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B.E. IV (ECE)
9

Roll No. 20UECC8905

Adv. Comm. Sys.

FINAL B.E. Examination 2023

(ECE / ECC / EEE)

(VII SEMESTER CBCS)

EC - 403 A: ADVANCE COMMUNICATION SYSTEMS
(ECE / ECC / EEE)

Time - Three Hours
Maximum Marks - 100

Note:(1) Attempt any FIVE questions.
(2) Answer should be to the point.
(3) All questions carry equal marks.

1. (a) What contitutes a short-haul microwave system and long-haul microwave system? Explain. 10

(b) What is troposcatter communication? Explain the working principle with the help of suitable diagram. 10

2. (a) Explain the different types of diversity techniques used in microwave communication systems. 10

(b) What are the orbital parameters required to determine a satellite's orbit? Name and explain them. 10

(Contd.)

3. (a) Briefly explain about a satellite, what is a passive and an active satellite? Contrast non-synchronous and synchronous satellite. 10

(b) Explain, what is Angle of Elevation and Azimuth angle? 5

(c) Describe a footprint in reference to satellite communication. 5

4. (a) What is the structure of an optical fiber explain? Give advantages of optical fiber over metellic cables. 10

(b) What is the difference between single mode and multimode fiber? Find the numerical aperture NA and Core radius of the fiber for a single mode fiber operating at 1300 nm with $\eta_{core} = 1.5$ and $\eta_{clad} = 1.45$ 10

5. (a) What is optical Amplifier? Write down the types of optical amplifiers and explain the working principal in brief with suitable diagram. 10

(b) What are the advantages and disadvantages of LASER diode? Explain the principle of working of LASER diode. Name the pumping techniques used in LASER diode. 10

6. (a) What is the difference between step index fiber and graded index fiber? How does the ray of light propagate in a graded index fiber? 10

(b) Define the Critical angle, acceptance angle and acceptance cone and numerical aperture for a fiber cable. 6

(c) What are the important characteristics of light detectors. 4

7 Write short notes on any two :- 10+10=20

(i) Splicing techniques

(ii) Losses in optical fiber

(iii) Optical Couplers.

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Roll No. 20.V.E.C.S.8.0.5

BE IV (ECE)

9 Engg. Mgt. & Eco.

FINAL B.E. EXAMINATION, 2023
((ECE / ECC / EEE)
(VII SEMESTER CBCS)

EC 408 A: ENGINEERING MANAGEMENT & ECONOMICS

(EC/EEE/ECC)

Time – Three Hours
Maximum Marks – 100

Note: (i) Attempt any **Five** questions.
(ii) Answer should be to the point.
(iii) All questions carry equal marks.

1. Define Management. What are the various functions of management? Differentiate between Management & Administration. (2+12+6)
2. What do you understand by change Management? Explain in detail the "ADKAR" Model for implementation of change in an organisation. How authority differs from responsibility?(4+12+4)
3. Explain in brief the various types of organisations listing their merits and demerits. Describe importance of communication and barriers to it. (12 + 8)

4. Write short Notes on any two of the following:
   a) Leadership
   b) Motivation
   c) SWOT Analysis
   d) Industry Life Cycle (10 +10)

5. Explain the meaning of Break Even Point (BEP). Draw Chart and show BEP and various elements of cost on it. Find out the following for a company with Fixed Cost (FC) Rs 10,00,000, variable cost per unit as Rs 100 and selling price per unit Rs 150.
   a) Break Even quantity
   b) Break Even Sales
   c) Contribution if actual production Quantity is 1,00,000.

(10+10)

6. What do you understand by Inventory control? Explain Economic order quantity. Briefly describe A-B-C Analysis technique of inventory control. How Quality control differs from Quality Assurance. (2+3+12+3)

7. Briefly explain Job, Batch & Mass Production. What is Productivity? List various forms of Business Ownership. What is Monopoly and free Competition market? (10+2+4+4)

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BE IV (ECC)
11

Roll No. 20UECC8003....

Parl. Proc. Tech.

FINAL B.E. EXAMINATION, 2023
(ELECTRONICS & COMPUTER ENGINEERING)
(VII SEMESTER CBCS)
ECC-404 A: PARALLEL PROCESSING TECHNOLOGY

Time – Three Hours
Maximum Marks – 100

Note: (i) Attempt any **Five** questions.
(ii) Answer should be to the point.
(iii) All questions carry equal marks.

1. (i) What is pipelining? Explain its various types according to functionality. 10

(ii) What do you mean by pipeline hazads? Explain any two hazads with suitable examples. 10

2. (i) What do you mean by CPU performance? Explain in terms of clock speed, cache size and no. of cores. 10

(ii) How is CPU performance impacted by the instruction set and compiler technology? Explain. 10

3. Define the concept of parallel computing with advantages and disadvantages? Explain Flynn's classification of computing systems with a suitable example. 20

4. (i) Explain SIMD architecture? Also differentiate between fine-grained and Coarse-Crained SIMD architecturs. 10

(ii) A non-pipelined system takes 50 ns to process a task. The same task can be processed in a six-segment pipeline with a clock cycle of 10 ns. Determine the speed up ratio of the pipeline for 100 tasks. What is the maximum Speedup that can be achieved? 10

Cont.

