

2022

3rd Semester Examination

PHYSICS (General)

Paper : SEC 1-T

[CBCS]

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

[Physics Workshop Skill]

Full Marks : 40

Time : Two Hours

Group - A

Answer any *five* from the following questions :

2×5=10

1. What is vernier constant of a vernier callipers ?
2. What is least count of a screw gauge ?
3. What is a gear system ?
4. What are levers ?
5. What are the types of welding joints ?
6. What are pulleys ?
7. What are the uses of lubricating oils ?
8. Briefly describe the concept of workshop practice.

P.T.O.

(2)

Group - B

Answer any *four* from the following questions :

$$5 \times 4 = 20$$

9. How can we measure the dimensions of a cubic block and the diameter of a thin wire ?
10. Explain the method of measuring the height of a building using a sextant.
11. Briefly explain the different types of manufacturing methods.
12. Briefly explain the different types of welding defects.
13. Explain the operation of an oscilloscope with suitable diagram.
14. Explain the working of a timer circuit.

Group - C

Answer any *one* from the following questions :

$$10 \times 1 = 10$$

15. Briefly explain with suitable diagrams the working principle of an electric power generation system. What are regulated power supplies ? How do we design it ?
16. What are pulleys ? Briefly explain the pulley experiment.

$$6 + 1 + 3$$

$$2 + 8$$

(5)

OR

[Computational Physics]

Full Marks : 25

Time : Two Hours

Group - A

Answer any *three* from the following questions :

$$2 \times 3 = 6$$

1. Write down the difference between TeX and LaTeX.
2. Write down a general form of DO LOOP.
3. Give the description of the following Gunplot commands :
 - (i) set
 - (ii) replot
4. What do you mean by LaTeX environment ?
5. Write the functions of $\log_{10}(x+1)$ and $\sqrt{x^3 + 5x}$ in Fortran code.

Group - B

Answer any *two* from the following questions :

$$5 \times 2 = 10$$

6. Write a programme in Fortran that calculates the real roots of a quadratic equation $ax^2 + bx + c = 0$ for a given values of a , b and c . The programme should print a message if the roots are imaginary and should also be able to solve the equation if $a = 0$.

5

P.T.O.

7. Write a programme in Fortran to print natural odd number between 1 and 100. 5
8. What is Gnuplot ? Write down the limitations of Gnuplot. 2+3

Group - C

Answer any **one** from the following questions :

9×1=9

9. (a) What is an algorithm ? What are the characteristics of an algorithm ? 1+2
- (b) Write an algorithm for the Fortran programme that reads three numbers and print the value of the largest number. 3
- (c) Use the block IF and GOTO statements to write a programme that calculates the summations $1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!}$, for given values of x and n . 3
10. (a) Give the following description of the following LINUX commands : 3
- (i) cp
- (ii) rm
- (iii) touch
- (b) Write down the title of a document in LaTeX. 2

(7)

(c) Write down the typeset of the following in LaTeX.

(i) $\bar{x} \cdot \bar{y} = 0$ if and only if $\bar{x} \perp \bar{y}$.

(ii) The equation $(fg)' = f'g + fg'$ as in-line and displayed mathematical text. 2+2

বঙ্গানুবাদ

বিভাগ - ক

যে কোনো তিনটি প্রশ্নের উত্তর দাও : ২×৩=৬

- ১। TeX ও LaTeX এর পার্থক্য লেখ।
- ২। DO LOOP এর সাধারণ রূপটি লেখ।
- ৩। Gnuplot এর ক্ষেত্রে নিম্নলিখিত Command গুলির বর্ণনা দাও।
(ক) Set
(খ) replot
- ৪। LaTeX পরিবেশ বলতে কি বোঝ?
- ৫। Fortran Code এ নিম্নলিখিত অপেক্ষকগুলি লেখ।

(ক) $\log_{10}(x+1)$

(খ) $\sqrt{x^3 + 5x}$

P.T.O.