of control channel for mobile communication?
  - b) What is Half-rate and Full-rate traffic channels?
  - c) Compute the total time duration allotted for one TDMA frame. **[2+2+1]**
3.
  - a) How is data transfer handled in GPRS architecture?
  - b) How is data routing done and in what respect is it different from voice routing? **[3+2]**
4.
  - a) A geographical area of a cellular system is 4200 km<sup>2</sup>. A total of 1001 radio channels are available for handling traffic. Suppose the area of a cell is 12 km<sup>2</sup>.
    - i) How many times would the cluster of size 7 have to be replicated in order to cover the entire service area? Calculate the number of channels per cell and the system capacity.
    - ii) If the cluster size is decreased from 7 to 4, then does it result into increase in system capacity?
  - b) Mention the Uplink and Downlink frequencies allotted for GSM 900 frequency band.
  - c) What are Umbrella cells? **[2+2+1]**
5.
  - a) In the AMPS system, the system bandwidth is 12.5 MHz, the channel spacing is 30 KHz and the edge guard spacing is 10 KHz. The number of channels allocated for control signaling is 21. Find, i) the number of channels available for message transmission, ii) the spectral efficiency in FDMA.

- b) In cell splitting, prove that  $\frac{P_{t1}}{P_{t2}} = 12$  dB, for  $K=4$ . ( $K \rightarrow$  Path loss exponent,  $P_{t1}$  and  $P_{t2}$  be the transmitted power of the large base station and the medium cell base station.) [2+3]

### GROUP –C

#### (Long Answer Type Questions)

Answer *any two* of the following

**2 × 10 = 20**

6. a) What do you mean by fading? How does it effect on signal strength in GSM system?  
b) Determine the proper spatial sampling interval required to make small scale propagation measurements which assumes that consecutive sample are highly correlated with time. How many samples will be required over 20 m travel distance if  $f_c = 1800$  MHz,  $v = 60$  m/s. How long would it take to make these measurements? What is the Doppler spread  $B_D$  for the channel?  
c) Derive the expression relates the Doppler shift to the mobile velocity and the spatial angle between the direction of motion of the mobile and arrival of the wave. [1+3+3+3]
7. a) Derive an expression for mobile point to point propagation model to determine the received signal power.  
b) How does near-far effect influence CDMA system? What are the countermeasures available in CDMA systems?  
c) How does frequency reuse increase spectrum efficiency in a cellular system? [5+3+2]
8. Write short notes any two of the following: [2x5 = 10]  
a) Rayleigh Fading distribution  
b) Synchronous and asynchronous TDMA  
c) WLAN system architecture  
d) OFDM
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## ADAMAS UNIVERSITY

### END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech

Semester: VI

Stream : ECE

Paper Title : Electronic Measurement and Instrumentation

Paper Code: EEC43110

Maximum Marks : 40

Time duration: 3 hours

Total No of questions: 08

Total No of Pages: 02

#### Instruction for the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

#### Answer all the Groups

##### GROUP-A

Answer *all* the questions of the following

$5 \times 1 = 5$

1. a) What is the advantage of instrument transformers?  
b) Two equal voltages of same frequency applied to X and Y plates of CRO, produce a circle on the screen. What will be the phase difference between the two voltages?  
c) A voltage of 200V produces a deflection of  $90^\circ$  in a PMMC spring controlled instrument. If the same instrument is provided with gravity control, what would be the deflection?  
d) What is damping torque?  
e) What is the need of Meggar?

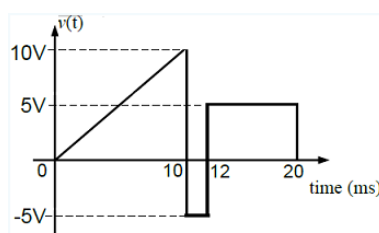
##### GROUP –B

##### (Short Answer Type Questions)

Answer *any three* of the following

$3 \times 5 = 15$

2. Derive the general equations for balance in AC bridges. Show that both magnitude and phase conditions need to be satisfied for balancing an AC bridge. [3+2=5]
3. A periodic time varying voltage is measured across a load by an oscilloscope having a waveform shown below. What is the value of the permanent magnet moving coil (PMMC) meter if it is connected across the load? [5]



4. A 0-25A ammeter has a guaranteed accuracy of 1 percent of full scale reading. The current measured by this instrument is 10A. Determine the limiting error in percentage. [5]

