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FOR MAHARASHTRA BOARD (MSBSHSE) CLASS 12 EXAM PREPARATION

Maharashtra Board (MSBSHSE) Class 12 2026 Question Paper · Electronics Paper 2

EXAM
Maharashtra Board (MSBSHSE) Class 12

YEAR
2026

TYPE
Question Paper

SUBJECT
Electronics Paper 2

DAY - 22 SEAT NUMBER

2026 | III | 10 | 1100 | V - 767 | (E)

ELECTRONICS
PAPER - II (C-2)

Time : 3 Hours | **4 Pages** | **Max. Marks : 50**

Instructions : *(1) All questions are compulsory.*
(2) Draw neat labelled diagrams wherever necessary.
(3) Figures to the right indicate full marks.
(4) Use of log table is allowed.

1. (A) Select correct alternatives from the following sub-questions and rewrite the complete sentences :

(a) In any logic family when speed of operation is increased the total amount of power dissipated in it _____. 1

(i) Increases
(ii) Decreases
(iii) Does not change
(iv) Zero

(b) 1:64 Demultiplexer can be designed with _____ select lines. 1

(i) 4
(ii) 5
(iii) 6
(iv) 3

(c) In _____ A/D converter for high resolution system many comparators are necessary. 1

(i) Counter type
(ii) Successive approximation type
(iii) R-2R ladder type
(iv) Simultaneous type

(d) To produce graphical images _____ device is used. 1

(i) OMR

(ii) COM

(iii) Plotter

(iv) OCR

(B) Attempt **any two** of the following :

(a) With suitable example explain Hexadecimal to Decimal Conversion. 3

(b) Define : (i) Power dissipation, (ii) Fan-in, Fan-out, (iii) Noise margin. 3

(c) Explain the working of Master-slave JK Flip-flop. Draw suitable diagram. 3

2. (A) Attempt **any two** of the following :

(a) Solve : 3

(i) $(1110)_2 - (0101)_2 = (?)_2$

(ii) $(1101)_2 + (1011)_2 = (?)_2$

(iii) $(11010)_2 - (1010)_2 = (?)_2$

(b) Draw and explain basic circuit of CMOS Inverter. 3

(c) Draw the diagram of 4-bit right shift register using D-flip-flop and explain its working. 3

(B) Attempt **any one** of the following :

(a) State and prove Demorgans theorems. Draw logic diagram and truth table. 4

(b) Draw logic diagram of 4:1 Multiplexer using logic gates and explain it with truth table. 4

3 (A) Attempt **any two** of the following :

(a) Draw and explain basic circuit of TTL NOR gate. 3

(b) Implement the expression

$f(A,B,C) = \Sigma m\ (2, 5, 4, 7)$ Using multiplexer. 3

(c) Explain the working of counter type Analog to Digital Converter. 3

(B) Attempt **any one** of the following :

(a) Draw the logic diagram of 3-bit Synchronous Counter and explain its working. 4

(b) Draw block diagram of Digital Computer and explain function of each block. 4

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4 (A) Attempt **any two** of the following

(a) Explain 1's complement and 2's complement with suitable examples. 3

(b) Explain NAND and NOR gates in brief 3

(c) Explain the working clocked RS Flip-flop using NAND gates 3

(B) Attempt **any one** of the following

(a) Explain 1:4 Demultiplexer Draw logic diagram, truth table. Give one application of Demultiplexer 4

(b) Explain the working of R-2R ladder type Digital to Analog Converter. 4

5 (A) Attempt **any two** of the following

(a) Explain Hexadecimal number system. Convert Hexadecimal number into binary 3

(i) $(AB9)_{16} = (?)_2$

(b) Implement the following expressions using Demultiplexer having active low outputs 3

(i) $f_1 = \Sigma m\ (1, 3, 5, 7)$

(ii) $f_2 = \Sigma m\ (2, 4, 6)$

(c) Explain : (i) RAM, (ii) EPROM, (iii) EEPROM 3

(B) Attempt **any one** of the following

(a) Prove using Boolean Laws : 4

(i) $\overline{A \oplus B} = A \cdot B + \bar{A} \cdot \bar{B}$

(ii) $A + \bar{A}B = A + B$

(b) What is Modulus of counter ? How many Flip-flops are required to construct each of following counter : 4

(i) Mod - 8

(ii) Mod - 16

(iii) Mod - 32

OR

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5 (A) Attempt **any two** of the following :

(a) What are different number systems ? Give Radix for various number system. 3

(b) Explain Half adder with logic diagram and truth table. 3

(c) Explain the working of clocked D Flip-flop with logic diagram and truth table. 3

(B) Attempt **any one** of the following :

(a) What is Decoder ? Explain the working of BCD to Decimal decoder using gates 4

(b) Explain the working of Weighted Resister type Digital to Analog Converter. Write its disadvantages. 4

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