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Reg. No. | | | | | | | | |

III Semester B.Sc. (NEP) Degree Examination, December/January- 2024-25
CHEMISTRY(DSC)
(Regular/Repeater)

Time : 2 Hours **Maximum Marks : 60**

Instructions to Candidates :

1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.

1. Answer any **Six** questions. **(6×2=12)**

a) Mention two factors affecting the scattering of light.

b) Mention how light splits and utilised in double beam spectrophotometer.

c) How solubility of ionic solids related to solvation energy.

d) State octate rule.

e) What are deactivating groups? Give examples.

f) Write saytzeff elimination reaction.

g) How free energy change is related to spontaneity of a process?

h) What is heterogeneous catalysis? Give example.

2. Answer any **Three** questions. **(3×4=12)**

a) State Beer-Lambert's law. Derive its mathematical equation.

b) Explain the colorimetric determination of copper.

c) Write in brief the principle of turbidimetry and the choice between nephelometry and turbidimetry.

d) Explain in brief the nephelometric determination of phosphate.

3. Answer any **Three** questions. **(3×4=12)**

a) Calculate the limiting radius ratio of ionic solid when coordination number is 3.

b) Write about the following

i) Limitations of radius ratio concept.

ii) Kapustinskii equation and its significance.

P.T.O.

c) Write the effect of following on shape of molecule

i) Lone pair of electrons

ii) Electro negativity

d) Discuss the shape of ammonia molecule by VSEPR theory.

4. Answer any **Three** questions. **(3×4=12)**

a) Write the free radical mechanism of addition of HBr to propene.

b) Write about the following

i) Ozonolysis of propene

ii) Diel-Alder reaction

c) Explain the mechanism of SN^1 reaction and mention the solvent effect on it.

d) What happens when benzene is treated with conc HNO_3 in presence of conc H_2SO_4 at 60°C? Write the mechanism of reaction.

5. Answer any **Three** questions. **(3×4=12)**

a) Show that the Joule-Thomson expansion of a gas occurs with constant enthalpy.

b) Derive expression for the variation of free energy with temperature and pressure.

c) Derive the Gibb's-Helmholtz equation.

d) What is homogeneous catalysis? Explain the intermediate compound formation theory.

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III Semester B.Sc. 6 (NEP) Degree Examination, December/January- 2024-25

PHYSICS

Wave Motion and Optics

(Regular)

Time : 2 Hours **Maximum Marks : 60**

Instructions to Candidates :

1) Calculators are allowed.
2) Write intermediate steps while solving numerical problems and derivations.

1. Answer any Six questions. **(6×2=12)**

a) Mention two characteristics of progressive waves.

b) What are beats?

c) What is the distance between a node and antinode in a stationary wave in terms of wavelength.

d) Define reverberation and reverberation time.

e) Define wavefront.

f) What is a thin film?

g) Give the expression for focal length of a zone plate.

h) State Maly's law.

2. Answer the questions 'a and b' OR 'c and d'.

a) Derive the differential form of progressive wave. **(8)**

b) The general equation of a progressive wave is given by :

$y = 0.5\sin(200\pi t - 2\pi x)\ cm$.

Determine frequency and wavelength of the wave. **(4)**

(OR)

c) Derive the expression for resultant displacement of a particle due to superposition of two collinear harmonic oscillations with equal frequencies. **(8)**

d) Derive the rectified formula for velocity of sound in gases due to Laplace's correction. **(4)**

[P.T.O.

3. **Answer the questions 'a and b' OR 'c and d'.**

a) Derive the expression for velocity of a longitudinal wave in gaseous medium. **(8)**

b) The string in a guitar is of length 80 cm. Its mass is 0.32g and has tension of 80 dynes. Calculate the velocity of wave on this stretched string. **(4)**

(OR)

c) Derive Sabine's formula. **(8)**

d) Mention accoustical requisites for an auditorium. **(4)**

4. **Answer the questions 'a and b' OR 'c and d'.**

a) With a neat diagram, explain the biprism experiment to determine the wavelength of monochromatic light. **(8)**

b) In Young's double slit experiment , yellow light of wavelength 5893 A° from a narrow slit is incident on a double slit. If the overall separation of 10 fringes on a screen 200 cm away from the slit is 2 cm, find the slit width. **(4)**

