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Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2015

(UG—CCSS)

Core Course—Physics

PH 5B 12—ELECTRONICS (ANALOG AND DIGITAL)

(2009—2012 Admissions)

Time : Three Hours Maximum : 30 Weight

Part A

Answer **all** *questions.*

Each question carries ¼ weightage.

1. The diodes in a bridge rectifier have a maximum d.c. current rating of 2A. This means the d.c. load current can have a maximum value of :

   (a) 1A. (b) 2A.

   (c) 4A. (d) 8A.

2. A Zener diode :

   (a) Is a battery.

   (b) Is a rectifier diode.

   (c) Has a constant voltage in the breakdown region.

   (d) Is forward biased.

3. In a transistor the collector diode has to be :

   (a) Forward biased. (b) Reverse biased.

   (c) Non-conducting. (d) None of these.

4. The base- emitter voltage of an ideal transistor is :

   (a) 0.3V. (b) 0.7V.

   (c) 0V. (d) High voltage.

5. Three different Q points are shown on a load line. The upper Q point given the :

   (a) Minimum current gain. (b) Intermediate current gain.

   (c) Maximum current gain. (d) Cut-off point.

Turn over

6. Voltage divider bias needs :

(a) Only three resistors.

(b) Only one supply.

(c) Precision resistors.

(d) Active devices.

7. The input impedence of a JFET :

(a) Approaches zero.

(b) Approaches one.

(c) Approaches infinity.

(d) Impossible to predict.

8. The coupling circuit in an oscillator is :

(a) Lag circuit.

(b) Lead circuit.

(c) Lead- lag circuit.

(d) Resonant circuit.

9. Each 4 bit binary group is called :

(a) Bit.

(b) Nibble.

(c) Byte.

(d) Word.

10. In a digital computer binary subtraction is performed using :

(a) Using 2'S complement method.

(b) Using 9'S complement method.

(c) Using 10'S complement method.

(d) None of these.

11. An AND gate can be imagined as :

(a) Switches connected in series.

(b) Switches connected in parallel.

(c) Transistors connected in series.

(d) Transistors connected in parallel.

12. K- map is used :

(a) To minimize the number of flip flops in a digital circuit.

(b) To minimize the number of gates only in a digital circuit.

(c) To minimize the number of gates and the fan in requirements.

(d) To design gates.

(12 × ¼ =

Part B

Answer **all** *questions*

Each question carries 1 *weightage.*

13. What is ripple factor ? On what factors does it depend.

14. What property of the transistor is used in the process of amplification ? Explain.

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15. What is negative feedback ? What are its important characteristics ?

16. What is amplitude modulation ? Where is it used ?

17. What is slew rate ? On what factors does it depend ?

18. Distinguish between LC and RC oscillators.

19. Why is the binary number used in digital systems ?

20. Explain the sign magnitude representation of numbers.

21. Explain how voltage stabilization is done using a Zener diode.

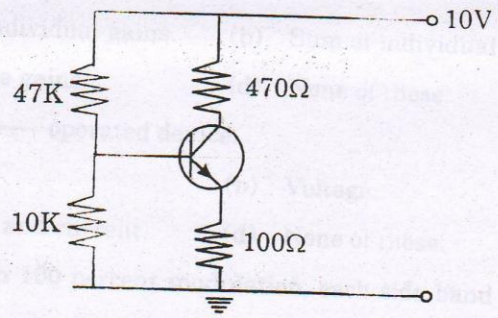
(9 × 1 = 9 weightage)

Part C

Answer any **five** *questions.*
Each question carries 2 weightage.

22. Draw and explain the common emitter characteristics of an NPN transistor. Draw the load line and define quiescent point.

23. Explain voltage- divider bias. For the circuit given below calculate IC, IE, VCE and Q point.



24. What sis frequency modulation ? Where is it used? Compare it with AM.

25. What is demodulation ? How is demodulation achieved using a straight receiver.

26. Distinguish between Inverting and Non-inverting amplifiers using figures.

27. Discuss 1's and 2's complement methods of subtraction

28. State and prove Demorgains theorem.

(5 × 2 = 10 weightage)

Part D

Answer any **two** *questions.*
Each question carries 4 *weightage.*

29. Describe the working of RC coupled amplifier. Using the a.c. equivalent circuit obtain an expressi for the amplification. Draw the frequency response and define band width.

30. Describe the construction and working of an RC phase-shift oscillator. Obtain the expression frequency. Design a phase-shift oscillator to have a frequency of 1 kHz.

31. (a) What is the necessity to reduce Boolean expression. Give the procedure to reduce Bool expression.

    (b) What are universal gates ? Explain the working of NAND and NOR gates as universal ga

32. Explain the working of a fullwave rectifier. What are filter circuits ? Explain its how it affects output of rectifier curcuits.

(2 × 4 = 8 weight