GOVT ARTS AND SCIENCE COLLEGE FOR
WOMEN – BARGUR
DEPT OF PHYSICS _In B.Sc physics)_
CYCLE TEST- I [2018/   Max Mark : 50
Time : 2hr
ELECTRICITY AND MAGNETISM

SECTION – A

ANSWER ALL QUESTION: 5 × 2 = 10

1. Define temperature co-efficient of resistance ?
2. What is thermo electric diagram ?
3. what are the uses of the potentiometer ?
4. State the law of intermediate metals ?
5. Define Thomson co-efficient ?

SECTION – B

ANSWER ANY TWO QUESTION:-   2 × 5 = 10

6. What is Meant by peltier effect ? Describe the SG starling method of demonstrating it.
7. Describe the theory of carey Foster bridge ?
8. Describe the theory & diagram in Ammeter ?

SECTION – C

ANSWER ANY THREE QUESTION:-   3 × 10 = 30

9. Describe the thermo-electric diagram and their uses in detail ?

10. Analyse the thermodynamics of a thermo couple and thereby obtain the expression for the peltier and Thomson co-efficients.?

11. Describe about measurement of low resistance [kelvin double Bridge method] ?

12. Describe about see back effect ?

K. Santhi

GOVERNMENT ARTS AND SCIENCE COLLEGE

FOR WOMEN - BARGUR

DEPARTMENT OF PHYSICS   Cycle Test - 2

Numerical Methods [- 2018]

Time = 2 hours

Maximum Marks = 50

PART-A

Answer All the Questions. $5 \times 2 = 10$

1) Define symmetric and skew symmetric?

2) Define rank of a matrix?

3) What is meant by diagonalization of matrices?

4) What is i) diagonal matrix
   ii) Unit matrix.

5) Explain with example i) transpose of matrix ii) conjucate of a matrix.

PART- B

Answer All the Questions. $4 \times 5 = 20$

6) a) Explain Hermition and skew Hermition matrix with examples?
   (Or)
   b) Prove that $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ is orthogonal.

7) a) Determine the rank of a matrix $\begin{bmatrix} 1 & 2 & -1 & 3 \\ 3 & 4 & 0 & -1 \\ -1 & 0 & -2 & 7 \end{bmatrix}$
   (Or)
   b) What are Eigen values and Eigen Vectors.

8) a) Find the rank of matrix $\begin{bmatrix} 3 & -1 & 2 \\ -6 & 2 & -4 \\ -3 & 1 & -2 \end{bmatrix}$
   (or)
   b) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$

9) a) Verify Cayley-Hamiton theorem for matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ 0 & 1 & -1 \\ 3 & -1 & 1 \end{bmatrix}$
   (or)
   b) Find Eigen values and Eigen vector of a matrix $A = \begin{bmatrix} 2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$

PART-C

Answer any two questions. $2 \times 10 = 20$

10) State and prove cayley-Hamilton theorem. Find the characteristic equation of the matrix $A = \begin{bmatrix} 1 & 2 & -2 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix}$ Hence find A^{-1}

11) Determine the characteristic roots and corresponding vectors for the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ Hence diagonalize A

12) Using Cayley-Hamilton theorem find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 & 4 \\ 2 & 1 & 2 \\ 4 & 2 & 1 \end{bmatrix}$

Arts and Science College for Women, Bargur.

Model Exam Question Paper – 2019. I MSC PHYSICS

Subject: Condensed Matter Physics

Max. Marks – 75

Max. Hrs: 3 Hours

PART- A

Answer all the questions

$10 \times 1 = 10$ MARKS

1. Define type-I superconductor
2. Expression for dielectric constant
3. Define Polarizability
4. Define reciprocal lattice
5. Expression for London equation
6. Define Hall voltage
7. Expression for Wiedemann- Franz law.
8. Define BCS theory
9. Define Meissner effect
10. Condition of Bragg's reciprocal lattice

PART- B

Answer all the questions

$5 \times 5 = 25$

11. Describe Bloch theorem
12. Expression for reciprocal to fcc lattice
13. Expression for reciprocal to bcc lattice
14. Explain thermodynamic superconducting transition
15. Give the application of superconductors

PART- C

Answer all the questions

$5 \times 8 = 40$

16. Explain Kronig - Penney model
17. Describe Clausius - Mosotti equation
18. Describe Brillouin zone
19. Explain Atomic Scattering Factor (ASF) (or) Form factor
20. Derive the expression for DC and AC Josephson effect.

P. P

CLASS Incharge

H.O.D

All the Best ☺!

17PPH04

M.Sc. DEGREE EXAMINATION, NOVEMBER 2018.

Second Semester

Physics

CONDENSED MATTER PHYSICS

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 1 = 10 marks)

Answer ALL the questions.

1. When do ionic compounds conduct electricity?

(a) In gaseous state

(b) When dissolved in water

(c) In solid state

(d) They never conduct

2. The first Brillouin zone of bcc lattice is

(a) Rhombic dodecahedron

(b) Rhombic decahedron

(c) Truncated decahedron

(d) Truncated octahedron

3. The number of optical phonon branches for two atoms in the primitive cell is

(a) 1   (b) 2

(c) 3   (d) 6

4. The classical value of molar electronic specific heat is

(a) 1.5 R   (b) R

(c) 3 R   (d) 0.75 R

5. If E, J and B are Hall field, current density and magnetic field strength, then Hall constant is given by

(a) $R_H = \dfrac{EJ}{B}$ (b) $R_H = \dfrac{BJ}{E}$

(c) $R_H = \dfrac{B}{EJ}$ (d) None of the choices

6. The free electron theory could not explain which of the following properties?

(a) Electrical and thermal conductivity of metals

(b) Thermal and thermal conductivity of non-metal

(c) Ferromagnetism

(d) Ohm's law

7. In which of the following, the magnetic moment is zero?

(a) Dia-magnetic material

(b) Parra-magnetic material

(c) Ferromagnetic material

(d) Ferrimagnetic material

8. What is the material used in two port device?

(a) Ferromagnets

(b) Ferrites

(c) Antiferromagnets

(d) Paramagnets

9. Meissner effect occurs in superconductors due to which of the following properties?

(a) Diamagnetic property

(b) Magnetic property

(c) Paramagnetic property

(d) Paramagnetic property

10. Which of the following materials exhibit Ferro-electricity?

(a) Iron   (b) Platinum

(c) Hydrogen   (d) Rochelle salt

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) What is ionic bond? Give any four properties.

Or

(b) Explain the reciprocal lattice for bcc lattice.

12. (a) What are phonons? Discuss the momentum of phonons.

Or

(b) Derive the expression for the specific heat of solids using Einstein's model.

13. (a) State and prove Bloch's theorem.

Or

(b) State and explain Wiedemann Franz law. Give the significance of Lorentz number.

14. (a) Explain Langevin's classical theory of diamagnetism.

Or

(b) Write a note on ferromagnetic domain and its origin.

15. (a) Derive the Clausius-Mossotti equation.

Or

(b) Explain the concept of flux quantisation.

SECTION C — (5 × 8 = 40 marks)

Answer ALL questions.

16. (a) Derive the expression for the Madelung constant and the repulsive exponent (n) for the ionic Crystal.

Or

(b) Derive the Bragg diffraction in terms of reciprocal lattice vector.

17. (a) Discuss the vibrations of one-dimensional monoatomic linear lattice.

Or

(b) Explain the density of mode in one and three dimension and derive the expression for the number of modes in each case.

