

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 1587

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Roll No.....

Unique Paper Code : 222205

Name of the Paper : Digital Electronics (PHHP-206)

Name of the Course : B.Sc. (Hons.) Physics, Part I

Semester : II

Duration : 1 Hour

Maximum Marks : 20

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **twenty** questions.
3. **All** question carry equal marks.

1. Convert to BCD

(a) 142_{10}

(b) 61_{10}

2. When does an XOR gate give high output ?

3. What is duality theorem in Boolean algebra ? Explain with an example.

4. What is the parity of X-NOR gate ?

5. Reduce the following Boolean Expression.

$$(AB+C) (\overline{AC} + BC) + ABC + \overline{AB}$$

6. Draw the truth table of full subtracter.

7. What do the numbers and alphabets in LM74LS 00 represents.

8. What factor generally limit the number of gates packed with a single IC package.

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9. In a seven-segment Common Anode LED display which segments will glow to display the digit 3.
10. How edge-triggered JK flip-flop is different from Master-Slave JK flip-flop.
11. Why D-flip-flop is called a delay flip-flop ?
12. How many JK flip-flops are needed to construct the following MOD counters ?
 - (a) MOD33
 - (b) MOD15
13. Differentiate between open loop and closed loop gain of an Op-Amp.
14. Define (a) Nibble (b) Propagation delay.
15. Draw the circuit of a non-inverting amplifier of gain 11 using an Op-Amp.
16. Draw the frequency response of Op-Amp as an Inverting amplifier.
17. For a gain-bandwidth product of 2MHz in the case of an Op-Amp. Calculate the new bandwidth if the gain is 4.
18. Obtain minimal sum of product expression for the following function.
 $F(A,B,C,D) = \sum m(0,1,2,5,8,9,10)$.
19. What is role of Time-Base in a cathode-Ray Oscilloscope ?
20. How long will it take to shift an 8-bit binary number in a serial in-parallel out (SIPO) shift register if the clock is 1MHz.
21. Draw the logic circuit for a Mod-8 asynchronous counter.
22. Draw the pin-out diagram of a 555 timer used as an A-stable multivibrator.
23. Define the resolution of a D/A Converter.
24. Give one application for a Schmitt Trigger being used in open-loop configuration.
25. Differentiate between an EPROM and EEPROM.