2. (a) Derive Lagrange's equation motion from Hamilton's

Unit I

2. (b) What is the advantage of using generalized coordinates in classical mechanics?

3. (c) Differentiate between point and identity transformations.

3. (d) Show that the conserved of area velocity is a general section rather than local scattering cross-section.

3. (e) Why is the cross-section used in scattering experiments when we are generally from each unit? Note: Attempt five questions in all, selecting one question from each unit.

Maximum Marks: 55

Time: Three Hours

Paper 1

CLASSICAL MECHANICS

MDE/D-17

4305

Total Pages: 03

Roll No. 2431/1-4305
II
Problem of a simple harmonic oscillator using this theory.

5
Describing the Hamilton-Jacobi theory and hence solve the

For this case,
p = dp is canonical. Also find the new Hamiltonian

\[ H' = \frac{1}{2} \dot{q}^2 + \frac{1}{2} \dot{p}^2 - \frac{1}{2} m \dot{q} \frac{1}{\sqrt{1 - \frac{1}{2} m \dot{q}^2}} \]

Under what conditions the transformation \( L = C \)?

5 (a) What do you understand by canonical

8. (a) What is the equation of an inverse square law of

 UNIT II

7. Derive the Lagrange's equation of motion for a non-holonomic system

3. Find the equations of motion for a particle moving under a

5. Central force and find the corresponding equation of

UNIT III

6. (a) Write the Lagrange's equation of motion for a particle moving under a

6. (b) Write the properties of the transformation matrix.

What are orthogonal transformations? Discuss the

5. (a) State and prove Euler's theorem.

UNIT IV

6. (b) State and prove Vitali's theorem. Also list its

Is central if it describes a conic:

5. (a) Show that force under which the particle is moving

II

Method.

Also solve the problem of a simple pendulum using this

Using the Lagrange's method of undetermined multipliers,

3. Find the equations of motion for a particle moving under a
1. From each unit 0, No. 1 is compulsory.

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

Maximum Marks: 55
Time: Three Hours

Paper II
APPLIED MATHEMATICS

4306
MDE/D-17

(3) Show that a set matrices $A, B, C$ is similar.

Describe various steps involved in the construction of a $6 \times 6$ matrix of a group of six elements $F, D, E, A, B, C$.
5. Under matrix multiplication, for the following four matrices, prepare group multiplication table:

\[
\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}
\]

6. Using the method of least square, fit a curve of the form \( \frac{xq + p}{x} = \lambda \) to the following data.

7. Using the Gaussian law of error, describe the method of orthogonal property of Legendre polynomials.

8. Using the method of residue evaluate:

\[
\int_0^\infty \frac{x^q + p.x}{\sin x} x^0 \sin r = 1
\]

9. Describe the Laurent series expansion of a function:

\[
u = w\quad \text{if } \quad \lim_{n \to \infty} \left\{ \nu \right\} = \lim_{n \to \infty} \left\{ \nu \right\} = x + x^2 + x^3 + \cdots
\]

II

1. Prove that for Legendre polynomials:

\[
(\cos x)^n = \sum_{k=0}^{n} \frac{(-1)^k}{k!} \binom{n}{k} (\sin x)^{2n-2k}
\]

2. Using the method of residue evaluate:

\[
\lim_{n \to \infty} \frac{\nu}{\nu} + \frac{\nu}{\nu} + \frac{\nu}{\nu} = x + x^2 + x^3 + \cdots
\]

II

1. Using the method of residue evaluate:

\[
\int_0^\infty \frac{x^q + p.x}{\sin x} x^0 \sin r = 1
\]
Define relaxation process and relaxation time.

2. What effect would raising the temperature have on the intensity of ESR and anti-ESR lines?

3. Why do infrared radiation and raman scattering have to be applied for the observation of ESR spectrum?

4. Why don't the major contributions of ethylene oxide appear in the IR spectrum?

5. Why is the major contribution of ethylene oxide not observed in the Raman spectrum?

**Computer Question**

Question from each Unit (a) No. I is compulsary.

Note: Attempt Five questions in all, selecting at least one from each Unit.