18. (a) Discuss the Kronig-Penney model by considering a periodic rectangular well structure.

Or

5   S.No. 311

(b) What is Hall effect? Describe its experimental study and hence derive the expressions for (i) Hall Voltage (ii) Hall coefficient (iii) Hall mobility. (2+2+2+2)

Or

19. (a) Discuss the quantum theory of ferromagnetism and hence deduce the expression for χ.

Or

(b) Explain the quantum theory of ferromagnetism and hence show that curie point is proportional to field constant.

20. (a) Write short notes on (i) dielectric constant (ii) polarisability (iii) ferroelectric crystals.

Or

(b) Compare Type – 1 and Type – II superconductors. Give any 3 applications of superconductors. (3+3+2)

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6   S.No. 311

Govt. Arts and Science college for Women
Bargur.   M.SC

Cycle Test - I

Paper code : PPHEC04

Time : 1½ hours

Paper name : Energy Physics

marks : 25

PART - A

1 × 5 = 5

1. Solar cell operate at ____

2. Silicon solar cells have an operating (or) practical efficiency of ____.

3. The equipment used for heating water using solar energy is ____.

4. In solar water systems the heat transfer midium is ____.

5. The maximum power of solar cell is ____.

PART - B.

2 × 5 = 10

1. Briefly explain the types of energy sources? -

2. Write the conventional and non-conventional energy differentiation.

PART - C

1 × 10 = 10

1. Explain briefly Renewable energy sources.

K. sauth 2/8/19
subject incharge

Government Arts And Science College for womens
Bargur
Cyclic Test II - Sep 2019
I B.Sc physics (Properties of Matter and Sound)

Marks: 30   hours: 1:30 hours.

I Answer all the five questions: 5×2=10

1. Define co-efficient of viscosity
2. What is critical velocity of a liquid.
3. What is diffusion.
4. What is transpiration.
5. Write any three graham's of diffusion in liquid.

II Answer any two question given below: 2×5=10

6. What is meant by Critical velocity & write the expression for it

7. Define co-effecient of diffusion. Analogy with heat conduction.

8. Write down the correction for Pressure expressions P_n Poiseuille's formula

III Answer any one question: 10×1=10

9. Compare the viscosity of two liquid using oswald's viscometer.

10. Poiseuille's formula for the flow of liquid through a capillary tube.

(M.KALAIVANI)   (M.KALAIYANI)
Classincharge   Subject incharge
M.Kaliv   M.Kaliv
     13/9/19   19/9/19

PART - A (10 x 2 = 20)

monimum mark =75
Time = 3 hours

1) Draw the Structure of cells & its parts ?

2) write any 3 characteristics of resting potential ?

3) write the type of electrode system in ECG lead configuration?

4) what is called phenocadlography ?

5) write the different modes of operation in pace makers ?

6) what are the requirments for the design of artificial heart values

7) Draw the flow chart at laser based doppler blood flow meters

8) what is blood cell counter ?

9) what is known as personal monitoring ?

10) write Stochastic & non- Stochastic effect ?

PART - B (5 X 5 = 25)

1) a) write the nature of cancer cells ? (or)
   b) what is resting & acting potential ?

2) a) Define ECG (or)
   b) Explain the origin of heart Sounds ?

3) a) difference between the enternal & internal pace maker (or)
   b) what are the problems regarding artificial heart values ?

4) a) write the recording fetal heart monments & blood circulation using doppler ultrasonic method (or)
   b) what is B.P measurment ? its types

5) a) what is pocket type alarm in radiation monitoring instruments
   (or) b) write the effects of radiation enposure ?

(Any 3 question) PART - C (3 x 10 = 30)

1) write the different system of human body ?

2) what is ECG lead configuration & Breifly enplain & its types.

3) what is called brain waves ? Breifly enplain & its classification?

4) Breifly enplain the blood cell counter ?

5) Enplain the radiation safety instrumentation.

| 17UPH04 |

(For the candidates admitted from 2017–2018 onwards)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2019.

Fourth Semester

Physics

OPTICS

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What do you mean by coherence of light sources?

   ஓளியல் ஒளிமூலங்கள் பற்றி தீவிர் அறிவது என்ன?

2. Give any two uses of holography.

   தடம் கலைஞலியின் பயன்கள் ஏதேனும் இரண்டினைத் தருக.

3. What are called zone plates?

   மண்டலத் தட்டுகள் என்றால் என்ன?

4. Define resolving power.

   பிரிதிறன் வரையறு.

5. What is a nicol prism? Give its uses.

   நிகால் பட்டகம் என்றால் என்ன? அதன் பயன்களைத் தருக.

6. Define optical activity.

   ஒளிமியல் வினை வரையறு.

7. What do you mean by chromatic aberrations?

   நிறமிறுத்திப் பற்றி நீங்கள் அறிவது என்ன?

8. Write down the method of minimizing spherical aberration.

   கோளப்பிறழ்ச்சியை குறைப்பதற்கான முறைகளை எழுதுக.

9. What is meant by total internal reflection?

   முழு அக எதிரொளிப்பு என்றால் என்ன?

10. Define acceptance angle.

    ஏற்புக் கோணம் வரையறு.

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain briefly about temporal and spatial coherence.

    Temporal மற்றும் இட ஒளியல் மூலக்களைப் பற்றி சுருக்கமாக விளக்கு.

    Or

    (b) Describe how would you testing the flatness of a surface by air wedge experiment.

    காற்று ஆப்பு சோதனையின் வாயிலாக பரப்பு தட்டையாக உள்ளது என்பதை எவ்வாறு சோதனை செய்வாய் என்பதை விளக்குக.

12. (a) (i) Compare zone plate with convex lens.

    (ii) State Rayleigh's criterion.

    (i) மண்டலத்தட்டினை குவி ஆடியுடன் ஒப்பிடுக.

    (ii) ராலே நிபந்தனையைக் கூறுக.

    Or

    (b) Derive an expression for resolving power of a grating.

    கிறணியின் பிரிதிறுக்கான கோவையை வருவிக்கவும்.

13. (a) Explain the construction of Babinet's componsatory.

    பாபினேட் ஈடுசெய்வியின் அமைப்பினை விளக்குக.

    Or

    (b) Describe the working principle of Laurent's half shade polarimeter.

    லாரண்ட் அரை நிழல் போலாரிமீட்டர் செயல் தத்துவத்தை வியாசி.

14. (a) Define the following:

    (i) Astigmatism and

    (ii) Distortion.

    கீழ்க்கண்டவற்றை வரையறு.

    (i) புள்ளிக் குவிவின்மை மற்றும்

    (ii) உருக்குலைவு.

    Or

    (b) Compare Huygen' and Ramsden eye piece.

    ஹைஜன் மற்றும் ராம்ஸ்டன் கண்வளரை விளக்கவளமை ஒப்பிடுக.

15. (a) Outline the classification of optical fibers.

ஒளியிழைகளை வகைப்படுத்துவதை பற்றி குறிப்பு
வரைக.

Or

(b) Distinguish between step index and graded index fiber.

படி மற்றும் குறியீட்டு எண இழைகளிடையே உள்ள வேறுபாட்டினைத் தருக.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the construction and recording of a Hologram.

தடம் வரைவி அமைப்பு மற்றும் பதிவு செய்வதை பற்றி விளக்குக.

