Hall Ticket Number :										

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)

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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 α_{ac} and β_{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

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Hall Ticket Number :										

R-11 / R-13

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)

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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^Q)v(~P^R)v(Q^R) ↔(~PvQ)

2. a) Show that **R →S** can be derived from the premises **P → (Q →S), ¬RVP, 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.

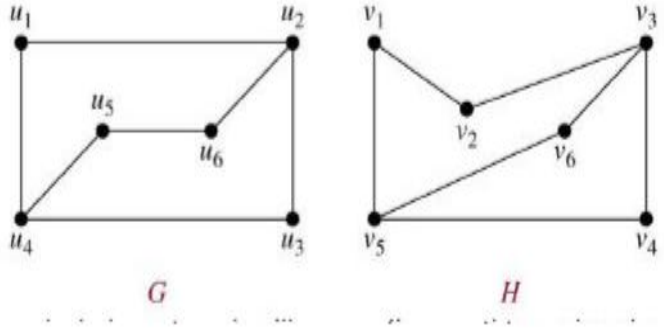
4. a) On the set Q of all relational numbers, the operation * is defined by a*b =a+b-ab. Show that, under this operation, Q forms a commutative monoid.
   b) Prove that the intersection of two submonoids of a monoid is a monoid.

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 verex
      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

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC33

II B.Tech. I Semester Supplementary Examinations May 2019

Probability & Statistics

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

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

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1. a) Find the mean, median and mode for the following distribution.

x	15	20	25	30	35	40	45	50	55
y	2	22	19	14	3	4	6	1	1

6M

b) Find the rank correlation coefficient for the following data

x	5	2	8	1	4	6	3	7
y	4	5	7	3	2	8	1	6

8M

2. a) Box A contain 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If marble is drawn from each box, what is the probability that they are both of same colour. 7M

b) State and prove Baye's theorem. 7M

3. a) A random variable X has the following probability distribution

X	1	2	3	4	5	6	7	8
P(X)	K	2K	3K	4K	5K	6K	7K	8K

Find K and $P(2 \le X \le 5)$. 7M

b) If a random variable has the probability density function

$$f(x) = \begin{cases} k\left(x^2 - 1\right), & -1 \le x \le 3 \\ 0, & \text{elsewhere} \end{cases}$$ find k and $P\left(\frac{1}{2} \le x \le \frac{5}{2}\right)$. 7M

4. a) If a Poisson distribution is such that $P(X = 1).\frac{3}{2} = P(X = 3)$, find $P(X \ge 1)$ and $P(X \le 3)$. 7M

b) In a Normal Distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution. 7M

5. A population consists of five numbers 2, 3, 6, 8, 11. Consider all samples of size two which can be drawn without replacement from this population.

Find (a) Population mean

(b) Population Standard deviation

(c) Mean of the sampling distribution of means

(d) Standard deviation of the sampling distribution of means. 14M

6. a) A random sample of size 100 has a standard deviation of 5. What can you say about the maximum error with 95% confidence? 7M

b) A sample of 11 rats from a central population had an average blood viscosity of 3.92 with a standard deviation of 0.61. Estimate the 95% confidence limits for the mean blood viscosity of the population. 7M

7. a) An ambulance service claims that it takes on the average less than 10 minutes to reach its destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and the variance of 16 minutes. Test the claim at 0.05 level of significance. 7M

   b) An average breaking strength of steel rods is specified to be 18.5 thousand pounds. To test this sample of 14 rods were tested. The mean and standard deviations obtained were 17.85 and 1.955 respectively. Is the result of experiment significant? 7M

8. From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees.

Employees			
Soft Drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumsup	15	30	65
Fanta	50	60	30

14M

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