1B2A22183

(Pages : 2)

Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Degree Examination April 2022

BPH2C02 – Optics, Laser, Electronics & Communication

(2019 Admission onwards)

Time: 2 hours

Max. Marks : 60

Section A- Short Answer Type

(Answer all questions in two or three sentences, each correct answer carries a maximum of 2 marks, Overall Ceiling 20)

1. Write down the conditions for constructive and destructive interferences.
2. Explain colours of thin films.
3. Why are Newton's rings circular ?
4. State Rayleigh's criterion for resolution of spectral lines.
5. What is diffraction?
6. State Malu's law.
7. What is the difference between unpolarized light and circularly polarized light?
8. Define ripple factor.
9. Draw the frequency response curve of a transistor amplifier.
10. How will you construct OR gate using NAND gates?
11. What is the active medium in a Ruby Laser?
12. What is spontaneous emission?

(Ceiling-20)

Section B- Paragraph/ Problem Type

(Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks)

13. A soap film of refractive index 1.33 and thickness 1.5×10^{-4} cm is illuminated by white light incident at an angle of 60^0. The light reflected by it is examined by a spectroscope in which is found a dark band corresponding to a wave length of 5×10^{-5} cm. Calculate the order of interference of the dark band.
14. In a Newton's ring experiment the diameter of 3rd and 23rd dark rings are 0.2cm and 0.6cm respectively. If the radius of curvature of plano convex lens is 92cm, find the wave length of light.
15. Distinguish between resolving power and dispersive power of a grating.
16. 80 g of impure sugar when dissolved in a litre of water gives an optical rotation of 9.9^0 when placed in a tube of length 20cm. If the specific rotation of sugar is 66^0 find the percentage purity of the sugar sample.
17. With the help of a suitable diagram explain the working of pi filters.
18. A half wave rectifier is used to supply 50V d.c to a resistive load of 800Ω. The diode has a resistance of 25Ω. Calculate a.c voltage required.
19. With the help of energy level diagram explain the working of He-Ne Laser.

(Ceiling- 30)

Section C- Essay Type

Answer any one question. Answer carries 10 marks

20. Explain interference in plane parallel film due to reflected light and obtain conditions for maximum and minimum intensities.
21. With the help of a neat diagram explain the working of bridge rectifier. Explain PIV and find out efficiency of full wave rectifier.

(1x10= 10 marks)

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(Pages : 2)

Reg. No:.....

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Physics Degree Examination April 2022

BPH2B02 – Mechanics

(2019 Admission onwards)

Time: 2 hours

Max. Marks : 60

The symbols used in this question papers have their usual meanings

Section A- Short Answer Type

(Answer all questions in two or three sentences, each correct answer carries a maximum of 2 marks)

1. Write the expression for any one fictitious force. What is its unit?
2. What is the principle of equivalence in the context of gravitational force?
3. Write down the expression for the time for the plane of oscillation to rotate once for a Foucault pendulum at latitude λ.
4. Write the effects of Coriolis force on the river flow and air current on earth's surface.
5. What is centrifugal potential in central force motion?
6. Give the advantages of the concept of reduced mass in two body central force problems.
7. Write down any two Keplers' laws of planetary motion.
8. Write down the expression for (a) the average potential energy and, (b) the expression for potential energy as a function of displacement from the mean position for a particle executing simple harmonic motion.
9. What are the effects of damping on resonant frequency and energy of a harmonic oscillator?
10. Write down the expression for the displacement of a forced harmonic oscillator as a function of the driving frequency.
11. Write any one definition of Q factor. What is its significance? What is its unit?
12. What are phase velocity and group velocity of waves? Write the expressions of each.

(Ceiling-20)

Section B- Paragraph/ Problem Type

(Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks)

13. Calculate the deflection of a stone dropped from a height of 100m at the equator due to Coriolis force.
14. Draw the variation of U_{eff} with separation r in the energy diagram. Show the various cases of planetary orbits with different total energies.
15. Briefly describe the formation of water tides due to the accelerated frame of earth around the sun.
16. A musician's tuning fork rings at 440Hz. The intensity of the sound produced decreases to one fifth of its original intensity in 4 s. What is the Q factor of the tuning fork?
17. The dispersion relation for electromagnetic wave in ionosphere is $\omega^2 = \omega_p^2 + c^2k^2$. Show that the phase velocity is greater than c and the group velocity is less than c.
18. If a wavefunction is given by $y(z,t) = 2 \cos(10\pi t - 10\pi z + 0.4)$, find:
    1. The amplitude, 2. The Wavelength, 3. The frequency, 4. The direction of propagation, 5. The wave velocity
19. Show that the force $f = -bv$ always causes a decrease in the stored energy of a damped harmonic oscillator, where v is the velocity of the particle.

(Ceiling- 30)

Section C- Essay Type

(Answer any one question. Answer carries 10 marks)

20. Derive the expression for velocity of sound through air according to Newton's model. Also explain the correction to Newton's formula for velocity.
21. Assuming that the energy and angular momentum are the constants of motion under central force, derive the expression for the various types of possible orbits for planetary motion.

(1 x 10 = 10 Marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Psychology Degree Examination April 2022

BPS2B02 – Basic Themes in Psychology – II

(2019 Admission onwards)

Time: 2hours

Max. Marks : 60

SECTION -A

Answer *ALL* Questions. Answer in Two or three sentences. Each carries 2 marks. There shall be ceiling of 20 marks in this section

1. Concepts
2. Means – ends analysis
3. Functional fixedness
4. Prospective memory
5. Eyewitness testimony
6. Encoding specificity principle
7. Affiliate motive
8. Primary emotions
9. Learned motives
10. James – Lang theory of emotion
11. Drive theory
12. Growth need

(Ceiling 20 marks)

SECTION -B

Answer *all* questions. Answer in a paragraph of about half a page to one page .Each question carries 5 marks. There shall be ceiling of 30 marks in this section

13. The information processing model of memory
14. Define heuristics. Discuss the role of heuristics in problem solving
15. Working Memory
16. Balance theory
17. Discuss the influence of cognitive styles on problem solving
18. Describe the elements of emotional experience
19. Define sexual orientations. Give an account on different sexual orientations

(Ceiling 30 Marks)

SECTION –D

Essay Type Questions

Answer *Any one* of the following .Each Carries 10 Marks.

20. Describe the nature of creative thinking. Elaborate the stages of creative thinking

21. Define motivation. Discuss the cognitive theories of human motivation.

(1 x 10= 10 marks)