2019

PG

2nd Semester Examination

PHYSICS

Paper - PHS 204 (CBCS)

Full Marks : 40 Time : 2 Hours

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

Group - A

1. Answer any *four* bits from the followings :- 4×2=8

   (a) Mention two important developments of physical science before 20th century.

   (b) Write two applications of optical fibre.

   (c) What is the difference between electric-motor and electric-generator?

[Turn Over]

(d) Write the concept of inertia from Newton's first law of motion.

(e) Write the importance of velocity of light in physics.

(f) Write main differences between a diode and a resister.

(g) Show the variation of M and B with applied magnetic field for a superconducting to normal phase change.

(h) Give the working principle of Ultrasonography (USG).

Group - B

2. Answer any *four* bits from the followings : 4×4=16

(a) Compare the advantages and disadvantages of

(i) incandescent bulb; (ii) CFL; (iii) LED

(b) What are the common properties of nano materials? What is 'quantum dot'?

(c) (i) What is areal velocity of a planet. 1

(ii) Deduce Newton's law of graviation from Kepler's laws of planetary motion. 3

(d) (i) Differentiate the properties of α, β and γ-radiations. 2

(ii) A Concave lens of focal length 15 cm forms an image at 10 cm from the lens. How far is the object placed from the lens? 2

(e) Show that total flux in a resistance less circuit is constant. 4

(f) Give a brief note on 'Meissner effect'. 4

(g) (i) Define amplitude modulation and frequency modulation. 2

(ii) State the types of modulation used in TV picture and sound transmission. 1

(iii) Calculate the lenght of a $\frac{\lambda}{4}$ antena used to transmit a 100 MHz FM signal. 1

(h) (i) What is the full form of MTSO? What does it do? 2

[Turn Over]

(ii) Write the salient features of GSM 2G communication. 2

Group - C

3. Answer any *two* bits from the followings : 2×8=16

(a) (i) A huge spherical helium filled baloon is prevented from floating upward by a rope tying it to the ground. The baloon plastic structure plus all the helium gas inside of the baloon has a total mass of 9.2 kg. The diameter of the baloon is 3·5 m. The density of air is 1.293 $kg.m^{-3}$. What is the tension in the rope? 3

(ii) What were Galileo's principle contributions to the advance of science? 2

(iii) Write short note on 'Halo'. 3

(b) (i) Write down the observations and conclusions of the Rutherford's α-scattering experiment. 4

(ii) Give the working principle of Magneto Resonance Imaging (MRI). 4

(c) (i) What is the fundamental difference between the generation of radiation from a laser system and a Na-vapour lamp? 4

(ii) What is the working principle of fluorescent tube? 4

(d) Write the principle of LASER production. Write briefly on different level laser system. What is FET? 8
