



K16U 0524

Reg. No. : .....

Name : .....

**IV Semester B.Sc. Degree (CCSS-Supple./Imp.) Examination, May 2016**  
**COMPLEMENTARY COURSE IN PHYSICS**  
**4C04 PHY : Modern Physics and Electronics**  
**(2013 and Earlier Admissions)**

Time : 3 Hours

Max. Weightage : 30

**SECTION - A**

Choose the correct answer. **Each** bunch carries a weightage of 1.

1. i) The phase difference between the input and output voltages of a CE amplifier is
  - a) 180°
  - b) 0°
  - c) 90°
  - d) None of the above
- ii) An oscillator converts
  - a) a.c power into d.c power
  - b) d.c power into a.c power
  - c) mechanical power into d.c power
  - d) none of the above
- iii) When an input signal 1 is applied to a NOT gate, the output is
  - a) 0
  - b) 1
  - c) Either 0 or 1
  - d) None of the above
- iv) When a nucleus emits a gamma ray photon, what happens to its atomic number ?
  - a) Atomic number unchanged
  - b) Atomic number increased to 1
  - c) Atomic number decreased to 1
  - d) None of the above
2. i) The Milky Way system is
  - a) Spiral galaxies
  - b) Irregular galaxies
  - c) Elliptical galaxies
  - d) None of the above
- ii) The particles with half odd integer spin obey the Fermi-Dirac statistics are called
  - a) Bosons
  - b) Hyperons
  - c) Fermions
  - d) None of the above

P.T.O.



- iii) Line imperfections are called
- |                      |                      |
|----------------------|----------------------|
| a) Vacancy           | b) Dislocations      |
| c) Schottky's defect | d) None of the above |
- iv) A material having different properties in different directions is known as
- |              |              |                |                      |
|--------------|--------------|----------------|----------------------|
| a) Amorphous | b) Isotropic | c) Anisotropic | d) None of the above |
|--------------|--------------|----------------|----------------------|

(W = 2×1=2)

## SECTION – B

Answer any six. Each question carries a weightage of 1.

- Mention the classification of amplifiers based on its biasing conditions.
- What do you understand by single stage transistor amplifiers ?
- Draw the circuit symbol and equivalent switching circuit of AND gate.
- What is an integrated circuit ?
- Define mean life of a radioactive element.
- What is meant by Carbon dating ?
- Draw the circuit symbol of a exclusive OR gate.
- Define natural radioactivity of a substance. (W = 6×1=6)

## SECTION – C

Answer any nine. Each question carries a weightage of 2.

- What are the essentials of a transistor oscillator ?
- What are the drawbacks of LC oscillators ?
- What is a feedback circuit ? Explain how it provides feedback in amplifiers.
- What are the applications of a emitter follower ?



- The half life of thorium is  $1.4 \times 10^{10}$  years. Calculate the time taken by 1 gm of thorium for 10% of the sample to disintegrate.
- Define half life and decay constant of a radioactive element.
- Explain the classification of stars.
- What is a half subtractor ? Write down its truth table.
- What is meant by nuclear fission ? Give an example.
- Give an account of nuclear fusion.
- Write a short note on nuclear reactors.
- What is quark flavour ? Identify the three quark generations. (W = 9×2=18)

## SECTION – D

Answer any one. Each question carries a weightage of 4.

- What is an oscillator ? List the different types of transistor oscillators. With neat circuit diagram, explain the principle and working of a tuned collector oscillator.
- Discuss different types of point imperfections and line imperfections in crystalline solids. (W = 1×4=4)