



22102160

QP CODE: 22102160

Reg No :

Name :

**B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE
EXAMINATIONS, JULY 2022**

First Semester

Core Course - PH1CRT01 - METHODOLOGY AND PERSPECTIVES OF PHYSICS

(Common to B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications, B.Sc Physics Model III Electronic Equipment Maintenance)

2017 Admission Onwards

DF0DF96D

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Write down the year and the contribution for which J J Thomson was awarded Nobel prize.
2. How many times Marie Curie won the Nobel prize and for what?
3. Who explained the blue colour of the sky successfully for the first time?
4. What was Max Planck's major contribution to physics?
5. Convert hexadecimal value $(A16)_{16}$ to decimal.
6. What is sign magnitude numbers?
7. What are the disadvantages of BCD code?
8. Express the relation between (x, y, z) and (r, θ, ϕ)
9. What do you understand by the sensibility of a balance?
10. With reference to pendulum clock what is meant by escapement.
11. What is the equivalent resistance of an ideal ammeter and an ideal voltmeter?





12. What are the rules in rounding off numbers?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Write a note on the contributions of Werner Heisenberg.

14. What is Chandrasekhar limit? What is its importance?

15. Add the following binary numbers a) $110.11 + 11$ b) $111.101 + 11.1$ c) $10 + 111$ d) $1010 + 10001$.

16. Perform the subtraction in 2's complement method and check in decimal system: i) $1101 - 1$ ii) $100 - 1101$ iii) $1100.1 - 11.11$.

17. A body of mass 500g, free to move, is subjected to a force of $i+2j+k$ N. What velocity will it acquire after 4s and what distance will it have covered in that interval of time?

18. The vernier scale of a travelling microscope has 50 divisions which coincide with 49 main scale divisions. If each main scale division is 0.5 mm, calculate the minimum inaccuracy in the measurement of distance.

19. Time for 20 oscillations of a pendulum is measured as $T_1 = 39.6$ s, $T_2 = 39.9$ s, $T_3 = 39.5$ s. What is the precision in measurements? What is the accuracy of the measurement?

20. In an experimental measurement, the refractive index of water is measured as 1.29, 1.33, 1.34, 1.35, 1.32, 1.36, 1.30 and 1.33. Calculate the mean value, absolute error, the relative error and percentage error.

21. The kinetic energy of a moving object is calculated as $\frac{1}{2}mv^2$. The mass of an object was measured with a 4% uncertainty and its velocity with a 3% uncertainty. What will be the uncertainty in its calculated kinetic energy?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Discuss the major contributions of Albert Einstein to modern science.





23. Write down the steps to subtract bigger number from smaller number and vice versa in 2's complement form. Perform the following subtraction in 1's complement and check the result in ordinary binary subtraction method. i) $1001 - 110$ ii) $10001 - 100$ iii) $1001 - 1101$ iv) $111.01 - 100.11$ v) $1001.01 - 11.011$
24. If $p = yz^2 i - 3xz^2 j + 2xyz k$ and $q = 3x i + 4z j - xy k$ and $f = xyz$. Find
- i) $p \times (\nabla f)$
 - ii) $(\nabla \times p) \times q$
 - iii) $q \cdot (\nabla \times p)$
 - iii) $(p \times \nabla) f$
25. Explain how angle of a prism can be measured using a spectrometer.

(2×10=20)





QP CODE: 23104632



23104632

Reg No :

Name :

**B.Sc DEGREE (CBCS) REGULAR/IMPROVEMENT/REAPPEARANCE
EXAMINATIONS, FEBRUARY 2023**

First Semester

Core Course - PH1CRT01 - METHODOLOGY AND PERSPECTIVES OF PHYSICS

(Common to B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications, B.Sc Physics Model III Electronic Equipment Maintenance)