Maximun Marks: 55

Time: Three Hours

PAPER III

APPLIED SPECTROSCOPY

MED/D-17

RECOMMENDATION: Calculate the recoil velocity and energy of free.
1. Why is recall energy loss?
7. Utilization for characteristics, the instrument of a NMR spectrometer and its

UNIT IV

7. Specgra. Explain the vibrational coarse structure of electronic
4. Lines with intensities 1: 2: 1. Why are these
Interacting with two equivalent protons shows three
3. The ESR spectrum of an unpaired electron
7. What is g-factor? What factors affect the g-value?
5. Section for intensity quantitation of vibrational electronic
6. What is Frank-Condon principle? How it accounts

UNIT III

5. Meaningful Raman Spectra? What would be the ideal source to be used for
1. Section of N_{2}N_{5}N_{6}
6. Would there be an intensity attenuation in the
5. Would the values of g differ?
4. Why does it differ from \( \sqrt{3} \) from \( N_{2}N_{5}N_{6} \)?
2. Calculate the bond length \( \sqrt{3} \).

UNIT II

8. What are Hot Bands? Why are they so called?
7. Spectra, molecule, assuming it as a vibronic molecule, discuss the vibronic
4. Derive an expression for energy level of a vibronic
3. Different levels of vibronic molecule?
2. What is the effect of isotopic substitution on energy
8. Different from rigid rotor. How is its spectrum. Discuss its spectrum, How it is
4. Obtain an expression for the rotational energy levels
II
Discuss Second Harmonic Generation and Phase Matching.

9. Write a note on PolaroGraphy.

8. (a) Discuss Special Frequency Fitting.

7. Explain the principle, construction and working of a free laser.


5. Discuss the principle, construction and working of Raman Laser.

4. Discuss the principle, construction and working of Fabry Perot Interferometer.

3. Describe different pumping schemes in lasers.

2. Discuss homogeneous and inhomogeneous broadening.

2. (a) When arc emission coefficients? Derive a relation between them.

1. (a) When is a Q-switched laser?

1. (a) What is mean by active material in laser?

1. (a) What are spontaneous transitions?

Note: Attempt five questions in all. Take one question from each unit. No. 1 is compulsory. All questions carry equal marks.

Maximum Marks: 75

Paper: I

Laser Physics

4308

Made/Date: 17

Total Pages: 02

Repeat No.
Unit I

3. (a) (d) Effective & Explain
in which frequency region electronic polarization is
2. (c) Define Orowan mechanism
3. (b) What are Ferroelectric domains?
3. (a) Reason for your answer
I. (a) Are planar defects equilibrium defects? Give

Compulsory Question

From each Unit 0, No. I is compulsory.

Note: Attempt Five questions in all, selecting one question

Maximum Marks: 55

Time: Three Hours

Paper I

MATERIAL SCIENCE-1

2009 MD0/D-17

Roll No. 03

Total Pages: 03
1. Define fracture in materials. How ideal fracture

2. due to Griffith boundaries.
   Discuss the mechanism of strengthening
   boundary. What do you understand by a Griffith and Grain
   facet.
   in detail. Also explain the significance of Schmidt
   surface energy = 0.3 Jm⁻².
   of the crack, (Young’s modulus 70 GPa) and
   tensile force is applied perpendicular to the plane
   its surface. At what stress will it fracture when a
   A glass plate has a sharp crack of length 2 mm in
   stress for a material can be calculated.

3. What are ferroelectric materials? (q)

4. Which of these local H-fields exist?
   atomic site. How is it different from macroscopic
   electric field. How is it different from macroscopic
   Obitain an expression for local electric field in an
   for which the Lorentz local H-field exists.

5. How are dislocations multiplied in crystals? (q)

6. Obitain the relationship between dielectric constant
   and electronic polarization. For crystal structures
   
7. What are pyroelectric materials? (a)

8. What is Frank’s rule? Use it to show that super
   dislocations really exist in crystals. (q)

9. What is temperature? (q)

10. How does the order parameter depend on
    phase transitions? Give some examples. (q)

11. Discuss theory of spontaneous polarization in Barium
    Thinate. (q)

12. What is an order parameter in Landau’s theory of
    \( T = 0 \)? (q)
Discuss.

Can you use any material under a vacuum chamber?

2 d)

Define the term Vacuum. What are its units?

2 e)

What does diffusion pump always work with a

2 f)

What is cathode contamination problem? Explain.

2 g)

What is the mechanism of sublimation? Explain.

(Compulsory Question)

Questions carry equal marks.

Note: Attempt five questions in all. Select at least one from each Unit. Q. No. 1 is compulsory.

