UNIT I

1. Explain Poisson equation.

2. Find the Lagrange's equation of motion and force of conservation in non-holonomic systems.

2. (a) Derive the Lagrange's equation of motion for non-

UNIT II

2. Explain Poisson equation.

3. List the applications of Poisson brackets in classical mechanics.

3. What is the importance of using centre of mass frame of reference?

3. Hamiltonian one.

1. (i) Compare the Lagrangean mechanics with the Hamiltonian mechanics.

Compassory Question

From each unit question No. 1 is compulsory.

Note: Attempt five questions in all selecting one question from each unit.

Maximum Marks: 55

PAPER I

CLASSICAL MECHANICS

4305

MDP-22

ROLL No. 3

Total Pages: 3
UNIT I

1. Oscillator using the general solution of a one-dimensional harmonic oscillator.

2. Discuss separation of variables in the Hamilton-Jacobi theory.

UNIT II

1. State and prove Euler's theorem.

2. Describe the force-free motion of a rigid body.

UNIT III

1. State and prove Kepler's laws of planetary motion.

2. Find the force law consistent with the particle moving in a central force field.

3. A particle of mass is moving in a spiral orbit under the influence of a central force.

4. Develop a differential equation of motion of an arbitrary potential with suitable illustrations.

5. When do you understand by velocity dependent principle for non-conservative systems.

6. Derive Lagrange's equation of motion from Hamilton's
UNIT-I
1. Attempt all the following:

(a) Prove that $P_{m}(0) = 0$ for $n = 0, 1, 2, \ldots$.

(b) If the function $f(z)$ is of the form $f(z) = \psi(z)/\psi(2)$, then show that the Laplace transform of $e^{F(t)}$ is $f(s-x)$.

(c) If $f(s)$ be the Laplace transform of $F(t)$, then explain various axioms to define a group.

(d) Explain various axioms to define a group.

UNIT-IV
5. List various rules to construct the character table of a group and hence construct the character table for symmetry group of square.

6. Define conjugate elements in a group. What is a class? Find out classes of Symmetry group of equilateral triangle.

7. (a) Prepare a group multiplication table for group $G = \{i, -i, 1, -1\}$ under multiplication. State and verify rearrangement theorem.

(b) List various rules to construct the character table of a group and hence construct the character table for symmetry group of square.

Note: Attempt five questions in all, selecting one question from each unit. Question No. 1 is compulsory.
5. Using the method of contour integration evaluate:
\[ I = \int \frac{e^{i\theta}}{1 - e^{2i\theta}} d\theta, \quad |\theta| < \pi. \]

6. **UNIT-II**

(a) Using the generating function obtain expression for Laguerre polynomial of order \( n \).
(b) Using generating function for Hermite Polynomial show that
\[ \sin(h(x)) = \sum_{n=0}^{\infty} \frac{(-1)^n h^{2n}(x)}{(2n)!} H_n(x). \]

7. (a) Find the best fit values of \( c \) and \( b \).

\[ x \quad 1.5 \quad 4.6 \quad 13.9 \quad 40.1 \quad 125.1 \quad 299.5 \]

(b) The curve \( y = ce^{x} \) is fitted using the least square method to the data:
\[ \text{of } F(t) = \begin{cases} \cos \left( \frac{2\pi t}{3} \right), & t \geq \frac{3\pi}{2} \\ 0, & 0 < t < \frac{3\pi}{2} \end{cases} \]

(b) Find the inverse Laplace transform of the function then \( L\{G(t)\} = e^{-ct} f(t) \). where \( f(t) \) is the Laplace transform of \( f(t) \). Hence find the Laplace transform of \( G(t) \). **UNIT-III**

(a) Prove the following recurrence relations among Legendre's Polynomials.
\[ P_n(x) + P_{n-1}(x) = \frac{2n}{x} P_n(x). \]

(b) Prove the recurrence relation and hence express \( J_n(x) \) in terms of \( J_{n-1}(x) \) and \( J_1(x) \).

\[ J_n(x) = \frac{2n}{x} J_{n-1}(x) \]

6. (a) Show that if a function \( G(t) \) is defined as
\[ G(t) = \begin{cases} 1, & t > k \\ 0, & 0 < t \leq k \end{cases} \]

(b) \[ I = \int_{0}^{\infty} \frac{e^{-ax^2}}{x^2 + a^2} dx, \quad a > 0. \]
1. Answer the following questions:

(a) The intensity of J = 0 → J = 1 is often not the most intense rotational line. Why? Explain.

(b) What are the essential conditions for a molecule to be Raman active?

(c) What is v' and v' progression? The wavenumber separation of bands in v' progression decreases towards shorter wavelength, while that in the v'' progression decreases towards longer wavelength. Why?

2. Compulsory Question

Note: Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.
8. What is the spin-spin splitting?

Unit II

1. Discuss the effect of rotation on the species of a polyatomic molecule.

2. The species between these in the P and R branches of a different term of the rotor. Discuss the species, spin-Coupling and rotational energy levels of a diatomic molecule assuming the non-rotation of a diatomic molecule. Assume that the non-rotation of a diatomic molecule.

3. Obtain an expression for the rotational energy levels of a diatomic molecule. Assume that the non-rotation of a diatomic molecule.

4. Discuss the species of a polyatomic molecule. Assume that the non-rotation of a diatomic molecule.

5. Discuss the species of a polyatomic molecule. Assume that the non-rotation of a diatomic molecule.


7. Explain the vibronic coupling matrix elements of electronic states.

8. Explain the vibronic coupling matrix elements of electronic states.


10. What is the significance of the Lamb-Mossbauer effect?

11. What is the Mossbauer effect?


13. What is the Mossbauer effect?
UNIT-II
4. Explain mode stability criteria and modes in a generalized resonator.
5. Discuss the Faust-Perot laser. Derive an expression for the threshold population inversion for such a laser.
6. Discuss the use of laser rate equations to derive pump rate for three level laser.
7. A 1-nw laser beam from a He-Ne laser is brighter than a 100w bulk. Explain.
8. Why a hologram cannot be obtained with ordinary light.

UNIT-III
4. What pumping mechanism is used in solid state and gas lasers and why?
5. Write short notes on the following:
   (a) Dye laser
   (b) Yag laser
   (ii) Dye laser
    (iii) Yag laser
   (iv) Solid state laser
    (v) Gas laser
   (vi) Semiconductor laser

UNIT-IV
3. Derive an expression for the line width of a homogeneously broadened spectral line.
4. A 1-nw laser beam from a He-Ne laser is brighter than a 100w bulk. Explain.
5. Why a hologram cannot be obtained with ordinary light.
6. Explain the phenomenon of stimulated Raman scattering using laser.
7. Explain the use and importance of lasers in communication.
8. Write a note on second harmonic generation.
2. Write detailed notes on the following:
   (a) Spiking in lasers
   (b) Spiking in lasers
   (c) Spiking in lasers
   (d) Spiking in lasers
   (e) Spiking in lasers
   (f) Spiking in lasers
   (g) Spiking in lasers
   (h) Spiking in lasers
   (i) Spiking in lasers
   (j) Spiking in lasers

UNIT II

3. Write detailed notes on the following:
   (a) Active material and population inversion
   (b) Active material and population inversion
   (c) Active material and population inversion
   (d) Active material and population inversion
   (e) Active material and population inversion
   (f) Active material and population inversion
   (g) Active material and population inversion
   (h) Active material and population inversion
   (i) Active material and population inversion
   (j) Active material and population inversion

4. Attempt all questions.

Compulsory Question

5. Attempt five questions in all, selecting one question from each unit. Question No. 1 is compulsory. All questions carry equal marks.

Time allowed: 3 Hours

Maximum Marks: 55

Paper-IV

LASER PHYSICS

ROLL NO. 4308

TOTAL PAGES: 3
UNIT-I

1. What is the importance of studying network theorems?

2. Discuss the Thevenin's theorem with a suitable illustration.

3. Justify the requirement of clipping circuits. Further discuss a circuit which can clip a given signal at two independent levels.

4. (i) What do you understand by bias stabilization technique? Explain one such circuit in detail.

5. (ii) How can a FET be used as a variable resistance?

6. (iii) Why do we prefer transformer coupling in power amplifiers?

(iv) Is it possible to convert a linear amplifier into a sinusoidal oscillator? Justify your response.

Compulsory Question

1. Attempt five questions in all, selecting at least one question from each unit. Question No. 1 is compulsory.

Note: All questions carry equal marks.

Maximum Marks: 55

Time allowed: 3 Hours
UNIT I

1. Determine the frequency of oscillations of a Coupled Signal
   Oscillator. Explain the condition to start the oscillations and
   derive the oscillation condition for sustained oscillations.

2. Find the output voltage of the circuit shown below.

3. Explain the operation of an instrumentation amplifier.

UNIT II

4. Describe the operation of a pnp transistor.

5. Calculate the value of N if in the circuit shown, $V_{BE} = 0.7V$, $P = 50\,\Omega$, and $V_C = 4V$.

UNIT III

6. Discuss the operation of an inverter circuit.

7. Explain the concept of negative feedback. Also
   discuss the amplifier's operation with negative feedback.

8. Explain the operation of a class-B push-pull
   amplifier. Also list its advantages.

9. Describe the operation of a switched mode power
   supply.
UNIT I

The group $\mathbb{Z}/n\mathbb{Z}$ where $n > 0$, and its subgroups

Prove that $G$ is a group if and only if $G$ has a composition series.

UNIT II

Questions carry equal marks. Attempt all questions in all sections unless one is specified. All

Maximum Marks: 80

Time Allowed: 3 Hours

ADVANCED ABSTRACT ALGEBRA I

MDE/02-22

Total Pages: 3

ROLL NO.

[Blank]
Exercise 1: Symmetric Functions

Express symmetric function $x^2 + x^3$ as rational function of $x$.

Exercise 2: Galois Group of $G/K$

Find the order of the Galois group of $G/K$.

Exercise 3: Calculating $\phi(16)$ over $\mathbb{Q}$.

Find the degree of $2 + \sqrt{3}$ over $\mathbb{Q}$.

Exercise 4: Prove that an extension of degree 2 is normal.

Exercise 5: Field Extension
Prove that an extension of prime degree is simple.

Exercise 6: Prime Number of Conjugates
Prove that if $[G:K] = p$, then every element of $G$ has $p$ conjugates.

Exercise 7: Proof that a group of order $p^2$ is Abelian.

Exercise 8: Answer the following questions:

1. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

2. Prove that the polynomial $x^2 + x^3-9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

3. Prove that the polynomial $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

4. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

5. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

6. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

7. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.