17. Describe the fraunhoffer diffraction pattern with 'N' shifts.

'N' துளைகள் கொண்ட பிரான்ஹோபர் விளிம்பு விளைவு பாங்கினை விளக்கி

18. Explain the production and detection of plane, circularly and elliptically polarised light.

தள, வட்ட மற்றும் நீள் வடிவ தளவிளைவையுற்ற ஒளியினை உண்டாக்கவும் அதனை கண்டறிவதையும் விளக்குக.

19. Describe the kerr-cell method of determining the velocity of light.

கொர்-செல் முறையில் ஒளியின் திசைவேகத்தை கண்டறிவதை விளக்கி.

20. Explain the fiber optic communication system with a neat diagram.

ஒளியிழை அமைப்பு தகவல் தொடர்பு அமைப்பினை தெளிவான படத்துடன் விளக்குக.

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5   S.No. 2409   6   S.No. 2409

2021
odd sem.

GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN-BARGUR

DEPARTMENT OF PHYSICS

CYCLE TEST - 2

SUBJECT:SOLID STATE PHYSICS

TIME:2hr

MARKS:50

I.ANSWER ANY FIVE QUESTIONS GIVEN BELOW   (5X2=10)

1. Define primitive lattice.

2. Define packing fraction.

3. State MOSLEYS LAW

4. What are the uses of X-RAY diffraction method?

5.Write about grain boundaries

6 .Define magnetic susceptibility.

7. Define superconductivity.

II.ANSWER ANY TWO QUESTIONS BERIFLY   (2X5=10)

8.Listout the crystal structure in detail(table)

9. Explain FCC structure

10. Explain screw dislocation with suitable diagram

11. Explain Quantum theory of ferromagnetism

III ANSWER ANY TWO QUESTIONS IN DETAIL   (3x10=30)

12. Explain simple cubic structure.

13. Explain rotating crystal method of X-RAY diffraction

14. Langevin theory of diamagnetism and paramagnetism

15. Explain the types of superconductors

M.Kal   31/10/20
SIGN OF SUBJECT INCHARGE

SING OF HOD 31/10/2020

GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN, BURGUR

CYCLIC TEST - II

BASIC ELECTRONS

III - B.SC

SECTION A - (5X2=10)

ANSWER ANY FIVE QUESTIONS:

1. Write any two applications of photo diode.

2. What is a varactor diode.

3. Define stability factor.

4. What is MOSFET?

5. What are the types of multivibrators?

SECTION B -(4X5=20)

ANSWER ALL THE QUESTIONS:

6. a) Briefly discuss the theory, construction and applications of LED with suitable diagram.   (or)

   b) Explain the construction, operation and applications of Schottky diode.

7. a) Discuss about three types of configurations for operating a transistor. Obtain expression for α and β

   (or)

   b) Explain base resistor method of transistor biasing.

8. a) Describe the working of common source JFET amplifier. (or)

   b) Describe the operation and V-I characteristics of SCR.

9. a) Explain the working and frequency response of a transformer coupled amplifier. (or)

   b) Explain the working of Hartley oscillator and obtain expression for its frequency of oscillation.

SECTION C - (2X10=20)

ANSWER ANY TWO QUESTIONS:

1. Discuss the construction and V-I characteristics of tunnel diode with tunnel theory.
2. Explain the operation and characteristics of JFET and JFET parameters.

K.Santh 2/11/20
Subject Incharge

Head of the Department

GOVERNMENT ARTS AND SCIENCE COLLAGE FOR WOMEN – BARGUR

DEPARTMENT OF PHYSICS : I M SC PHYSICS – MODEL EXAM

FUNDAMENTALS OF COMPUTERS AND COMMUNICATION

TIME : 3 HRS 　　　　　　　　　　　　　　　　　　　　　　　MARKS :
75 MARKS

PART – A 　　　　　　　　　　　　　　　　　　　　　　　15X1=15.

1. Which of the following is the correct definition of computer?

(a). Computer is a machine or device that can be programmed to perform arithmetical or logic operation squences automatical.

(b). Computer understand only binary language which is written in from of 0s and 1s

(c). Computer is a programmable electronic device that stroes retrives and processes the data

(d). All of the mentioned.

2. Which of the following unit is responsible for converting the data received fron the user into a computer understandable format?

(a). Output unit 　(b). Input unit 　(c). Memory Unit 　(d). Arithmetic and Logic unit

3. The physical components of a computer are called?

(a). Software 　　(b). Hardware 　　(c). ALU 　　(d). CPU

4. Mouse is know as_____

(a). Pointing device 　(b). Control device 　(c). Monitoring device 　(d). Gaming device

5. A scanner looks lilke a _____ machine.

(a). Type machine 　(b). Franking machine 　(c). Photocopier 　(d). Cyclostyle

6. Which of the following is a temporary output?

(a). Hard copy 　　(b). Soft copy 　　(c). Duplicate copy 　　(d). On paper

7. Which of the following is not an operating system?

(a). Windows 　　(b). Linus 　　(c). Oracle 　　(d). DOS

8. A_____ is a small program that tells the operating system how to communicate with a specific device.

(a). Buffer 　　(b). Driver 　　(c). performance monitor 　　(d). device

9. which of the following is not and operating system?

(a). windows 　　(b). linus 　　(c). oracle 　　(d). DOS

10. Internet is

(a). A worldwide interconnected network of computers which use a comman protocol to communicate with one another. (b). A worldwide network of computers (c). An interconnected network of computers (d). A local computer network

11. A _____ is a web application that combines services from two or more sources creating a new application

(a) Document management system (b). peer-to-peer network (c). web services (d). Mashup

12. Which of the following is a type of wireless communication

(a). LAN (b). WAN (c). PAN (d). All of the mentioned

13. When an organization uses _____ many programs and user share the data in the database

(a). a data model (b). a file processing system (c). a database approach (d). a chck digit

14. The database Analyst (DA) _____ -

(a) monitors the performance of the database (b).creates & maintances the data dictionary

(c) decides on the properplacement of fields (d) checks backup & recovery procedures

15. _____ involes the examination of computer media, programs, data & log files on computers, servers and network.

(a). Encryption key (b). email filtering (c) digital forensics (d) trusted sources

PART-B
2X5=10

ANSWER ANY TWO QUESTIONS

16 List and describe the five components of a computers.

17 What are the various type of printers?

18 What are features of windows 7 , Mac OS X, UNX & Linux operating system?

19 Discuss about the purpose of computer software.

20 How do interact with web database?

PART – C
5X10=50

ANSWER ALL QUESTION

21. (a) Explain the system software and application software. Give the differences between the system and application software (OR)

(b) Illustrate the mobile computer and mobile device

22. (a) What is input device? Explain the keyboard and pointing devices. (OR)

(b) Explain the various display devices. what are purpose of speakers and headphones?

23. (a) Define operating system. Explain what the functions of an operating system (OR)

(b) Discuss about the graphics and multimedia programs

24.(a) Illustrate the World Wide Web. (OR) (b) Explain the various physical and wireless transmission media

25.(a) Disscus about database management system (OR)

(b) What are techniques to prevent unauthorized access and use? Explain

(For the candidates admitted from 2017-2018 onwards)

M.SC. DEGREE EXAMINATION, APRIL/MAY - 2021

First to Fourth Semester

Physics

Elective - ULTRASONICS AND ITS APPLICATION

Time : Three hours

Maximum : 75 marks

Part - A - (10 × 1 = 10 Marks)

Answer all questions.