Maximum Marks: 55

Time: Three Hours

Paper: III

THIN FILMS AND VACUUM TECHNIQUES

MDA/D-17

ROLL NO: 03

TOTAL PAGES: 03
II
characteristics, which can be used in different vacuum 
under vacuum? Describe the materials along with its 
When are the characteristics of materials for their use

II
industries. Discuss their applications in each of these 
instrumentation, space, pharmaceutical and cryogenic 
Describe the vacuum systems which can be used in

Unit V

3
Explain the process of each 
4
Gauge for measuring vacuum of ~10-4 Torr. 
Explain the principle and working of a vacuum 
of the rotary pump with a suitable diagram. 
Discuss the basic principle, construction and working 
measurement of this pressure. 
Using Getter pump. Discuss the process of 
Give the minimum pressure that can be achieved 
suitable diagram.

II
be deposited using this technique 
be deposited using this technique and the materials that can 
Give the minimum pressure at which Films can be 
the laser evaporation technique for Thin Film deposition. 
Discuss the basic principle, working and mechanism of 

Unit III

2
Describe in detail various types of thermal evaporation
2. Can be calculated?

How the wavelength of electron beam used in TEM

2. Of a material?

(d) How does ion implantation affect the microstructure?

Discuss.

(e) What is the principle of electron multiplier?

Discuss.

Technique?

(f) Can you identify a low Z, impurity using RBS

and diffusion? Explain.

I. What is the difference between ion implantation

Compulsory Question

from each unit. No. 1 is compulsory.

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

Maximum Marks: 55

Time: Three Hours

Paper IV

CHARACTERIZATION TECHNIQUES

SURFACE MODIFICATION AND

MEO/D-17

5012

Roll No. Total Pages: 03
Unit I

1. Explain the basic principle of Auger electron spectroscopy (AES) technique.
2. Discuss the process of Depth Profiling using AES technique.
3. How will you carry out compositional analysis and depth profiling of ion implanted samples using AES technique?

Unit II

1. Explain the basic principle of X-ray photoelectron spectroscopy (XPS) technique using schematic explanation.
2. Discuss the process of Depth Profiling using RBS technique.
3. What is the process of electron energy spectrum? How will energy level diagram be used in studying the chemical shift and oxidation states of the elements in a material?
4. What do you understand by electron energy loss technique?

Unit III

1. Explain the effect of thin films plating on electron attenuation.
2. Discuss the process of ion implantation giving a suitable diagram.
3. 100 KEV Ar+ ions are implanted in iron and aluminium simultaneously. Discuss in which one of these two materials, Ar+ will have more projected range.
4. What do you understand by the process of ion beam mixing? Explain.
5. Discuss basic mechanism of Radiation Damage in solids.
6. Discuss the effects of ion implantation on the crystal lattice of materials.
7. Explain the basic principle, working and methodology involved in Grazing Angle X-ray Diffraction Technique with suitable diagram.
8. Where are its applications?
2. (a) What is the units of energy flux, energy fluence?

Unit 1

2. Case of SSNTD?
   (d) Why tracks are enlarged after chemcal etching in
   (c) What is the principle of gamma camera?
   (b) Waste
   (a) What is the procedure for handling the radioactive
   (b) Level of radiation?
   (a) What do you understand by maximum permissible

carry equal marks.

from each Unit. No. I is compulsory. All questions
Note: Attempt Five questions in all, selecting one question
[Maximum Marks: 55]

Time: Three Hours

Paper: \textit{A}

\textbf{RADIATION PHYSICS}

\textbf{MDG/D-17}

Roll No. 04
Unit I

5. Are the glow curves and hillshidden their importance? What is the origin of thermal quenching? What measurement by giving the suitability example?

8. (a) Explain the various possible ways for radiation dose protection? How the radiation hazards are assessed?

5. (a) What are the various means for radioactive radiation? Give two examples of radiation that do you understand by delayed effects of change in tissues by giving specific examples?

2. (a) Discuss in detail the radiation induced chemical change.

Unit II

3. (a) What is the basic principle of computed axial tomography (CAT)? What information can be obtained from this technique? What is the basic principle of computed axial tomography (PET)? What information can be deduced from this technique?

4. (b) What is the principle of position emission tomography? What is the basic principle and applied to X-ray imaging? What are diagnostic X-rays? How they are produced?

Unit III

5. What are the different types of nuclear radiation? Will you handle the prompt and delayed effect of radiation? How are the biological effect of radiation?

