

R18

Code No:151AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December - 2018

CHEMISTRY

(Common to EEE, CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Give the reason for crystal field splitting of d-orbitals [2]
- b) Why do you express hardness of water in CaCO_3 equivalents. [2]
- c) Salt bridge is not required in Lead-acid storage cell. Explain. [2]
- d) Why Markownikoff's rule fails in the addition of HBr to propene in presence of H_2O_2 . [2]
- e) How many fundamental vibrations are possible in HCN, CH_4 . [2]
- f) Write the energy level diagram for N_2 molecule. [3]
- g) What is Caustic embrittlement? How do you present it? [3]
- h) Why coating of zinc on iron is called sacrificial anode. Explain. [3]
- i) How enantiomers differs from diastereomers. [3]
- j) Give reason why O_{16} , O_{18} , C_{12} do not exhibit NMR spectrum. [3]

PART - B**(50 Marks)**

- 2.a) Explain about crystal field theory.
 - b) Mention the difference between atomic and molecular orbitals. [5+5]
- OR**
- 3.a) Give an account of LCAO.
 - b) Write notes on molecular orbital theory. [5+5]
- 4.a) Discuss the ion-exchange process of softening of hard water. How the exhausted resins are regenerated.
 - b) Give the steps involved in the treatment of domestic water [5+5]
- OR**
- 5.a) What is the principle involved in complex metric method in estimation of hardness of water.
 - b) Differentiate between scales and sludge's. [5+5]

6.a) How can you determine the pH of an unknown solution by using quinhydrone Electrode.

b) Iron corrodes faster than aluminum. Explain. [5+5]

OR

7.a) Write an account of lithium ion batteries.

b) Explain the chemical reactions involved in electrochemical corrosion. [5+5]

8.a) What are S_N^1 and S_N^2 reactions. Write the mechanism with suitable examples. Give their stereochemistry.

b) Explain different conformations of butane with the potential energy diagram. [5+5]

OR

9.a) What are elimination reactions? Explain dehydro halogenations of alkyl halides with a suitable examples.

b) What is isomerism? How is it classified? Explain with suitable examples. [5+5]

10.a) What are various electronic transitions? Give a brief note with suitable examples.

b) Write the basic principle of IR spectroscopy. Give various molecular vibrations in the technique. [5+5]

OR

11.a) What are the selection rule in IR spectroscopy? Give any two applications of IR Spectroscopy.

b) What is the principle involved in Nuclear magnetic resonance Spectroscopy? [5+5]

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R18

Code No:151AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December – 2018

PROGRAMMING FOR PROBLEM SOLVING

(Common to CE, ME, ECE, EIE, MCT, MMT, AE, MIE, PTM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) What is a flowchart? Explain with one example. [2]
- b) Discuss about Strlen() function with an example. [2]
- c) Explain fseek() function with example. [2]
- d) Explain about the parameter passing using copy by address. [2]
- e) Write an algorithm to find the given number is prime or not. [2]
- f) C is a structured programming language? Justify. [3]
- g) How pointer can be used for accessing multi dimensional arrays? Discuss. [3]
- h) Name few preprocessor directives. [3]
- i) Write Recursive function for towers of honoi. [3]
- j) Find out no. of comparisons to sort {2,1,7,4,8,6}. [3]

PART - B

(50 Marks)

- 2.a) Describe the various control structures available in 'C'. [5+5]
 - b) Write a program to find whether the given no is am strong or not. [5+5]
- OR**
- 3.a) Explain about different bit-wise operators with examples. [5+5]
 - b) What are command line arguments? Explain with a complete 'C' program. [5+5]
- 4.a) Explain about Enumerated data types with an example. [5+5]
 - b) Consider the array declaration: float a[5]; and the memory address of a[0] is 4056. What is the memory address of a[2]? [5+5]
- OR**
- 5.a) What is a structure? Explain how to declare, initialize and access the structure elements. [5+5]
 - b) Write a program to find the string length by using string function. [5+5]

- 6.a) What is a file pointer? Explain the steps for sequential file operations.
b) Compare *gets()* and *fgets()* with an example. [5+5]

OR

- 7.a) Write a program to copy the contents of one file to another file.
b) List and define the preprocessor statements in C. [5+5]

- 8.a) What is a function prototype? Give an example.
b) Explain about different parameter passing mechanisms with examples. [5+5]

OR

- 9.a) Define Recursion. Write a recursive function for swapping of two numbers.
b) Write a program for printing Fibonacci series by using Recursive function. [5+5]

- 10.a) Apply linear search on {22,11,66,44,99,55,88}.
b) Apply bubble sort on the above given data. [5+5]

OR

- 11.a) What do you mean by sorting? Mention the different types of sorting.
b) Explain quick sort in detail on {24,12,11,76,39,12,67,34,88,91,26,45,78}. [5+5]

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R16

Code No:131AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I-Year I Semester Examinations, December - 2018

MATHEMATICS-II

(Common to CE, ME, MCT, MMT, AE, MIE, PTM, CEE, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub-questions.

