Oct-2014

Seat Number

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कुमकुम - 058 / 059

PHYSICS PAPER - II : PHY-232
(A) Electronics - I (New) (23126) OR /
(B) Instrumentation - I (New) (23127)

P. Pages : 4

(A) Electronics - I (New) (23126)

Time : Two Hours **Max. Marks : 40**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and carry equal marks. Figures to the right indicate full marks.
5. Draw neat and labelled diagram wherever necessary.
6. Use of logarithmic table or standard electronic calculator is allowed.

1. Attempt **any eight** of the following. **8**

i) When the external voltage applied to the junction is in such directions that potential barrier is _____, it is called reverse biasing.

a) increased b) variable
c) decreased d) constant

ii) Special diodes designed to conduct in the reverse direction are called _____ diode.

a) Zener b) Varactor
c) LED d) Switching

iii) _____ is the base of binary number system.

a) 4 b) 8
c) 2 d) 16

iv) When the feed-back energy is _____ out of phase with the input signal and thus opposes it, it is known as negative feed-back.

a) 50^0 b) 90^0
c) 170^0 d) 180^0

v) The output of two input AND gate is high _____.
   a) only if both input are low.
   b) only if both input are high.
   c) only if one input is high and other is low.
   d) If at least one of the input is low.

vi) Demorgan's second theorem is _____.
   a) $\overline{A+B} = \overline{A}.\overline{B}$
   b) $\overline{A}.\overline{B} = \overline{A}+\overline{B}$
   c) $A(\overline{A}+B) = AB$
   d) $A(A+B) = A$

vii) In hexadecimal number system the number 14 is represented by ____ alphabate.
   a) F b) C c) A d) E

viii) The method used for decimal to binary conversion is called as_____.
   a) Hex dabble method
   b) Octal dabble method
   c) Double dabble method
   d) divided by 16

ix) The current amplification factor in CE configuration is _____.
   a) α b) β c) $1+\beta$ d) $\frac{1}{\beta}$

x) The function of Transistor is to do _____.
   a) rectification
   b) impedance matching
   c) stabilization
   d) amplification

8

2. Attempt **any four** of the following.
   a) Define ripple factor.
   b) Draw the symbol of Zener diode
   c) Convert $(9AF)_{16}$ into binary.
   d) Define Radix or base of the number system.
   e) What is NOT gate? Draw the symbol of NOT gate.
   f) What is an amplifier?

8

3. Attempt **any two** of the following.
   a) With neat diagram explain capacitor filter.
   b) Name the three transistor configuration. Explain anyone of them.
   c) What is LED? Draw the symbol of LED and state applications of LED's.

6

4. a) Attempt **any two** of the following.
   i) Why the biasing is needed for transistor?
   ii) Convert binary $(1101\ 1000\ 0110\ 1110)_2$ into hexadecimal.
   iii) Explain forward biasing of a p-n junction.

2

   b) Draw the symbol of OR gate.

6

5. a) Attempt **any one** of the following.
   i) What is an Oscillator? Draw the block diagram and explain it.
   ii) What is NAND gate? Give the symbol and truth table for two input AND gate.

2

   b) What is BCD.

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(B) Instrumentation - I (New) (23127)

Time : Two Hours **Max. Marks : 40**

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5. Use of logarithmic table or standard electronic calculator is allowed.

1. Attempt **any eight** of the following. **8**

a) Acoustics is the branch of physics studying _____.
   i) light ii) heat
   iii) sound iv) motion of planets

b) A McLeod gauge is a scientific instrument to measure very low_____.
   i) frequency ii) pressure
   iii) area iv) density

c) The frequency of audible range is in between _____.
   i) 20 Hz to 20 khz ii) 1 Khz to 20 kHz
   iii) 1.5 kHz to 25 kHz iv) None of these

d) Sensitivity on an instruments is defined as "the ratio of the magnitude of change in _____ signal to the magnitude of change in _____ signal."
   i) output , input ii) input , output
   iii) input, input iv) output, output

e) Pressure is defined as _____ per unit _____.
   i) force, area ii) height, area
   iii) length, height iv) area, area

f) When the velocity of molecule is zero, the temperature is_____.
   i) 0^0c ii) 273 K
   iii) -273^0c iv) -273 K

g) The output voltage of typical thermocouple is _____.
   i) less than 100 mV
   ii) greater than 1 V
   iii) thermocouple vary resistance not voltage.
   iv) none of the above.

h) Accuracy is defined as _____.
   i) A measure of how often an experimental value can be repeated.
   ii) The closeness of a measured value to the real value.
   iii) The number of significant figures used in a measurement.
   iv) None of these.

i) The standard temperature and pressure refers to _____.
   i) 0 atom and 273 K
   ii) 1 atom and 273 K
   iii) 101.325 KPa and OK
   iv) more than one of the above

j) A Hall probe is used to determine _____.
   i) magnetic moment of a coil
   ii) the susceptibility of a material.
   iii) relative permittivity.
   iv) magnetic flux density.

8

2. Attempt **any four** of the following.
   a) On what principle non-electrical methods of temperature in based?
   b) What is positive temperature coefficient of resistance?
   c) What is precision?
   d) Differentiate between high pressure and low pressure.
   e) What are advantages of Rotameter?
   f) State the principle of electrodynamics microphone.

8

3. Attempt **any two** of the following.
   a) Explain the characteristics of sound.
   b) Write a note on electrical resistance thermometers.
   c) Write note in brief on Venturi tube.

6

4. a) Attempt **any two** of the following.
   i) Discuss advantages of Pyrometer.
   ii) Write an expression for Bernoulli's theorem and explain each term in equation of theorem.
   iii) What is search coil? How is it connected for measurement of magnetic field?

2

   b) What is microphone?

8

5. a) State working principle of thermocouple. Explain construction and working of thermocouple.

OR

Explain the construction and working of carbon granules microphone.

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