6. (a) What are the possible health hazards from nuclear radiation? How these are different from solar radiation?

6. (c) What are the different types of nuclear radiation?
Section IV

Let \( \mathbb{R} \) be a ring with unity. Prove that if \( \mathbb{R} \) is a commutative ring, then every finitely generated \( \mathbb{R} \)-module is projective.

Prove that \( \mathbb{R} \) is a commutative ring if and only if every finitely generated \( \mathbb{R} \)-module is projective.

Find the splitting field of \( \mathbb{Q} \) over \( \mathbb{Q} \).
basic for \( X \)
\( \in \) \( X \), the set of all closed neighborhoods of \( x \) is a
Prove that a topological space \( X \) is regular if \( X \)
8
be closed maps.
Prove that projections are open maps but need not
8
State and prove Lindelöf theorem.
8
\[ A \subseteq B \text{ for some closed set } B \text{ of } X \]
\( X \), \( A \), prove that a subset \( A \) of \( X \) is closed if \( X \)
A
\( \text{Let } (X, \tau) \text{ be a subspace of a topological space } X \)
8
and \( C(E) \), derived set of \( E \).
\( C(E) = E \cap (C(E)) \) where \( C(E) \) denotes closure of \( E \)
8
Show that for any set \( E \) in a topological space,

Section

question from each Section
Note: Attempt five questions in all, selecting at least one
[Maximum Marks: 80/100 (Re)]
[Time: Three Hours]

PAPER III (M-M-403)
TOPOLOGY AND FUNCTIONAL ANALYSIS
4030-S
MDM/D-17
Roll No. 03
Total Pages: 03
Section I

8. State and prove uniform boundedness theorem.

9. Show that \( \|T\| \leq \|T\|_X \) is a bounded linear operator. Also, show that every Hilbert space is reflexive.

10. Show that the dual space of a Hilbert space is a Hilbert space.

Section II

8. Show that a bounded linear operator is continuous if \( p \not= q \).

9. Show that if \( p \not= q \) is not a Hilbert space.

10. Let \( X \to Y \) be a bounded linear operator, where

\[ T(x) = \sum_{n=1}^{\infty} \alpha_n \langle x, e_n \rangle e_n, \]

Section III

7. (a) Compute the dual space of the space \( C_c \).

8. (a) State and prove F. Riesz lemma.

8. (b) Prove that a locally compact space \( X \) is compact if every collection of closed subsets of \( X \) with the finite intersection property has a non-empty.

8. (c) Prove that a topological space \( X \) is compact if every intersection of closed sets with the finite intersection property has a non-empty.

Section IV

4. State and prove Tietze's Extension Theorem giving full details.

5. Space \( X/R \) in \( \mathbb{T}^2 \).

6. Open and \( R \) is closed in \( X \times X \) then the quotient is open and \( R \) is closed in \( X \times X \).

7. Prove that if the projection map \( p : X \to x/R \) is open.
State and prove Liouville's theorem.

\[ |z| = 1 \]

\[ \left( \frac{6 - \frac{z}{\pi}}{\sin \left( \frac{\pi}{2} \frac{z}{\pi} \right)} \right)^{1/2} \]

Evaluate:

1. State and prove Cauchy integral formula and use it in the evaluation of:

2. State and prove Cauchy-Goursat theorem.

Section I

Marks:

Instructions:

- Questions from each Section All questions carry equal marks.
- Attempt five questions in each section, at least one from each set.
- Time: Three hours

Complex Analysis

Paper I (Quiz-404)

Mathematics

MDE/01-17

10. (a) State and prove Cauchy-Goursat theorem.
9. Define Poisson Kernel and show that it satisfies the following properties:

\[ (\theta) \Delta (\theta) = \frac{1}{\theta} \int_{\theta}^{\infty} \frac{\partial \Delta}{\partial \zeta} \frac{\zeta}{1} d\zeta \]

Section A

are analytic combination of each other.

\[ \frac{1 + (1 + z)^{0 + m}}{u(1 + z)} \sum_{\infty}^{\infty} \frac{1 + u z}{u^2} \sum_{\infty}^{\infty} \]

Section II

Let \( G \) be a region and let \( n \in G \) such that there is a point \( q \) in \( \partial G \) with period \( 2\pi \) for all \( \theta \), \( d(\theta) = (\theta - \theta)^d \) for all \( \theta \) and \( 0 < (\theta)^d \).

\[ 2 \]

\[ (z)^{\theta} = (z)^{\theta} \]

of the form which is never zero then must also only and conversely if \( (z)^{\theta} = (z)^{\theta} \) is an entire function then is an entire function which is never zero.