PART - A**(25 Marks)**

- 1.a) Write the Dirichlet's Conditions of Laplace transform. [2]
- b) Find the Laplace transform of $3\cos 4(t-2)u(t-2)$. [3]
- c) Write the relation between β and γ functions. [2]
- d) Evaluate $\int_0^1 \frac{dx}{\sqrt{1-x^4}}$. [3]
- e) In evaluating $\iint_R f(x,y)dydx$ over the first quadrant of the circle $x^2 + y^2 = 4$, find the limits. [2]
- f) Evaluate $\int_0^1 \int_0^x ydydx$. [3]
- g) Evaluate ∇xyz . [2]
- h) If $\vec{F} = xi + xyj + zzk$, Evaluate $\text{curl } \vec{F}$. [3]
- i) State the transformation between surface and volume integral in Cartesian form. [2]
- j) State Gauss divergence theorem. [3]

PART - B**(50 Marks)**

2. Solve $y''' - 2y'' + 5y' = 0$ given that $y(0) = y'(0) = 0, y''(0) = 1$ using Laplace transform. [10]
- OR**
- 3.a) Using Laplace transform of evaluate $\int_0^\infty t e^{-t} \sin t dt$.
 - b) Using Convolution theorem find $L^{-1} \left[\frac{1}{(s^2 + a^2)^2} \right]$. [5+5]
- 4.a) Show that $\int_0^\infty x^{2n-1} e^{-ax^2} dx = \frac{\Gamma(n)}{2a^n}, a > 0, n > 0$.
 - b) Evaluate $\int_0^1 x^3 \sqrt{1-x} dx$ using Beta Gamma functions. [5+5]
- OR**
- 5.a) Evaluate $\int_0^1 x^4 \left(\log \frac{1}{x}\right)^3 dx$.
 - b) Evaluate $\int_0^\infty x^2 e^{-x^a} dx \times \int_0^\infty x^2 e^{-x^4} dx$. [5+5]

- 6.a) Evaluate $\int \int_R y \, dx \, dy$ where R is bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$.
 b) Evaluate $\int_0^{\pi/2} \int_0^{a \sin \theta} \int_0^{(a^2 - r^2)/a} r \, dr \, d\theta \, dz$. [5+5]
- OR
- 7.a) Evaluate $\int_0^{\pi/4} \int_0^{a \sin \theta} \frac{r}{\sqrt{a^2 - r^2}} \, dr \, d\theta$.
 b) Evaluate $\iiint_V xyz \, dx \, dy \, dz$ where V is bounded by the co-ordinate planes and the plane $x + y + z = 1$. [5+5]
- 8.a) If \vec{r} is the position vector of the point (x,y,z), prove that $\nabla^2(r^n) = n(n+1)r^{n-2}$.
 b) Find the directional derivative of the function $2xy + z^2$ at the point (1, -1, 3) in the direction of the vector $\vec{i} + 2\vec{j} + 2\vec{k}$. [5+5]
- OR
- 9.a) Prove that $\nabla \times (\nabla \times \vec{F}) = \nabla(\nabla \cdot \vec{F}) - \nabla^2 \vec{F}$.
 b) Find the angle between surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point (2, -1, 2). [5+5]
10. Verify Stoke's theorem for $\vec{F} = (2x - y)\vec{i} - yz^2\vec{j} - y^2z\vec{k}$ and S is the upper half surface $x^2 + y^2 + z^2 = 1$ of the sphere and C is its boundary. [10]
- OR
- 11.a) Find the work done in moving a particle by the force $\vec{F} = 3x^2\vec{i} + (2xz - y)\vec{j} + z\vec{k}$ along the line joining (0,0,0) to (2,1,3).
 b) Evaluate $\iint_S \vec{F} \cdot \vec{n} \, ds$ where $\vec{F} = 12x^2y\vec{i} - 3yz\vec{j} + 2z\vec{k}$ and S is the portion of the plane $x+y+z=1$ included in the 1st octant. [5+5]

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R16

Code No:131AH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December - 2018

ENGINEERING PHYSICS-I
(Common to EEE, ECE, CSE, EIE, IT, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A**(25 Marks)**

