

Microwave Engineering*(Electronics & Communication Engineering)***Max. Marks: 70****Time: 03 Hours**

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) What is the range of Microwave Spectrum? What are various bands in the spectrum? Write the applications of each band. 7M
- b) Show that the TM_{01} and TM_{10} modes in rectangular waveguides do not exist. 7M
2. a) What is a circular waveguide? In what way, it is superior to rectangular waveguide? Derive an expression for the cutoff frequency for the TE mode in a circular waveguide. 7M
- b) An air filled circular waveguide is to be operated at 6 GHz and is to have dimensions such that $f_c = 0.8f$ for the dominant mode. Determine the diameter of the guide, and guide wavelength λ_g . 7M
3. a) With a neat sketch, explain the working principle of Magic Tee. Explain any one application of Magic Tee in detail. 7M
- b) Obtain the S-matrix of a two hole directional coupler. 7M
4. a) What are ferrites? What is their importance in microwave engineering? With a neat sketch, explain the operation of a circulator. 7M
- b) What is coupling? Why is it needed? What are various types of waveguide couplings? Explain them in brief. 7M
5. a) Why conventional tubes at microwave frequencies? Explain the reasons and remedies in detail. 7M
- b) With a neat sketch, explain the working principle of Reflex Klystron. What is Applegate Diagram? What is the information obtained from this diagram? 7M
6. a) Derive an expression for the Hull cutoff magnetic field in a magnetron. 7M
- b) Write a short note on slow wave structures. 7M
7. a) Explain the Ridley-Watkins – Hilsum Theory in detail. How is this theory used in the Gunn Diode? 7M
- b) With a neat sketch, explain the working principle of IMPATT diode 7M
8. a) What are the components of a typical microwave bench setup? Explain the function of each block. 7M
- b) Explain how VSWR is measured using a microwave bench? 7M

III B.Tech. II Semester Regular Examinations, May 2015

VLSI Design*(Electronics & Communication Engineering)***Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

1. With neat sketches explain oxidation process in IC fabrication. 14M
2. a) What is the working principle of MOS transistors? 5M
b) Draw the physical structure of a NMOS transistor. What is meant by depletion mode and enhancement mode operations of a MOSFET? Write the expression of threshold voltage and explain about each parameter in it. 9M
3. Draw the CMOS inverter, its physical lay out with its stick diagram. 14M
4. a) What are the sources of capacitance that contribute to the overall wiring capacitance? Explain. 7M
b) Define fan-in and fan-out. Explain their effects on propagation delay. 7M
5. a) Discuss about the tradeoff between power-delay in optimizing a good design of an IC. 7M
b) Draw the schematic and logic diagram for a zero/one detect system and explain its working. 7M
6. a) What are deferent classes of programmable CMOS devices? Explain them brief. 7M
b) What is the basis for standard-cell? Explain standard cell based design. 7M
7. a) Write about timing analysis and optimization of IC design. 7M
b) Explain with an example how timing analysis differ from simulation. 7M
8. a) Explain the gate level and function level of testing. 6M
b) Explain different fault models in detail. 4M
c) Compare functionality test and manufacturing test. 4M

Digital and Data Communications
(Electronics & Communication Engineering)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Explain A-law and μ -law 8M
 b) For a compressor with a $\mu = 255$, determine
 - i. The voltage gain for the following relative values of V_{in} : V_{max} , $0.75 V_{max}$, $0.5 V_{max}$, and $0.25 V_{max}$.
 - ii. The compressed output voltage for a maximum input voltage of 4 V.
 - iii. Input and output dynamic ranges and compression. 6M
2. a) Indicate for the BPSK
 - i) truth table, ii) phasor diagram,
 - iii) constellation diagram, and iv) time domain waveforms. 8M
 b) For a BPSK modulator with a carrier frequency of 70 MHz and an input bit rate of 10 Mbps, determine the maximum and minimum upper and lower side frequencies, draw the output spectrum, determine the minimum Nyquist bandwidth, and calculate the baud. 6M
3. a) Discuss QAM error performance. 8M
 b) Determine the minimum bandwidth required to achieve a $P(e)$ of 10^{-7} for an 8-PSK system operating at 10 Mbps with a carrier-to-noise power ratio of 11.7 dB. 6M
4. a) Derive information capacity law. 8M
 b) Draw bandwidth-efficiency diagram and indicate Shannon limit and capacity boundary. 6M
5. a) Explain CRC-16. 8M
 b) Determine the BCS for the following data and CRC generating polynomials:
 Data $G(x) = x^7 + x^5 + x^4 + x^2 + x^1 + x^0 = 10110111$
 CRC $P(x) = x^5 + x^4 + x^1 + x^0 = 110011$ 6M
6. a) Discuss connection-oriented and connectionless protocols. 6M
 b) Explain data network topologies. 8M
7. a) Discuss data communication circuits using POTS. 7M
 b) Draw neatly UART transmitter block diagram 7M
8. a) Compare the features of circuit and packet switching. 5M
 b) Explain any three packet switching networks. 9M