1. The SI unit of piezoelectric stress constant is

a) V/N

b) Pair of parallel

c) pair of diad axis

d) None

2. A piezoelectric crystal produces _____

a) pressure waves

b) Electrical waves

c) Light waves

d) simple harmonic waves

3. In the sing-around method, the velocity (c) is related to the pulse repetition rate (PPR) and the length of the specimen (l) as follows.

a) $c = \dfrac{PPR}{l}$

b) $c = (PPR)^* l$

c) $l = \dfrac{PPR}{c}$

d) $c = \dfrac{PPR}{l^2}$

4. Using pulse-Echo overlap method which one of the follow parameter can be determined _____

a) Group speed

b) phase speed

c) Mechanical speed

d) Amplitude

5. Equivalent unit for attenuation is/are

a) nepers per meter

b) ~~phase speed~~ decibel

c) ~~Mechanical speed~~ both (a) and (b)

d) Amplitude newton

6. The ultrasound works on the principle of ___

a) Reflection

b) Refraction

c) Both (a) and (b)

d) propagation

7. ___ dielectrics, have higher breakdown strength.

a) solid

b) Liquid

c) Gases

d) plasma

8. In a polar or non-polar dielectric material when an electric field is applied on lower surface there exists a net charge density which is ___

a) positive

b) Negative

c) Neutral

d) zero

9. Applications of non-destructive tests are

a) detecting flaws in materials with impairing their usefulness

b) detecting flaws in materials without impairing their usefulness

c) detecting flaws that impair the use of the materials such as pressure testing

d) detecting flaws that do not impair the use of the materials such as pressure testing.

which of the following statements is true for the ultrasonic test?

a) wave generated are health harardous
b) complicated shapes can be easily scanned
c) Equipoment used for ultrasonic testing is portable
d) None of these.

part-B - (5×5=25 marks)
Answer ALL questions

11. a) Explain the experimental arrangement for the detection of ultrasonic waves by thermal method

(or)

b) Discuss the importance of electrochememechanical coupling factors.

12. a) Explain the radiation pressure method of ultrasonic investigation

(or)

b) Describe the optical techniques used in ultrasonic investigations.

13. a) Deduce an expression for excess intermolecular free length

(or)

b) write brief notes on dispersion of sound in liquids.

14. a) List the properties of dielectrics in liquid mixture at different temperatory

(or)

b) write brief notes on dielectric breakdown and strength of glasses.

15. a) Briefly explain the non-destructive technique of liquid penetrant method.

(or)

b) Distinguish between the ultrasonic imaging and high resolution imaging.

PART-C - (5×8 = 40 marks)

Answer ALL questions.

16) a) How does piezoelectric effect produce ultrasonic waves? Explain with a neat diagram.

(or)

b) Write short notes on:
i) transducers and
ii) detection of ultrasonic waves by optical methods

17) a) State and Explain the principle, construction and working of an ultrasonic interferometer.

(or)

b) Highlight the ultrasonic method of measuring hypersonic velocity.

18) a) write detailed notes on the different mechanisms of absorption of ultrasonic waves in liquids.

(or)

b) Highlight the nature and importance of the relaxation phenomena of ultrasonic waves in liquids.

19. a) with relevant theory, explain the method of measurem of elastic constant in solids (or)

b) write short notes on:
i) Dipole moment of polar and non-polar molecules

ii) Dielectric absorption

20. a) with the help of necessary diagram, describe the principle and operation of an ultrasonic flaw detector (or)

b) Define and explain i) Thermography & ii) SONAR

Time: 3 Hours

Maximum: 50 marks

(PART- A) (10 x 1 = 10 Marks)

Choose the correct answer from the given options.

1) Self Introduction means introducing ----------
   a) Another   b) Oneself   c) Neighbor

2) In Self-Introduction an interviews--------- is assessed.
   a) Language Skill   b) Dressing   c) Facial Book

3) Short Vowel sounds have just-------- parts.
   a) Two   b) Three   c) one

4) Heat up the water is a------
   a) Pan   b) Can   c) Ban

5) Plato was an influential Greek Philosopher the name Plato was ------- noun.
   a) Common   b) Abstract   c) Proper

6) A Pronoun is used for all 3 persons (1ˢᵗ, 2ⁿᵈ, 3ʳᵈ) is known as ----- Pronoun.
   a) Emphative   b) Reflexive   c) Personal

7) A dictionary is of immense value in building your-----.
   a) Vocabulary   b) Writing   c) Reading

8) There is no singular form for-----.
   a) Cattle   b) Furniture   c) Baggage

9) ---------- refers to the process of reading.
   a) Scanning   b) Skimming   c) Intensive

10) ---------- gives list of reference.
    a) Thesaurus   b) Encyclopedia   c) Dictionary

(PART- B) (2 x 5 = 10 Marks)

Answer any TWO of the following questions.

1) What is listening?
2) Write a note on Tone?
3) What is Thesaurus? How do we use it?
4) Describe to your partner, your favorite dish, how it is prepared and how it tastes?

(PART- C) (3 x 10 = 30 Marks)

Answer any THREE of the following questions.

1) Write an essay on "How to use an Attention grabber"?
2) Write an essay on "Listening for specific Information"?
3) Write an essay on "Dairy Writing"?
4) What is a noun? What is its type?
5) Write an essay on "How to form Plurals"?

Subject Incharge
Dr. D. Punitham

20/11/2021
HoD

Government Arts And Science College for women-Bargur
Department of Physics
I BSC Physics
Cycle Test II (Jan 2022- Sem I)
Professional English

Time: 2 hours   Mark: 50 Marks.

I   Answer All the questions (fill in the blanks)   5×1=5
1   Positively charged Particles of toner powder are then applied to___
2   Computer Graphics is not associated with Text or ___
3   An Instrument measuring atmospheric Pressure ___
4   A machine that resembles a human ___
5

II   Answer the following questions: 5×3=15
6.   Explain Classification of Computer graphics.
7.   write the history of Matches and lighters.
8   Draw the flow chart: Process of Making photo copies.

III   Answer the given Below in detail   3×10=30
9   Explain light emitting Diode (LED)
10   The effect of Mobile phones
11   Explain (i) radiator
              (ii) Rheostat
              (iii) Robot
              (iv) Scientist
              (v) Sensor

M. kaliv 28/12/22
Subject Incharge

Government Arts and Science College for women, Bargur 29 copies

Department of physics.

model question paper (Nov- 2021)

Time: 3 hrs

Max. Marks : 75

Mathematical physics and Numerical methods:

Part A: choose the Correct answer: (10×1 = 10)

1. The form of characteristic equation is

a) $\lambda^3 - a_1\lambda^2 + a_2\lambda - a_3 = 0$ b) $\lambda^3 - a_1\lambda^2 - a_2\lambda - a_3 = 0$ c) $\lambda^2 + a_1\lambda^2 + a_2\lambda + a_3 = 0$ d) None.

2. Students i distribution is also called as the distribution of

a) ∂- function   b) β- function   c) α- function   d) x - function.

3. $\int_0^1 x^{m-1}(1-x)^{n-1}dx$ is the expression for

a) β function   b) ∂ - function   c) α - function   d) x- function.

4. $\int_0^\infty e^{-x} x^{m-1}dx$ is the gamma function of

a) m variable   b) n-variable   c) x-variable   d) none of these.

5. $\Sigma y = a\Sigma x + nb$ is the expression for

a) Straight line   b) parabola   c) hyperbola   d) none of these

6. The Condition $y = ae^{bx}$ is the expression for

a) straight line   b) parabola   c) hyperbola   d) none of these

7. The function $y = f(x)$, here $f(x)$ is called

a) transcendental equation   b) algebric eqn.   c) Integral eqn.   d) Iterative eqn.