(OR)

c) Explain the principle, construction and working of Michelson's interferometer. **(8)**

d) Obtain an expression for path difference in case of interference due to transmitted light. **(4)**

5. **Answer the questions 'a and b' OR 'c and d'.**

a) Explain Fresnel's half period zone and obtain an expression for the radius of n^{th} half period zone. **(8)**

b) Write a note on diffraction grating. **(4)**

(OR)

c) Obtain an expression for R.P of prism. **(8)**

d) Determine concentration of solution of length 0.15 m which produces an optical rotation of 30°. Given that specific rotation of liquid is 0.0418 rad $kg^{-1}m^2$. **(4)**

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III Semester B.Sc. (NEP) Degree Examination, December/January - 2024-25

GENERIC ENGLISH - 3 [AECC]

(Regular)

Time : 2 Hours **Maximum Marks : 60**

Text: The Fire and The Rain

I. Answer any **Five** of the following questions in a sentence or two each. **(5×2=10)**

1. Who is Vishaka?
2. Who is the father of Aravasu and Paravasu?
3. Name the author of the play The Fire and The Rain?
4. How did Raibhya intend to Punish Yavakri?
5. Who played the role of Indra in the play within the play?
6. What is the relation between Aravasu and Paravasu?
7. Who is the father of Yavakri?

II. Answer any **Two** of the following questions in a paragraph. **(2×5=10)**

1. Nittilai
2. Raibhya
3. Aravasu

III. Sketch the character of Paravasu. **(1×10=10)**

(OR)

Write a critical note on the tragic love story of Aravasu and Nittilai.

IV. Write short notes on any **Two** of the following. **(2×5=10)**

1. Dr. B.R. Ambedkar's constituent Assembly speech.
2. Kiran Bedi's speech on Visionary leadership.
3. Narayan Murthy's speech at Lal Bahadur Shastri institute of Management.

V. A) Importance of usage of charts and diagrams. **(1×5=5)**

(OR)

B) Discuss the role of body language in the effective presentation.

[P.T.O.

VI. A) Describe the techniques of descriptive writing. **(1×5=5)**

(OR)

B) Write an essay on Elections in India.

(OR)

C) Analyze the main features of reflective writing.

VII. A) Write a letter of enquiry to a book store in Bengaluru, Seeking information about the availability and supply of books to your library. **(1×5=5)**

(OR)

B) Prepare a resume for the post of Assistant professor.

(OR)

C) Write a letter of complaint to the PDO of your village highlighting the inadequate water supply in your area.

VIII. A) Draft an advertisement for the sale of Jewellery of your shop. **(1×5=5)**

(OR)

B) Write a product Manual for a new bike of your company.

(OR)

C) Describe a pic-nic day to Hampi from your college.

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III Semester B.Sc. (NEP) Degree Examination, December/January - 2024-25

MATHEMATICS

Ordinary Differential Equations and Real Analysis - I (DSC)

(Regular/Repeater)

Time : 2 Hours **Maximum Marks : 60**

Instructions to Candidates :

1) **Answer any Six questions from question number 1.**
2) **Answer any Three questions from question number 2, 3, 4 and 5.**

Answer any Six of the following. **(6×2=12)**

1. a) Solve $P^2 - 5P - 6 = 0$.

b) Find the general solution of $(y - px)(p - 1) = p$

c) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} - 4y = 0$.

d) Find the particular integral of $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = \sin 3x$.

e) State Cauchy's First theorem on limits.

f) Define divergent sequence and give an example.

g) Show that $\{a_n\} = \left\{1 + \frac{1}{3} + \frac{1}{3^2} + .------ + \frac{1}{3^n}\right\}$ is bounded.

h) Define an alternating series and give an example.