2017 Admission Onwards

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Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Who is the author of "Dialogue Concerning the Two Chief World Systems"?
2. What is Curie's law?
3. Who discovered Argon?
4. Write down the year and the contribution for which C V Raman was awarded Nobel prize.
5. Convert the binary number 101012 to decimal.
6. What is the 1's complement of 1's complement of a number?
7. Obtain the decimal equivalent of the BCD number 0100 0011 1001
8. Give its physical significance of curl of a vector function.
9. Why a physical balance is enclosed in a glass case?
10. Explain the term "Ping" with reference to SONAR.
11. Why pendulum clocks require windings?
12. Define rounding error.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. What was the purpose of J J Thomson's cathode ray experiment and what was his conclusion?
14. Write a note on the contributions of Werner Heisenberg.
15. Perform the binary multiplication: i) 11×11 ii) 111×101 iii) 1011×1001 .
16. Subtract the following decimal numbers in the 1's compliment method after converting to binary: i) $12 - 7$ ii) $15 - 32$ iii) $8 - 16$
17. Calculate the line integral of the function $A = y^2 i + 2x(y + 1) j$ from the point $(1,1,0)$ to the point $(2,2,0)$ along the paths $(1,1,0) \rightarrow (2,1,0)$ and $(2,1,0) \rightarrow (2,2,0)$
18. A galvanometer of 24Ω resistance can carry a full load of $500 \mu A$. If it is shunted by a resistance of 3Ω , how much current can this system carry without damage?
19. It is claimed that the two Caesium clocks, if allowed to run for 100 yrs, free from external disturbances, may differ by 0.02s. What is the accuracy of this clock in measuring a time interval of 1s?
20. The length and breadth of a room is measured as $l=27.4 \pm 0.3$ m, $b=3.45 \pm 0.2$ m, respectively. If the height of the room is $h=4.1 \pm 0.1$ m, calculate the following quantities, with percentage and absolute errors; (a) floor perimeter, (c) floor area, (d) large wall area, (e) difference between the length and width of the floor, (f) volume of the space.
21. Calculate the focal length of a spherical mirror from the following observation. Object distance = $u=50.1 \pm 0.5$ cm, image distance $v=20.1 \pm 0.2$ cm

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Discuss the contributions of Isaac Newton and Albert Einstein to physics.
23. Write down the rules of binary addition. Perform the following binary addition and check it in decimal number system i) $101.11 + 11.01$ ii) $111.0011 + 111.111$
iii) $1010 + 1010.111.110$ iv) $11101.001 + 1010.01$ v) $11111.11 + 11111.11$
24. Prove that (i) $div grad \phi = \nabla^2 \phi$ ii) $curl grad \phi = \nabla \times (\nabla \phi) = 0$ iii)
 $div curl f = \nabla \cdot (\nabla \times f) = 0$ iv)
 $curl curl f = \nabla \times (\nabla \times f) = grad div f - \nabla^2 f$, where ϕ is a scalar and f is a vector quantity.
25. Describe in detail how a spectrometer and stellar parallax is used for measuring angle.

(2×10=20)





21102430

QP CODE: 21102430

Reg No :

Name :

B.Sc DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

First Semester

Core Course - PH1CRT01 - METHODOLOGY AND PERSPECTIVES OF PHYSICS

(Common to B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance)

2017 Admission Onwards

9727D405

Time: 3 Hours

Max. Marks : 60

Part A

Answer any **ten** questions.

Each question carries **1** mark.

1. What is principle of equivalence?
2. Who won the Nobel prize for his work on the conduction of electricity in gases?
3. Which are the two elements discovered by Marie Curie?
4. What is the major contribution of C V Raman to diffraction of light?
5. What is the base of the decimal number system and how many digits are there in the system?
6. Perform using binary multiplication: **a.** 110×11 **b.** 1010×100
7. Add the numbers 16 and 22 by converting to binary.
8. Define Stokes theorem.
9. What do you understand by resting point of a common balance?
10. What is a shunt resistance?
11. What are fundamental units?
12. Define standard deviation.

(10×1=10)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Write a brief note on the contributions of Rayleigh.