8. The method of function $f(a) = -e$ and $f(b) = +e$ is called

a) Bi- Section method   b) Iterative   c) Integral   d) none of these

9. Integration method can be expressed as

a) $x = \phi(x)$ b) $y = f(x)$ c) $y = g(x)$ d) $x = g(y)$

10. $x_1 = x_0 - \dfrac{f(x_0)}{f'(x_0)}$ is _____ order expression for approximation in

newton - raphson method.

a) zero,   b) first   c) second   d) third

                                                              (5×5 = 25)

Part B: Answer all the questions

11. a) Explain i) Symmetric, Skew Symmetric and ii) Hermilton-Skew Herni. matri

(or) b) prove that $\begin{vmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{vmatrix}$ is orthogonal.

12. a) Find the eigen value and eigen vectors of matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ or

<P.T.O>

b Find the eigen values of matrix $\begin{bmatrix} 2 & 1 & 3 \\ -5 & 2 & n \end{bmatrix}$

(14) a. Explain second and third form of Beta function (or)

b Prove that $\Gamma(1/2) = \sqrt{\pi}$

(15) a. Prove that the values of m and n subject to $m > -1$ and $n > -1$ for

$$\int_0^{\pi/2} \cos^m\theta \, \sin^n\theta \, d\theta = \frac{\Gamma(\frac{m+1}{2}) \, \Gamma(\frac{n+1}{2})}{\Gamma(\frac{m+n+2}{2})} \quad \text{(or)}$$

b. Evaluate $\int_0^\infty \frac{x}{1+x^6} \, dx$.

(16) a. Evaluate $\int_0^{\pi/2} \frac{d\theta}{\sqrt{1 - \frac{1}{3}\sin^2\theta}}$ (or)

b. Fit a straight line for

x	1	2	3	4	5
y	14	27	40	55	68

Part : C: Answer all the questions! (8×5 =40)

16. a. Verify Cayley-Hamilton's theorem for $A = \begin{bmatrix} 1 & 2 & 1 \\ 0 & 1 & -1 \\ 3 & -1 & +1 \end{bmatrix}$ (or)

b. Diagonalize : $\begin{bmatrix} 7 & -2 & -2 \\ -2 & 1 & 4 \\ -2 & 4 & 1 \end{bmatrix}$

17. a. Show that $\beta(m, n) = \dfrac{\Gamma m \, \Gamma n}{\Gamma(m+n)}$ (or)

b) Derive the duplication formula $\Gamma m \, \Gamma(m+\frac{1}{2}) = \dfrac{\sqrt{\pi}\,\Gamma 2m}{2^{m-1}} \beta(m, n) = 2^{1-2m} \beta(m, \frac{1}{2})$

18. a From the method of least square determine the constants a and b such that $y = ae^{bx}$ to the data

x	0.0	0.5	1.0	1.5	2.0	2.5
y	0.10	0.45	2.15	9.15	40.35	180.75

19. (a) b Find the root of the equation $x^3 - x + 1 = 0$ Correct to four decimal places using Bi-Section method.

19. a) Explain trapezoidal rule also express Simpson's $\frac{1}{3}$ and $\frac{3}{8}$ rule from it. (or)

b) Explain Taylor's Series and Laurent Series (or)

20. a) Express Gaussian quadrature formula from trapezoidal rule (or)

b) Find the real root of the equation $x^3 - x^2 - 1 = 0$ by iteration method.

—.

R.Byamundur.
Subject Incharge

(For the candidates admitted from 2019–2020 onwards)

M.Sc. DEGREE EXAMINATION, JUNE 2022

Fourth Semester

Physics

COMMUNICATION ELECTRONICS

Time : Three hours   Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL the questions.

1. In a sky wave propagation, which of the following frequency will be suitable for beyond the horizon communication.

   (a) 1 kHz   (b) 10 kHz

   (c) 100 MHz   (d) 1000 MHz

2. The secant law is the relation between Maximum Usable Frequency (MUF), Critical Frequency (CF) and incident angle (θ) and is written as _____.

   (a) $MUF = CF / \cos\theta$ (b) $MUF = CF * \cos\theta$

   (c) $CF = MUF / \cos\theta$ (d) $CF = MUF * \cos\theta$

3. When a wave is reflected in ungrounded antenna, its polarity is changed by _____.

   (a) 0°   (b) 90°

   (c) 180°   (d) 270°

4. The modulation system which is inherently most noise-resistant is _____.

   (a) Frequency Modulation

   (b) Pulse-Position Modulation

   (c) Pulse-Width Modulation

   (d) Pulse-Code Modulation

5. A band pass signal extends from 1 KHz to 2 KHz. Then the minimum sampling frequency that is needed to retain all information of the sampled signal is _____ KHz.

   (a) 1   (b) 2

   (c) 3   (d) 4

6. In communication systems, noise is most likely to affect the signal at _____.

   (a) The transmitter

   (b) The channel

   (c) At the destination

   (d) The information source

7. A submarine cable repeater contains _____ among other equipment.

   (a) Pilot injected pilot extract equipment

   (b) Filters for the two directions of transmission

   (c) Multiplexing and demultiplexing equipment

   (d) A dc power supply and regulator

8. Time division multiplexing is used in _____.

   (a) Analog circuit   (b) Digital circuit

   (c) Modulation circuit (d) Multiplier circuit

9. _____ amplifier is widely used in transponder to provide the final output power required to the trans tube and its power supplies.

   (a) Klystron   (b) MASER

   (c) TWT   (d) Gunn diode

10. If the peak transmitted power in a radar system is increased by a factor of 81, the maximum range will be increased by a factor

    (a) 3   (b) 9

    (c) 27   (d) $\sqrt{3}$

11. Which of the following communication transmission media is open space or free space?

    (a) Line   (b) Radio

    (c) Transmitter (d) All the above

12. Television transmission communication occurs in _____ direction only.

    (a) One   (b) Two

    (c) Three   (d) Four

13. The cut-off wavelength for the dominant mode (TE_{11}) in the cylindrical waveguide is (here r is radius) _____.

    (a) $3.14 r$ (b) $3.41 r$

    (c) $3.14 r^2$ (d) $3.41 r^2$

14. Light travelling in an optical fiber follows the principle of _____.

    (a) Huygens principle (b) Light theory

    (c) Fermat's principle (d) Snell's law

15. The use of orbiting satellites to receive, amplify and retransmit data to earth stations is defined as _____.

    (a) Optical communication

    (b) Digital communication

    (c) Satellite communication

    (d) Analog communication

PART B — (2 × 5 = 10 marks)

Answer any TWO questions.

16. Given account of a short dipole antenna.

17. Discuss differential PCM delta modulation technique.

18. Write short notes on role of a magnetron for microwave generation.

19. Explain the working principle of delta gun picture tube.

20. Define (a) Acceptance angle and (b) Numerical aperture in optical fibre communications.

PART C — (5 × 10 = 50 marks)

Answer ALL the questions.

21. (a) Explain how will you distinguish between grounded and ungrounded antennas with relevant diagrams.

Or

(b) Discuss Ecles and Larmor theory of wave propagation.

5   S.No. 120

22. (a) With help of sampling theory, explain low pass and band signals and describe the bandwidth for a PAM signal.

Or

(b) Write detailed notes on FSK, DPSK and QASK.

23. (a) With a neat diagram, explain the construction and working of a reflex klystron.

Or

(b) Distinguish between coaxial cables and submarine cables.

