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R-11 / R-13

Code: 1G431

II B.Tech. I Semester Supplementary Examinations May 2019

Digital Logic Design and Computer Organization

(Information Technology)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)

- 1. a) List out differences between Multiprocessors and Multi computers. 6M
b) I. Convert to Binary:
 i) $(12A4)_{16}$ ii) $(1724)_8$ iii) $(101)_{10}$
 II. Convert to Hexadecimal:
 iv) $(0101011)_2$ (v) $(612)_8$ 8M

- 2. a) Implement the following Boolean function F using no more than two NOR - gates and draw the circuit.
 $F(A,B,C,D) = \sum(0, 1, 2, 9, 11) + d(8, 10, 14, 15)$ 7M
b) Obtain the complement of the following Boolean expressions:
 i. $A'B + A'BC' + A'BCD + A'BC'D'E$
 ii. $ABEF + ABE'F' + A'B'EF.$ 7M

- 3. a) Design a 4-bit ring counter using T-flip flops and draw the circuit diagram and timing diagrams. 7M
b) With logic diagram explain how a Demultiplexer can be obtained from a Decoder. 7M

- 4. a) Explain the hardware algorithm to perform multiplication of two binary numbers with help of a flow chart. Multiply 10111 with 10011 with the above procedure given. Show all the registers content for each step. 7M
b) Explain Arithmetic subtraction with an example. 7M

- 5. a) Explain various phases of Instruction Cycle. 7M
b) Explain different addressing modes with suitable examples. 7M

- 6. a) With an example explain microprogrammed control unit. 7M
b) What are the two different ways to construct a common bus structure and explain each with a neat sketch? 7M

- 7. a) Explain about performance considerations in memory system. 7M
b) Write the concept of virtual memory and explain the page replacement algorithms in virtual memory. 7M

- 8. a) (i) What is Direct Memory Access? Explain the working of DMA.
 (ii) What are the different kinds of DMA transfers? Explain. 7M
b) What are the different modes of data transfer? Explain each mode in detail. 7M

Hall Ticket Number :

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R-11 / R-13

Code: 1G334

II B.Tech. I Semester Supplementary Examinations May 2019

Electronic Devices and Circuits

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Distinguish between Zener Break down and Avalanche Break down.
b) Draw the Zener diode V-I characteristics. Explain how Zener diode provides a constant output voltage.
2. a) Draw the circuit diagram of Half-Wave rectifier and explain its operation
b) List out the differences between Half wave and Full wave rectifier
3. a) Derive the relationship between i_{ac} and i_{dc} .
b) Construct Common Emitter configuration and derive Output characteristics
4. a) Write short notes on
 - i) Thermal resistance
 - ii) Heat sink.
b) What are the advantages of self-bias over fixed bias?
5. a) With neat sketches, necessary equations explain the drain & transfer characteristics of MOSFET in enhancement mode.
b) Establish a relation between the three JFET parameters, μ , r_d and g_m .
6. a) Define an amplifier? List various types of Amplifiers?
b) Draw the small signal h-parameter model for CE, CB configurations.
7. a) Explain about voltage series and current series feedback.
b) Draw and explain voltage series feedback.
8. a) With a neat circuit diagram explain the working of RC phase shift oscillator
b) Distinguish between Hartley and colpitts oscillator

Code: 1G133

II B.Tech. I Semester Supplementary Examinations May 2019

Mathematical Foundations of Computer Science

(Common to CSE & IT)

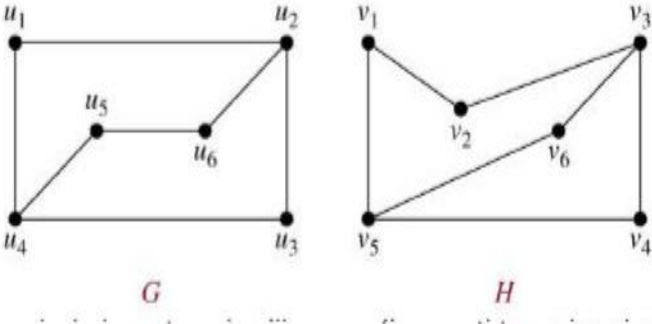
Max. Marks: 70

Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks** each)

1. a) List out the different types of connectives and explain with truth tables.
b) Construct the truth table for the following statement formula:
 $(P \vee Q) \vee (\neg P \wedge R) \vee (Q \wedge R) \quad (\neg P \vee Q)$
2. a) Show that **$R \vee S$** can be derived from the premises **$P \vee (Q \wedge S), \neg R \vee P, Q$**
b) State and explain automatic theorem proving.
3. a) Explain properties of binary relations in a set with examples.
b) Explain representation of relation.
4. a) On the set Q of all rational numbers, the operation $*$ is defined by $a*b = a+b-ab$. Show that, under this operation, Q forms a commutative monoid.
b) Prove that the intersection of two submonoids of a monoid is a monoid.
5. a) Define the following with examples:
i) Sum rule
ii) Product rule
b) State and explain pigeon hole principle with an example.
6. Solve the recurrence relation $a_n + 2a_{n-1} - 3a_{n-2} = 4n^2 - 5$ for $n \geq 2$, given that $a_0 = 0$ and $a_1 = 1$.
7. a) Define a Graph and Explain the different types of representing a Graph.
b) Define the following with examples:
i) Indegree
ii) Out degree
iii) Isolated vertex
iv) Null graph

8. a) Find whether the following graphs are isomorphic or not.



b) Prove that if G is a connected plane graph then $|V| - |E| + |R| = 2$