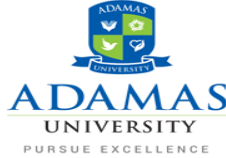
5. A coil of PMMC instrument has 60 turns, on a former that is 18 mm wide, the effective length of the conductor being 25 mm. It moves in a uniform field of flux density 0.5 Tesla. The control spring constant is  $1.5 \times 10^{-6}$  Nm/degree. Calculate the current required to produce a deflection of 100 degree. [5]

**GROUP –C**  
**(Long Answer Type Questions)**  
Answer *any two* of the following

**$2 \times 10 = 20$**

6. a) Explain the terms: i) Precision, ii) Sensitivity, iii) Reproducibility  
b) Define random errors and explain how they are analyzed statistically? [6+4=10]
7. a) Discuss the advantages and Disadvantages of Maxwell's bridge for measurement of unknown inductance.  
b) The four arms of a bridge supplied from a sinusoidal source are configured as follows:  
Arm AB: A resistance of  $100\Omega$  in parallel with a capacitance of  $0.5\mu\text{F}$   
Arm BC: A  $200\Omega$  noninductive resistance  
Arm CD: A  $800\Omega$  noninductive resistance  
Arm DA: A resistance R in series with a  $1\mu\text{F}$  capacitance  
Determine the value of R and frequency at which the bridge will balance.  
Supply is given between terminal A and C and the detector is connected between nodes B and D. [4+6=10]
8. a) What is meant by the deflection factor and deflection sensitivity of a CRO? What is aquadag?  
b) An electrically deflected CRT has a final anode voltage of 2000V and parallel deflecting plates 1.5 cm long and 5 mm apart. If the screen is 50 cm from the center of deflecting plates, find (i) beam speed, (ii) the deflection sensitivity of the tube and (iii) the deflection factor of the tube. [5+5=10]
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# ADAMAS UNIVERSITY

## SCHOOL OF ENGINEERING AND TECHNOLOGY

END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech.

SEMESTER-VI

Stream: ECE

PAPER NAME: Elective-III (Fiber Optics Technology)

PAPER CODE: EEC43112

Maximum Marks: 40

Time: 3 Hours

Total No of questions:08

Total No of Pages: 02

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### Instruction for the Candidate:

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### Answer all the Groups

#### Group – A

Answer all the questions of the following

1.  $5 \times 1 = 5$
- (a) Why Scattering is occurred in an optical fiber?
  - (b) Write down Urbach rule.
  - (c) What do you mean by ZBLAN?
  - (d) Which material is used in plastic fibers?
  - (e) When Brillouin Scattering is happened in an optical fiber?

#### Group – B

#### (Short Answer Type Questions)

Answer *any three* of the following.

- $3 \times 5 = 15$
2. A typical relative r.i. difference for an optical fiber designed for long distance transmission is 15%. Estimate NA and the solid acceptance angle in air for the fiber when the core index is 1.46. Further calculate the critical angle at the core-cladding interface within the fiber. [5]
  3. Drive the expression of power radiated in solid angle in an optical fiber. [5]
  4. Discuss about the propagation mechanism and conditions of light in an optical fiber. [5]

5. A Si optical fiber with a core diameter large enough to be considered by ray theory analysis has a core r.i. of 1.5 and cladding r.i. of 1.48.

a) Determine the critical angle at the core-cladding interface

b) The NA for the fiber

c) The acceptance angle in air for the fiber.

[2+2+1]

### Group – C

#### (Long Answer Type Questions)

Answer *any two* of the following

6 Drive the mathematical expression of NA and acceptance angle.

$2 \times 10 = 20$

[5+5]

7. a) What is V-parameter?

b) Calculate V-number in terms of NA.

c) In which type of optical fiber are free from waveguide dispersion and why?

[2+5+3]

8. Discuss about the waveguide dispersion of light in an optical fiber.

[10]



**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program	: B.Tech	Semester	: VI
Stream	: ECE		
Paper Title	: Optical Communication	Paper Code	: EEC61117
Maximum Marks	: 40	Time duration	: 3 Hours
Total No of questions	: 08	Total No of Pages	: 02

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**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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  3. Assumptions made if any, should be stated clearly at the beginning of your answer.
- 

***Answer all the Groups***

**GROUP-A**

Answer ***all*** the questions of the following

**5×1 = 5**

1. a) Define refractive index of any material.  
b) What do you mean by graded index optical fiber?  
c) What is SONET?  
d) Name one semiconductor material that is used to fabricate LEDs.  
e) What do you mean by wavelength for zero dispersion?