24. (a) Derive the RADAR equation and illustrate RADAR performance factors.

Or

(b) Discuss working and operation of a colour TV transmission and reception system and draw a neat block diagram.

25. (a) Write brief notes on step index and graded index fibres and draw relevant diagrams.

Or

(b) Highlight the salient features of INSAT communication satellites.

6   S.No. 120

Government Arts and science college for women, Bargur.
Department of Physics.

II BSC
III Sem ◯

Cycle Test - I

Thermal and Statistical Physics.

Max. marks: 50
Time: 2 hrs

Part - A - choose the best answer: $10 \times 1 = 10$

1) The principle of resistance Thermometer is based on
(a) change in resistance with change in temperature.
(b) change in pressure with change in temperature
(c) change in volume with change in temperature.
(d) None of these.

2) The principle of thermoelectric thermometer is based on
(a) thermo electricity. (b) change in resistance with change in temperature.
(c) change in pressure with change in temperature.
(d) change in volume with change in temperature.

3) The principle of magnetic thermometer is based on
(a) change in susceptibility with change in temperature.
(b) change in pressure with change in temperature.
(c) change in volume with change in temperature.
(d) change in resistance with change in temperature.

4) The principle of Bimetallic thermometer is based on
(a) Expansion of solids   (b) thermoelectricity.
(c) Variation of resistance   (d) Expansion of gases.

5) The heat transferred by the substance is expressed as
(a) $H = mc\theta$ (b) $H \propto c\theta$ (c) $H \propto m\theta$ (d) All of these.

6) The quantity of heat required to raise the temperature of a substance by 1 degree centigrade is called as.
(a) Specific heat   (b) Heat capacity (c) Both a and b (d) none of these.

7) Newton's law of cooling is expressed as
(a) $\frac{dH}{dt} = -k(\theta - \theta_0)$ (b) $\frac{dH}{dt} = k(\theta_0 - \theta)$ (c) $dH = -k(\theta - \theta_0)dt$ (d) All of these.

8) The liquified temperature of helium gas is
(a) $-230°c$ (b) $-240°c$ (c) $-250°c$ (d) $-270°c$

9) The inversion temperature of gas molecule is
(a) $T_i = \frac{2a}{Rb}$ (b) $T_i \propto \frac{a}{Rb}$ (c) $T_i \propto \frac{2a}{b}$ (d) All of these.

10) The expression for falling temperature in adiabatic Demagnetisation is

(a) $\Delta T = \dfrac{C_V B_i^2}{2 C_B T_i}$ (b) $\Delta T = \dfrac{B_i^2}{2 C_B T_i^2}$ (c) $\Delta T = \dfrac{C_V B_i^2}{2 T_i}$ (d) $\Delta T = \dfrac{C_V B_i}{2 C_B T_i}$

Part -B: Answer any Four questions: $4 \times 5 = 9$

11) Explain Newton's law of cooling to find the specific heat of a given liquid.

12) Explain the determination of C_V by Joly's Differential Steam Calorimeter.

13) Explain the determination of C_p by Regnault's method.

14) Explain the process of Liquifaction of hydrogen.

15) Explain the process of Liquifaction of helium.

16) Discuss about Helium I and II

Part - C : Answer any Two questions:
                                                        $2 \times 10 = 20$

17) Describe the function of Platinum wire in platinum resistance thermometer & Discuss the correction using callander and Griffth's Bridge also mention advantages and disadvantages.

18) Explain the change in pressure to volume of a gas molecule by using Porous plug experiment [Theory & Experiment].

19) Describe Joule -Thompson effect and explain adiabatic Demagnetisation.

—— x ——

R. R

Government Arts and Science college for women -Bargur

Department of physics

IIrd - B.sc physics. cyclic. 2

(E)

subject code: 21UPHP04

paper : optics and Spectroscopy

Hours: 2 hours

Total: 50 marks

part-A

I choose the correct answer $10 \times 1 = 10$

1. The relation between path and phase difference is given
   by ① phase difference = $\frac{2\pi}{\lambda}$ × path difference.

   ② $\frac{\text{phase diff}}{\text{path diff}} = \frac{2\pi}{\lambda}$ ③ $\lambda = \frac{\text{path diff}}{2\pi \times \text{phase diff}}$ d.) All the above.

2. Fringe width is expressed as
   a) $\beta = \frac{\lambda D}{d}$ b.) $\frac{\beta}{\lambda} = \frac{D}{\lambda}$ c.) $\beta \propto \frac{1}{d}$ d.) all the above.

3. The condition for bright and dark fringes in interference
   of coloured light rays is
   a) $(2m+1) \lambda/2$ & $2m\lambda/2$ b) $(m+1) \lambda/2$ & $m\lambda/2$ c) $(m+1) \lambda/2$ & $m\lambda/4$

   d.) $2(2m+1) \lambda/2$ & $2(2m\lambda/2)$

4. In Newton's rings excpt the wave length can be determined by any
   the formula. a.) $\lambda = \frac{Dm^2 - Dp^2}{4(m-p)R}$ b.) $\lambda = \frac{Dm^2 - Dp^2}{2(m-p)R}$ c.) $\frac{Dm^2 - Dp^2}{(m-p)R}$ d.) None of the
   above.

5. circular fringes are also called as
   a.) Haidinger's fringes   ⑥ equal inclination fringes.
   c.) both ⓐ and ⑥   d.) None of the above

6. The bendey of light waves around the corners of the
   substance is known as a.) Diffraction   b.) Interference
   c.) palarization d.) None of the above.

7. The Interesity of light waves is expressed as
   a.) $\bar{I} = (d/2)^2$ b.) $I = (d^2/4)$ c.) both a & b   d.) None of the above.

8. The radius of nth zone is expressed an
   a.) $r_n = \sqrt{n}$ b.) $r_n = \sqrt{r}$ c.) $r = \sqrt{rn}$ d.) $r = \sqrt{rn}$.

9. The focal length of zone plate is expressed an
   a.) $f_n = \frac{r_n^2}{n\lambda}$ b.) $f_1 = \frac{r_n}{\lambda}$ c.) $f_n = \frac{r_n^2}{\lambda}$ d.) $f_n^2 = \frac{r_n^2}{n\lambda}$

10. The limit of resolution of the microscope is
    a.) $d = \frac{1.22\lambda}{2\sin i}$ b.) $d = \frac{1.22\lambda}{2.NA}$ c.) both (a) & (b)   d.) None of these.

part - B

Answer any four of the following Question. $4 \times 5 = 20$

11. Differentiate Resolving power of microscope & telescope.

12. Explain the construction of working of phase diffraction grating.

13. Explain the two kinds of diffraction effects.

14. Explain the determination of thickness by Newton's rings experiment.

15. Discuss above frusnel's Bi-prism

16. Explain the thing of interferance fringes.

part - c

Answer any two Questions. $2 \times 10 = 20$

17. Briefly Discuss above zone plate: Also compare with convex lens.

18. Construct the Fabry-perot Interferometer also explain its characteristics

19. Explain with principle of Michelson's Interferometer mention its uses.

R.R

TIME DURATION: 3 HOURS   [I] B-Sc PHYSICS   MAX.MARKS – 75 MARKS

PART- A

Answer all the questions   (15x1 =15)

1. The binary equivalent of the decimal number 10 is _____
   a) 0010   b) 10   c) 1010 d) 010

2. The number 251 in decimal system is expressed in binary system by
   a. 11110111   b. 11111011 c. 111111101 d. 111111110