Answer any Three of the following. **(3×4=12)**

2. a) State and prove necessary condition for a differential equation $Mdx + Ndy = 0$ to be exact.

b) Find the suitable integrating factor and solve the equation $xydx - (x^2 + 2y^2)dy = 0$.

c) Solve $y - 2px + yp^2 = 0$

d) Reduce the equation $y^2(y - px) = x^4p^2$ into clairauts form by using the substitution $x = \frac{1}{4}$ and $y = \frac{1}{2}$.

P.T.O.

Answer any Three of the following. **(3×4=12)**

3. a) With usual notation prove that

$$\frac{1}{f(D)}xV = x\frac{1}{f(D)}V + \left[\frac{d}{dD}\left(\frac{1}{f(D)}\right)\right]V \text{ where V is a function of } x$$

b) Solve $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = \sin 3x$.

c) Solve $\frac{d^2y}{dx^2} + 4y = x^3$.

d) Derive the condition for the integrability of the equation $Pdx + Qdy + Rdz = 0$ where P,Q,R are functions of x,y,z.

Answer any three of the following. **(3×4=12)**

4. a) State and prove Cauchy's general principle of convergence.

b) If $\lim_{n\to\infty} a_n = l$ *and* $\lim_{n\to\infty} b_n = m$ then prove that $\lim_{n\to\infty}(a_n + b_n) = l + m$.

c) Show that $\lim_{n\to\infty} \frac{(n!)^{1/n}}{n} = \frac{1}{e}$

d) Prove that $\lim_{n\to\infty}\left[\sqrt{n+1} - \sqrt{n}\right] = 0$.

Answer any Three of the following. **(3×4=12)**

5. a) State and prove Raabe's Test.

b) Discuss the convergence of $\frac{1}{1.2.3} + \frac{3}{2.3.4} + \frac{5}{3.4.5} + \ldots\ldots\ldots\ldots$

c) Discuss the convergence of $\sum\left(\sqrt{n^2+1} - n\right)$

d) State and prove Leibnitz's theorem for alternating series.

Q. P. Code: 126BSC03LANAEC87T

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B.Sc III Semester (NEP Regular) Examination, Feb/March - 2025

ವಿಷಯ: ಆವಶ್ಯಕ ಕನ್ನಡ

(ದಾರಿಯ ಬುತ್ತಿ)

Duration of Paper: 2 Hrs. **Maximum Marks :60**

ವಿಶೇಷ ಸೂಚನೆ :

ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.

ಪ್ರಶ್ನೆ : 1 10

a) ಭೀಮ ವ್ಯಷಿಕೇತು ಹಾಗೂ ಮೇಘನಾದರು ಕಂಡ ಭದ್ರಾವತಿ ವರ್ಣನೆಯನ್ನು ವಿವರಿಸಿ.

ಅಥವಾ

b) 'ದೇಶ ಸುತ್ತಿ ನೋಡು ಕೋಶ ಓದಿ ನೋಡು ' ಗೊರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರರ ಅನುಭವ ಕುರಿತು ಬರೆಯಿರಿ.

ಪ್ರಶ್ನೆ : 2 10

a) 'ಕಟ್ಟುವೆವು ನಾವು' ಕವನದಲ್ಲಿ ಕನ್ನಡ ಜನರ ಕೆಚ್ಚನ್ನು ಎಚ್ಚರಿಸುವುದು ಹೇಗೆ ವಿವರಿಸಿ.

ಅಥವಾ

b) 'ಒಬ್ಬ ನಿಷ್ಠಾವಂತ ಅಧ್ಯಾಪಕ' ಸಮಾಜಕ್ಕೆ ಹೇಗೆ ಮಾದರಿಯಾಗಿದ್ದಾನೆ ಎಂಬುದನ್ನು ವಿವರಿಸಿರಿ.

ಪ್ರಶ್ನೆ : 3 10

a) ವೈಜ್ಞಾನಿಕತೆ ಮತ್ತು ವೈಚಾರಿಕತೆ ಆಧುನಿಕ ಬದುಕಿಗೆ ಹೇಗೆ ಪ್ರೇರಕ ಶಕ್ತಿಯಾಗಿದೆ ವಿವರಿಸಿ.

