Seat Number

April 2015

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

P. Pages : 7

(A) Electronics - I
(23126)

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

Instructions to Candidates :

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

1. Attempt **any eight** of the following. Select correct option. **8**

i) The maximum efficiency of a full-wave rectifier is .....

a) 40% b) 81.2%

c) 90% d) 60%

ii) Band width of an amplifier is .....

a) $\frac{f_2 - f_1}{2}$ b) f_2 / f_1

c) $f_2 - f_1$ d) $f_2 + f_1$

iii) The most commonly used transistor circuit arrangement is ..... circuit.

a) CE b) CB

c) CC d) CD

iv) In positive feedback ..... gain of the amplifier.

a) Stable
b) Reduce
c) Decrease
d) Increases

v) The output of OR gate is .....

a) $y = A \cdot B$
b) $y = A + B$
c) $y = A - B$
d) $y = A / B$

vi) Find value $(IE)_{16} = (---)_{10}$

a) 29
b) 32
c) 31
d) 30

vii) The first De-Morgan's theorem is .....

a) $\overline{A+B} = \overline{A} \cdot \overline{B}$
b) $\overline{\overline{A+B}} = \overline{A} \cdot \overline{B}$
c) $\overline{\overline{A}} \cdot \overline{\overline{B}} = A \cdot B$
d) None of above

viii) Forward resistance of P-N junction diode is .....

a) zero
b) very high
c) high
d) low

ix) Find value $(12)_{10} = (----)_2$

a) 1011
b) 1101
c) 1100
d) 1010

x) A filter circuit is used to remove ..... and allows only the .... to reach the load.

a) DC....AC
b) AC....DC
c) AC....AC
d) DC....DC

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

a) Explain P-N Junction diode.

b) Make the conversion $(110110)_2 = (?)_{10}$.

c) What is Binary number system ?

d) Why Biasing is needed for transistor ?

e) What do you understand by feedback ? Give types of feedback.

f) Show that NAND gate acts like an Universal gate.

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

a) What is Zener diode ? Explain it's forward and reverse I-V characteristics.

b) Derive gain of an amplifier $A' = \frac{A}{1-AB}$ also derive condition for oscillator.

c) What is voltage regulator ? Explain how zener diode acts as a voltage regulator.

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

i) Explain BCD code.

ii) Write a note on LED.

iii) Describe the action of capacitor in filter circuit.

b) Find value $(36)_{10} = (?)_2$. 2

5. a) Explain the truth table and circuit action of clocked R-S flip-flop using Nand gate. 6

OR

Define the parameters α and β. Obtain the relation between them.

b) State the De-Morgan's theorem. 2

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(B) Instrumentation - I
(23127)

Time : Two Hours | Max. Marks : 40

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5. Draw neat diagrams wherever necessary.
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1. Attempt **any eight** of the following. **8**

a) The audible range of human hearing mechanism is usually measured at .....
   i) 1 kHz ii) 10 kHz
   iii) 100 Hz iv) 50 Hz

b) Error can be defined as .....
   i) difference between measured value and true value
   ii) Closeness to the true value
   iii) Repeatability of measuring system
   iv) Both repeatability and closeness of measured value

c) PTC means ..... of thermister.
   i) Positive temperature co-efficient.
   ii) Primary training center
   iii) Pressure transducer center
   iv) None of above

d) The selective pyrometer works on principle of .....
   i) Plancks law ii) Boyle's law
   iii) Kirchoff's law iv) None of above

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

f) Pitot tube is an instrument used for measurement of ..... of the liquids or gas through pipe.
i) velocity ii) force
iii) density iv) temperature

g) Which method is used for measurement of high temperature.
i) Radiation pyrometery
ii) thermocouple
iii) constant volume thermometer
iv) none of these

h) Unit of vacuum measurement is .....
i) Torr ii) Newton
iii) Dyne iv) Joule

i) Frequency analysis is carried out in ..... bands.
i) 2 ii) 4
iii) 8 iv) 6

j) For static calibration of pressure measuring device ..... is used.
i) Dead weight tester ii) Venturi tube
iii) Pitot tube iv) Rotameter

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

a) Define microphone ? Mention any two types.

b) On which principle pirani gauge works.

c) Draw a neat diagram of ferrys total radiation pyrometer.

d) What is an error ? Mention different types of errors.

e) Draw characteristics of thermocouple.

f) Define decibel.

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

a) Draw block diagram of functional elements of measurement system and explain in short.

b) Write note on hall gauge meter.

c) Explain construction and working of pitot tube.

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

   i) Explain characteristics of sound.

   ii) Write note on thermister.

   iii) How will you measure low pressure using Mcleod gauge.

   b) Draw block diagram of sound level meter. **2**

5. a) Explain in detail rotameter with an equation for rate of flow of fluid Qv. **8**

OR

Explain selective radiation pyrometer in detail.

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