Electronic Measurements and Instrumentation
(ECE)

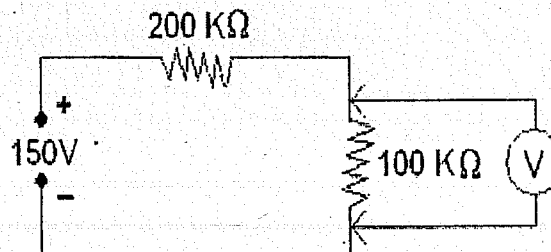
Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Explain about the construction and principle of operation of PMMC instrument. 9M
- b) Write advantages of PMMC instrument. 5M
2. a) Write short notes on multirange DC voltmeter 5M
- b) It is desired to measure the voltage across the $100\text{ K}\Omega$ resistor in the circuit given below. Two voltmeters are available for this measurement: Voltmeter 1 with a sensitivity of $1,000\ \Omega/\text{V}$ and voltmeter 2 with a sensitivity of $20,000\ \Omega/\text{V}$. Both meters are used on their 50 V range. Calculate (i) The reading of each meter.
(ii) Error in each reading, expressed as a percentage of the true value.



3. a) Explain the principle and working of Spectrum analyser with necessary block diagram. 9M
- b) Write the differences between wave analyzer and harmonic distortion analyzer. 8M
4. a) Explain the features and functionality of CRO. 6M
- b) Explain the process of measurement of frequency and Phase using CRO. 7M
5. a) Draw the simplified block diagram of the sampling oscilloscope and explain in detail. 7M
- b) Explain with neat block diagram the Digital Storage oscilloscope. 7M
6. a) Draw the circuit of Wein bridge and derive the expression for frequency? 8M
- b) Determine equivalent parallel resistance and capacitance that causes a Wein bridge to balance with the following component values: $R_1 = 2.7\text{ K}\Omega$, $C_1 = 5\ \mu\text{F}$, $R_2 = 22\text{ K}\Omega$, $R_4 = 100\text{ K}\Omega$. The operating frequency is 2.2 KHz ? 6M
7. a) What is transducer? Write in detail the classification of transducers. 7M
- b) What is force? Explain how strain gauges can be used for measurement of force. 7M
8. a) What is the need of data acquisition system? Explain DAS with necessary diagram. 7M
- b) Where is strip chart recorder used? Explain the functionality with diagrams. 7M

Code : 1GA62

R-11

III B.Tech. II Semester Regular Examinations, May 2015

Management Science

(*Electronics & Communication Engineering*)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Which of Fayol's principles and functions of management do you believe still apply today?
b) Discuss the three types of analysis to be made for finding out what kind of structure is needed for a specific enterprise.
2. a) What are the objectives of Inventory Management?
b) Explain work study.
3. a) What is Product Life Cycle? Discuss different stages in it.
b) Define product. Explain the process of new product development.
4. a) Define Human Resource Management
b) What is Separation?
5. What is Programme Evaluation and Review Technique (PERT)?
6. a) What is SWOT analysis? Why should it be made?
b) List out various steps involved in process of strategy formulation.
7. What is enterprise resource planning?
8. Discuss the ethical issues in Operations Management.

Code : 1G363

R-11

III B.Tech. II Semester Regular Examinations, May 2015

Microprocessors and Interfacing
(*Electronics & Communication Engineering*)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Discuss about registers of 8086 microprocessor. 7M
b) With a diagram, explain about minimum mode operation of 8086. 7M
2. a) With examples, discuss about addressing modes of 8086. 7M
b) Write an ALP in 8086 to multiply two 8-bit hexadecimal numbers. Result is 16-bit. 7M
3. a) Discuss about programming 8255 using Mode set and BSR control words. 7M
b) Discuss about ADC interfacing using 8255 with an example. 7M
4. a) Interface 4k x 8 SRAM and 4k x 8 EPROM to 8086. Use 74138 decoder. 7M
b) With a neat internal diagram, explain about 8257 DMA controller. 7M
5. a) Explain about interrupt vector table with a neat diagram. 4M
b) Describe the function of 8259 with a neat internal diagram. 10M
6. Write in detail about 8279 programmable keyboard and display controller with a neat architectural diagram. 14M
7. a) Draw the internal diagram of 8251 USART and explain its functioning. 8M
b) Explain about RS232C in detail with necessary diagrams. 6M
8. Compare and contrast between Pentium and Pentiumpro processors with respect to architectures. 14M
