



K22U 1736

Reg. No. :

Name :

IV Semester B.Sc. Degree (CBCSS – Supplementary) Examination, April 2022
(2016 – 18 Admissions)

COMPLEMENTARY COURSE IN PHYSICS
4C04PHY : Modern Physics and Electronics

Time : 3 Hours

Max. Marks : 32

Instruction : Write answers in English Only.

SECTION – A

Very short answer. **Each** carries 1 mark. Answer **all** questions.

1. Radioactivity was discovered by _____.
2. Total amount of energy given out by a star in all directions per unit time is called _____.
3. _____ defect is an example for point defect in which an ion is displaced from the lattice into an interstitial site.
4. The process of returning a part of the output signal from a circuit back to the input of that circuit is called _____.
5. The output of _____ logic gate is low only if all the inputs are low. **(5×1=5)**

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SECTION – B

Short answer type. **Each** carries 2 marks. Answer **any 4** questions.

6. What is meant by half-life period of a radioactive isotope ?
7. What is meant by spectral classes of stars ?
8. What are twin boundaries in surface defects crystals ?
9. List any four drawbacks of integrated circuits.
10. Give Barkhausen criterion for continuous oscillation.
11. Convert binary number $(11001.11)_2$ into its decimal equivalent. **(4×2=8)**

SECTION – C

Short essay/problem type. **Each** carries 3 marks. Answer **any 3** questions.

12. The activity of 1.00 mg of radon is 153.5 Ci. Calculate its activity after two weeks. Half life of a radon is 3.8 days.
13. A star has a radius that is 10 times smaller than the Sun's, while its temperature is 4 times greater. How does the star's luminosity compare to that of the Sun ?
14. What is meant by dislocation in crystals ? Give any four differences between edge dislocation and screw dislocation.
15. An amplifier with a negative voltage feedback gives an output of 10 V with an input of 0.5 V. When feedback is removed, it requires 0.25 V input to get the same output. Calculate the gain without feedback and feedback fraction.
16. Draw the block diagram of a full adder and write down its truth table. **(3×3=9)**



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SECTION – D

Long essay type. **Each** carries 5 marks. Answer **any 2** questions.

17. What are the conditions required for nuclear fusion ? Explain nuclear fusion happening in stars.
18. Give an account of the birth of a star indicating protostar, main sequence and maturity.
19. Explain different types of point defects in crystals.
20. Draw the circuit diagram of a single stage CE amplifier and describe its working. Discuss the phase shift and write the expression for voltage gain. **(2×5=10)**