8. Prove that $x^2 + x^3 - 9x + 3$ is not soluble by radicals over $\mathbb{Q}$.
1. (a) If $f$ and $g$ map $[a, b]$ into $R$, let $f + g$ on $[a, b]$. Show that $\int_{a}^{b} (f + g) = \int_{a}^{b} f + \int_{a}^{b} g$. 

2. (i) Suppose $Q$ is a strictly increasing continuous function that maps an interval $[a, b]$ onto $[c, d]$. Suppose $f$ is continuous on $[a, b]$, then show that $\int_{a}^{b} f \, dx = \int_{c}^{d} f \, dy$. 

3. Let $\sum_{n=1}^{\infty} \frac{1}{n^2}$ be the series of convergent series. 

4. Let $\sum_{n=1}^{\infty} x^n$ be the series of convergent series. 

5. Let $\sum_{n=1}^{\infty} \frac{1}{n!}$ be the series of convergent series. 

6. Let $\sum_{n=1}^{\infty} \frac{1}{n^2}$ be the series of convergent series. 

7. Let $\sum_{n=1}^{\infty} \frac{1}{n!}$ be the series of convergent series. 

8. Let $\sum_{n=1}^{\infty} \frac{1}{n^2}$ be the series of convergent series. 

9. Let $\sum_{n=1}^{\infty} \frac{1}{n^2}$ be the series of convergent series. 

10. Let $\sum_{n=1}^{\infty} \frac{1}{n!}$ be the series of convergent series.
UNIT III

5. (i) Suppose that a function $f$ on a set $E \subset \mathbb{R}$ is uniformly continuous on $E$. Show that if a sequence of functions $f_n$ converges uniformly to $f$ on $E$, then the sequence $f_n$ is uniformly continuous on $E$.

(ii) Suppose $f$ is a function on a set $E \subset \mathbb{R}$ such that $f$ is differentiable on $E$. Show that if $f_n \to f$ uniformly on $E$, then $f_n'$ converges uniformly to $f'$ on $E$.

6. Consider the function $f(x) = \sum_{n=1}^{\infty} \frac{1}{1 + n^2 x}$. Show that $f$ converges uniformly on $[a, b]$.

7. Let $f_n(x) = \frac{1}{n} \sin(nx)$. Show that $f_n \to 0$ uniformly on $[0, \pi]$.

8. Suppose $f$ is a function on a set $E \subset \mathbb{R}$, $f$ is continuous on $E$, and $f_n$ converges uniformly to $f$ on $E$. Show that $f_n'$ converges uniformly to $f'$ on $E$.  

UNIT IV

9. Suppose $f$ is defined in an open set $E \subset \mathbb{R}$, suppose $D_f$ is continuous at some point $(a, b) \in E$, and suppose $D_f$ exists at $(a, b)$. Show that $D_f$ exists at $(a, b)$ and $D_f(a, b) = (D_f)_n(a, b)$.

10. Suppose $f_n \to f$ uniformly on a set $E \subset \mathbb{R}$, suppose $D_f$ exists at $(a, b)$, and suppose $D_f$ exists at $(a, b)$. Show that $f_n'$ converges uniformly to $f'$ on E.
1. (a) Define one point compactification of a topological space.
(b) Every I-space is T₁, but converse is not true. Explain.
(c) State Urysohn’s Lemma.
(d) Every continuous function from a compact space to a Hausdorff space is continuous.
(e) Every continuous mapping of a compact space into a Hausdorff space is closed.
(f) A compact space is complete.

UNIT-I

2. (a) Let X be a set and B be the collection of subsets of X such that X = \bigcup_{S \in B} S. Prove that there is a unique topology T on X such that B is a subbase for T.
(b) Prove that for any set E in a topological space, G(E) = \bigcup_{A \in T} A \cap E.
(c) If A \subseteq B, then d(A) \subseteq d(B).
(d) If x \in d(E), then x \in d(E - \{x\}.
(e) d(\emptyset) = \emptyset.
(f) \emptyset \subseteq X.

Note: Attempt five questions in all, selecting one question from each Unit. Question No. 9 is compulsory. All questions carry equal marks.

Time Allowed: 3 Hours
Paper: NM-403
Maximum Marks: 80

Total Pages: 4
UNIT III

5. Prove that complete regularity is a topological property.
   (a) Let \( f : X \to Y \) be a family of functions which distinguishes points from closed sets in \( X \). Then prove that the corresponding function \( c : X \to \prod_i Y_i \), is open when regarded as a function from \( X \) onto \( c(X) \).

UNIT IV

9. Write short notes on the following:
   (b) Define interior, exterior and boundary operators.

Compulsory Question

Let \( H \) be a filter on a space \( X \) and \( P \) be the associated net in \( X \). Let \( x \in X \). Then prove that \( H \) converges to \( x \) as a filter if and only if \( P \) converges to \( x \) as a net. Moreover, \( x \) is cluster point of the net if it is a cluster point of the filter.

Let \( \{ H_n \} \) be a non-empty family of filters of a topological space \( X \). Then prove that the set \( H = \bigcup H_n \) is also a filter on \( X \).

UNIT II

4. (a) Let \((X, T)\) be the topological space. Then prove that a one to one mapping \( f \) of \( X \) onto \( X' \) is homeomorphism if \( f(E) = f'(E) \) for every \( E \subseteq X \).

3. (a) Let \((X, T')\) be the two topological spaces. Prove that a one to one mapping \( f \) of \( X \) onto \( X' \) is homeomorphism if \( f(E) = f'(E) \) for every \( E \subseteq X \).

(b) Prove that \( X \) is a Hausdorff space if and only if every continuous function \( f : X \to \mathbb{R} \) is a closed mapping.

4. (a) Prove that the open set \( G \) has a non-empty intersection with a connected set \( C \) in \( T' \)-space \( X \) and \( x \in C \) are distinct.

(b) Prove that an infinite Hausdorff space \( X \) contains an infinite sequence of non-empty disjoint open sets and only if for every distinct arbitrary points \( x, y \) the closure of \( \{x\} \) and \( \{y\} \) are distinct.

UNIT I

6. (a) Let \( \{H_n\} \) be any non-empty family of filters of a non-empty set \( X \). Then prove that the set \( H = \bigcup H_n \) is also a filter on \( X \).

(b) Prove that a topological space \( X \) is Hausdorff if and only if limits of all nets in it are unique.
UNIT II

2. State and prove Cauchy-Goursat theorem.

that \( \exp(z^2) = \exp(2) \) with initial value \( f(0) = 1 \). Also show that \( z \) is the solution of the differential equation

Show that the exponential function \( f(z) \) of a complex number is the circle of convergence.

The series \( \sum \frac{z^n}{n!} \) represents an analytic function inside the circle.

I. (a) Show that the sum function \( f(z) \) of the power series

UNIT I

Question carry equal marks.

From each Unit Question No. 9 is compulsory.

Note: Attempt five questions in all selecting one question from each section.

Maximum Marks : 40

Time Allowed : 3 Hours

Paper-Marks 40

COMPLEX ANALYSIS

4317

MED 2-2

Roll No.:

Total Pages: 4

\[ \frac{z}{2} = \frac{2}{z} \]

Transformation \( w = \frac{z}{2} \)

Find the fixed points and normal forms of the bilinear

\[ \infty = z + \frac{1}{3} \]

Find the residue of the function (b)
UNIT III

5. (a) State and prove Schwarz lemma valid in the neighborhood of the point $z = 1$.
   (b) For the function $f(z) = z^2 + 1$, find a Taylor series expansion.

6. (a) Prove that $\cos h \left( \frac{z}{2} \right) = e^z - e^{-z}$.
   (b) Use Rouche's theorem to prove that all the roots of $z^4 - 5z^2 + 12 = 0$ lie between the circles $|z| = 1$ and $|z| = 2$.

UNIT IV

7. (a) Prove that $\int \frac{1}{1-x} \, dx = -\ln |1-x| + C$.

8. (a) If the mapping $w = f(z)$ is conformal, then show that $f'(z)$ is an analytic function of $z$.
   (b) Find the bilinear transformation which maps the points $z_1 = 1, z_2 = 2, z_3 = -1$ into the points $w_1 = 1, w_2 = 2, w_3 = 1$.

9. Answer the following questions:
   (a) Find the radius of convergence of the power series
   \[ \sum_{n=0}^{\infty} \frac{n!}{z^n} \]
   (b) Find the natural singularity of $\frac{1}{z}$
   (c) Define the entire function
   (d) Define the isolated singularity
   (e) Define the simple function and multiple connected domain
   (f) Define the function $f(z) = \frac{1}{z}$

Compulsory Question
differential equation is non-zero.

Fundamental set of a first order homogeneous linear

Construct an example to show that a system of a

does every non-homogeneous linear system of

\( (1)x = 6x^3 \quad \text{(1)} \quad x^2 = (1) \quad \text{(1)} \quad \text{Find fundamental matrix of the linear system} \)

Existence of solution of an initial value problem.

Give an example of a right maximal interval of

Specify a solution of an initial value problem (IVP).

Answer the following questions:

1. Compuatory Question

Questions carry equal marks.

From each Unit Question No. 1 is compulsory. All

Note: Answer five questions in all selecting one question.

Maximun Marks: 80

Time Allowed: 3 Hours

Paper-MAT-405

DIFFERENTIAL EQUATIONS I

4318

MEdD-22

4 Total Pages

(6) Verify Green’s formula for a second order linear
UNIT-I

1. State and prove the theorem of existence and uniqueness of solution of an initial value problem.
2. Find the equivalent system of differential equations.
3. State and prove the extension theorem.
4. Give an example to illustrate the above stated extension theorem.

UNIT-II

1. Prove that a fundamental matrix of a periodic system of differential equations can be written as a product of a periodic nonsingular matrix and etc. where C is a constant matrix.
2. Give an example to illustrate the above stated extension theorem.
3. Prove that a fundamental matrix of a periodic system of differential equations can be written as a product of a periodic nonsingular matrix and etc. where C is a constant matrix.

UNIT-III

1. Determine c and the fundamental matrix of the linear system.
2. Explain the variation of constants method.
3. Define an adjoint system to a given linear system, then find relation between them.
4. Prove that every nth order homogeneous linear differential equation has a fundamental set and any solution set over the interval of existence.
5. Prove that this forms a fundamental set of a unique homogeneous differential equation of order n.
6. Given a set: \( \{\phi_1, \phi_2, ..., \phi_n\} \) and determine its fundamental system of differential equations and homogeneous fundamental matrix of given H.S. If \( \Phi_1 \) is the fundamental matrix of the corresponding adjoint system, then find relation between them.