ಅಥವಾ

b) 'ಶ್ರೇಷ್ಠತೆಯ ವ್ಯಸನ' ವ್ಯಕ್ತಿಯ ಏಳಿಗೆಗೂ ಮತ್ತು ಸಾಮಾಜಿಕ ಸ್ವಾಸ್ಥ್ಯಕ್ಕೂ ಧಕ್ಕೆ ತರುವುದು ವಿವರಿಸಿರಿ.

ಪ್ರಶ್ನೆ : 4 10

a) ಶರಣರ ಬರಹಗಳಲ್ಲಿ ಮೂಡಿ ಬಂದಿರುವ ಸ್ತ್ರೀ ಸಮಾನತೆನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

ಅಥವಾ

b) 'ದಾರಿಯ ಬುತ್ತಿ' ಸರ್ವರೂ ಅನುಸರಿಸುವ ಮಾರ್ಗ ವಿವಿಧ ಅಂಶಗಳ ಮೂಲಕ ವಿವರಿಸಿರಿ.

ಪ್ರಶ್ನೆ: 5 ಬೇಕಾದ ಎರಡಕ್ಕೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ **(2X5=10)**

a) ಬಸವಣ್ಣ

b) ಪುರಂದರದಾಸರು

c) ಲಕ್ಷ್ಮೀಶ

d) ಹಾ.ಮಾ.ನಾಯಕ

ಪ್ರಶ್ನೆ: 6 ಒಂದೇ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿರಿ. **(10x1=10)**

a)ಬಸವಣ್ಣನವರ ಜನ್ಮಸ್ಥಳ ಯಾವುದು?

b)ಪುರಂದರದಾಸರ ಗುರುಗಳು ಯಾರು?

c)'ಬಿದ್ದಿಯಬ್ಬೇ ಮುದುಕಿ' ಕಾವ್ಯ ಬರೆದ ಕವಿ ಯಾರು?

d) ಕಡಕೋಳ ಮಡಿವಾಳಪ್ಪನವರ ತಾಯಿ ಹೆಸರೇನು?

e)'ಜೈಮಿನಿ ಭಾರತ' ಕೃತಿಯ ಕರ್ತೃ ಯಾರು?

f)'ಭೂತಯ್ಯನ ಮಗ ಅಯ್ಯು' ಕಾದಂಬರಿ ಬರೆದವರು ಯಾರು?

g)ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗರು ಯಾವ ಕಾಲೇಜಿನಲ್ಲಿ ಪ್ರಾಂಶುಪಾಲರಾಗಿದ್ದರು?

h)ಹಾ.ಮಾ.ನಾಯಕರ ಪೂರ್ಣ ಹೆಸರೇನು ?

i)'ಕಾನೂರ ಸುಬ್ಬಮ್ಮ ಹೆಗ್ಗಡತಿ' ಕೃತಿಯ ಕರ್ತೃ ಯಾರು?

j)'ಸೂರ್ಯ ಚಂದ್ರರಿಲ್ಲದ ನಾಡಿನಲ್ಲಿ' ಕಥೆಯ ಲೇಖಕರು ಯಾರು?

Q. P. Code:126BSC03LANAEC16T/126BCA03LANAEC19T

Reg No | | | | | | | | | | | |

B.Sc./BCA III Semester (NEP Repeater) Examination, Feb/March -2025
Subject: General English-3(AECC)
Text: The Fire and the Rain

Duration of Paper: 2 Hrs. **Maximum Marks :60**

Instruction to the Candidate: Read the questions carefully, write answers legibly and clearly.

I. Answer any Five of the following in a sentence or two: **(5x2=10)**

1. Whom does Arvasu love?
2. Who kills Raibhaya?
3. Name the wife of Paravasu.
4. Why did Yavakri spend ten years in the forest?
5. Who plays the role of Vritra in the play performed in the palace of the king?
6. What does rain symbolize in the play?
7. By whom was Nittilai Killed?