**GROUP –B**

**(Short Answer Type Questions)**

Answer ***any three*** of the following

**3×5 = 15**

2. What is the advantage of using optical fiber as a communication medium? What are the limitations of it? [5]
3. What do you mean by optical window? Along with proper plots explain the reason behind choosing different optical windows. [5]
4. Draw the basic block layout of SONET layers in comparison to the OSI layers. Discuss each of them. [2+3]
5. What is quantum efficiency for an optical detector? Prove that for 100% quantum efficiency responsivity is directly proportional to wavelength. [2+3]

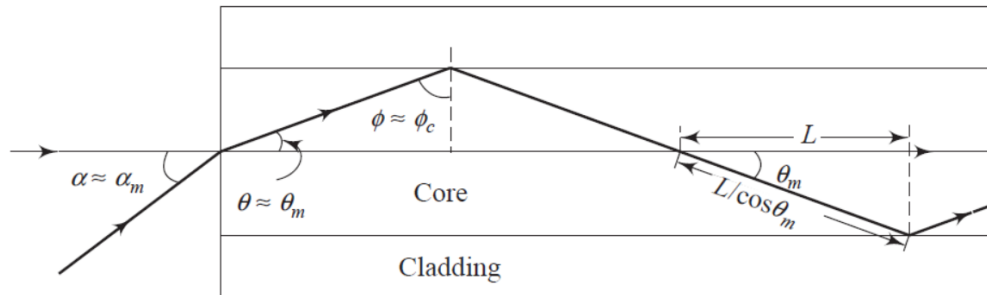
**GROUP –C**  
**(Long Answer Type Questions)**  
Answer *any two* of the following

**2×10 = 20**

6. a) Explain Snell's law along with proper diagram. What do you mean by total internal reflection?

[2+2]

b)



If the step-index fiber shown in the above figure has a core of refractive index 1.5, a cladding of refractive index 1.48, and a core diameter of 100  $\mu\text{m}$ , calculate, assuming that the fiber is kept in air, the

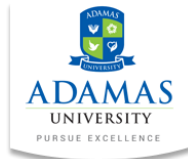
(i) NA of the fiber

(ii) angles  $\alpha_m$ ,  $\theta_m$ , and  $\phi_c$

(ii) pulse broadening per unit length ( $\Delta T/L$ ) due to multipath dispersion.

[1+3+2=6]

7. a) Discuss the three major factors that determine continuous length of an optical fiber along a communication link. [3]
- b) Explain how Fresnel reflection is responsible for fiber connection loss. [3]
- c) Two compatible multimode SI fibers are jointed with a small air gap. The fiber axes and end faces are perfectly aligned. Determine the refractive index of the fiber core if the joint is showing a loss of 0.47 dB. [4]
8. What do you mean by multipath time dispersion? With proper illustration derive the expression for pulse broadening per unit length due to multipath time dispersion. [2+8]



**ADAMAS UNIVERSITY**  
School of Engineering and Technology  
**END-TERM EXAMINATION (July 2020)**  
Department of CSE/ME/ECE/EE  
B. Tech  
3<sup>rd</sup> Year  
Semester – VI

**Maximum Marks:** 40  
**Name of Paper:** Management I  
**Total No. of Questions:** 14

**Times:** 3 Hours  
**Paper Code:** MBA43144  
**Total No. of Pages:** 1

**Section A**

**Write Short Notes on the followings:**

**5 x 2 Marks = 10 Marks**

- |                |              |               |
|----------------|--------------|---------------|
| 1. Management  | 2. Directing | 3. Efficiency |
| 4. Forecasting | 5. Six Sigma |               |

**Section B**

**Answer any Five**

**5 x 4 Marks = 20 Marks**

6. What do you mean by Planning? Discuss in brief different types of plans.
7. Explain the concept of Management by Objectives (MBO).
8. What do you mean by Control? Discuss in brief the control process.
9. Explain the concept of Total Quality Management.
10. What do you mean by Material Management? Discuss in brief the objectives of Material Management.
11. Discuss in brief the motivation theory of X and Y.
12. From the below information calculate Re-Order Level, Minimum Level and Maximum Level:

	A	B
Maximum Consumption per week (in units)	250	250
Average Consumption per week (in Units)	175	175
Minimum Consumption per week (in units)	100	100
Re-order period in weeks	8 to 12	4 to 8
Re-order qty (in units)	300	500

**Section C**

**Answer any One**

**1 x 10 Marks = 10 marks**

13. What do you mean by Scientific Management? Discuss the principles of Scientific Management. Also discuss in brief the different experiments conducted by the initial authors in this school of thoughts.
14. Describe the concept of Industrial Management. Also discuss the importance and problems of Industrial Management.