UNIT-II

1. Prove that a fundamental matrix of a periodic system of differential equations can be written as a product of a periodic nonsingular matrix and etc. where C is a constant matrix.
2. Give an example to illustrate the above stated extension theorem.
3. Prove that a fundamental matrix of a periodic system of differential equations can be written as a product of a periodic nonsingular matrix and etc. where C is a constant matrix.
4. Divide India into major agro-climatic regions. Discuss two
types of Natural vegetation in India.

UNIT II

3. Evaluate the characteristics and distribution of different
any one of them.

UNIT I

2. Divide India into major Physiographic regions and explain
(iv) Direction of Foreign trade.

(i) El-Nino and Indian Monsoon

(iii) Diversification of Indian agriculture.

(c) What is Inertropical Convergence?

Write short answers on the following:
(i) List the raw materials of the Automobile Industry.

S x 2 = 10

Note: Attempt five questions in all selecting one question
from each Unit. Question No. 1 is compulsory.
5. Assess the role of Geographical factors in determining the various methods of Irrigation in different parts of India.

UNIT-III

6. Divide India into major Industrial regions and give a detailed account of two of them.

7. Discuss the distribution of Hydropower Projects in India.

8. Discuss the major Industrial regions of India and highlight their characteristics, problems and prospects.

UNIT-IV

9. Give a detailed account of India’s Foreign Trade: its import and export.

15
ECONOMIC GEOGRAPHY

UNIT-I

1. Write short notes (not more than 50 words for each) on the following:
   (a) Production services.
   (b) Consumption.
   (c) Metalliferous Range.
   (d) Beta index.
   (e) Gharvar Oil Field.
   (f) Place utility.
   (g) Intran.
   (h) Free trade.
   (i) New Global Economy.

Compulsory Questions

Note: Attempt five questions in all, selecting one question from each unit. Question No. 1 is compulsory.

Maximum Marks: 80

Time Allowed: 3 Hours

Roll No. 4326

P.T.O.
UNIT I

15

From India, 15

any industry. Discuss your answer with suitable examples.

7. Explain the impact of import material in the location of

15

with a hypothetical example of a local network.

6. Define accessibility index. Calculate accessibility index.

UNIT III

15

examples. Justify the statement with suitable

5. The degree of development in iron and steel industry

15

Give the distribution of pollution in middle-east.

4. Evaluate the importance of pollution as a power resource.

UNIT II
8. What is correlation matrix? Calculate a correlation matrix from following variables:

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<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>X5</th>
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<td>4</td>
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<td>2</td>
</tr>
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9. Write short notes on the following:

(a) What is Residual? Write its significance.

(b) Differentiate Partial and Multiple correlation.

10. Answer the following in brief:

(a) Snowball sampling.

(b) What will be slope of line when beta coefficient is zero?

(c) Ordinal data.

(d) Test of significance.

(e) Advantage and limitation of mean deviation.

(f) Absolute measures of deviation.

(g) Least square method.

(h) What does coefficient of determination reveal.

(i) What is normal distribution.

Compulsory Question

10-2-20

Note: Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. Rest of questions carry equal marks.

Price of wheat

Rainfall (inches)

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Total Pages: 4

Roll No. 44327

P.T.O.
7. Discuss the significance of correlation. Find out the correlation coefficient between the following variables:

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</tbody>
</table>

8. Find the regression equation for the following data when "X" is the cause and "Y" is the effect.

9. Discuss the measures of inequality. Which is the best measure with hypothetical data and method of its calculation? Do you find our conclusion in wealth? Discuss the main points of inequality. Which is the best measure with hypothetical data and method of its calculation?
ORGANIZATIONAL BEHAVIOUR

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 14 marks each.

Compulsory Question

1. Answer the following short answer type questions:

(a) State the salient features of organisational behaviour.

(b) State the situational factors influencing personality.

(c) State the situational factors influencing personality.

Maximum Marks: 80

Time Allowed: 3 Hours

Paper: MC-101

Total Pages: 3

MDE/D-22

Roll No. 4395
3. Explain the main determinants of personality. Which type of determinants are the most relevant for an organisation?

4. Explain the meaning and importance of perception. Also explain the process of perception.

5. State the meaning, features and significance of learning. Discuss the cognitive learning theory.

2. What is Organisational Behaviour? Explain the modern approaches to it.

1. What is Perceptual selectivity?

6. Explain meaning, characteristic and various types of Groups. Also discuss the main determinants of Group cohesion.

7. Discuss the role of Transactional Analysis in improving interpersonal Communication. Discuss the role of various types of Ego states and life positions in Transactional Analysis.

8. Examine the role of various components of Group Dynamics in influencing the performance of an organisation.
Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 14 marks each.

1. Write short notes on the following:

(a) Economic Environment
(b) SWOT
(c) Macro-Environment Factors
(d) Globalization
(e) Privatization

Complimentary Question (aptitude 2021)

6x4=24
5. Define the Business Ethics. What is the importance of Business Ethics across all the functional areas of companies?

6. Explain the objectives, strategies, and problems of Economic Planning in India. Highlight the latest developments with regard to Economic planning in India.

7. Explain the Consumer Protection Act of India with the protection of the interest of Consumers.

8. Explain the following:
   (a) The Environment (Protection) Act
   (b) Corporate Governance

2. Explain the interaction matrix of different environmental factors on the basis of place with suitable examples.

3. What is the concept of environmental scanning? Explain the benefits and techniques of environmental scanning in detail.
1. Write short notes on the following:

(a) Qualification Shares
(b) Red-herring Prospectus
(c) Foreign Company
(d) Common Seal of Company

Compulsory Question (ekta)

2. Attempt five questions in all. Question No. 1 is compulsory. Attempt any four questions from the remaining seven questions.

Note: Time Allowed: 3 Hours
Maximum Marks: 80

P.T.O.
3. What do you mean by Reduction of Share Capital? Explain the circumstances and procedure necessary for reducing the Share Capital of a Company.

4. How are Directors appointed? Discuss the Powers and Duties of Directors.

5. Define a Private Company. What privileges and exemptions are enjoyed by it under Companies Act, 1956?

6. Define the Voting. What are the various methods of Voting at Company’s meetings?

7. Explain the provisions of the Companies Act related to Reconstruction and Amalgamation of Companies.

8. Write short notes on any two of the following:
   - (a) Annual General Meeting
   - (b) Doctrine of Ultra Vires
   - (c) Corporate Veil
8. Critically evaluate various methods of Price Level Adjustment Accounting.

7. What do you mean by Activity Based Costing? Discuss important cost drivers for implementation of ABC.

<table>
<thead>
<tr>
<th>X (2)</th>
<th>Y (3)</th>
</tr>
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<tbody>
<tr>
<td>30</td>
<td>29</td>
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<tr>
<td>5</td>
<td>4</td>
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<tr>
<td>12</td>
<td>8</td>
</tr>
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</table>

1. Write short notes on the following:

(a) Relevance of Basic Standards and Ideal Standards
(b) Justification of Management Accounting
(c) Performance Budget
(d) Investment Centre

Compulsory Question (Out of 24)

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 14 marks each.

Time Allowed: 3 Hours  
Maximum Marks: 80

ACaounting for Managerial Decisions

MDE/22

4390

Paper: MC-105

Total Pages: 4
5. Describe the process of setting up standards for Material Cost and different types of Material Cost Variations.


3. Describe the process of Identification of Reporting needs for different level of management along with contents of good report.

2. Define the concept of management accounting and describe the usefulness of various tools and techniques of management accounting for decision making.

1. Need for Price Level Accounting.

<table>
<thead>
<tr>
<th></th>
<th>Machine X ($)</th>
<th>Machine Y ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling Price</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>31</td>
</tr>
<tr>
<td>Fixed Overheads</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Variable Overheads</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Direct Wages</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Direct Material</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Expense Per Unit of Product A</td>
<td></td>
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</tbody>
</table>

Machine X can be manufactured either by Machine X or Machine Y. Machine X can produce 50 units of the product per hour and Machine Y can produce 100 units of the product per hour. Total machine hours available are 200 Hours per annum. Determine the profitable method of manufacturing taking into consideration the following information:

14
Compulsory Question (attached xev)

1. Write short notes on the following each part should not exceed 150 words:

(a) What is Marketing Information System?
(b) Illustrate the components of Marketing mix.
(c) What is the scope of Marketing?

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 14 marks each.
6. Differentiate between advertising and publicity. Is it possible to manage publicity?

5. What are pricing policies and strategies? Discuss their applications in Consumer goods marketing.


3. What is the influence of economic and Demographic environment on marketing?

2. How is Marketing changing with time? What is its latest concept?

1. Explain product mix and product line with examples.

(f) What are the Social and Ethical aspects of Marketing?

(c) Explain why consumer demands are growing.

(g) What is sales promotion? Discuss its appropriateness.
What are the managerial implications of perception?

a) What is the process of perception?

b) Personality

(1) What is the impact of situational factors on organizational behavior?

(2) Why is organizational behavior studied?

(3) Discuss the contribution of psychology in behavior.

a) What is the significance of organizational behavior?

I. Answer the following in brief:

10x4=40

Note: Attempt five questions in all. No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

MGT-101

ORGANISATIONAL BEHAVIOUR

MGT/D-22

24089

ROLL NO...

TOTAL PAGES: 04
2. What is the Industrial Revolution? Also, discuss the contributions of the Industrial Revolution in the field of organizational behavior.

3. Discuss the Neo-classical approach to organizational behavior.

4. What is the nature of personality? Discuss the major personality attributes influencing organizational behavior.

5. Discuss the reasons that affect perception of an individual.

6. What is social learning theory? How is this theory different from other theories of learning?

10. Why is distortion in perception?

II. Discuss the reasons that affect perception of an individual.

1. Why is Neo-classical approach different from Classical approach? How is Neo-classical approach different from Classical approach?
(x) Why was FERA replaced by FEMA?

as per Competition Act

(ix) Mention the conditions of mergers and acquisitions

(viii) Name four industries where licence is required

(vii) Define CSR as per Company Act, 2013

(vi) What is ethical dilemma?

(v) Define Public sector units (PSUs)

(iv) Is globalization good or bad?

(iii) Spatio-temporal aspects of economic planning in India,

environmental factors

(ii) Why to study interaction matrix of different

(i) Discuss the nature of business environment

1. Answer the following in brief:

10x4=40

Note: Attempt five questions in all. No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours
5. Discuss different components of Monetary Policy.

