KATHMANDU UNIVERSITY
End Semester Examination c.
November/December, 2023

Marks Scored:

Level : B.E.
Year : II
Course : EEEG 204
Semester : I
Exam Roll No. :
Time: 30 mins.
F. M. : 10
Registration No.:
Date 29 NOV 2023

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Choose and encircle in the most appropriate option

1. When a PN junction diode is reverse biased ,____.
   a. electrons and holes are attracted and move towards depletion region.
   b. electrons and holes move away from depletion region.
   c. width of potential barrier decreases.
   d. no changes in potential barrier.

2. The knee voltage of Silicon diode is _____.
   a. 0.3 V b. 0.4 V c. 0.5 V d. 0.7 V

3. In full-wave rectification, if input frequency is 50 Hz then output frequency is ____.
   a. 50 Hz. b. 75 Hz c. 100 Hz d. 150 Hz

4. A half-wave rectifier has an input voltage of 240 V r.m.s. If the step-down transformer with a turns ration 8:1 is used, the peak load voltage will be _____.
   a. 42.5 V b. 30 V c. 86.5 V d. 240 V

5. Rectification efficiency of a half wave rectifier without filter is nearly equal to _____.
   a. 81.6 % b. 71 % c. 61 % d. 41 %

6. The emitter-base junction of a bipolar transistor is_____.
   a. always forward bias b. always reverse bias
   c. open junction d. neither forward or reverse bias

7. In Zener diode, _____
   a. negative resistance characteristics exists
   b. forward voltage rating is high.
   c. sharp breakdown occurs at a low reverse voltaged.
   d. All of the above

8. In a transistor, base current is about _____of the emitter current.
   a. 5% b. 50% c. 75% d. 95%

9. The element that has the biggest size in a transistor is _____.
   a. emitter b. base c. collector d. emitter-base junction

10. The total collector current $I_C = \alpha I_E +$_____.
    a. I_{CBO} b. I_{CEO} c. I_B d. βI_B

11. A non-inverting closed loop op amp circuit generally has a gain factor _____
    a. less than one b. equal to one
    c. zero d. greater than one

12. While designing digital to analog converter, _____ circuit is used.
    a. non-inverter b. summer
    c. voltage follower d. differential amplifier

13. Differential amplifiers are used in, _____
    a. instrumentation amplifiers. b. voltage followers
    c. voltage regulators d. buffers

14. The self-generating type transducers are _____transducers.
    a. secondary b. primary c. passive d. active

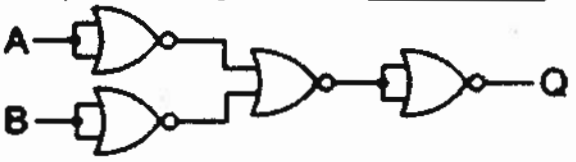
15. _____is one example of digital transducer.
    a. Strain gauge b. Encoder c. Thermistor d. LVDT

16. Air friction damping is used in _____.
    a. moving iron b. moving coil c. induction d. all of the mentioned

17. _____is not the logic gate.
    a. AND b. NAND c. NOT d. IF

18. In an op-amp, the input impedance is _____and the output impedance is _____
    a. high; high b. low; low c. low; high d. high; low

19. The output of the given logic gate is equivalent to _____.



    a. NOR b. OR c. NAND d. AND

20. There are _____min-terms for 3 variables (a, b, c).
    a. 8 b. 4 c. 2 d. 0

KATHMANDU UNIVERSITY
End Semester Examination [C]
November/December, 2023

29 NOV 2023

Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : EEEG 204
Semester : I
F. M. : 40

SECTION "B"
[5 Q. × 8 = 40 marks]

Attempt *ANY FIVE* questions. Assume suitable data if necessary, Symbol has their usual meaning.

1.

a. Explain full-wave bridge rectifier circuit and derive its efficiency. [2+2=4]
b. In reference to Figure-1, find the Zener current (I_z). [4]

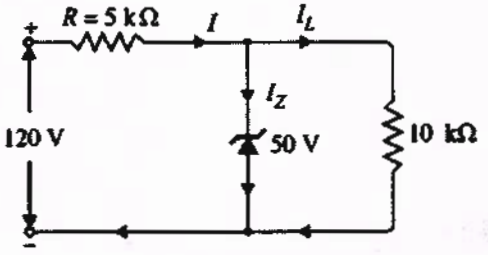


Figure1

2.

a. Discuss the working principle of NPN transistor with the help of circuit diagram. [4]
b. In reference to figure 2, draw a load line and determine Q point, if $R_1 = 5.6\ K\Omega$. (Assume the standard values if necessary) [1+3=4]

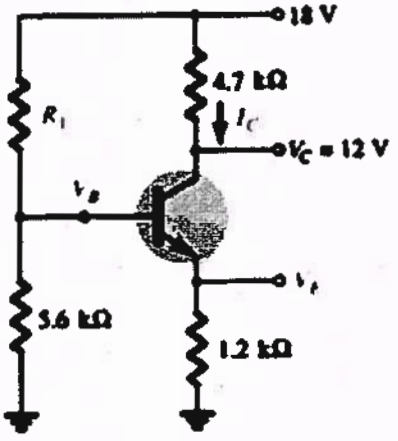


Figure 2

3.

a. In BJT configurations, what is the meaning of alpha and beta? Also, derive their mathematical relation. [1+3=4]
b. What is op-amp? Derive the gain of non-inverting op-amp. [1+3=4]

4.

a. Discuss summing amplifier using op-amp. Also derive the expression for three input voltages. [2+2=4]
b. Discuss D/A conversion with one example. [4]

5.

a. What are the universal gates? Represent the expression, $F = A + B$ with the help of universal gate. [2+2=4]
b. Reduce the logic expression, $F = A'B'C + AB'C' + ABC' + ABC$ and draw the logic diagram of reduced expression. [4]

6.

a. Explain the working principle of permanent magnet moving coil instrument. [4]
b. Explain data logger with the help of block diagram and write its application. [3+1=4]