Section III

Use the method of contour integration to evaluate

\[ \int_{0}^{\infty} \frac{z^x + 1}{(z^x + 1)^{\theta}} \frac{d\theta}{\theta} \]

The roots of the circles the roots of the circles are bounded on some closed neighborhood of the neighborhood of the point \( 0 = (z)^f \). Then \( (z)^f \) is an isolated singularity and \( v = 0 \).

Show that \( \Delta \) is a removable singularity.

4. Show that if \( z = \Delta \), then \( v = 0 \).

Show that \( (z)^f \) is an entire function.

5. Show that if \( v = z \).

Section 1

State and prove Schwartz Lemma.

Show that the points are inside D, then \( 0 = (z)^f \).

7. Show that if \( \Delta = (z)^f \).

State and prove Maximum-Minimum Theorem.

Show that if \( \Delta = (z)^f \).

State and prove Whitney-Tukey's Theorem.
Section B

1. (a) Let $G$ be a cyclic group of order $n$. Prove that $G$ is isomorphic to the group of units of the ring $\mathbb{Z}/n\mathbb{Z}$.

(b) State and prove Schreier's refinement theorem.

Section A

Marks

Note: Attempt five questions in all selections at least one

Maximum Marks: 80

Time: Three Hours

MDE-D-17

ADVANCED ABSTRACT ALGEBRA-I

4337

Total Pages: 63

ROLL No. 63
not solvable by radicals over $\mathbb{Q}$.

Prove that the polynomial $X^2 - 10X^2 + 1X^2 + 5X^2 + 5!$ is irreducible over $\mathbb{Q}$.

Prove that if $F$ is a solvable group, then $G(F)$ is a solvable group.

Prove that if $K$ is the splitting field of $F$ over $\mathbb{Q}$, then $H = AN$.

Let $H$ be a normal subgroup of $AN$ such that $H$ has solvable factor group.

Prove that a factor group of a solvable group is solvable.

Section A

Deduction symmetric functions, express $x^2 + \frac{x^2}{x}$ as a rational function of the $Zd/Z$.

Prove that a group of order $65$ is not simple.

Prove that the polynomial $X^2 + Z$ is irreducible over $\mathbb{Q}$.

Find the degree of the splitting field of $X^2 + 3$ over $\mathbb{Q}$.

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

Prove that $G(C)$ is Abelian.

Write down a composition series of a cyclic group.

Section B

Finite field, let $F$ be a finite field.

Prove that a finite normal extension is a splitting field.

Prove that if $F = \{0\} \neq F_\mathbb{Q}$ is a cyclic group, then $F$ is a cyclic field.

Section C

Field of some polynomial, prove that a finite normal extension is a splitting field.

Prove that if $F_\mathbb{Q}$ is a cyclic group, then $F$ is a cyclic field.

Section D

Finite field, let $F$ be a finite field.

Prove that if $F = \{0\} \neq F_\mathbb{Q}$ is a cyclic group, then $F$ is a cyclic field.
8

\[ p \phi \big|_{[a, b]} = \phi \big|_{[a, b]} \]

and

If \( F \) is continuous on \( [a, b] \), show that \( F \) is rectifiable.

(b)

\[ \int_{[a, b]} x^2 \phi \, dx = \int_{[a, b]} \phi \, dx \]

Show that \( f \in E(R) \) if \( f \) is \( \phi \)-Riemann integrable on \( [a, b] \).

(a)

Let \( f \) be a bounded real function on \( [a, b] \).

Suppose \( a \) increases monotonically and \( a, b \) on

Show that \( h \in E(R) \) on \( [a, b] \).

Suppose \( \phi \in R(a) \) on \( [a, b] \).

Suppose \( \phi \in E(R) \) on \( [a, b] \).

Show that \( f \in E(R(a)) \).

(a)

Suppose \( \phi \in E(R) \) on \( [a, b] \).

Show that \( f \in E(R) \).

(a)

Suppose \( \phi \in E(R) \) on \( [a, b] \).

Show that \( f \in E(R) \).

(a)

Section I

All questions carry equal marks.

Note: Attempt five questions in all. Select at least one from each section.