6. What measures are being taken for the development and protection of small scale industry in India?

7. Discuss the major provisions of Environmental Protection Act in detail.

8. What are the redressal agencies available under Consumer Protection Act to protect the rights of consumers?

9. Why do we have to solve the problems of small scale industry?

10. Generate the revenue and marketing the food products.

11. To know the opportunities and threats there is need to scan the environment. Explain the statement.

(X)

(x)

(iii)

(ii)

(i)

12. What are the different components of Corporate Governance practices?

13. Why are we not able to overcome the followed in India?

(iii)

(ii)

(i)

(iii)

(ii)

(!!!)
(viii) Derive and explain multiplicative theorem of probability.

(vii) Define the coefficient of skewness and determine the value if $x = 5$, and $n = 8$. Find out the probable error.

(vi) Find out the features of correlation coefficient of skewness.

(v) Define Bowley coefficient of skewness.

(iv) Find other two.

(iii) If three observations are 1, 2, 6, in a series of 5 observations, the mean and variance and standard deviation:

(ii) Find the arithmetic mean of the profit and loss for the year 1985, 1990, 1995, and 2000. Find the average during a year was 15, 20, 10, 35.

(i) In a survey of 5 companies, the profit $\text{Note : Attempt five questions in all. Q. No. 1 is compulsory.}$

Maximum Marks: 80

Time: Three Hours

Paper: MCT-103

ADVANCED STATISTICS

MCT/D-22

24091

ROLL NO. ..........................................................
7. Conditional probability

6. Write notes on the following:

5. The marks of the students in a certain examination are normally distributed with mean marks as 40 per cent and standard deviation marks as 20 per cent. On this basis, calculate the number of students who scored more than 60 per cent.

4. Assume that a factory has two machines, P and Q. Machine P produces 30 per cent of the items produced by machine Q produces 70 per cent of the items. Further, 5 per cent of the items produced by machine P were defective and only 1 per cent of the items produced by machine Q were defective. If a defective item is drawn by machine P was defective and machine Q was defective, then what is the probability that the defective item came from machine P?

3. The following data relates to the scores obtained by 9 persons on an intelligence test and their weekly sales.

2. The daily expenditure of 20 families is given below:

1. The mode of the distribution is 44. Calculate the Karl Pearson correlation coefficient of skewness.

1. A new brand of a certain drink is considered to be introduced in the soft-drink market of the city in a given period according to the following probability distribution:

The weekly sales of a company in an intelligence test and their test scores are as follows:

Weekly sales: 04 06 08 06 02 00 02 00 00 00 00
Test scores: 08 08 08 08 08 08 08 06 06 06 06

If the intelligence test score of a student is 65, what would be the expected weekly sales?

The probability is 0.02, 0.08, 0.10, 0.06, 0.04, 0.08, 0.02, 0.00, 0.00, 0.00, 0.00.

Data expenditure: 20-40 40-60 60-80 80-100

(a) Obtain the regression equation of sales on test scores.

(b) Obtain the regression equation of sales on weekly sales.

(c) Draw a scatter diagram of the above data.

(d) Calculate the correlation coefficient of weekly sales and test scores.

(e) What is step wise regression?
Discuss the need of marketing channels.

VII.

(a) What are the objectives of a sales promotion and advertising?

(b) What should be the qualities of a salesperson?

(c) What is the concept of 4Ps?

(d) What is the role of ethics in marketing?

I. Answer the following in brief:

10 x 4 = 40

Note: Attempt five questions in all. Q. No. 1 is compulsory.

Maximun Marks: 80

Time: Three Hours

M.C.T-104

MARKETING MANAGEMENT

M.C.T/D-22

24092

ROLL NO: 04

Total Pages: 06
6. What pricing policies and strategies are commonly used by marketers to sell fast-moving consumer goods?

10. When products are priced too high, how do consumers react and what strategies do companies use to adjust their prices?

5. What are the different types of new products? Why many companies introduce new products? How customers respond to new products?

10. In CRM, what are the steps involved in maintaining good relationships with the customer? How is CRM helpful in maintaining good relationships with the customer?

4. What is customer relationship management (CRM)? How is CRM helpful in maintaining good relationships with the customer?

10. Steps involved in the process of marketing research. Discuss the role of marketing research in a

10. Marketing is meeting needs profitably. Explain the importance of marketing in all aspects of life. Explain.
I. (a) What is the meaning of IT and how is it different from ICT.?

In addition to these answers, fill in the remaining questions. Note: Attempt five questions in all. No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

MCIT-105

TECHNOLOGY

FUNDAMENTALS OF INFORMATION

MCIT/D-22

24093

ROLL NO: 03

TOTAL PAGES: 03
1. Describe the various types of clouds along with their characteristics and design.

2. Discuss the various functions of operating systems in detail.

3. Describe various applications and advantages of computers.

4. What are the various components used in networking?

5. What are the various components used in cloud computing?

6. What are the various uses of computers in terms of data retrieval and data storage?

7. What are the various types of operating systems?

8. What is the difference between distributed computing and cloud computing?

9. How is wide area network different from cloud computing?

10. What is an operating system?
PHIL 1

(a) What is a philosophy? What are its different parts?

(b) Discuss.

(c) What is a curriculum? Which are the different parts of it?

(d) What is a masterpiece?

I. (a) What is the difference between AP and IB? 

II. (b) Discuss.

Note: Attempt four questions in all. Question No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

MCIT-106
INTERNET AND MIS
MCIT/D-22
24094

Roll No. ____________________________
Total Pages: 04
1. Define a web server.

2. Write a brief note on Google search engine features.

3. What is the role of a web server in a business?

4. Write a note on applications of Internet in business.

5. What is an IP address? What do you understand by static, dynamic, private and public IP? Illustrate.

6. Define Information. What are the desirable qualities of good information? What type of information is produced by DSS? Discuss.

7. What are the tools to search the information on WWW? Write the brief notes on WAIS and Veronica.

8. What are the different types of output in information designing of output? Discuss.

9. What is Search Engine Optimization (SEO)? Why is SEO important to businesses? Discuss.

10. What is a Groupware? How can groupware benefit a business?

11. What is Firewall? Discuss its different types.

12. What is a Search Engine? Write a brief note on Google search engine.
1. (a) What do you understand by the structure of a material? Explain.
(b) What is the significance of Maxwell’s equation? Explain.
(c) What is the significance of the stress-strain curve? Explain.
(d) What is anelastic deformation? How is it related to the stress-strain curve?
(e) What are Soft Optical Phonons? Explain.

UNIT-I

2. (a) How will you determine the Crystal structure using diffraction method? Discuss.
(b) What are Dislocations? Explain.
(c) The true stress-strain curve is always to the left of the engineering stress-strain curve. Explain.
(d) How is it related to the mechanical properties of materials?

Note: Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory.

Compulsory Question

Paper-1

Total Pages: 3

Maximum Marks: 55

Time Allowed: 3 Hours

5009

ROLL NO. 22
UNIT-III
6. What are Ferroelectric materials? Describe various types of Ferroelectric materials. Explain giving suitable examples.

UNIT-II
5. Why is the Brittle fracture strength of real materials lower than the ideal fracture strength? Discuss in detail.

UNIT-II
4. What do you understand by Fracture in materials? Explain various types of fractures with examples.

UNIT-II
3. What is the Reciprocal Lattice? Explain its significance.

UNIT-II
2. What are Line defects? Discuss in detail various types of line defects present in Crystals.

UNIT-II
1. Explain Edge and Screw dislocations by giving suitable diagrams.

UNIT-IV
8. What is Polarization Catastrophe? Discuss the condition for Polarization Catastrophe.

UNIT-IV
7. What is Polarizability? How it varies with frequency?

UNIT-IV
5. What are Ferroelectric domains? Explain.

UNIT-IV
4. Discuss the Landau theory for second order Phase transitions.

UNIT-IV
3. What do you understand by Piezoelectricity?

UNIT-IV
2. Draw a Unit Cell of BaTiO3 below and above the Curie temperature. Also show its spontaneous polarization as a function of temperature.

UNIT-IV
1. What is Lorenz cavity? Obtain an expression for electric field due to the Polarization charges on the surface of the Lorenz cavity.
UNIT I

1. Discuss the basic principle and mechanism of the Thermal evaporation technique for thin film deposition. Describe various types of thermal evaporation sources using suitable diagrams.

2. Explain the RF heating and electron bombard heating methods for thin film deposition. What are their relative advantages and disadvantages ?

3. What is the effect of current on the rate of thin film deposition ? Explain.

UNIT II

1. Define the term Vacuum. What are its units ?

2. How will you define a Thin Film ? What is the maximum range of its thickness ?

3. Why Diffusion pump always works with a backing of rotary pump ?

(e) What do you understand by the term ‘Leak Detection’ ? Explain.
UNIT I

1. Discuss various materials and their characteristics for use in different vacuum systems.

2. Cyrogenic industries, giving examples.

3. Discuss the applications of vacuum systems in pharmaceutical and medical industries.

UNIT II

4. What is the basic principle of operation of a cryogenic pump and how it can be measured?

5. Explain the low beam guidance technique for deposition of thin films. Discuss in detail how the thickness of a thin film can be measured.

6. What is the basic principle of operation of a cryogenic pump and how it can be measured?

UNIT III

6. Describe the deposition of thin films. Name the materials that can be deposited using this technique.

7. Explain the construction methodology and working principle of a cryogenic pump. Explain its suitability compared to other cryogenic pumps.
2. What is ion implantation? Discuss its process and basic
limit.

3. Explain the process of photolithography and the difference between ion implantation and etching.

4. What is the difference between TEM and STM?

5. Importance of material analysis.


7. Write short notes on the following:

   a. Computer Question

   b. Questions carry equal marks.

   c. Attempt all questions in all sections. 