- 1.a) Define interference. [2]
- b) What is diffraction [3]
- c) Explain the phenomenon of polarization of light. [2]
- d) Explain spontaneous emission. [3]
- e) Write any two applications of optical fiber. [2]
- f) What is optical fiber? Explain basic principle of optical fiber [3]
- g) Define Space lattice. [2]
- h) Distinguish between unit cell and primitive cell. [3]
- i) What are the conditions to occur diffraction due to X-rays? [2]
- j) Define Burger's vector. [3]

Part-B**(50 Marks)**

- 2.a) Discuss interference in thin film due to transmitted light.
- b) Write a note on Newton's ring experiment.
- c) What is Coherence? [4+4+2]

OR

- 3.a) Write a note on division of amplitude.
- b) Distinction between Fresnel and Fraunhofer diffraction.
- c) Discuss diffraction due to N- slits. [3+3+4]

- 4.a) Explain Malus law.
- b) What is double refraction?
- c) Explain the terms population and population inversion. [3+3+4]

OR

- 5.a) Explain Quarter wave plate.
- b) With neat diagram explain working principle of Ruby laser system.
- c) Write any two applications of lasers. [3+5+2]

- 6.a) With neat diagram explain construction of optical fiber.
b) Derive an expression for Acceptance angle.
c) Derive an equation for Numerical aperture. [4+3+3]
OR
- 7.a) Explain how Step index optical fibers are classified.
b) Write a note on graded index optical fiber.
c) What are the medical applications of optical fiber? [4+4+2]
- 8.a) With neat diagram explain types of crystal systems.
b) Define crystal plane.
c) Discuss construction of Diamond structure. [4+2+4]
OR
- 9.a) What are the Bravais lattices?
b) What are the Miller indices?
c) Derive an expression for inter planner spacing of orthogonal crystal system. [4+3+3]
- 10.a) Derive an equation for Bragg's law.
b) Discuss powder method.
c) Explain vacancy defect. [4+4+2]
OR
- 11.a) Discuss Laue method.
b) What is Frenkel defect?
c) Write a note on Schottky defect. [4+3+3]

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R15

Code No: 227AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Pharmacy IV Year I Semester Examinations, November/December-2018****PHARMACY ADMINISTRATION****Time: 3hours****Max.Marks:75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- | | | |
|------|--|-----|
| 1.a) | What is Joint stock company? | [2] |
| b) | What is public enterprise? | [3] |
| c) | What is statistical quality control? | [2] |
| d) | Write notes on c chart. | [3] |
| e) | Define pharmacovigilance. | [2] |
| f) | Write notes on comparative clinical effectiveness. | [3] |
| g) | Write some channels of distribution. | [2] |
| h) | Write notes on sales promotion. | [3] |
| i) | What do you mean by export trade of drugs | [2] |
| j) | Enlist some drugs of synthetic origin. | [3] |

PART-B**(50 Marks)**

- | | | |
|-----------|---|------|
| 2.a) | Discuss briefly about Partnership. | |
| b) | Discuss evaluation of sole proprietorship. | [10] |
| OR | | |
| 3. | Discuss characteristic features of business in detail. | [10] |
| OR | | |
| 4.a) | Discuss principles of plant layout in detail. | |
| b) | Discuss various types of plant layout. | [10] |
| OR | | |
| 5.a) | Write notes on p chart. | |
| b) | Write notes on R chart. | [10] |
| 6. | Discuss about compliance and adherence to medication. | [10] |
| OR | | |
| 7.a) | Discuss abuse of prescription drugs | |
| b) | Write notes on Irrational Drug Combinations. | [10] |
| 8. | Discuss factors influencing channels of distribution. | [10] |
| OR | | |
| 9. | Discuss importance of sales organization. | [10] |
| 10. | Discuss progress in the manufacture of basic drugs in detail. | [10] |
| OR | | |
| 11.a) | Write notes on export of drugs and pharmaceuticals. | |
| b) | Write notes on import of drugs and pharmaceuticals. | [10] |

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R13

Code No:111AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I-Year Examinations, December - 2018

ENGINEERING PHYSICS

(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, AME, MIE, PTM, MSNT, AGE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is have a, b, c as sub questions. compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may

PART - A

(25 Marks)

- | | | |
|------|---|-----|
| 1.a) | Define atomic radius, co-ordination number? | [2] |
| b) | Draw the following planes of cubic structure. (121), (010), (202) | [3] |
| c) | State and explain Heisenberg uncertainty principle. | [2] |
| d) | What do you understand from Davisson and Germer experiment? | [3] |
| e) | Define Electric dipole, polarizability. | [2] |
| f) | Define piezoelectricity and pyroelectricity. | [3] |
| g) | What is meant by optical resonator? | [2] |
| h) | How will you classify the optical fibers? | [3] |
| i) | Origin of nanoscience - explain. | [2] |
| j) | Explain the working principle of a Solar cell? | [3] |