14. Write a note on the contributions of Max Plank.
15. Perform the binary subtraction: **i)** $10011 - 11001$ **ii)** $11.01 - 10.11$ **iii)** $10001.11 - 100.1101$
iv) $100 - 110.11$ **v)** $110011 - 1011.11$
16. How can you differentiate BCD from straight binary number system? Encode each of the following decimal numbers to their BCD equivalent **a)** 1235 **b)** 118 **c)** 915
17. Find grad r^m where r is the distance of any point from the origin.
18. A ship sends a pulse of ultrasound and receives an echo 0.3 seconds later. If the speed of sound in water is 1500 m/s calculate its depth.
19. Describe the working of a pendulum clock.
20. How can you convert a galvanometer of internal resistance 75 ohms and showing full scale deflection at 5mA current to (i) An ammeter to measure a maximum current of 500mA (ii) A voltmeter to measure a voltage of 10V.
21. How many significant figures are quoted in each of the following measurements?
a) 783.9 kJ **b)** 0.035 cm **c)** 90.24 kg **d)** 86,400 s **e)** 0.0060 m **f)** 6.07×10^7 m

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Describe Galileo's contributions in the fields of astronomy and mechanics.
23. Show the 8-bit addition of these decimal numbers in 1's complement representation:
a. +50, +23 **b.** +35, -42 **c.** -11, -88 **d.** -44, -12
24. Discuss the scalar and vector product of two vectors in terms of its rectangular components, together with its properties and one of its physical applications.
25. Let Δx and Δy are the errors associated with variable x and y . Find the propagated error associated with variable z , Δz , for (i) $z = ax + by$, (iii) $z = xy$, (iii) $z = x / y$ and (iv) $z = cx$, where a , b , c are constants.

(2×10=20)





6

QP CODE: 18103630



18103630

Reg No :

Name :

B.Sc.DEGREE(CBCS)EXAMINATION, DECEMBER 2018

First Semester

Core Course - PH1CRT01 - METHODOLOGY AND PERSPECTIVES OF PHYSICS

(Common to B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics,
B.Sc Physics Model II Computer Applications, B.Sc Physics Model III Electronic Equipment Maintenance)

2018 Admission only

4DB2699D

Maximum Marks: 60

Time: 3 Hours

Part A

Answer any **ten** questions.

Each question carries **1** mark.

1. Through the famous Leaning Tower of Pisa experiment, Galileo was able to prove what?
2. Who authored the book "The Theory of Sound"?
3. What is the significance of Schrodinger equation?
4. What is a crescograph?
5. Convert the binary number 1110010_2 to hexadecimal number.
6. Explain whether 1010 is a BCD.
7. Find the gradient of the function $F(x,y,z) = x^2 y^3 z^4$
8. Represent the Cartesian coordinates x, y, z in spherical polar coordinates.
9. How do you define one kilogram in SI units?
10. What is the difference in the measurement of one division on the main scale and that of vernier scale in the case of a vernier calliper?
11. Name the two elements used for measuring time in atomic clocks.
12. Which has more resistance – a galvanometer or a milli ammeter?

(10×1=10)


Part B

Answer any **six** questions.

Each question carries **5** marks.

13. What was the purpose of J J Thomson's cathode ray experiment and what was his conclusion?
14. What are the major discoveries of Madam Curie?



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15. Subtract the decimal number 125 from 200 using 2's complement binary operation. Express the numbers in hexadecimal.
 16. Perform the indicated operation i) $110 + 011$ ii) $11010 + 0111$ iii) $110 - 010$ iv) 11011×101 v) 101×11
 17. Vector $a = -3i + 4j - \mu k$, $b = 2i - j + k$ and $c = i - 4j - 3\mu k$, find the value of μ , if the vectors are coplanar.
 18. A current of 3.5 ± 0.5 ampere flows through metallic conductor when a potential difference of 21 ± 1 volt is applied. Find the resistance of the wire?
 19. The original length of a wire is 153.7 ± 0.6 cm. It is stretched to 155.3 ± 0.2 cm. Calculate the elongation in the wire with error limits.
 20. A physical quantity x is calculated from the relation $x = \frac{a^3 b^2}{\sqrt{cd}}$. Calculate the percentage error in x if a, b, c, d are measured respectively with an error of 1%, 3%, 4% and 2%.
 21. A student scores 85, 100, 92, 96, 87, 94, 75. in his examinations. Find the mean and standard deviation. Another student scores 56, 58, 55, 56, 57, 61, 60 for the same test. Who is more consistent?, explain the reason mathematically.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Discuss the contributions of Issac Newton in starting a new era in physics.
23. What are the rules for binary addition and multiplication? Add and multiply the following decimal numbers after converting to binary equivalent a) 25 and 78 b) 34 and 89. Check your answer in decimal system.
24. i) Write down the procedure to convert hexadecimal number to binary numbers. ii) Discuss the steps involved in subtracting smaller number from bigger number and vice versa in 1's compliment form. lii) subtract the following hexadecimal numbers using 2's complement method after converting to binary: a) $F - 4$ b) $1C - 20$ c) $AA - 11$
25. Explain how angle of a prism can be measured using a spectrometer?