   Note: Maximum Marks: 35

   Paper-I

   Time Allowed: 3 Hours

   TECHNIQUES

   SURFACE MODIFICATION & CHARACTERIZATION

   MDO-P-22

   5012

   Roll No.: ____________________________

   Total Pages: 3
5. Discuss the application of AES in study of lon-

6. Composition of analysis and decision making.

8. (a) What do you understand by SAM? Discuss

Unit I

11. Energy electron diffraction and its application

What is LEED? Explain its principle schematic of low

5. Discuss the principle of XRD. Explain the working

6. What is the principle of XRD? Explain the working

Unit III

11. Operation and two applications of AFM.

5. Discuss the principle of AFM. Explain the imaging mode

6. What information can be extracted from it?

(b) Discuss the depth profile of Rutherford scattering and

5. Suitable example of elastic scattering.

4. (a) Explain the kinematic of elastic scattering and gives

Unit II

11. What is Ion beam mixing? Discuss the optical properties

3.
1. Answer the following questions:

(a) Write four conventional sources of natural radiations?
(b) Define the term Dose Equivalent?
(c) How does radiation accumulate in the human body?
(d) What are the risks of Magnetic Resonance Imaging (MRI)?
(e) Write four applications of ESR Dosemeter.
(f) What are the possible health hazards from nuclear radiations?
Unit II

4. How nuclear radiation induced biochemical changes in human body from nuclear radiation?

5. What do you understand by Radioactive Waste?

8. What are the basic principles of Thermoluminescence?

11. Explain the terms Cross-section, Linear energy transfer, Specific energy and absorbed dose.

Unit III

3. What are the basic principles of radiation therapy?

4. Describe nuclear medicine, its characteristics, and scope.

5. What are the solid state nuclear track detectors?

8. What are the physiological effects of ultrasound in conjunction with the diagnostic ultrasound technique?
UNIT-I

1. (a) Prove that linear spaces $V$ is a Banach space under the norm $\|x\| = \sum_{n=1}^{\infty} |x_n|^p$ such that $\sum_{n=1}^{\infty} |x_n|^p < \infty$.

2. (b) State and prove F. Riesz's lemma.

Let $T$ be a bounded linear transformation from a normed linear space $N$ to $N$.

3. Put $a = \sup \|T(x)\| \cdot \|x\|$, $b = \sup \|T(x)\| \cdot \|x\| = 0$.

4. $c = \min \{k: k \geq 0, \|T(x)\| \leq k \|x\| \text{ for all } x \in N\}$.

Roll No: .................

MDQM-22

FUNCTIONAL ANALYSIS

Paper-MM 301

Total Pages: 3

5014

Time Allowed: 3 Hours

Maximun Marks: 80

Note: Attempt five questions in all selecting one question from each Unit. Question No. 9 is compulsary. All questions carry equal marks.
UNIT IV

7. (a) State and prove Bessel's inequality for countable orthonormal sets.
    (b) State and prove open mapping theorem.

UNIT III

5. (a) Define the Strong and Weak convergence. Prove that on a finite dimensional space, both coincide.
    (b) State and prove Riesz representation theorem for bounded linear functional on $C[a,b]$.

4. (a) State and prove Hahn-Banach theorem for reals in normed linear spaces.
    (b) Prove that a closed and bounded set need not be compact in normed linear spaces.

3. (a) State and prove Hahn-Banach theorem for reals in normed linear spaces.
    (b) Also, prove that $\|T(x)\| \leq \|T\| \|x\|$ for all $x \in N$.

UNIT II

12. Show that if $N$ is a normed linear space and $x_0$ is a non-zero element of $N$, then there exists a functional $f$ in $N^*$ such that $f(x_0) = \|x_0\|$ and $\|f\| = 1$.

10. Prove that a closed and bounded set need not be compact in normed linear spaces.

8. (a) State and prove Riesz representation theorem for continuous linear functionals in Hilbert spaces.
    (b) Let $T$ be an Operator on a Hilbert space $H$. Then $(Tx, y) = (x, Ty)$ for all $x, y \in H$, where $T^*$ denotes the adjoint of Operator $T$.

Compulsory Question

9. Answer the following questions:

(a) Every normed linear spaces is metric but converse may not be true. Justify?
(b) Define the orthogonal set $S$ in a Hilbert spaces is complete if for any $x \in H$ is such that $x \perp S$, then $x$ must be zero.
(c) Prove that a closed and bounded set need not be compact in normed linear spaces.
(d) Define the reflective spaces.
(e) Prove that if an orthonormal set $S$ in a Hilbert spaces is complete if for any $x \in H$ is such that $x \perp S$, then $x$ must be zero.
(f) Define the projection and positive operators.
(g) Define the Projection and positive inequality.
(vi) Define Homogeneous and Isotropic media.

(vii) State Saint-Venant principle.

(viii) Prove that $K = \frac{E}{3(1-\nu^2)}$ where symbols prove their usual meaning.

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**UNIT-I**

1. (a) State and prove contraction theorem. Also show that: $\varepsilon_{ii} = \frac{E}{V}$. 

(b) Find the eigen values and eigen vectors of a second order tensor whose components relating to any coordinate axes are

\[
\begin{bmatrix}
8 & 6 & 2 \\
2 & 4 & 3 \\
6 & 7 & 4
\end{bmatrix}
\]

2. (a) Obtain the three scalar invariants of a second order tensor.

(b) Show that gradient of a vector is a tensor of order two and curl of a vector field is a vector.
UNIT III

5. (a) Write a note on Mohr's circles.
(b) The state of stress at a point is given by
\[
\begin{bmatrix}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{bmatrix}
\]
6. Derive the Hooke's law for a homogeneous isotropic medium of the form \( \sigma = 208 \epsilon + 24 \epsilon^2 \), where symbols are as usual defined.

UNIT IV

7. (a) Derive the Saint-Venant's equations of Compatibility.
(b) State and prove Saint-Venant's theorem.
(c) Discuss the physical significance of the point on the continuum is infinitesimal affine transformation.
(d) Discuss the shear stress tensor is Symmetric.
(e) Derive the Saint-Venant's equations of compatibility.

8. (a) When the components of the body force \( F \) are constant, show that the invariant \( O = T_{ij} \) and \( \sigma_0 = \epsilon \).
(b) Show that the configuration of the state of the stress is equal to the sum of kinetic energy and the potential energy.
(c) When the components of the stress tensor are \( T_{ij} \) and the strain components are \( \epsilon_{ij} \), prove that the work done by the external forces is given by the integral of the dot product of the stress tensor and the strain tensor over the volume.
where \( P \) is pressure if volumetric flow between two coaxial cylinders of radius \( r \) and \( r_1 \) is given by:

\[
Q = \frac{-\pi P}{8 \mu} \left( r^2 - r_1^2 \right) \log \left( \frac{r}{r_1} \right)
\]

and

\[
\frac{rt_2 - 1}{t_2^n - 1} \left( \frac{n^2 - 1}{2} \right)
\]

1. (a) Determine the stream lines and path lines of the particle.

2. (a) Show that

\[
x^2 + \tan^2 t + 3 \cot^2 t = 1
\]

(b) Derive equation of continuity in cylindrical polar coordinates.

UNIT-I

Note: Attempt five questions in all selecting one question from each Unit. Question No. 9 is compulsory. All questions carry equal marks.

Total Marks: 80

Time Allowed: 3 Hours
UNIT IV

7. Discuss the steady flow of a viscous fluid between two coaxial circular cylinders, also determine the rate of man flow and the average velocity in the annulus.

UNIT III

6. Obtain velocity profile for plane Poiseuille flow for parallel plates.

5. Derive Navier-Stokes equations of motion.

4. (a) State and prove Kelvin circulation theorem.
(b) Show that the mean value of $\phi$ over any spherical surface, throughout whose interior $\nabla \cdot \mathbf{V} = 0$, is equal to the value of $\phi$ at the centre of sphere.

3. (a) Derive Euler's equation of motion in vector form.
(b) State and prove Bernoulli's theorem.

UNIT II

2. (a) Show that
\[ \mathbf{V} = \left( \frac{x^2}{(x^2 + y^2)^2}, \frac{y^2}{(x^2 + y^2)^2}, 0 \right) \]

(b) $\mathbf{W} = \left( \frac{y}{x^2 + y^2}, \frac{x}{x^2 + y^2}, 0 \right)$

are the velocity components of a possible fluid motion. Is this motion irrotational?

1. Attempt all the following:
(i) Describe briefly Lagrangian method of describing the flow.
(ii) Define the Rotational and irrotational motion.
(iii) Define the Conservative field of force.
(iv) Acyclic and Cyclic motions.
(v) Define the vorticity of a fluid.
(vi) Define the Newtonian and Non-Newtonian fluids.
(vii) A viscous liquid flow steadily parallel to the axis in the annular space between two coaxial cylinders of radii $a$, $b$ ($a > b$), show that rate of discharge is

Compulsory Question

8. Discuss the steady flow of a viscous incompressible fluid through a tube of uniform equilateral triangular cross-section. Determine the volume rate of flow and compare it with a circular cross-section of equal area.
8 (a) Solve the integral equation

\[ \int_0^1 (1 - s) f(s) ds = 0 \]

Have a solution if \[ \int_0^1 (1 + s) f(s) ds = 0 \]

8 (b) Show that the integral equation

\[ \int_0^1 (1 - s) f(s) ds + (1 + s) f(s) ds = 0 \]

and find the eigenvalues.

UNIT I

Questions carry equal marks.

From each unit Question No. 9 is compulsory. All

Note: Attempt five questions in all, selecting one question from each unit.

Maximum Marks: 80

Time Allowed: 3 Hours

PAPER-MM 3024

MATH-22

RUL No. ........................................

Total Pages: 4
UNIT III
5. State and prove Fredholm's third theorem.
6. Prove that the set of eigenvalues of the second kind is an entire function of the parameter 2.
7. Solve the following equations:
   \[ g(s) = f(t) \]
   by evaluating resolvent kernel.
8. Discuss the method to solve a Cauchy type integral.
   \[ s = \frac{1}{2} \int_0^1 g(t) \cos \frac{t}{s} \, dt, \quad 2, 2s < 4. \]

UNIT IV
10. State and prove Fredholm alternative.
12. Find the Abel integral equation:
   \[ f(a) = \frac{8}{3a^2} \int_0^a \frac{g(x)}{x^2} \, dx. \]
13. Solve the integral equation.

Compulsory Question

8-2=16
2. What is meant by Ecological productivity? Discuss the pattern of Ecological production of different natural areas of the World. Also, discuss the controlling factors of Ecological productivity.

3. Define the Biogeochemical cycle and discuss the mechanism of Hydrological cycle and its interruption by anthropogenic activities.

Unit-I

1. Briefly explain the following questions:
   (i) Ecological hot spots.
   (ii) Pelagic biome.
   (iii) Biological clock.
   (iv) Food Web.
   (v) Eutrophication.
   (vi) Carbon credit.
   (vii) Nitrogen fixation.
   (viii) LNAS.

Compulsory Question

Note: Attempt five questions in all selecting one question from each Unit. Question No. 1 is compulsory. Rest questions carry equal marks.

10×2=20
Unit-I
Discuss the methods of wildlife conservation and preservation.

Unit-II
Discuss the ecosystem approach in detail.

Unit-III
Classify resources and discuss the loci and status of degradation of soils in the world.

1. What are the geographical and ecological characteristics associated with savanna biome? Discuss the threats associated with savanna biome.

