TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Bhadra

| Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	ALL Except BEI, BAR	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

Subject: - Basic Electronics Engineering *(EX 451)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt __All__ questions.
✓ The figures in the margin indicate __Full Marks__.
✓ Assume suitable data if necessary.

1. What is filter? Explain High Pass Filter. [1+3]

2. Find the voltage across the 4Ω resistor by using the Superposition theorem. [6]
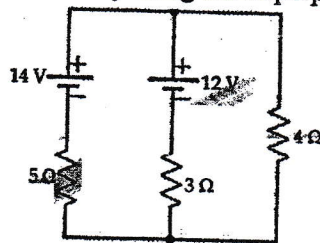
3. Explain the operation of photo diode. Draw the circuit diagram of fullwave bridge rectifier. [4+2].

4. Show the relationship between current gain alpha (α) and beta (β) of BJT. Explain the importance of dc loadline analysis in transistor biasing to find collector current & collector emitter voltage. [2+3]

5. Differentiate between depletion and enhancement type MOSFET. Explain NMOS as a switch. [2+4]

6. Determine I_{CQ} and V_{CEQ} for the following circuit. [5]
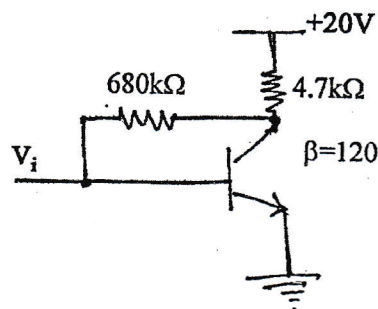
7. Explain how square wave is generated at output terminal using Op-Amp circuit as square wave generator and draw the circuit diagram of triangular wave generator. [4+2]

8. Show the concept of positive feedback with suitable block diagram. Draw the circuit diagram of Wein Bridge Oscillator using Op-amp. [3+2]

9. Design a summer circuit using op amp as: $V_o = -5V_1 - 10V_2 - 15V_3$

   Where, V_o is an output voltage and V_1, V_2 & V_3 are input voltages. [5]

10. Differentiate between internet and intranet. How Light-propagates through Optical fiber? [2+3]

11. Why modulation is needed? Differentiate AM and FM. [2+3]

12. Differentiate between SR and JK filp-flop. Explain Master-Slave flip-flop with block diagram. [1+3]

13. Simplify using Boolean Algebra. [3×2]

   a) $AC + ABC + \overline{A}(C + A\overline{C})$

   b) $(A + B)(\overline{A} + B)(A + \overline{B})$

   c) Subtract $(20)_{10}$ form $(3)_{10}$ using 1's complement method

14. Simplify the function using K-map:
    $F(D,C,B,A) = \Sigma(3,4,5,7,9,13,14,15)$ and realize this circuit using gates. [6]

15. Write short notes on: *(Any Two)* [3×2]
   a) Data logger
   b) Regulated power supply
   c) Transducer

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