

Reg. No

Name

B Sc DEGREE END SEMESTER EXAMINATION - OCTOBER 2019
SEMESTER 1 : PHYSICS
COURSE : 19U1CRPHY1 : METHODOLOGY AND PERSPECTIVES OF PHYSICS
(For Regular - 2019 Admission)

Time : Three Hours

Max. Marks: 60

Section A**Answer any 8 (2 marks each)**

1. What is photoelectric effect
2. What are the major contributions of Madam Curie
3. How Plank solved the blackbody puzzle
4. Explain personal errors and how it can be effectively minimized
5. Explain absolute error and relative error
6. State rules of binary addition.
7. What are vectors?
8. Is usage of 2's complement representation advantageous? Explain.
9. Make a note on the geometrical interpretation of divergence.
10. Give the transformation matrix of a 3D vector rotation.

(2 x 8 = 16)

Section B**Answer any 6 (4 marks each)**

11. A current of 2.34 A flows in a resistance of 11.11111Ω. Calculate the potential difference across the given resistance with significant figure
12. Given the capacitance of a capacitor $C = 2 \pm 0.1$ Farads and the applied voltage $V = 25 \pm 0.5$ volts. Calculate the relative and percentage error in the charge on the capacitor.
13. The refractive index of water measured to have values 1.29, 1.33, 1.34, 1.35, 1.32, 1.36, 1.30 and 1.33. Calculate the mean, absolute error, relative and percentage error
14. The length of object measured to have values 22.8 cm, 23.1 cm, 22.7 cm, 22.6 cm, and 23.0 cm. Calculate the mean, absolute error, relative and percentage error
15. Give the schematic of a three bit full adder.
16. Convert 65,535 to its binary and hexadecimal forms.
17. Find the gradient of r (magnitude of position vector).
18. Sketch the function $\vec{v} = \hat{r}/r^2$ and compute its divergence.

(4 x 6 = 24)

Section C**Answer any 2 (10 marks each)**

19. Describe in detail about,
 - a) Homi J Bhaba and Indian Nuclear programme.
 - b) Vikram Sarabhai and Indian space program

20. Describe with theory the instruments for measuring voltage. How will you convert a galvanometer of resistance 12 ohms showing full scale deflection for a current of 3 milli ampere to a Voltmeter of range 0 to 18V?
21. Explain what are half and full adders. Give the corresponding logic circuit diagrams and truth tables.
22. Make a note on cylindrical coordinate system. Obtain the corresponding formulae of gradient, divergence and Laplacian operations. Show one application of this coordinate system.

(10 x 2 = 20)