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SYJC

Guessing-Papers-1-2

12th-Electronics

XII Electronics Guessing Paper-1: March 2024 Exam

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagram wherever necessary.
4. Use of log-table is allowed.

Ques 1. (A) Select correct alternative and rewrite the sentence. (4 marks)

- a) The full wave rectifier the PIV of each diode is greater than _____.
 - i) $2V_p$
 - ii) V_p
 - iii) $V_p/2$
 - iv) $4V_p$
- b) If input voltages of an inverting adder are 1V, 2V and $-3V$; and if its input resistance is equal to feedback resistance, then its output voltage will be _____ volts.
 - i) 6V
 - ii) 12V
 - iii) 2V
 - iv) 0V
- c) When a Lissajou's pattern of a circle is obtained on the screen, the phase difference between the two waves will be _____.
 - i) 90° or 270°
 - ii) 90° or 180°
 - iii) 0° only
 - iv) 45° or 135°
- d) The modulation index in amplitude modulation is the ratio of _____.
 - i) V_c to V_m
 - ii) V_m to V_p
 - iii) V_m to V_c
 - iv) V_p to V_c

Ques 1. (B) Answer ANY TWO of the following. (6 marks)

- a) Draw the block diagram of CRO and explain the function of each block in brief.
- b) Calculate the average DC voltage and load current of an FWR circuit, if secondary voltage of transformer is 30V and $R_L = 9\Omega$. (Ans: $V_{dc} = 27V$, $I_L = 3A$)
- c) Draw the circuit of IC 555 as astable multivibrator and explain its working.

Ques 2. (A) Answer ANY TWO of the following. (6 marks)

- a) Draw the neat labelled diagram of CRT used in CRO and explain its working in details.
- b) Define the following:
 - i) Open loop gain of an opamp
 - ii) Slew rate of an Opamp
 - iii) Virtual ground
- c) Draw the circuit of differential amplifier and explain its working.

Ques 2. (B) Answer ANY ONE of the following. (4 marks)

- a) What are the sidebands in AM? Explain the importance of AM communication system.
- b) What are the ideal characteristics of Opamp? Give any six of them.

Ques 3. (A) Answer ANY TWO of the following. (6 marks)

- a) Draw the circuit of voltage follower using Opamp and explain its working with derivation.
- b) An audio signal is used to modulate a high frequency carrier wave $v=25\cos 628000000.t$ to produce amplitude modulation process. The modulating signal is $v=10\sin 31400.t$. Then calculate the modulation index, percentage modulation, frequency of side bands, and bandwidth of the system.
(Ans: $m=0.4$, $M=40\%$, $USB=100.005MHz$, $LSB=99.995MHz$, $BW=10kHz$)
- c) Explain how Lissajou's pattern can be used in CRO to measure unknown frequency, with diagram.

Ques 3. (B) Answer ANY ONE of the following. (4 marks)

- a) Explain the working of shunt zener regulator with neat diagram.
- b) Draw the circuit of DMM and explain its working.

Ques 4. (A) Answer ANY TWO of the following. (6 marks)

- a) Derive the output equation of subtractor using Opamp with neat circuit diagram.
- b) Write a note on LDR. Explain its one application with neat diagram.
- c) What is LVDT? Explain its working in details with neat diagram.

Ques 4. (B) Answer ANY ONE of the following. (4 marks)

- a) Draw block diagram of function diagram and explain its working.
- b) How optical fibre communication system works? Explain with neat diagram.

Ques 5. (A) Answer ANY TWO of the following. (6 marks)

- a) Define the following:
 - i) Phosphorescence for CRO
 - ii) Amplitude modulation
 - iii) Duty cycle for IC 555
- b) Compare FM over AM with any three points.
- c) Explain types of network topologies i.e. Star, Ring and Bus network with neat diagrams.

Ques 5. (B) Answer ANY ONE of the following. (4 marks)

- a) Draw the circuit diagrams of T-type and π -type LC filters and explain their working in brief.
- b) Draw the circuit of half wave rectifier with neat circuit diagram.

OR

Ques 5. (A) Answer ANY TWO of the following. (6 marks)

- a) Define simplex and duplex communication systems.
- b) Draw block diagram of a regulated power supply and explain its working.
- c) What are the advantages of optical fibre communication system? Given any three.

Ques 5. (B) Answer ANY ONE of the following. (4 marks)

- a) Explain basic concept of RADAR system with diagram.
- b) Draw the circuit of IC 555 as FSK and explain its working.

Chapter-wise Marks Scheme

- 1) Instruments – 15%
- 2) DC Power Supplies – 20%
- 3) Transducers – 10%
- 4) Operational Amplifiers – 25%
- 5) Modern Electronics Communication – 10%
- 6) Study of Integrated Circuits – 20%

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XII Electronics Guessing Paper-2: March 2024 Exam

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagram wherever necessary.
4. Use of log-table is allowed.

