DEVASWOM BOARD COLLEGE
THALAYOLAPARAMBU
(Affiliated to Mahatma Gandhi University, Kottayam)

CRITERION I
Curricular Aspects

Submitted to
The National Assessment and Accreditation Council
(NAAC)
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DEPARTMENT OF PHYSICS, DEVASWOM BOARD COLLEGE THALAYOLAPARAMBU

FIFTH SEMESTER
OPEN COURSE - PH5OPT02 - PHYSICS IN DAILY LIFE
SECOND INTERNAL EXAMINATION 2022

Time – 90 min Marks – 30

Part A
(Answer any 5 questions. Each carry 2 marks)

1. Name the biggest and smallest planets of the solar system.
2. What do you understand by the term Black hole?
3. Why does a Canon recoil after firing?
4. Why do we place handles at maximum possible distance from the hinges in a door?
5. Riders on a roller coaster may feel weightlessness at the top of the ride why?
6. Give any two application of Bernoulli's theorem.
7. Some people measure heat energy in calories. How many calories makes a Joule?

Part B
(Answer any 3 questions. Each carry 5 marks)

8. What is one kWh? How it can be equated to Joule?
9. The velocity of water in a river will less on the bank but great in the middle?. Do you agree. Why?
10. Write a short note about the Celsius scale of temperature.
11. How does uniform linear motion differ from uniform circular motion? Give two points of differences.
12. When we travel in a vehicle which takes a curve, we feel a pull to the outward direction of curve. Explain this phenomenon

Part C (Answer any 1 question. Each carry 10 marks)

13. What are the different Power generation techniques known to us? Write a short note on each of it bringing out its principle , merits and demerits
14. How do we classify stars?

DEVASWOM BOARD COLLEGE THALAYOLAPARAMBU

MSc Chemistry(CSS)2nd Semester Internals 2022

Topic – Chemical Bonding and Computational Chemistry

Chpt 1 - Group Theory

Time : 1 hour weight : 10

SECTION A

1. $A_1 - A_1$ transition is allowed in C_{2v} point group. True or false. Give reasons.
2. What are the selection rules for electronic spectra to occur?
3. Explain how the change from cubic symmetry will make a forbidden transition becoming allowed.

SECTION B

1. With respect to group theory, explain with examples how we can predict the optical activity of molecules?

SECTION C

1. Discuss on electronic transitions in C_{2v}, C_{3v} and C_{2h} using direct product terms.

ALL THE BEST!

DEPARTMENT OF PHYSICS, DEVASWOM BOARD COLLEGE THALAYOLAPARAMBU

FIFTH SEMESTER
OPEN COURSE - PH5OPT02 - PHYSICS IN DAILY LIFE
MODEL EXAMINATION-2021

Time – 3 h Max. marks – 80

Part A

(Answer any ten questions. Each carry 2 marks)

1. What is the law of motion involved in the working of a rocket?
2. How do physicists measure inertia?
3. What is the name of the instrument we use to measure voltage?
4. Why do we place handles at the maximum possible distance from the hinges in a door?
5. What is the SI unit of temperature?
6. What is the principal of optical fiber?
7. Which type of mirror is used by dentists to see the cavity in the tooth of a patient?
8. Which type of lens is called a converging lens?
9. What is meant by instantaneous velocity?
10. Explain the term weightlessness.
11. Which type of mirror is used as a rear view mirror in a motor vehicle?
12. The sounds emitted by bats are extremely intense. Then why can't we humans hear them?

Part B

(Answer any 6 questions. Each carry 5 marks)

13. A transformer has 2300 windings in the primary and 100 windings in the secondary. If a voltage of 230V AC is applied to the primary, how much voltage do you expect at the secondary?
14. An airplane requires a long run on the ground before taking off. Explain why?
15. What are the various scales we use to measure temperature?
16. Explain the electromagnetic spectrum and mark the position of UV, IR, visible, and microwave in it.
17. What are the laws of refraction?
18. Explain the reason for the twinkling of stars.
19. How does uniform linear motion differ from uniform circular motion? Give two points of differences.
20. When we travel in a vehicle that takes a curve, we feel a pull to the outward direction of the curve. Explain this phenomenon.
21. What is one kWh (kilowatt-hour)? How can it be equated to Joules?

Part C

(Answer any 2 question. Each carry 10 marks)

22. Write note on any three defects of human eye and give their corrections by lens.

Devaswom Board College, Thalayolaparambu
Internal Examination
Common Course 5 - EN3CC05 - Literature and/as Identity

Time: 1 Hr 30 Min

Total Marks: 40

Part A

Answer any **five questions** from the following. Each carries **2 marks.** (5 x 2 = 10 marks)

1. Who is Orka? How did he treat Pinyar?
2. What is the author's sense of childbirth?
3. Who in the Indian side finds the dog? (The dog of Tithwal)
4. Why did Ayah hate Chato?
5. What does the speaker mean by stating that the Englishman is 'too young to be flavoured by Raj'?
6. Explain how Kashmir shrinks into the speaker's mailbox.
7. Why did Shubhopriyo invite Shudip to his home?