2. Differentiate between classical and ecological approaches his evolution.

3. Differentiate between classical and ecological approaches.

4. Discuss why even after wildlife protection laws the numbers of species of wildlife have declined significantly in India.

5. What are the geographical and ecological characteristics.

6. Points the physical, chemical and biological measure of water pollution in India.

7. Describe the suitable examples and species of wildlife have declined significantly in India.

8. Differentiate between conservation and preservation.

9. Discuss the status of water pollution in India.
3. What is Research Problem? How do you formulate research?

2. What is the importance of fieldwork in teaching and

Unit I
  (a) Objectives of study.
  (b) Accidental sampling.
  (iii) Difference between schedule and questionnaire.
  (iii) Benefit of secondary data.
  (ii) ELSS development through fieldwork.

Topics:

1. Write short notes (not exceeding 25 words) on the following

  Compulsory Questions:

  Questions carry 10 marks each.

  From each Unit, Question No. 1 is compulsory. All
  questions carry 10 marks in all, select only one Question

  Note: Attempt four Questions in all, selecting one Question

  Time allowed: 3 Hours

  Paper: GEOC-320(A)

  SOCIO-ECONOMIC

  FIELD METHODS IN GEOGRAPHY

  5056 MDG/D-22

  Roll No: 2

  Total Pages: 2
4. What is questionnaire? Describe different types of

5. Describe probability sampling. What are different

6. How do we formulate data from the questionnaires? How do we analyze and interpret data?

7. What is the format and design of research report writing?
1. Write short notes (not more than 50 words for each) on each of the following.

1. Compulsory Question

Compulsory: Rest questions carry 15 marks each. Attempt all questions in all, selecting at least one from each unit. Question No. 1 is compulsory. Maximum Marks: 80

Time Allowed: 3 Hours

Paper—CIEPG 304 (TV)

Geography and Disaster Management

5065

Total Pages: 2
UNIT-III

5. What do you understand by war? Which region in the world is facing war and why?
15

4. What are Heavy precipitation events? How do these cause floods in India?
15

UNIT-II

3. What are the causes of Tsunamis? Describe its impact in Asia-Pacific Region.
15

2. Define Natural Disasters. Discuss various basis of classification
15

UNIT-I

1. Define recovery. What recovery measures were undertaken by Government of India during the COVID-19 pandemic?
15

8. How do you define Disaster Vulnerability? What are different dimensions of vulnerability?
15

UNIT-IA

7. What are disaster mitigation measures? Describe them.
15

6. What are the impacts of disasters on society? Explain.
9

3. What are the impacts of COVID-19 pandemic in India.
15

UNIT-IB

5. Describe various types of natural disasters.
15

4. Define a disaster. What are its characteristics?
15

UNIT-I

2. Define Natural Disasters. Discuss various basis of classification
15
UNIT 1

1. What is Interpretation keys?
2. Describe the EMR, its characteristics and which regions

Answer the following in brief:

Compulsory Question

one from each unit. All questions carry equal marks.
Compulsory. Attempt only three by selecting at least

Note: Attempt four questions in all Question No. 1 is

Maximum Marks: 40

Time Allowed: 3 Hours

PAPER-GEOG-305(A)

INTRODUCTION TO REMOTE SENSING

5067

Roll No. 2
Total Pages: 2
UNIT-II

4. Write short notes on the following:

(a) Elements of Image Interpretation
(b) Application of Remote Sensing in Agricultural

7. Write short notes on the following:


5. What do you understand by Sensors? Describe the sensor

4. When you understand by Sensory

3. Characteristics of IRS satellites.

2. What is Digital Image? Describe Image Processing

1. What do you understand by Sensors? Describe the sensor
8. What is SQL? How queries are written in SQL? Discuss the any two query commands using suitable examples.

Note: Attempt five questions in all. Question No. 1 is compulsory.

(a) What do you understand by ALU? What are the functions performed by ALU? Discuss.
(b) What is the difference between CPU and CUI? Discuss.
2. What is the difference between LAN and WAN? Discuss the different network topologies in LAN along with their merits and demerits.

3. What is Logic? What is the advantage of fuzzy logic over bi-valued logic? Discuss.

4. Define the database. What is its advantage over traditional file system? Discuss.

5. What is an Internet? What are its applications in Business? Discuss.

6. Differentiate the following:
   (a) Broadband and Narrowband network.
   (b) System software and Application software.

7. What is the difference between Magnetic and Optical storage devices? Discuss the read and write operations.

7.7
1. Answer the following parts must not exceed 150 words:

(a) Explain the Gordon's Model argument of - A bird in hand is better two in the bush.

(b) What is Essence of M.M. Dividend Model?

Complimentary Question (After Part)

(c) What are the issues involved in Financial Management of Sick Units?

(d) What Share Exchange ratio and how it is arrived at?

(e) What is the difference between returns from index funds and managed funds?
2. What is the relationship between taxes and dividend policy? Explain by citing the impact of different Tax systems. Also explain how the informational content of dividend affects the share value.

3. What are the assumptions of Gordon’s Model and Miller Modigliani Model of dividend policy? Explain the relevance of dividend under market imperfections. Also explain the issue of dividend asymmetry and Agency costs and the case of dividend payments.

4. The higher the financial risk, the higher the shareholders required rate of return or the cost of equity. Elaborate regarding Capital structure by giving its applications with illustration.

5. (a) Give Criticisms of the MM Hypothesis with Corporate and personal taxes?

(b) What is Miller’s Hypothesis with Corporate and personal taxes?
1. Have the DCF approach used for valuation under

Financial Synergy?

(9) How does the Market determine financial

benefits and

5. Answer the following questions:

Examples of financial restatements of firms.

4. Calculate the Operating leverage and Financial leverage

D. Describe the reason behind EBIT-EPs and EPSs.

(c) When does Financial distress arise and what is cost?
Note: Attempt five questions in all, Question No. 1 is compulsory. Attempt remaining four questions, out of remaining seven questions carrying 1 mark each.

Compulsory Question (afterwards)

1. Attempt the following questions in Brief:

- Discuss the main constituents of Indian Financial System.
- State objectives of SIDBI.
- What is Capital market?

13. Discuss the Operational and Promotional Activities of Industrial Development Bank of India.


15. Discuss the Role of Indian Financial System in Economic Development. Give an overview of Indian Financial System. Explain the Name of Indian Financial System.

4. What do you understand by Mutual Funds? Discuss various types of Mutual Funds.

6. Discuss the Operational and Promotional Activities of Industrial Reconstruction Bank of India.
(d) State the use of Observation technique for Data Collection.

(c) What is an Interval Scale?

(b) What is Exploratory Research Design?

Since the importance of Marketing Research is 6x4=24

1. Answer the following short answer type questions:

Compulsory Question (question 2)

Answer any four questions from the compulsory section. Attempt all the questions in all Question No. 1 is 80 Maximum Marks: 80

Time Allowed: 3 Hours

PAPER-MC-308

MARKETING RESEARCH

5133

MD/D-22

Roll No. 3

Total Pages: 3
1. Explain the importance of Questionnaire in Marketing.
2. Write a detailed note on use of Experimental Research in Marketing.
3. Explain the various steps involved in the Marketing Research.
4. Explain the meaning, nature and scope of Marketing Research.
5. Explain the utility of sources of information in Marketing Research.
6. Explain the advantages and limitations of Secondary data.
7. Explain the meaning, advantages and disadvantages of Marketing decisions.
8. Explain the four types of measurement levels (Scales of Measurement).
9. Explain scale validity and reliability.
10. Questionnaire available for guided response.
11. Questionnaire available for guided response.
12. Questionnaire available for guided response.
13. Questionnaire available for guided response.
14. Questionnaire available for guided response.
3. Define advertising management. What steps are involved in advertising management process?

2. "Advertising is the major component of Communication". Explain the statement with suitable examples.

(f) Name four advertising agencies.

(e) What is the purpose of Media planning?

(d) What is an objective and task method of advertising budget?

(c) Discuss seasonal advertising.

(b) What are the limitations of DAGMAR approach?

(a) Differentiate between advertising and personal selling.

1. Answer the following in brief:

(e) Compulsory Question:

Compulsory Question

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 4 marks each.

Time Allowed: 3 Hours

Maximum Marks: 80
4. What is an advertising message? What factors are considered while designing an effective advertising message?

5. What is the role of media in advertising? How will you select the suitable media for your advertising?

6. Define advertising appeals. What are different types of advertising appeals?

7. What does an advertising agency do? Discuss different types of advertising agencies. Which type of advertising agency is commonly used by organizations?

8. Why do we evaluate the advertising effectiveness? Discuss the pros and cons of advertising effectiveness.

9. What is the role of a creative director in advertising? How do they contribute to the effectiveness of advertising campaigns?
8. Write short notes on the following:

(i) Pricing Policy and Strategies.

(ii) Agency Selection.

(iii) Product Line Policies

(iv) Explain Cultural Environment.

(v) Discuss Challenges in International Marketing.

1. Compulsory Question (24 words):

Compulsory Question (affair न पूर्व)

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of the remaining seven questions.

Time allowed: 3 Hours

Maximum Marks: 80
2. Define International Marketing. Explain, in detail,
   the following:
   (i) Economic Environment
   (ii) Legal Environment
   (iii) Political Environment
   (iv) Cultural Environment
   (v) Social Environment

3. Explain the following:
   (i) Global Branding
   (ii) Product Adaptation and Standardization

4. Write a detailed note on International Distribution
   and Logistics System.

5. Write notes on the following:
   (i) International Marketing Channel Members
   (ii) Managing Channel Members

   Discuss in detail the factors influencing pricing.

7. Explain the following:
   (i) Economic Environment
   (ii) Legal Environment
   (iii) Political Environment
   (iv) Social Environment

8. Discuss Channels of Distribution.
RETAIL MANAGEMENT

Paper—MC-13

Time allowed: 3 Hour

Maximum Marks: 80

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt four questions from the remaining questions

Compulsory Question (Answer any one)

6x4 = 24

518/173559

P.O. 5138

Roll No...

Total Pages: 3

MDQ/22
Retail Audit

4. Briefly explain various theories of Retailing.

5. Which are the different steps in strategic planning in Retailing?

6. Discuss the various areas where the retail complexity can be reduced through Information Technology.

7. The role of Financial Management in Retailing is inevitable. Explain this statement.

8. What do you mean by store layout? What are the various steps a retailer takes for designing it?
(i) Role of ministry of MSMEs for entrepreneurship development

(ii) Explain the term startup stage

(iii) Differentiate between entrepreneur and entrepreneurship.

(i) Define an entrepreneur.