Ques 1. (A) Select correct alternative and rewrite the sentence. (4 marks)

- a) ASCII code is _____ bit code.
 - i) 8
 - ii) 5
 - iii) 7
 - iv) 3
- b) The 2's complement of a binary number is equal to _____.
 - i) the 1's complement of its original number.
 - ii) the 1's complement of original number – 1.
 - iii) the original binary number.
 - iv) the 1's complement of original number + 1.
- c) In JK flip flop, the flip flip is _____, when clock pulse arrives.
 - i) SET
 - ii) RESET
 - iii) TOGGLE
 - iv) RECES
- d) The method of converting decimal into binary is called as _____.
 - i) Double-dooble
 - ii) Dabble-double
 - iii) Double-dabble
 - iv) Double-double

Ques 1. (B) Answer ANY TWO of the following. (6 marks)

- a) Convert: $(947)_{16} = (?)_{10}$ $(111)_{10} = (?)_2$ $(11101)_2 = (?)_{10}$.
- b) Subtract using 2's complement method: $(11100)_2 - (1101)_2$ and $(1100)_2 - (11011)_2$
- c) Explain the working of RS FLIP FLOP using NOR gates. Draw the neat diagram also.

Ques 2. (A) Answer ANY TWO of the following. (6 marks)

- a) Compare Inclusive OR gate and Ex-OR gate with any three points.
- b) Explain the working of 1:4 line demultiplexer with neat logic diagram and truth table.
- c) Draw neat logic diagram of the logic equation: $Y = (A + B).(\bar{A} + \bar{B})$

Ques 2. (B) Answer ANY ONE of the following. (4 marks)

- Explain in brief different semiconductor memories used in computer.
- Explain the process of hex-dabble method with suitable example.

Ques 3. (A) Answer ANY TWO of the following. (6 marks)

- Define the characteristics of digital ICs: propagation delay, noise margin, fan-out.
- With the help of neat logic diagram, explain the working of TTL NAND gate.
- Construct a combinational logic circuit using 16:1 line Mux by implementing the following expression:

$$f(A, B, C, D) = \sum_m(2,4,6,5,7,11,13,15)$$

Ques 3. (B) Answer ANY ONE of the following. (4 marks)

- Explain the method to convert decimal numbers into hexadecimal number and convert $(125.8)_{10}$ into hexadecimal number. **Ans: $(7D.CCCCC...)_{16}$**
- Implement the following multipoint combinational circuit using 4:16 line demultiplexer with active high outputs.

$$F_1 = \sum_m(0,1,4,8) \quad F_2 = \sum_m(5,7,9,11,13) \quad F_3 = \sum_m(8,10,12,15)$$

Ques 4. (A) Answer ANY TWO of the following. (6 marks)

- Draw the block diagram of computer and explain the function of each block in it.
- Simplify the following logic equation using Boolean laws and then draw logic diagram using basic gates for the simplified logic equation.

$$Y = A.B.C + \bar{A}.B.C + B.\bar{C}.D$$

- Explain the working of CMOS NOT gate using MOSFETs. Draw neat circuit diagram also.

Ques 4. (B) Answer ANY ONE of the following. (4 marks)

- Enlist any four output devices used in computer and explain any one of them in brief.
- Draw the neat circuit diagram of 4-bit left shift register using D-flip flops and explain its working with wave diagram and truth table.

Ques 5. (A) Answer ANY TWO of the following. (6 marks)

- Construct an Ex-OR gate using basic gates and explain its working in brief.
- Find the output voltage of 5-bit binary ladder circuit for inputs of 11101, 10101 and 11000, if logic-0 = 0V and logic-1 = +12V.
- Explain the working of 3-bit up-down counter with neat circuit diagram.

Ques 5. (B) Answer ANY ONE of the following. (4 marks)

- Draw the circuit of BCD to 7-segment decoder using IC 7447.
- Explain the working of simultaneous ADC with neat circuit diagram.

OR

Ques 5. (A) Answer ANY TWO of the following. (6 marks)

- Explain the working of master-slave JK flip flops with neat circuit diagram.
- Explain in brief: MICR, Light pen and x-y plotter used in a computer system.
- Prove that: $A + \bar{A}B = A + B$

Ques 5. (B) Answer ANY ONE of the following. (4 marks)

- Draw the circuit of 8:1 line multiplexer and explain its working with truth table.
- Define ASCII and EBCDIC code with brief details.

Chapter-wise Marks Scheme

- Number Systems – 15%
- Logic Gates – 15%
- Logic Families – 10%
- Combinational Logic Circuits – 20%
- Flip flops, Registers & Counters – 20%
- ADC & DAC – 12%
- Computer Fundamentals – 08%

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