Oct-2013

Seat No. | | | | | | |

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कुंतल - 067 / 068

# PHYSICS PAPER - II PHY - 232

## A) Electronics-I (New) (23126) OR /

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

P. Pages : 4

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*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. Answersheet 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) n-type semiconductor is obtained by -
   a) Doping with trivalent element
   b) Doping with pentavalent element
   c) Doping with tetravalent element
   d) Doping with a mixture of trivalent and tetravalent element.

ii) The maximum efficiency of full wave rectifier is .....
   a) 40% b) 90% c) 31.2% d) 81.2%

iii) The collector is ..... than emitter.
   a) larger b) smaller c) narrow d) thick

iv) When the feed back energy is in phase with the input signal and thus aids it, it is called .....
   a) negative feed back b) voltage gain
   c) power gain d) positive feed back

v) The decimal number system has radix or base is .....
   a) 10 b) 2 c) 16 d) 8

vi) The output of two input OR gate is high .....
   a) both inputs are low
   b) one input is high and other is low
   c) at least one of the input is high
   d) both inputs are high

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vii) A properly doped crystal diode, which has a sharp breakdown voltage known as .....
a) photo diode b) zener diode
c) P-I-N photodiode d) Avalanche

viii) A full wave bridge rectifier consist of ..... diodes
a) 2 b) 6 c) 4 d) 5

ix) 8421 BCD code is ..... code.
a) weighted b) Johnson
c) Non - weighted d) Gray

x) De-Morgan's first theorem is
a) $\overline{A} \cdot \overline{B} = \overline{A} + \overline{B}$ b) $A + AB = A$
c) $\overline{A + B} = \overline{A} \cdot \overline{B}$ d) $\overline{A \cdot B \cdot C} = \overline{A} + \overline{B} + \overline{C}$

**2.** Attempt **any four** of the following. 8

a) State the requirements of biasing circuit.

b) Draw the symbols of NPN and PNP transistors.

c) Conversion of binary $(11001001)_2$ to hexadecimal.

d) Draw a circuit diagram of oscillator.

e) What do you mean by 1's complement ?

f) What is OR gate.

**3.** Attempt **any two** of the following. 8

a) Discuss forward bias of p-n junction.

b) Explain the basic construction of Bipolar transistor.

c) Convert the decimal number $(29)_{10}$ into it's binary equivalent.

**4.** a) Attempt **any two** of the following. 6

i) What is rectifier ? State the types of rectifier.

ii) Write a note on LED.

iii) What is filter ? Why it is necessary ?

b) How many digits are present in decimal number system ? 2

**5.** a) Attempt **any one** of the following. 6

i) What is feedback ? Explain types of feedback.

ii) What is NAND gate ? Give it's symbol and truth table.

b) What is p-n junction diode. 2

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

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

Instructions to Candidates :

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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 diagrams wherever necessary.
6. Use of logarithmic table or standard calculator is allowed.

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

a) 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 these

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

c) Standard temperature and pressure refers to .....
   i) 0 atom and 273 K ii) 1 atom and 273 K
   iii) 101.325 kPa and 0 K iv) more than one of the above

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

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

f) 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.

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g) Rotameter is a ..... area meter.
i) fixed ii) variable
iii) both iv) none of these

h) fluid in motion is called .....
i) flow ii) force
iii) pressure iv) mass

i) Pitot tube is an instrument used for measurement of the ..... of liquids or gases through pipe.
i) force ii) velocity
iii) density iv) none of these

j) The selective pyrometer works on principle of .....
i) plank's law ii) Boyle's law
iii) Kirchhoff's law iv) none of these

2. Attempt **any four** of the following. 8

a) On what principle the constant volume thermometer works ?

b) Enlist head type flow meter.

c) What are standard of measurement ?

d) Draw neat diagram of McLeod gauge.

e) Define sound power level.

f) What is pirani gauge ?

3. Attempt **any two** of the following. 8

a) Write characteristics of sound.

b) Write short note on Hall probe or Hall gauge meter.

c) Explain condenser microphone with neat diagram.

4. a) Attempt **any two** of the following. 6

i) Enlist different types of standard of measurement.

ii) Define : Gauge scale, absolute scale and vacuum scale.

iii) What is a search coil ? How it is connected for measurement of magnetic field.

b) What are advantages of rotameter ? 2

5. a) Explain construction and working of Pitot tube with suitable diagram. 8

OR

a) What is thermocouple ? Explain construction of thermocouple with suitable.