II. Answer any Two of the following in a paragraph: **(2x5=10)**

1. Yavakri
2. Arvasu
3. Andhaka

III. 1. Sketch the character of Paravasu. **(1x10=10)**

OR

2. Discuss the central themes of the play 'The Fire and the Rain'.

IV. Write short notes on any Two of the following: **(2x5=10)**

1. Kiran Bedi's views on 'Visionary Leadership'.
2. Constituent Assembly speech of Dr.B.R.Ambedkar.
3. Rabindranath Tagore's views on 'Civilization'.

V.1. Discuss the role of Body Language in the effective presentation. **(1x5=5)**

OR

2. Analyse the features of a good presentation.

VI.1. Describe the characteristics of an effective Descriptive Writing. **(1x5=5)**

OR

2. What is Reflective Writing? Explain its main features.

OR

3. Write an essay on 'Save Environment' or 'Cleanliness.'

VII.1. Write a letter of enquiry to the Administrator in-charge of Success Coaching Centre, seeking clarification about the classes, timing, duration, staff, transport and other necessary details for joining the institute. **(1x5=5)**

OR

2. Write a letter of complaint to the District Commissioner to take necessary actions regarding the deteriorating law and order situation in the city.

OR

3. Draft a letter of application for the post of a 'Manager' in a nationalized bank.

VIII.1. Draft an advertisement copy for the sale of 'Television' highlighting its unique features. **(1x5=5)**

OR

2. Write a product manual on 'Redmi Mobile'

OR

3. Draft a brochure format for the 'State Level workshop' in your college highlighting the name of the college, topic, date, entrance fees, facilities, chief guest, resource person etc.

Q. P. Code: 126BSC03PHYDSC03T

Reg No | | | | | | | | | | | |

B.Sc III Semester (NEP Regular) Examination, Feb/March -2025
Subject: PHYSICS
Wave Motion and Optics

Duration of Paper: 2 Hrs. **Maximum Marks :60**

Instructions to the Candidate:
1) Calculator is allowed to solve the problems
2) Write intermediate steps

1. Answer any SIX of the following questions **6x2=12M**

a) Define transverse waves.

b) State the principle of superposition.

c) What is resonance?

d) Write any two differences between music and noise.

e) Give Huygen's principle

f) What is interferometer?

g) A grating has 15cm of the surface ruled with 5000 lines per cm. What is resolving power of the grating in the first order.

h) State Malus's law.

2. Answer the question 'a' and 'b' OR 'c' and 'd'.

a) What is progressive wave? Derive differential form of a wave equation. 8M

b) The speed of a wave in a medium is 760 m/s. If 3600 waves are passing through a point in the medium in 2 min. What is the wave length? 4M

OR

c) Derive an expression for superposition of two perpendicular harmonic oscillations. 8M

d) Explain uses of Lissajous figures. 4M

3. Answer the question 'a' and 'b' OR 'c' and 'd'.

a) Drive the expression for velocity of longitudinal waves in gases. 8M

b) Write a note on vibrations in rods. 4M

OR

c) Derive Sabine's reverberation formula. 8M

d) A hall of volume 5500 m^3 is found to have a reverberation time of 2.3 sec. The sound absorbing surface of the hall has on area of 750 m^2 .Calculate the average absorption coefficient. 4M

4. Answer the question 'a' and 'b' OR 'c' and 'd'.

a) Explain Young's double slit experiment to obtain interference pattern. 8M

b) Write a note on Newton's corpuscular theory. 4M

OR

c) What are Newton's rings? Derive an expression for the diameter of bright and dark ring in Newton's rings by transmitted light. 8M

d) When a movable mirror in Michelson's interferometer is shifted by 5.89×10^{-5}m ,if the wavelength of light is 5890Å ,find the number of fringes formed. 4M

5. Answer the question 'a' and 'b' OR 'c' and 'd'.

a) What is zone plate? Describe the principle, construction and working of zone plate with necessary theory. 8M

b) The sodium doublet have wavelengths 5890 Å & and 5896 Å. Calculate the resolving power of grating. 4M

OR

c) Explain Fresnel's theory of optical activity. 8M

d) Obtain the expression for the thickness of quarter wave plate. 4M