Maximum Marks: 80

Time: Three Hours

NM-407

REAL ANALYSIS I

4338

ME/D-17

Total Pages: 03

 Krishna No.
\[ 8 \times 2 = 16 \]

Let \( \{ f_n \} \) be defined by:

\[
 f_n(x) = \begin{cases} 
 0 & \text{if } x < 0 \\
 1 - x & \text{if } 0 \leq x < 1 \\
 1 & \text{if } x \geq 1 
\end{cases}
\]

Suppose \( f \) is a bounded real function on \( \mathbb{R} \) and \( \int_a^b f \) exists. \( \int_a^b f \) is a Riemann integral of \( f \) on \( [a, b] \).

**Exercise Question**

\[
 \int_a^b f = \int_a^b 1
\]

3. State and prove the Cauchy criterion for uniform convergence.

4. State and prove the Weierstrass approximation theorem.

5. State and prove the inverse function theorem.

6. Suppose \( f \) is a continuous function on \( (a, b) \) and \( f \) is differentiable on \( [a, b] \) for every \( x \in E \). For every \( x \in E \), there is a real number \( M \) such that for all \( p \in (x, f(x)) \),

\[
\|p - q\|_\mathbb{R} \leq \| (p) f - (q) f \|
\]

7. State and prove Taylor’s theorem.

8. State and prove Parseval’s theorem.
Prove that in a second axiom space every collection of non-empty mutually disjoint open sets is countable.

2. (a) Prove that $\mathcal{C}(A) = \emptyset$.

(b) Let $X$ be a non-empty set and $\mathcal{C}(x) \in \mathcal{P}(X)$ and $\mathcal{C}(x) \subseteq \mathcal{P}(X)$. Let $\mathcal{A}(x)$ be the largest open set contained in the set $\mathcal{C}(x)$.

Section 1

Note: Attempt five questions in all. Selecting at least one question from each section, All questions carry equal marks.

Maximum Marks: 80

Time: Three Hours

MATHMATICS

4339

MDE/D-17

44/16/1-4339

(2)
Section

Compact.

Prove the product of compact topological spaces is compact.

Prove that a compact T₂-space is regular.

Prove that every compact T₁-space is normal.

Prove that a compact subset of a Hausdorff space is closed.

Section II

Let A and B be subsets of a topological space. Then A ∩ B = B ∩ A.

Section III

Let A be a subset of a T₁-space. Prove that if A is normal, then it is a T₂-space.

Prove that a topological space is normal if and only if it is regular and Hausdorff.
(vii) Define meromorphic function.

\[ \frac{z}{\sin 1} \]

(viii) Find the singularity of the function with simple poles.

(ix) Define winding number of a closed curve with simple Cauchy's inequality.

(x) Define piecewise smooth path.

\[ \frac{e^i}{u^2} \]

I. Find the radius of convergence of the power

(Compulsory Question)

Carry equal marks.

Note: Attempt five questions in all, selecting one question from each section. Q. No. 1 is compulsory. All questions have equal marks.

[Maximun Marks: 80]

Time: Three Hours

VIII-404

COMPLEX ANALYSIS-I

4340

MDE/D-17

ROLL NO. 04

Total Pages: 04

9. Prove that:

\[ \frac{z}{\sin z} = \frac{z}{\cos z} \int_0^1 x^0 \]

\( (1 > 0 > 1) \)

Apply the calculus of residue to prove that:

\[ \frac{z}{u^2} = \frac{z^x + 1}{xy} \int_0^\infty \]

\( (x) \)
Lemma. A non empty domain $D$ is simply connected if and only if for any closed curve $C$, the winding number $\nu(C)$ is constant.

Definition. For any curve $C$ in $\mathbb{R}^2$, the winding number $\nu(C)$ of $C$ is defined as the number of times $C$ winds around a point in $D$. If $C$ traverses the point once counterclockwise, $\nu(C) = 1$; if clockwise, $\nu(C) = -1$.

Remark. If $C$ is a simple closed curve, then $\nu(C) = 0$.

Section I

1. Define bounded variation and simply connected domain.

2. Define bounded variation and simply connected domain.

3. Define bounded variation and simply connected domain.

4. Define bounded variation and simply connected domain.

Section II

5. Define bounded variation and simply connected domain.

6. Define bounded variation and simply connected domain.

Section III

7. Define bounded variation and simply connected domain.

8. Define bounded variation and simply connected domain.

References.


Using Lagrange's identity, prove Green's formula.