Part B

Answer any **three questions** from the following. Each carries **5 marks.** (3 x 5 = 15 marks)

8. Describe Reverend Earl Little.
9. Why did Purnachandra say that he didn't trust Shudeep?
10. What do you learn about Pinyar's love as a mother?
11. Describe the poet's usage of postcard as the central image of the poem.
12. What are the challenges faced by a mother writer?

Part C

Write an **essay** from the following. (1 x 15 = 15 marks)

13. Discuss the questions of identity that the stray dog throws up.
14. Justify the title Nightmare.
15. Comment on the social life worlds that are reflected in the different songs in the folk song series.

DEVASWOM BOARD COLLEGE,THALAYOLAPARAMBU

B.Sc. Degree (CBCS, 2021 admission regular)

Internal Examination 1- Third Semester

January 2021

Core Course-MM3CRT01-Calculus

Time: 1 ½ hours **Max. Marks: 40 marks**

Part A

Answer any five questions. Each question carries 2 marks

1. State the first derivative test for local extreme values.
2. Find the points of inflection of the curve $y = x^3 - 3x^2 - 9x + 9$.
3. Evaluate the integral $\int_1^2 \int_0^4 2xy \, dy \, dx$.
4. Sketch the region of integration given by $0 \leq x \leq 3, 0 \leq y \leq 2x$.
5. State Fubini's Theorem for double integrals over rectangular region.
6. Write the double integral to find the volume of the region bounded above by the paraboloid $z = x^2 + y^2$ and bounded below by the square $R: -1 \leq x \leq 1, -1 \leq y \leq 1$.

Part B

Answer any three questions. Each question carries 5 marks

7. Expand $f(x) = \log(x + a)$ in powers of x using Taylor series.
8. Expand $e^x \sin x$ as Maclaurin series.
9. Evaluate $\int_0^3 \int_0^{\sqrt{9-x^2}} \int_0^{\sqrt{9-x^2}} dz \, dy \, dx$
10. Find the volume of the solid in the first octant bounded by the coordinate planes , the cylinder $x^2 + y^2 = 4$ and the plane $z + y = 3$.
11. Find the area of the region enclosed between the line $y = x + 2$ and the parabola $x = -y^2$.

Part C

Answer any one question. Each question carries 15 marks

12. Find the ranges of values x for which the curve $y = x^4 - 6x^3 + 12x^2 + 5x + 7$ is concave upwards or downwards. Also determine the points of infection and inflectional tangents to the curve.
13. Sketch the region of integration, reverse the order of integration and hence evaluate the integral

$$\int_0^3 \int_{\sqrt{\frac{x}{3}}}^1 e^{y^3} dy \, dx$$

DEVASWOM BOARD COLLEGE, THALAYOLAPARAMBU

INTERNAL EXAMINATION, FEBRUARY 2021

First Semester

M Sc MATHEMATICS

LINEAR ALGEBRA

PART - A

Answer Any 3 (Weight – 1)

1 Consider the linear operator T defined by T (x , x , x) = (3x, x – x, 2x + x + x). Prove that (T - I) (T – 3I) =0

2 Check whether the function D on the set of 3 3 matrices over the field of real numbers defined by D (A) =A A A Is linear

3.Let K be a commmutative ring with identity and let n be a positive integer.Show that there exist atleast one Determinant function on K

4.Let F be a field and let T be a linear operator on F defined by T(x , x) = (x + x , x) .Find T

PART - B

Answer Any 3 (Weight – 2)

Let T be a linear tranformation from V into W . Show that T is non – singular if and only if T carries each linearly Independent subset of V onto a linearly independent subset of W

6.Suppose V and W are finite dimensional vector space over the field F , and T : V ..... W be a linear transformation Show that the range of T is the annihilator of the nullspace of T.

7.Let K be a commutative ring with identity , and let A and B be n n matrices over K . Prove that det(AB) =(detA)(detB)

8.Find the rank and nullity of the linear transformation T : R ..... R defined by T (x ,x , x ,) = (x - x + 2x ,2x + x ,-x -2x + x)

PART - C

Answer Any 2 (Weight – 5)

DEVASWOM BOARD COLLEGE THALAYOLAPARAMBU

BSc Chemistry(CBCS)2nd Semester Internals 2019-20

Topic – ATOMIC STRUCTURE

Time : 45 minutes

Marks : 20

PART A

Each question carries 1 mark

1. An electron is in the 4d sub shell. What are the possible values of its 4 quantum numbers?
2. Give the de Broglie equation.
3. Why is Cu^{2+} a lot more stable than Cu^{+}?
4. What is Zeeman effect?
5. Is a 2f state possible? Explain.

PART B

Each question carries 5 marks

6. Discuss the experimental support for the wave nature of electrons.

PART C

Each question carries 10 marks

7. (a) Write a note on the principles which are very crucial in filling up of atomic orbitals by electrons.

   (b) Derive an expression for the frequency of the spectral lines of hydrogen based on Bohr theory.