(2×10=20)

Reg. No.....

Name.....

B.Sc. DEGREE (CBCS) EXAMINATION, JANUARY/FEBRUARY 2018**First Semester**Core Course—**METHODOLOGY AND PERSPECTIVES OF PHYSICS**

(Common to B.Sc. Physics Model I, II and III)

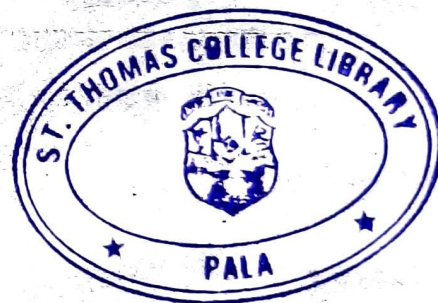
[2017 Admissions]

e : Three Hours

Maximum Marks : 60

Part A*Answer any ten questions.
Each question carries 1 mark.*

- What is Chandrasekhar limit ?
- Write down the year and the contribution for which Albert Einstein was awarded Nobel Prize.
- What is Photo electric effect ?
- Who is the author of "two new Sciences" ?
- How many bits constitute a nibble ?
- The decimal number corresponding to the BCD code 111010101 is :
- Find the gradient of the function $f(x, y, z) = x^2 y^3 z^4$.
- Convert $(D8)_{10}$ to decimal.
- What is a vernier calipers ?
- What is SONAR ?
- What is one astronomical unit ?
- What is parallax error ?



(10 × 1 = 10)

Part B*Answer any six questions.
Each question carries 5 marks.*

- Write a brief note on Lord Rayleigh.
- What are the three laws formulated by Newton to develop mechanics ?
- What is piezo electricity ? Write a brief note on the scientist who invented it.

Turn over

16. How can you differentiate BCD from straight number system? Encode each of the following decimal numbers to their BCD equivalent.

(a) 1235.

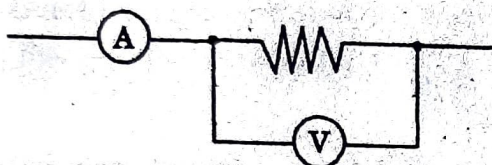
(b) 118.

(c) 915.

17. Check whether the force $F = (2xy + z^2)i + x^2j + 2xz k$ is conservative. If so calculate the work done on a particle in moving it from (0, 1, 2) to (5, 6, 8).

18. How are fractions taken into Account in Binary system? How can binary fraction be converted into decimal fraction and vice versa.

19. In the given figure below, the ammeter reads 5A and V reads 40 V. Calculate the actual value of the resistance R.



20. What is the perimeter of a soccer field if its length and width are measured to be 95.82 m and 71.836 m respectively?

21. What is the distance in km. of a quasar from which light takes 3.0 billion years to reach us?

(6 × 5 = 30)

Part C

*Answer any two questions.
Each question carries 10 marks.*

22. Briefly explain the contributions of any *three* famous Indian Scientists towards Science and Technology.

23. What are the rules of binary addition and multiplication? Add and multiply the following decimal numbers after converting to binary equivalent?

(a) 25 and 78.

(b) 34 and 89.

24. Describe the working principle of ammeter and voltmeter.

25. Explain how the angle of a prism can be measured using a spectrometer?

(2 × 10 = 20)