



Reg. No. :

Name :



M 8573

IV Semester B.Sc. Degree (CCSS-Reg./Supple./Imp.)
Examination, May 2015
Complementary Course in Physics
4C04 PHY : MODERN PHYSICS AND ELECTRONICS
(2009 Syllabus, 2009-12 Admn.)

Time : 3 Hours

Max. Weightage : 30

SECTION – A

(Choose the correct answer. **Each** Bunch carries a weightage of 1.)

1. i) An emitter follower is a
 - a) Voltage feedback amplifier
 - b) Negative current feedback amplifier
 - c) Positive current feedback amplifier
 - d) None of the above
- ii) The SiO_2 layer in an IC act as a
 - a) A resistor
 - b) Mechanical output
 - c) An insulating layer
 - d) None of the above
- iii) The Universal gate is
 - a) NAND gate
 - b) OR gate
 - c) AND gate
 - d) None of the above
- iv) An α - particle is a
 - a) He nucleus having 2 protons and 2 neutrons
 - b) He nucleus having 2 protons and 1 neutron
 - c) He nucleus having 1 proton and 2 neutrons
 - d) None of the above

P.T.O.



2. i) The building blocks of the Universe are
- | | |
|-------------|----------------------|
| a) Planets | b) Stars |
| c) Galaxies | d) None of the above |
- ii) The particles with half odd integer spin obey the Fermi-Dirac statistics are called
- | | |
|-------------|----------------------|
| a) Fermions | b) Bosons |
| c) Hyperons | d) None of the above |
- iii) Ideal crystals have
- | | |
|----------------------------|----------------------|
| a) Only screw dislocations | b) Real crystals |
| c) No imperfections | d) None of the above |
- iv) The linear disturbance of atomic arrangement is known as
- | | |
|------------------|----------------------|
| a) Imperfections | b) Dislocations |
| c) Slip | d) None of the above |
- (2×1=2)**

SECTION – B

(Answer **any six**. Each question carries a weightage of 1.)

- List out the various classifications of amplifiers based on its input signals.
- Write the Barkhausen condition for sustained oscillation.
- Write down the truth table of a OR-gate.
- Draw the circuit symbol of a Exclusive OR gate.
- Define natural radioactivity.
- What are the different types of galaxies ?
- What is dislocation ?
- Give an account of different types of crystal defects. **(6×1=6)**



SECTION – C

(Answer **any nine**. Each question carries a weightage of 2.)

- When negative feedback is applied to an amplifier, the output voltage falls from 50 V to 25 V. Constant signal voltage = 1 V. Calculate the feedback fraction.
- What is meant by LSB and MSB ?
- Write a short note on logic gates.
- How long does it take for 60 percent of a sample of radon to decay ? Half life of radon = 3.8 days.
- Define and briefly explain AND gate.
- What is a half adder ? Write down its truth table.
- Give an account of carbon dating.
- Explain nuclear fusion in stars.
- What are quarks and gluons ?
- Briefly explain White dwarfs.
- What are leptons ? Name the six leptons.
- Explain edge dislocation in a crystal. **(9×2=18)**

SECTION – D

(Answer **any one**. Each question carries a weightage of 4.)

- Classify imperfections in crystals elaborately, and discuss different types of point imperfections.
- What do you understand by feedback ? Explain the principle of feedback in amplifiers. Mention the advantages of negative feedback. **(1×4=4)**