**********GOOD LUCK**********

DEVASWOM BOARD COLLEGE,THALAYOLAPARAMBU

B.Sc. Degree (CBCS, 2017 admission regular)
Internal Examination 1 - First Semester
December 2019
Complementary Course-MM1CMT01

Partial Differentiation, Matrices, Trigonometry and Numerical Methods

Time: 1 ½ hours **Max. Marks: 40 marks**

Part A

Answer any five questions. Each question carries 2 marks

1. Separate $\tan(x+iy)$ into real and imaginary parts.
2. Express $\sin 3\theta$ in terms of $\sin\theta$.
3. If $x = \cos\theta + i\sin\theta$, find the imaginary part of $\frac{1}{x}$.
4. Define transcendental equations. Give one example.
5. Give the generalized Newton's formula to find a root of $f(x) = 0$ with multiplicity p
6. Write the condition of convergence for solving $f(x) = 0$ using iteration method.

Part B

Answer any three questions. Each question carries 5 marks

7. If $\sin(\theta + i\varphi) = \tan(x+iy)$, then show that $\frac{\tan\theta}{\tanh\varphi} = \frac{\sin 2x}{\sinh 2y}$.
8. Sum to infinity the series $1 + c\cos\theta + c^2\cos 2\theta + ---$, where $|c| < 1$.
9. Obtain a root correct to 3 decimal places for the function $x^3 - 3x - 5 = 0$ using bisection method.
10. Use the method of false position to obtain a root correct to four decimal places $x^3 - x - 1 = 0$.
11. By using Newton-Raphson method, establish the formula $x_{n+1} = \frac{1}{2}\left(x_n + \frac{N}{x_n}\right)$ for computing the square root of a given positive number N. Using the same, find the square root of 2 exact to four decimal places.

Part C

Answer any one question. Each question carries 15 marks

12. a. Prove that $\tanh(x+y) = \frac{\tanh x + \tanh y}{1 + \tanh x \tanh y}$

    b. Sum to infinity the series $c\sin\theta + \frac{c^2\sin 2\theta}{2} + \frac{c^3\sin 3\theta}{3} + ---$, where $|c| < 1$

13. Use Newton-Raphson method to obtain all the roots , each correct to four decimal places of the equation $x^3 + 3x^2 - 3 = 0$ (Hint- Use the initial approximations $1, -1$ and -3.

DEVASWOM BOARD COLLEGE,THALAYOLAPARAMBU

I SEMESTER BSC MATHEMATICS
INTERNAL EXAMINATION OCTOBER 2018
Complementary – Statistics – Descriptive Statistics

Time: 1.5 Hrs Max.Marks :40

Part A

Answer any **Five** questions
Each questions carries **2** marks

1. Define coefficient of variation
2. Find the range of 32, 44, 15, 18, 20, 25
3. Define dispersion
4. Find the median of the data 500, 480, 320, 70, 600, 540
5. Mention any two desirable properties of good measure of dispersion.
6. Define quartile deviation and give formula

(5x2=10)

Part B

Answer any **Three** questions
Each questions carries **5** marks

7. Explain Boxplot
8. Briefly explain the desirable properties of a good average
9. The mean age of a combined group of men and women is 35 years. If the mean age of the group of men is 38 and that of women is 26. Find the percentage of men in the group
10. Calculate arithmetic mean and mode for the data

x	6	14	19	10	6
f	8	10	15	5	2

11. Construct boxplot for the data 74,74,75,76,79,82,83,85,87,89,90

(3x5=15)

Part C

Answer any **One** question
Each questions carries **15** marks

12. From the following data on price of two commodities A and B during six weeks. Find out which commodity have more suitable price

A	5	8	10	12	19	20
B	3	10	15	20	8	7

13.Compute the mean, median and mode for the following distribution giving the monthly salary of 100 employees of a firm

Monthly Income	10-15	15-20	20-25	25-30	30-35	35-40	40-45
No.of employees		9	22	35	15	10	4

DEVASWOM BOARD COLLEGE , THALAYOLAPARAMBU
INTERNAL EXAMINATION-2018

Section A

answer any 10 questions

Each question carries a mark of 1

Time. 1 Hour

Max marks 60

1. What is primary standard?
2. Explain solubility
3. Write any two methods of microanalysis?
4. What is TLC?
5. What is buffer solution?
6. Write down the ionic product of water
7. How many significant digits are in 0.00435?
8. Write the principle of GC
9. Find out the solubility product of the dissociation of AgCl
10. What is Rf value?
11. Explain the principle of Gravimetry
12. Explain dual nature of matter

Section B

answer any 6 questions

Each question carries 5 marks

13. Explain photoelectric effect
14. Explain the hybridization in ethyne
15. Explain the buffer action of basic buffers.
16. Explain protonic theory of acids and bases in detail
17. Explain acid base titrations.
18. Briefly explain precision and accuracy
19. Explain the principle of paper chromatography
20. Determine the mass to prepare 0.025 N 100 ml of oxalic acid.

Section C

answer any 2 questions

Each question carries 10 marks

21. What are quantum numbers? Explain each with suitable example.
22. What is common ion effect? What are the applications?
23. Explain the classification of errors.
24. Explain the principle and working of HPLC.

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