PART-B

(50 Marks)

- | | | |
|-----------|---|-------|
| 2.a) | Explain the terms (i) basis (ii) space lattice (iii) unit cell. | |
| b) | Show that FCC crystals are closely packed than BCC crystals. | [5+5] |
| OR | | |
| 3.a) | Describe the Laue method of determination of crystal structure. | |
| b) | Calculate the Bragg angle at which electrons accelerated from rest through a potential difference of 80 volts will be diffracted from the (111) planes of a FCC crystal of lattice parameter 0.35 nm. | [5+5] |
| OR | | |
| 4.a) | Derive Schrodinger time independent wave equation. | |
| b) | Explain how Davisson-Germer experiment is used to explain the existence of matter waves. | [5+5] |
| OR | | |
| 5.a) | Derive an expression for energy levels of particle enclosed in one dimensional Potential box. | |
| b) | How band theory of solids leads to classification of solids in to conductors, semi conductors and insulators. | [5+5] |

- 6.a) Derive an expression for ionic polarizability.
b) Derive Clausius - Mossotti relation.

[5+5]

OR

- 7.a) Discuss the properties and effect of external field on the para and ferro magnetic materials.
b) What is meant by Hysteresis loss? Describe the formation of hysteresis loop using domain wall movement.

[5+5]

- 8.a) What is the difference between interference and diffraction?
b) Briefly explain the N-slits of diffraction pattern.

[5+5]

OR

- 9.a) Why the population inversion is necessary to achieve lasing action?
b) Describe the construction and working of Helium-Neon laser.

[5+5]

- 10.a) Explain the formation of PN junction diode and V-I characteristics of the same.
b) Derive an expression for density of electrons in intrinsic semiconductors.

[5+5]

OR

- 11.a) How do you synthesize the nonmaterial using Chemical Vapor Deposition (CVD) method?
b) Write short note on Ball milling method.

[5+5]

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R09

Code No: 51002

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year Examinations, December -2018

MATHEMATICS-I

(Common to CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, ETM, MMT, AE, BT, AME, MIE, PTM, MSNT, AGE)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

1.a) Discuss the convergence of the series $\frac{x}{1.2} + \frac{x^2}{3.4} + \frac{x^3}{5.6} + \frac{x^4}{7.8} + \dots$

b) Define absolute and conditional convergence of a series.
Test the following series for absolute or conditional convergence

i) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{n}$ and ii) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2}$. [7+8]

2.a) Verify Rolle's theorem for $f(x) = \sin x$ in $[0, 2\pi]$ and

Lagrange's theorem for $f(x) = x^3 - 4x$ in $[-1, 1]$.

b) Find the maximum and minimum values of the function

$f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$. [8+7]

3.a) Find the radius, centre and the equation of circle of curvature of the curve $y^2 = x^3$ at $(1, 1)$.

b) Trace the curve $y = x + \frac{1}{x}$. [7+8]

4.a) Change the order of integration in $\int_0^1 \int_{x^2}^{2-x} xy \, dy \, dx$ and hence evaluate the same.

b) Find the volume of the tetrahedron bounded by the plane $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ and the coordinate planes. [8+7]

5.a) Solve $y' + \frac{x}{3}y = \frac{x}{3y^2}$.

b) If a substance cools from 370 K to 330 K in 10 minutes and if the temperature of the surrounding air is 290 K , find the temperature of the substance after 40 minutes. [7+8]

6.a) Solve $y'' - 2y' + y = xe^x \sin x$.

b) Apply the method of variation parameters to solve $\frac{d^2 y}{dx^2} + y = e^{-x}$. [7+8]

7.a) Find the Laplace transform of $f(t) = \frac{e^{-t} \sin^2 t}{t}$.

b) Using Laplace transforms, solve $y'' + y = 2e^t$, $y(0) = 0$, $y'(0) = 2$. [7+8]

8.a) Prove that i) $\nabla^2 r^n = n(n+1)r^{n-2}$ and ii) $\nabla^2 \left(\frac{1}{r} \right) = 0$.

b) Verify Stoke's theorem for $\vec{V} = (x^2 + y^2) \hat{i} - 2xy \hat{j}$ taken around the rectangle bounded by $x = a$, $x = -a$, $y = 0$ and $y = b$. [7+8]

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