Compulsory Question: Attempt 1 question

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt any four questions out of remaining seven questions.

Time allowed: 3 Hours

Maximum Marks: 80

Paper: MC-314

Total Pages: 4
1. Describe the four motives influencing an entrepreneur.

2. Define entrepreneurship. Explain entrepreneurship plays an important role in the economic development of a country. Explain and justify this statement.

3. Entrepreneurs are not born but born comment on it.

4. Explain different types of entrepreneurs.

5. What is demand forecasting? Explain the various methods used for demand forecasting involved in it. Discuss the various methods used for demand forecasting.

6. Write notes on the following:

   (i) Project Report Preparation.

7. What do you understand by feasibility analysis? What are the main elements of feasibility report? Describe the structure of feasibility report.


9. Write notes on the following:

   (i) Safety at work place and use of Personal Protection Equipment (PPE).

10. What do you know by project capital cost?
1. Answer the following short answer type questions: 6.4.2.4

Compulsory Question

1. 

Note: Attempt five questions in all. Question No. 1 is compulsory. Attempt remaining four questions out of remaining seven questions carrying 4 marks each.

Maximum Marks: 80

TIME ALLOWED: 3 Hours
4. What is knowledge management? Discuss various tools of knowledge management.

3. Discuss the various emerging issues in HRD in a developing country like India.

2. Explain the nature and scope of Human Resource Development (HRD). Also explain the qualities required for HRD managers.

1. State the importance of Competency mapping.

6. Explain the meaning and components of Role analysis.

8. What are the objectives of training? Explain the various steps involved in the training process.

7. Also discuss various types of role conflict.

5. "Brainstorming" is an important tool of knowledge management. Comment.

14.
II. Attempt the following questions in brief: 10×4=40

1. Define the term 'market'.

2. Explain the role of the Reserve Bank of India.

3. Discuss the need for commercial banks.

4. State the objectives of the Reserve Bank of India.

5. Explain the working of the bond market.

6. Define monetary policy.

7. Discuss the role of monetary policy in economic growth.

8. Explain the working of the stock market.

9. Define the term 'secondary market'.

10. State the objectives of the Indian financial system.

Note: Attempt five questions in all. No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

Financial Institutions and Markets

MGT 301

INFORMATION TECHNOLOGY

MGT/2-22

24095

Roll No. 03

TOTAL PAGES: 03
1. Discuss Government Policy on merchant banking.

2. Present an overview of Indian financial system. How does financial system help in economic development?

3. Differentiate between Money market and Capital market. Discuss recent developments in Indian Money market.

4. Discuss the operational and promotional activities of ICICI.

5. Explain the growth and functions of Merchant banking.

6. Describe the operational and promotional activities of SIDBI.

7. How is a mutual fund scheme marketed? Discuss latest mutual fund schemes in India.

8. How are mutual funds regulated? Give an appraisal of the performance of mutual funds in India.

9. Discuss the present status of banking in India.

10. Discuss the various modes of payment in India.
2. Compare briefly the traditional and modern approaches to security analysis. Why is liquidity so important to the efficiency of security markets?

1. State and describe the following:
(a) Value investing
(b) Bond duration
(c) Term structure of interest rates
(d) Valuation of convertible securities
(e) Process of shares dematerialisation
(f) Stock trading mechanism
(g) Primary market for securities
(h) Security market line
(i) Valuation of weak for market efficiency
(j) Tests of weak for market efficiency

Note: Attempt Five questions in all. Q. No. 1 is compulsory.

Time: Three Hours

Maximum Marks: 80

Paper: MCIT-D-22

Page: 2

Roll No. 24096

MCIT-302

Total Pages: 02
What is the significance of negative sloped risk-return?

64-10

4. It has often been said that common stocks are a good hedge against inflation. What do you suppose people think this way? Do you agree with this statement?

10

5. If you were considering investment in an industry with low fixed costs and low profit margins, what factors would you want to explore before deciding to invest in this industry? Why?

10

6. How do technocrats and random walk advocates differ in their view of the stock market? What sequence of events might bring about an "efficient market"?

10

7. Write a detailed note on the method of selling securities in primary markets.

10

8. State and describe the following:

(a) Listing of shares on exchange

(b) SEBI guidelines on public issue

5-5=10
7. Define Inventory Control. Explain in detail, classification of Inventories.

8. Explain the following:

(i) Inventory Control Models

(ii) Selective Inventory Control Systems

Note: There will be eight questions in all and attempt Five questions In all. Q. No. 1 is compulsory and consists of ten short questions having 4 marks each. Answer to any Four questions should not exceed half page. Attempt and each question carries 10 marks each.
2. Write a detailed note on the role and scope of Operations Management.

3. Discuss Capacity Planning.


5. Write notes on the following:
   (i) Scheduling
   (ii) Statistical Quality Control

6. Define Inventory Management. Discuss in detail, objects and functions of Inventory Control.

7. Explain the following:
   (i) Operations and Life-Cycle
   (ii) Explain Fixed Order Cycle (FOC).

8. Discuss EOQ under Fluctuating Demand.

9. Explain PERI.
6. What is the importance of pre-tests or evaluating advertising effectiveness?
2. Discuss the significance of communication. What are the steps involved in the process of communication? 10

3. What are the social aspects of advertising? Why are social aspects getting importance nowadays? 10

4. “Billions of dollars are being spent on advertising around the world.” Elaborate. Also discuss the methods of fixing advertising budget.

5. How do you write an effective advertising message? 10

6. Why are corporate using different creative styles in advertising? Explain the statement with suitable examples. 10

7. What comes under other media? Up to what extent other media is effective as compared to print and broadcast media? 10
1. (a) What is meant by event driven language?
(b) How is combo box different from list box?
(c) Explain the syntax of if statement with the help of an example.
(d) How do you create view in SQL?
(e) Explain the syntax and purpose of update statement in SQL.
(f) Comment on the purpose of exit statement.

Note: Attempt Five questions in all. Q. No. 1 is compulsory. Answers to all the parts of first question should not exceed half page. Marks are shown against each question.

Time: Three Hours
Total Marks: 80

Maximum Marks: 80

MCITD-22
MCIT-305

VISUAL BASIC AND SQL

PTO.
2. Explain any five controls in the tool box in detail.

3. Explain the following in detail:
   (i) Menu Bar
   (ii) Property window.

4. Explain the various looping statements using suitable examples.

5. How can you connect VB with database using ADOCB? Explain by creating a small project using this type of connectivity.

6. What are the various types of constraints used in SQL? Explain using suitable examples.

7. What is a cursor? Explain various types of cursors in detail using suitable examples.

8. Differentiate between the following in SQL:
   (i) Procedure and Function
   (ii) SQL and PL/SQL.
Discuss the responsibilities of different types of database users.

(b) Explain the type of data independence which type of definition ensures.

(iii) Define data base schema, sub-schema and instance.

Computer Question (5+4+5)

1. Give an example of a relational database.

Note: Attempt five questions in all. No. I is compulsory.

Maximum Marks: 80

Time: Three hours

Paper: MCIT-306
DATA BASE MANAGEMENT SYSTEM
24100

MCIT/D-22

Rail No: 04

Total Pages: 04
1. Differentiate between tuple relational calculus and domain relational calculus. Give example.

2. What do you mean by keys? Discuss primary, super and foreign key.

3. What is meant by entity type and entity set? Explain.

4. Describe the three-schema architecture. Why do we need mapping among schema levels? How do different schema definitions support this architecture?

5. Draw the semantic and enterprise level diagram of EER diagram. Discuss the similarities and dissimilarities amongst ER and EER diagram.

6. What are spurious tuples? How is it generated?
1. 

2. 

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

Page 1
(8) अग्नि के प्राण रूप में कहते हैं।

(9) तीर्थाञ्जलि का मेला।

(10) निश्चित करें कि कौन सा विषय वर्ग में आता है।

(11) अग्नि के दो प्रकार हैं।

(12) नीचे का विषय का वर्गमयन करें।

(13) दो प्रकारक विषयों के मेले का मेला।

(14) अग्नि के दो प्रकार हैं।

(15) नीचे का विषय का वर्गमयन करें।

(16) दो प्रकारक विषयों के मेले का मेला।

(17) अग्नि के दो प्रकार हैं।

(18) नीचे का विषय का वर्गमयन करें।

(19) दो प्रकारक विषयों के मेले का मेला।
1. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

2. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

3. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

4. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

5. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

6. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।

7. इस सवाल को लेकर एक निर्देश दिए गए हैं। एक स्वतंत्र श्रेणी में उन्हें लिखें।
1. Write brief notes of about 150 words each on any four of the following:
   (a) Compulsory Question
   (b) Significance of the Seven Deadly Sins in "Doctor Faustus."
   (c) "Conceit of love in "The Fair Love.""
   (d) "Sign of hell in "Paradise Lost.""

   Time: Three Hours
   [Maximum Marks]: 80

   Note: Besides Question No. 1, which is compulsory, a candidate shall attempt one question from each of the four units attempting five questions in all. All questions carry equal marks.
UNIT I

1. Critically examine Doctor Faustus as a Morality play.
2. Discuss Doctor Faustus as a Tragic hero.

UNIT II

3. Critically examine Milton's grand style as exhibited in
   Paradise Lost.
4. Write a critical note on the epic conversations in book 1 of
   Paradise Lost.
5. Write a critical note on the epic conversations in book 1 of
   Paradise Lost.

UNIT III

6. Write a critical note on the epic conversations in book 1 of
   Paradise Lost.

7. Write a critical note on the epic conversations in book 1 of
   Paradise Lost.
UNIT-I

Compulsory Question

1. Write short notes in about 150 words on the following:
   (a) Elaborate Dryden’s art of characterization in Absalom and Achitophel.
   (b) Belinda in The Rape of the Lock.
   (c) Use of wit in The Way of the World.
   (d) Peter Teazle in The School for Scandal.

Note: Besides question number 1, which is compulsory, a candidate shall choose one question from each of four units. Attempting five questions in all. All questions carry equal marks.

Paper: ENL-512II
Maximum Marks: 80
Time: Three Hours
UNIT I

UNIT II

UNIT III

UNIT IV

9. Evaluate sentimental as well as anti-sentimental elements in The School for Scandal.

8. Discuss the theme of the play The School for Scandal.

7. Write a critical essay on The Way of the World as a comedy.


5. Critically evaluate Pope as a social satirist with special reference to The Rape of the Lock.

4. Write a detailed note on The Rape of the Lock as a mock heroic poem.
3. Discuss Wordsworth as a poet of nature.

OR

Attempt a critical summary of Wordsworth’s Ode to

UNIT-

1.

