

Seat Number

332855



गुरु - 014 / 015

APRIL 2017

PHYSICS PAPER - II : PHY-232
A) Electronics - I (231202) /
B) Instrumentation - I (231203)

P. Pages : 8

A) Electronics - I (231202)

Time : Two Hours

Max. Marks : 60

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 and carry equal marks.
5. Figures to the right indicate full marks.
6. Draw neat and labelled diagram wherever necessary.
7. Use of logarithmic table or standard electronic calculator is allowed.

1. a) Attempt **any six** of the following select the correct option and rewrite the following. 6
- i) De-Morgan's first theorem is -----.
- a) $\overline{A+B} = \overline{A} \cdot \overline{B}$ b) $A+B = A \cdot B$
c) $\overline{A \cdot B} = \overline{A} + \overline{B}$ d) $\overline{A \cdot B} = \overline{A} \cdot \overline{B}$
- ii) In half wave rectification during negative half cycle of wave, diode is -----.
- a) Forward biased
b) Reverse biased
c) Unbiased
d) Both, forward and reverse biased
- iii) The current gain Beta (β) is defined as -----.
- a) I_C / I_E b) I_B / I_E
c) I_C / I_B d) I_E / I_C

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- iv) When diode is reverse biased potential barrier will -----.
- | | |
|--------------|------------------|
| a) Decreases | b) Equal to Zero |
| c) Increases | d) None of these |
- v) Oscillators operate on the principle of -----.
- | | |
|----------------------|----------------------|
| a) Positive feedback | b) Negative feedback |
| c) Attenuation | d) None of these |
- vi) The base of decimal number system is -----.
- | | |
|-------|-------|
| a) 16 | b) 8 |
| c) 2 | d) 10 |
- vii) A transistor has ----- PN Junctions.
- | | |
|----------|---------|
| a) One | b) Two |
| c) Three | d) Four |
- viii) When a p-type semiconductor is sandwiched between n-type semiconductor then the transistor is known as -----.
- | | |
|-------------------|-------------------|
| a) Pnp-transistor | b) Nnp transistor |
| c) Npn transistor | d) Zener diode |

b) Attempt **any six** of the following answer in one sentence.

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- i) What is forward bias of diode?
- ii) What is the base of binary number system?
- iii) What is the out put of NAND gate?
- iv) Give the symbols of pnp and npn transistor.
- v) Which semiconductor materials are used in LED?
- vi) Define the factor ' α ' for transistor.
- vii) What is the main difference between JK and RS flip-flop?
- viii) What is feedback?

2. Attempt **any six** of the following.

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- i) What is Zener diode? Draw its symbol.

- ii) Draw the circuit diagram of CE configuration of npn/pnp transistor.
- iii) What is voltage regulation?
- iv) What are the requirements of biasing circuits?
- v) What is meant by rectifier? Give the types of rectifier.
- vi) Give the conditions of barkhausen criterion for oscillations.
- vii) What is NOR gate? Give its symbol and truth table.
- viii) What is one's complement? Give one example.

3. Attempt **any four** of the following.

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- i) State and explain Demorgan's 2nd theorem.
- ii) Explain capacitor filter with suitable diagram.
- iii) Convert the decimal number $(29)_{10}$ into its binary equivalents.
- iv) Calculate I_E in the transistor for which $\beta = 50$ and $I_B = 20\mu A$.
- v) Write a note on photodiode.
- vi) Derive the relation between α & β .

4. Attempt **any three** of the following.

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- i) With a neat labelled diagram explain the forward biasing of P-N junction.
- ii) Explain the working of Hartley oscillator.
- iii) Why NAND gate is called as universal building block?
- iv) Write a note on LED.
- v) Describe full wave rectifier with suitable diagram.

5. Attempt **any two** of the following.

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- i) With a neat labelled diagram explain the operation of single stage RC coupled CE amplifier.
- ii) Explain the working of JK flip-flop with truth table.
- iii) What is BCD system? Explain with suitable examples.