Let $\varphi$ and $\psi$ be $n$-times continuously differentiable functions on an open set $D$. Then

$$
\iint_D \nabla \varphi \cdot \nabla \psi \, dV = \oint_{\partial D} \varphi \frac{\partial \psi}{\partial n} \, ds - \oint_{\partial D} \psi \frac{\partial \varphi}{\partial n} \, ds
$$

for $n$-dimensional regions.

2. State Kreiss's theorem.

3. Find second approximate solution of $x(t)$

$$
\begin{align*}
\begin{bmatrix}
x_1(t) \\
x_2(t)
\end{bmatrix} &= \begin{bmatrix}
\alpha_1(t) \\
\alpha_2(t)
\end{bmatrix} + \int_{t_0}^{t} \begin{bmatrix}
\beta_1(s) \\
\beta_2(s)
\end{bmatrix} ds
\end{align*}
$$

where $\alpha(t)$ and $\beta(t)$ are solutions of the differential equations.

4. Show that a solution of an initial value problem depends

5. State and prove Osgood's theorem.

6. Order one together with $n$ initial conditions.

7. Prove that the initial value problem

8. Prove that the initial value problem

**Section IV**

9. By reduction of order

$$
0 = x \frac{d^2 y}{dx^2} + \alpha x \frac{dy}{dx} - \beta x
$$

Solve:

$$
\begin{align*}
\frac{d^2 y}{dx^2} + \alpha \frac{dy}{dx} - \beta y &= 0 \\
\text{Solve: }
\end{align*}
$$

10. State and prove Abel's identity.

8. Fundamental set

For each $n$-times continuously differentiable function $\varphi$ on an open set $D$ such that $\varphi(0) = 0$, define $\psi$ by

$$
\psi(x) = \int_0^x \varphi(\lambda) \, d\lambda
$$

for $x \in D$. Then the function

$$
\Psi(x) = \int_0^x \psi(\lambda) \, d\lambda
$$

is a solution of the differential equation

$$
\frac{d^2 \Psi}{dx^2} + \alpha x \frac{d\Psi}{dx} - \beta x \Psi = 0
$$

for $x \in D$. If $\phi \in C^2 \cap D$ and $\psi \in C^2 \cap D$ and $\Psi \in C^2 \cap D$ and $\phi \neq 0$, then prove that

$$
\psi(x) = \phi(x) \text{ for each } x \in D.
$$
8

\((u) = \begin{bmatrix} a & b \\ c & d \end{bmatrix}\)

: If the fundamental set for \(1 = 1\) is given by

and this has multiplicity \(1 = 1\), then prove that

\[0 = \sum_{i=0}^{\infty} \begin{bmatrix} a & b \\ c & d \end{bmatrix}^i u\]

the characteristic equation is \(\lambda^n + \ldots + a = 0\).

5. (a) If \(1 \neq 1\), then prove that the roots of the characteristic equation are distinct.

III

Section

where the symbols have usual meaning.

8

\[r = \int_1 \psi(s) q(s) \int_1 \phi(s) = (t)\phi\]

: Prove that

(b) Despite the Frobenius theorem,

5. (a) Determine the fundamental matrix for the system

\[\begin{bmatrix} 0 & 1 \\ 1 & 2 \end{bmatrix}\]

10

: Determine the fundamental matrix for the system

\[\psi = \begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}\]

II

Section

10

existence.

prove that a solution of an integral equation can be continued to be left or right of interval of integral.

prove that a solution of a given initial value problem is an integral equation.

3. (a) Prove that an integral solution of an integral equation is a unique solution of a system of equations.

16

Section I

equation and maximal interval of existence of a differential equation first order differential equations of a system of some integral zero and the function are inherently dependent over give an example of functions whose Wronskian is
1. (a) Find the equation of the integral surface of the differential equation
\[ 2(yz - 3)p + (2x - 2)q = y(2x - 3) \]
which passes through the circle \( z = 0, x^2 + y^2 = 2z \).
(b) Show that the equation \( x^2 = y^2, z(x^2 + y^2) = 2z \) are compatible and solve them.

2. (a) If \( u \in C^2(U) \) is harmonic, then prove that
\[ u(x) = \iint_{B(x)} \frac{u}{|B(x)|} \, dx \]
for each ball \( B(x) \) in \( U \).
(b) State and prove Liouville's Theorem.

Note: Attempt five questions in all, selecting at least one question from each Section. All questions carry equal marks.