5. (i) A block-set associative cache memory consists of 128 blocks divided into four block sets. The main memory consists of 16,384 blocks and each block contains 256 eight bit words.
   (A) How many bits are required for addressing the main memory?
   (B) How many bits are needed to represent the TAG, SET and WORD Fields? 10

   (ii) Define branch prediction in pipelining. Explain any two techniques for branch prediction. 10

6. (a) What do you mean by cache memory and cache mapping? Explain various techniques to perform cache mapping. 10

   (b) What do you mean by multiprocessor architecture? Differentiate between loosely coupled and tightly coupled multiprocessor. 10

7. Write short notes on: 4x5=20
   (i) RISC Versus CISC architectures
   (ii) Multiprocessing, Multiprogramming and Multitasking
   (iii) Parallelism versus Pipelining
   (iv) Vector processor versus array processor.

8. Write short notes on: 2x10=20
   (i) Role of Translation lookaside buffer (TLB)
   (ii) Techniques for improving the performance of cache memory.

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Roll No. .....

BE IV (ECC)
11

VLSI Dsgn. Tech.

FINAL B.E. EXAMINATION, 2023
(ELECTRONICS & COMPUTER ENGINEERING)
(VII SEMESTER CBCS)

ECC-401 A: VLSI DESIGN TECHNIQUIES

Time – Three Hours
Maximum Marks – 100

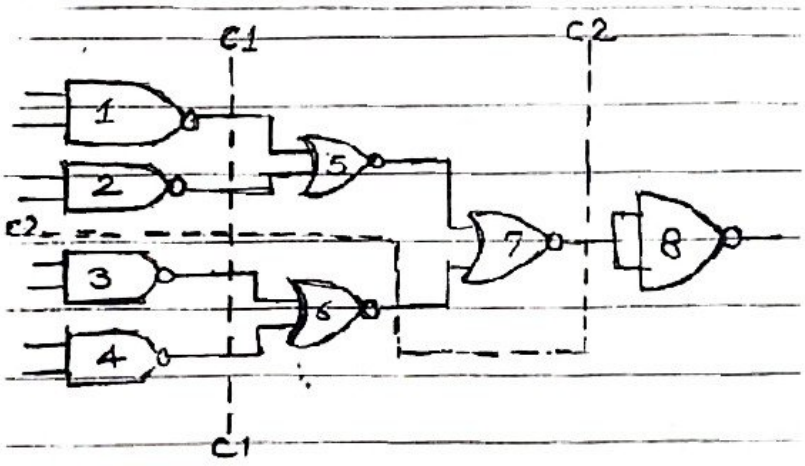
Note: (i) Attempt any **Five** questions.
(ii) Answer should be to the point.
(iii) All questions carry equal marks.

1. (a) Describe the layout approaches used to generate physical representation of circuits with their classification in full and semi custom lay out approaches. 10

(b) Explain VISI layout and its design steps. Take a suitable example and draw necessary diagrams. 10

2. (a) Discuss the role of `partision' in VISI. State types of partition algorithms and compare them. 10

(b) For the circuit given below two partition lines are C1 and C2. Draw it's I/O pin termination diagram using partision cutline C1 and C2. Also indicate how many off-chip will be there in C1 & C2 cases. 10



3. Explain the following in context with "floor planning". 5X4=20
   (i) Wire length, estimation
   (ii) Slicing and non slicing problem
   (iii) Polar representation
   (iv) Stockmeyer Algorithm.

4. (a) Five rigid blocks with dimensions are given below. Draw the possible feasible floor planes for them. 8

Module	Width	Height
1	1	1
2	1	1
3	2	1
4	1	2
5	1	3

   (b) Discuss the role of timing and congestion consideration in 'Placement'. 6

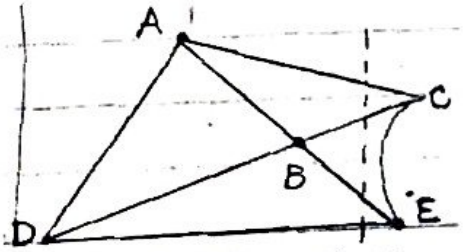
   (c) Explain Hall's quadratics. 6

5. (a) Explain Yoshimura and Kuth methods in routing and critically compare them. 10

   (b) Write down problems associated with channel routing and explain spanning forest problem in detail. 10

6. (a) Explain liburary Bindings and its algorithms. 10

   (b) For the fig. given below apply fiduccia-mattheyes algorithm and draw the gain bucket data structure using partition -base problem. 10



7. Write down short notes on [ANY TWO] 10x2=20
   (a) ASIC and SoC
   (b) hMETIS algorithm
   (c) Multi-level partitioning
   (d) Global & specialized routing

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BE IV (ECC)
11

Telematics

FINAL B.E. EXAMINATION, 2023
(ELECTRONICS & COMPUTER ENGINEERING)
(VII SEMESTER CBCS)
ECC-424 A: CORE ELECTIVE I: TELEMATICS

Time – Three Hours
Maximum Marks – 100

Note: (i) Attempt any **Five** questions.
(ii) Answer should be to the point.
(iii) All questions carry equal marks.