3. Convert 48 decimal to binary
   a. 101110 b. 110000   c. 101000 d. 101000

4. If the J-K flip flop is treated as input and inverter is connected between
   J and K inputs, J-K flip-flop becomes-----
   A.T- flip a flop   b. D latch   c. R-S flip-flop d. D- flip-flop

5. Master-Slave configuration is used in FF to
   a. increase its clocking rate b. reduces power dissipation c. eliminates race around
   condition d. improves its readability

6. When two asynchronous active low inputs PRESENT and CLEAR are applied to a J-K flip
   flop the output will be
   a. 0 b. Undefined c. Previous stated. 1

7. Logic gates required to build up a half adder circuit are
   a. Ex- OR gates and NOR gates b. Ex-OR gate and OR gate c. Ex-OR gate and AND
   gated. Ex-NOR gate and NAND gate

8 .A(A+B) = ?
   a.AB b. 1 c. (1+AB) d. A

9. The logical sum of two or more logical product terms is called -------
   a. SOP   b. POS   C. OR operation d. NAND operation

10. There are -------- Minterms for 3 variables (a,b,c)
    a. 0 b. 2 c. 8 d.1

11. The enable inputs is also known as ------
    a. Select input b. Decoded input c. strobe d. sink

12. Which one of the following is a type of combinational circuit?

(PTO)

a. Demultiplexer b. Multiplexer c. Both a and b d. None of the above

13. The encoder, multiplexer, decoder, multiplexer are examples for ------------- logic circuit.

    a. Sequential circuit b. Combinational circuit c. Both a and b D. None of the above

14. In which operation carry is obtained -------

    a. Subtraction b. Addition c. Multiplication d. both a and b

15. Half subtractor is used to perform subtraction of --------

    a. 2 bits b. 3 bits c. 4 bits d. 5 bits

<div align="center">

PART-B   2x5=10

Answer any two questions
</div>

16. State & prove De - morgans theorem.

17. Simplify the following expression using K- map $Y=F(A,B,C,D)=\sum$ (0,1,3,5,7,9,11,12,13,14,15).

18. Explain the function of half subtractor with truth table.

19. Draw a circuit of 4 bit shift right register and list out the outputs produce by it.

20. Explain the circuit and the working of a 3 bit binary D/A converter.

<div align="center">

PART-C   5X10=50
</div>

21. (a).Draw the symbol and write the truth table of NOR gate. Show that NOR is universal building block. OR

    (b)Discuss the binary number system.

22. a) Explain on the following: i)What is a k-map ? Simplify the following expression using k-map.

    ii)$Y=F(A,B,C,D)=\sum(0,1,2,3,4,6,8,9,10,11,12,14)$ OR (b)Explain 3 variable and 4 variable k-map

23. (a)Short note on i)Explain the function of full adder with truth table.

    ii) Explain BCD to 7 segment decoder. (OR)

    b) Explain the multiplexer and demultiplexer

24. a) i)Explain clocked R.S flip flop and D-flip flop. OR

    i)Explain R.S flip flop using NOR gate ii)Explain the Master- Slave J.K flip flop.

25 a)(i)Explain the circuit and working of a 4-bit R-2R ladder D/A converter with necessary theory.

    ii) Explain the ripple counter. (OR)

    b)(i)Difference b/w synchronous and asynchronous. (ii) What is meant by counter (iii) Explain successive approximation A/D Analog to Digital converter.

SUBJECT INCHARGE

HOD

(For the candidates admitted from 2019–2020 onwards)

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Fourth Semester

Physics

OPTICS

Time : Three hours   Maximum : 75 marks

SECTION A — (15 × 1 = 15 marks)

Answer ALL questions.

1. Michelson's interferometer works in the principle of ———————

   (a) Diffraction   (b) Interference

   (c) Polarization   (d) Specific rotation

   மைக்கேல்சனின் குறுக்கீட்டுவிளைவுமானி ———— தத்துவத்தில் வேலை செய்கிறது

   (அ) விளிம்பு விளைவு   (ஆ) குறுக்கீட்டு விளைவு

   (இ) தள விளைவு   (ஈ) குறிப்பிட்ட சுழற்சி

2. Fabry perot interferometer is a high resolving power instrument which make use of the fringes of equal —————

(a) Inclination   (b) Amplitude

(c) Thickness   (d) Phase-shift

∴பேப்ரி பெரோட் குறுக்கீட்டுவிளைவுமானி உயர் தீர்வுத்திறன் கருவி —————— இது சமமான கருள் பயன்படுத்துகிறது.

(அ) சாய்வு   (ஆ) வீச்சு

(இ) தடிமன்   (ஈ) கட்ட மாற்றம்

3. The technique by which image is obtained from a hologram is called as —————

(a) Formation

(b) Construction

(c) Reconstruction

(d) Projection

ஒரு முப்பரிமாணவியல் இருந்து படத்தைப் பெறும் நுட்பம் —————— என அழைக்கப்படுகிறது.

(அ) உருவாக்கம்   (ஆ) கட்டுமானம்

(இ) மறுகட்டுமானம்   (ஈ) திட்டம்

4. How many lenses are used in Fresnel Diffraction?

(a) Two Convex lenses

(b) Two Concave lenses

(c) One Convex lens

(d) No lens used

∴ப்ரெஸ்னர் விளிம்பு விளைவு சோதனையில் எத்தனை லென்ஸ்கள் பயன்படுத்தப்படுகின்றன?

(அ) இரண்டு குவிந்த லென்ஸ்கள்

(ஆ) இரண்டு குழிவான லென்ஸ்கள்

(இ) ஒரு குவிந்த லென்ஸ்கள்

(ஈ) லென்ஸ் பயன்படுத்தப்படவில்லை

5. In the case of Fraunhofer diffraction at a narrow rectangular aperture

(a) $\lambda = \dfrac{D}{ax}$ (b) $\lambda = \dfrac{ax}{D}$

(c) $\lambda = \dfrac{Dx}{a}$ (d) $\lambda = \dfrac{a}{Dx}$

ஒரு குறுகிய செவ்வக துளையில் ∴ப்ரான்ஹோஃபர் விலகல் என்பது

(அ) $\lambda = \dfrac{D}{ax}$ (ஆ) $\lambda = \dfrac{ax}{D}$

(இ) $\lambda = \dfrac{Dx}{a}$ (ஈ) $\lambda = \dfrac{a}{Dx}$

6. The Zone plate behaves like a ―――――
   (a) Concave Lens with multiple foci
   (b) Convex Lens with multiple foci
   (c) Convex Lens with single foci
   (d) Concave Lens with single foci

   மண்டல தட்டு ―――――― போல செயல்படுகிறது.
   (அ) பல குவியங்களுடன் கூடிய குழிவான லென்ஸ்
   (ஆ) பல குவியங்களுடன் குவிந்த லென்ஸ்
   (இ) ஒற்றை மையத்துடன் குவிந்த லென்ஸ்
   (ஈ) ஒற்றை குவியமுடன் குழிவான லென்ஸ்

7. A ―――――― light is a wave in which the electric vector is everywhere confined to a single plane
   (a) umpolarized
   (b) plane polarized
   (c) circularly polarized
   (d) elliptically polarized

   ஒரு ―――――― ஒளி என்பது ஒரு அலை, இதில் மின் வெக்டர் எல்லா இடங்களிலும் ஒற்றை தளம்.
   (அ) முனைவுற்றாத
   (ஆ) தள முனைவுற்ற
   (இ) வட்டமாக முனைவுற்ற
   (ஈ) நீள்வட்டமாக முனைவுற்ற