(d) Symbol of love in The Mill on the Floss
(e) Character of Fagin in Oliver Twist
(b) Opening stanza of Keats’ On Cease to Dream
(e) Symbol of inward eye in Daphnis

1. Write short notes in 150 words on the following Compositional Question

Attempt one question from each of the four units.

Note: Attempt five questions in all. Question No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

Course: III

Paper: ENL-513

Literature in English: 1981-1984 (Part-II)

9644

MDE/D-22

Total Pages: 2
4. Write a critical summary of Keats' 'Ode on a Grecian Urn.'

5. Discuss John Keats as a writer of Odes.

6. Discuss the theme of poverty in Oliver Twist.

7. Discuss Oliver Twist as a Bildungsroman.


UNIT I

3. Discuss Focus's character by analyzing a diocletian of fiction.

UNIT II

4. Write a detailed note on the relevance of the title "Pride and Prejudice".

I. Write short notes in 150 words on the following:

(a) Mrs. Jane Austen in the novel of "Pride and Prejudice".

(b) Discuss the second of the novel of "Pride and Prejudice".

(c) Discuss "Pride and Prejudice" in the novel of "Pride and Prejudice".

(d) Discuss Focus's character in the novel of "Pride and Prejudice".

II. Attempt one question from each of the four compulsory parts. Attempt one question in all.

Note: Attempt five questions in all. Question No. 1 is compulsory.

Time: Three hours

Maximum Marks: 80

Paper Course: V-ENG 515
STUDY OF A GENRE: FICTION (PART-I)

MPE/0-22

Total Pages: 2
UNIT-III

6. Discuss Elizabeth-Darcy relationship in Pride and Prejudice.

UNIT-IV

7. Discuss major symbols in The Scarlet Letter.

8. Discuss the character of Stephen Dedalus in A Portrait of the Artist as a Young Man.

9. Write a note on the plot and structure of A Portrait of the Artist as a Young Man.
UNIT-I

1. (i) Concept of recognition in Poetics.
(ii) Yeert inayashtra.
(iii) Shakespeare's plays are forests, not gardens. Justify.
(iv) Concept of unity of a poem according to Horace.

2. Write a note on Aristotle's conception of Imitation.

UNIT-II

3. According to Aristotle, Plot is the soul of Tragedy. Comment.

4. Enumerate five questions asked by the Munis to Lord Brahma with reference to Nyayashastra.

Compulsory Question

Note: Attempt five questions in all, selecting at least one question from each Unit. Question Number 1 is compulsory. All questions carry equal marks.
UNIT-IV

9. Comment on the merits and defects of Shakespeare as discussed by Johnson.


7. What is the poet's role in shaping the language of people.

6. Discuss some of the chief critical components of Horace's Ars Poetica.

5. What is Bharat Muni's contribution to the poetics of Indian Drama?

UNIT-III
1. Write a critical evaluation of Whitman's 'When Lilacs Last in the Dooryard Bloom'd'.

2. Discuss the theme of democracy in Walt Whitman's poetry.

3. Write a note on aphoristic style of Emily Dickinson.

OR

Write a note on aphoristic style of Emily Dickinson.

OR

Write a note on aphoristic style of Emily Dickinson.

OR

Discuss the theme of love and death in Emily Dickinson's poetry.

Note: Attempt all questions. All questions carry equal marks.

(a) Central theme of "On the Beach at Night by Whitman.
(b) First Stanza of "Because I Could not Stop for Death," (c) Pap in 'Huck Finn'.
(d) Lord Weburn in The Portrait of a Lady.

Time: Three Hours

Maximum Marks: 80
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UNIT I

(i) Explain common and borrowings.

(ii) Renaissance and the English Language

(iii) Importance of nouns in English

Followings:

1. Write general notes of about 100-150 words each on the

   Compulsory Question

   marks

   answering the question in all. All questions carry equal

   shall attempt one question from each of the four units.

   Note: Besides Question No. 1, which is compulsory, a candidate

   Maximum Marks: 80

   Time: Three Hours

   Paper: XA

   ENGLISH LANGUAGE PART-I

10827

MD/D-22

Roll No. Total Pages: 3
UNIT II

5. Mark information on the following:

UNIT II

4. Translate any of the following words phonemically.

UNIT II

3. Discuss the sociolinguistic influence in old English.

UNIT III

2. Explain with examples, blending and clipping.

UNIT III

1. Translate the following into English:

UNIT III

9. Translate the following into English:

UNIT III

8. Explain with examples, blending and clipping.

UNIT III

7. Discuss the sociolinguistic influence in Old English.

UNIT III

6. Discuss the changes that occurred in Middle English.

UNIT III

5. Discuss the changes that occurred in Middle English.

UNIT III

4. Translate any of the following words phonemically.

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UNIT III

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UNIT III

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UNIT III

3. Mark information on the following:

UNIT III

2. Explain with examples, blending and clipping.

UNIT III

1. Translate the following into English:

UNIT III

9. Translate the following into English:

UNIT III

8. Explain with examples, blending and clipping.

UNIT III

7. Discuss the sociolinguistic influence in Old English.

UNIT III

6. Discuss the changes that occurred in Middle English.

UNIT III

5. Discuss the changes that occurred in Middle English.
UNIT-I

2. Class discrimination and social hierarchies gave birth to gender inequalities during the Victorian era. Discuss in the context of Jane Eyre.

UNIT-II

3. Discuss the structure of Jane Eyre.

4. Write a note on the significance of title To The Lighthouse.

1. Write short notes in 150 words on the following:
   (a) Fire as a symbol in Jane Eyre.
   (b) Does Woolf think poems are superior to novels?
   (c) Blue Notebook as a symbol in The Golden Notebook.
   (d) The opening of To The Lighthouse.

Note: Attempt five questions in all. Question No. 1 is compulsory.

Time: Three Hours

Maximum Marks: 80

Opt. (i)
UNIT-III
5. To The Lighthouse is a novel about the search for meaning in life. Discuss.

UNIT-IV
6. What feminist concerns are raised by Virginia Woolf in A Room of One's Own?
7. Bring out Mrs. Ramsay character in A Room of One's Own.
9. Discuss the Golden Notebook as a Feminist novel.
2.

The following table shows the results of an experiment. Determine the relationship between the variables and provide a brief explanation of your findings.

<table>
<thead>
<tr>
<th>Variable 1</th>
<th>Variable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>e</td>
<td>f</td>
</tr>
</tbody>
</table>

Result: (x)
1.

Time: Three Hours

Maximum Marks: 80

Paper-XI (II)

1. Describe the relationship between human nature and societal norms. How do these norms influence our behavior and decision-making processes?

(a) Discuss the concept of 'collectivism' in relation to human nature and societal norms.

(b) Explain the influence of cultural background on individual behavior and societal norms.

(c) Analyze the role of education in reinforcing societal norms and shaping human nature.

(d) Evaluate the impact of globalization on human nature and societal norms.

(e) Discuss the significance of personal values in relation to societal norms and human nature.

(f) Reflect on the implications of changing societal norms on individual identity and self-esteem.

(g) Explore the challenges faced in reconciling traditional societal norms with modern human nature.

(h) Propose strategies for promoting understanding and acceptance of diverse human natures and societal norms.

(i) Discuss the importance of continuous learning and adaptation in the face of evolving societal norms.

(j) Evaluate the role of technology in shaping human nature and societal norms.

(k) Analyze the impact of legal systems on maintaining societal norms and shaping human nature.

(l) Discuss the importance of maintaining a balance between changing societal norms and preserving traditional values.

(m) Evaluate the role of media in shaping societal norms and human nature.

(n) Reflect on the ethical implications of changing societal norms and their potential impact on human nature.

(o) Propose strategies for fostering a inclusive and adaptable society in the face of diverse human natures and societal norms.

(p) Discuss the significance of personal responsibility in maintaining societal norms and shaping human nature.

(q) Explore the role of spirituality in understanding and reconciling human nature and societal norms.

(r) Evaluate the impact of historical events on shaping societal norms and human nature.

(s) Discuss the importance of critical thinking in navigating the complexities of human nature and societal norms.

(t) Analyze the role of international organizations in promoting understanding and acceptance of diverse human natures and societal norms.

(u) Evaluate the importance of intercultural communication in fostering understanding and respect for diverse human natures.

(v) Propose strategies for promoting cross-cultural dialogue and bridging the gaps in societal norms.

(w) Discuss the role of leadership in creating a supportive environment that values diverse human natures and societal norms.

(x) Evaluate the impact of economic policies on shaping societal norms and human nature.

(y) Analyze the role of family dynamics in reinforcing or challenging societal norms and human nature.

(z) Discuss the importance of individual agency in shaping societal norms and human nature.

1. "The Human Nature and Societal Norms: A Diverse Perspective" by [Author Name]

2. "Understanding Human Nature in the Context of Societal Norms: A Comparative Analysis" by [Author Name]

3. "Reconciling Modern Human Nature with Traditional Societal Norms: A Case Study" by [Author Name]

4. "Challenges and Opportunities in Shaping Human Nature and Societal Norms: A Global Perspective" by [Author Name]

5. "Promoting Interpersonal Understanding through Intercultural Dialogue: Strategies for Success" by [Author Name]

6. "The Role of Technology in Shaping Human Nature and Societal Norms: An Emerging Trend" by [Author Name]


8. "Navigating the Complexities of Human Nature and Societal Norms: A Philosophical Perspective" by [Author Name]

9. "Interpersonal Communication and Its Role in Bridging Cultural Gaps: A Practical Guide" by [Author Name]

10. "Leadership in the Era of Diverse Human Natures: Strategies for Success" by [Author Name]

11. "Personal Agency and Its Influence on Societal Norms: A Psychosocial Analysis" by [Author Name]

12. "Economic Development and Human Nature: Balancing Growth with Ethical Principles" by [Author Name]


3. আপনি কি জানেন যে মনোযোগ ব্যবহার করা বিশেষ সমস্যা সমাধানের জন্য উপযুক্ত হয়?

   (a) অভ্যাস
   (b) স্বপ্নপূর্ণির সমাধান
   (c) মনোযোগ ব্যবহার
   (d) বিচার-বিষয়ের মাধ্যমে

(3×5=15)

4. (i) উপরের উপাদানের প্রথম তিনটি কোন নিয়ম অনুসরণ করছে? (ii) কারণ কী?

(1×8=8)

কার্যকলাপ: পাঠ্যপুস্তক বুদ্ধির অ্যালগোরিদম দ্বারা প্রশিক্ষিত হওয়ার জন্য, এখন এই কার্যকলাপটি অনুসরণ করুন।