1. (a) What do you mean by the stored program control? Explain different levels of processing used in exchange control functions using distributed SPC. 10

(b) Explain the basic principle of operation of time division space switching. With the help of a diagram, explain the working of output controlled time division space switch. 4+6=10

2. (a) Explain with the help of a block diagram, how does a random input - random output control time division time switch work? 10

(b) What are different modes of operation of a time division time switch? Explain. 10

3. (a) What do you understand by time slot interchange? Explain the working of a TSI switch with the help of diagram. 10

(b) What are expanding and concentrating switches? Explain the different ways in which these switches can be configured. 10

4. (a) Draw functional block diagram of an STS switch and explain its working. 7

Cont.

(b) Compare on the traffic STS switch with a TST switch on the basis of cost, complexity and traffic handling capacity. 6

(c) Derive an expression for blocking probability and implementation complexity of an STS switch using Lee's graph. 7

5. Explain the following with reference to ATM 4x5=20

(a) Services specified by ATM forum.

(b) Switch architecture and operation.

(c) Header structure.

(d) Types of ATM adaptation layers.

6. (a) What do you understand by ISDN? Describe the main interfaces available with ISDN. 2+8=10

(b) Explain frame relay protocol data unit. How congestion control is achieved in frame relay networks? Explain. 5+5=10

7. Write short notes on (ANY FOUR) :- 4x5=20

(a) Common channel signalling

(b) Packet switching.

(c) Synchronous Digital Hierarchy

(d) Broad band ISDN

(e) Approaches for synchronizing a digital telecommunication network.

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Roll No. .....

BE IV (ECC)

11 Dsgn of Oper. Syst.

FINAL B.E. EXAMINATION, 2023
(ELECTRONICS & COMPUTER ENGINEERING)
(VII SEMESTER CBCS)
ECC-402 A: DESIGN OF OPERATING SYSTEMS

Time – Three Hours

Maximum Marks – 100

Note: (i) Attempt any **Five** questions.
(ii) Answer should be to the point.
(iii) All questions carry equal marks.

1. (a) Discuss different types of operating system. 10

(b) Suppose two processes enter the ready queue with the following properties: Process 1 has a total of 8 units of work to perform, but after every 2 units of work, it must perform 1 unit of I/O (so the minimum completion time of this process is 12 units). Assume that there is no work to be done following the last I/O operation. Process 2 has a total of 20 units of work to perform. This process arrives just behind P1. Show the resulting schedule for the round-robin algorithms. Assume a time slice of 4 units of RR. What is the completion time of each process? 10

2. (a) Explain FCFS scheduling algorithm. Find the average turnaround time and average waiting time for the processes given in the table below.

Process	CPU burst time(in ms)
P1	24
P2	3
P3	3

10

(b) A system contains 10 units of resource class **R**. The resource requirements of three user processes P1, P2 and P3 are as follows:

	P1	P2	P3
Maximum requirements	8	7	5
Current allocation	3	1	3
Balance requirements	5	6	2
New request made by P1	1	0	0

Using Banker's algorithm, determine if the projected allocation state is safe and whether the request of P1 will be granted or not. 10

3. (a) Describe the necessary conditions for Deadlock. 10

(b) What are semaphores? How it can be used to implement mutual exclusion? 10

4. (a) Given memory partitions of 100k, 500k, 200k, 300k, and 600k (in order), apply first fit and best fit algorithms to place processes with the space requirement of 212k, 417k, 112k and 426k (in order)? Which algorithm makes the most effective use of memory? 10

(b) Explain variable-partition contiguous storage allocation. 10

5. (a) Explain the differences between: 10

(i) Logical and physical address space.

(ii) Internal and external fragmentation.

(b) Explain with the help of examples LRU page replacement algorithms? 10

6. (a) Consider the situation in which the disk read/write head is

Cont.

currently located at track 45 (of tracks 0-255) and moving in the positive direction. Assume that the following track requests have been made in this order: 40, 67, 11, 240, 87. What is the order in which optimized C-SCAN would service these requests and what is the total seek distance? 10

(b) Describe the scheme of capability lists to implement protection in OS? Explain the techniques used for protection of user files. 10

7. Write short note on the following: 5x4=20

(a) C-LOOK algorithm

(b) I/O hardware polling

(c) Non-preemptive CPU Scheduling Algorithm

(d) Critical section problem