8. The property of rotating the plane of vibration of polarised light is known as
   (a) Optical activity
   (b) Refraction
   (c) Double refraction
   (d) None of the above

   முனைவுற்ற ஒளியின் அதிர்வின் தளத்தை சுழற்றும் திகழ்வு
   (அ) ஒளிசார் செயல்பாடு
   (ஆ) ஒளிவிலகல்
   (இ) இரட்டை ஒளிவிலகல்
   (ஈ) மேற்கூறியவை எதுவுமில்லை

9. In Nicol prism two parts of the crystal are cemented together with ―――――― layer.
   (a) Oil   (b) Silica
   (c) Canada balsam   (d) Glycerin

   நிக்கோல் முப்பட்டக படிகத்தின் இரண்டு பகுதிகள் ―――――― அடுக்குடன் இணைக்கப்படுகின்றன.
   (அ) எண்ணெய்   (ஆ) சிலிக்கா
   (இ) கனடா பால்சம்   (ஈ) கிளிசரின்

10. The aberration that occurs due to dispersion of light are called ―――――― aberration.
    (a) monochromatic   (b) coma
    (c) distortion   (d) chromatic

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ஒளியின் பரவல் காரணமாக ஏற்படும் பிறழ்வு
———————— பிறழ்வு என்று அழைக்கப்படுகிறது.

(அ) ஒளியல் ஒளி   (ஆ) கோமா

(இ) விலகல்   (ஈ) வண்ணமான

11. The coma can be eliminated if a lens satisfied
———————— condition.

(a) Snell's   (b) Abbe's sine

(c) Gauss   (d) Newton's

ஒரு லென்ஸ் ———————— நிபந்தனையை சரிசெய்தால்
கோமாவை நீக்க முடியும்

(அ) ஸ்னெல்ஸ்   (ஆ) அபேயின் சைன்

(இ) காஸ்   (ஈ) நியூட்டன்

12. The power of Huygens' eyepiece is ————————

(a) negative   (b) positive

(c) small   (d) zero

ஹைஜென்னின் கண் அருகுவில்லையின் திறன்
————————

(அ) எதிர்குறி   (ஆ) நேர்குறி

(இ) சிறுமம்   (ஈ) சுழி

13. The Numerical Aperture (N.A.) is dependent only
on ———————— of the core and cladding
materials.

(a) The angle of refraction

(b) The refractive indices

(c) Snell's law

(d) Multiple reflection

எண்ணளவுத்துளை உள்ளகம் மற்றும் உறைப்பூச்ச
பொருட்களின் ———————— பொருந்தது.

(அ) ஒளிவிலகல் கோணம்

(ஆ) ஒளிவிலகல் குறியீடுகள்

(இ) ஸ்னெல்லின் விதி

(ஈ) பல பிரதிபலிப்பு

14. What is the principle of fibre optical
communication?

(a) Frequency modulation

(b) Population inversion

(c) Total internal reflection

(d) Doppler Effect

கண்ணாடி இழை தகவல் தொடர்பின் தத்துவம் என்ன?

(அ) அதிர்வெண் பண்பேற்றம்

(ஆ) தலைகீழ் தொகை

(இ) முழு அக பிரதிபலிப்பு

(ஈ) டாப்ளர் விளைவு

15. The Graded index multi mode fiber is used in _____

(a) data links

(b) telephone links

(c) under water cables

(d) earthlings fiber

தரப்படுத்தப்பட்ட குறியீட்டு பல முறை கண்ணாடி இழை _____ பயன்படுத்தப்படுகிறது.

(அ) தரவு இணைப்புகள்

(ஆ) தொலைபேசி இணைப்புகள்

(இ) தண்ணீருக்கு அடியில் கம்பிவடங்கள்

(ஈ) பூமிக்கு அடியில் கண்ணாடி இழை

SECTION B — (2 × 5 = 10 marks)

Answer any TWO questions.

16. Write a short note on temporal coherence.

கால ஒத்திசைவு பற்றி சிறு குறிப்பை எழுதுக.

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17. Differentiate Fresnel and Fraunhofer diffraction.

ஃப்ரெஸ்னல் மற்றும் ஃப்ரான்ஹோஃபர் விளிம்பு விளைவு வேறுபடுத்துக.

18. Describe the Nicol prism and explain how it can work as analyzer und polarizer?

நிக்கோல் முப்பட்டகம் விவரி மற்றும் அது எவ்வாறு பகுப்பாய்வி மற்றும் முனைப்பாளானா செயல்பட முடியும் என்பதை விளக்குக.

19. What is coma? How this can be removed?

கோமா என்றால் என்ன? இதை எப்படி நீக்க முடியும்?

20. What are the difference between step index fibre and graded index fibre?

சில படி குறியீடு கண்ணாடி இழை மற்றும் பல நிலை படி குறியீடு கண்ணாடி இழை இடையே உள்ள வேறுபாடு என்ன?

SECTION C — (5 × 10 = 50 marks)

Answer ALL questions.

21. (a) Describe Air wedge experiment to determine the thickness of the thin wire.

மெல்லிய கம்பியின் தடிமனுக்கான காற்று ஆப்பு பரிசோதனையை பற்றி விவரி.

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(b) Describe the construction and working of Febry-Perot interferometer.

ஃபாப்ரி பெரோட் குறுக்கீட்டு விளைவுமானியின் அமைப்பு மற்றும் வேலை செய்யும் விதத்தை விவரி.

22. (a) With necessary diagram explain the Fraunhoffer diffraction at double slits.

தகுந்த வரைபடத்துடன் ஃப்ரான்ஹோஃபர் இரட்டை பிளவு விளிம்பு விளைவு பற்றி விவரி.

Or

(b) Explain the principal of a zone plate. How they are constructed? Give its theory.

ஒரு மண்டலத் தட்டின் தத்துவத்தை விளக்குக. அலை எவ்வாறு அமைக்கப்பட்டுள்ளன என்பதை விவரி.

23. (a) What is double refraction? Give the Huygens theory of double refraction in uniaxial Crystal.

இரட்டை ஒளிவிலகல் என்றால் என்ன? ஓரச்சு படிக இரட்டை ஒளிவிலகல் பற்றிய ஹூய்ஜென்ஸ் கொள்கையை விவரி.

Or

(b) Describe the experiment find the specific rotator power of sugar solution by Laurent's half shade polarimeter.

லாரன்ட்டின் அரை நிழல் துருவமுனை மூலம் சர்க்கரை கரைசலின் குறிப்பிட்ட சுழற்சி கண்டறியும் சோதனையை விவரி.

24. (a) Discuss the spherical aberration in a lens. How this can be minimized?

ஒரு லென்ஸில் கோள மாறுபாடு பற்றி விவரி. இதை எப்படி குறைக்க முடியும்?

Or

(b) Explain the construction of Ramsden eyepiece. Why cannot a cross-wire be used with it?

ராம்ஸ்டன் கண் அருகுவில்லை அமைப்பு பற்றி விளக்குக. அதனுடன் குறுக்கு கம்பியை ஏன் பயன்படுத்த முடியாது?

25. (a) Explain the total internal reflection providing the appropriate derivations.

முழு அக பிரதிபலிப்பு பற்றி விவரித்து அதற்கான சமன்பாட்டை வருவி.

Or

(b) Explain in detail fiber optic communication system.

கண்ணாடி இழை தொலைதொடர்பு பற்றி விரிவாக விளக்குக.