Maximum Marks: 80

Time: Three Hours

Paper: ME-501

MATHS
(Partial Differential Equations and Mechanics)
SECTION IV

7. (a) Test for extremal the functional

5. Solve the functional equation of motion

4. (a) Find the complete integral of the equations of motion

3. Solve the boundary value problem

2. Find the shortest distance between the points when \( y'(0) = 0 = y'(0) \)

1. (b) Define Hamilton's bracket and find the necessary and sufficient condition of a transformation to be a canonical transformation in terms of Lagrange's bracket.

(a) State and prove Jacobi's theorem and prove that the Jacob-Poisson's theorem.

(b) Define Poisson's bracket of two-dimensional variables.

(c) Define Hamilton's canonical equations of motion of the system in what case the total energy is conserved.

9. (b) Obtain general expression for variation of total energy.

8. (a) Define extended coordinate. Define Lagrange's equations.

SECTION III

where \( u \) is odd and \( \delta \) is smooth with compact support.

\( (0 = 1) \times \mathbb{R}^{n} \) on \( \mathbb{R}^{n} \)

\( (\infty = 1) \times \mathbb{R}^{n} \) in \( \mathbb{R}^{n} \)

\( (0 = 1) \times \mathbb{R}^{n} \) on \( \mathbb{R}^{n} \) with \( \delta = n \)

\( (\infty = 1) \times \mathbb{R}^{n} \) in \( \mathbb{R}^{n} \) with \( \delta = n \).

SECTION II

\( (0 = 1) \times \mathbb{R}^{n} \) on \( \mathbb{R}^{n} \) with \( \delta = n \)

\( (\infty = 1) \times \mathbb{R}^{n} \) in \( \mathbb{R}^{n} \) with \( \delta = n \).

\( (0 = 1) \times \mathbb{R}^{n} \) on \( \mathbb{R}^{n} \) with \( \delta = n \).

\( (\infty = 1) \times \mathbb{R}^{n} \) in \( \mathbb{R}^{n} \) with \( \delta = n \).
(a) Prove that \( D^w \) is a boolean algebra iff \( u \) is the product of distinct primes.

(2) Prove that \( D^w \) is a boolean algebra if \( \{ u \mid w \in \mathbb{N} \} \).
Section I

2. Write a C-program to compute the powers of 2, from 0 to 10
4. Write a user-defined function, with examples, for the application of matrices.
6. Write a short note on the following:

Section II

3. Explain the declaration and initialization of two-

Section III

5. Explain a circuit containing a circuit, vertex $G$, and a graph $G$. Prove that $P^2 \neq P$. Let $P^1$ and $P^2$ be two different paths between $G$ and $G'$. Graph $G'$ is the multigraph of $G$.
7. Prove that the rank of a circuit matrix of a connected graph.

Section

8. Explain a circuit containing a circuit, vertex $G$, and a graph $G$. Prove that the dimension of a circuit subspace of the even.
9. Explain a circuit and a sub-set in a connected graph is always a circuit and a sub-set in a connected graph is always a circuit and a sub-set in a connected graph.
10. Explain the definition of a C-language.
I. Define with examples:

(a) Sepable Kernel
(b) Eigen values and Eigen functions
(c) Convolution Integral
(d) The inner product of two functions
(e) The homogeneous equation
(f) Prove that the

II. Attempt five questions in all, selecting at least one

Section I

Note: Time: Three hours

Maximum Marks: 80

Problems

Mathematics

Paper: X

WM-50 OPR. 1

Integral Equations and Boundary Value

10. What is Generalized three-part boundary value problem?

9. Find the solution using Laplace transform:

8. (a) Find the solution using Laplace transform:

8. (b) Discuss the finite Hilbert transform and derive its

8. (c) Find the solution using Laplace transform:

Section I

I. Prove that the

II. Attempt five questions in all, selecting at least one

Section I

Note: Time: Three hours

Maximum Marks: 80

Problems

Mathematics

Paper: X

WM-50 OPR. 1

Integral Equations and Boundary Value

10. What is Generalized three-part boundary value problem?

9. Find the solution using Laplace transform:

8. (a) Find the solution using Laplace transform:

8. (b) Discuss the finite Hilbert transform and derive its

8. (c) Find the solution using Laplace transform:
8. Derive the Poisson integral formula.

9. Formulate the exact integral problem and solve

\[ 0 = (1)A x + (1)A, 0 = (0)A \]

Find the Green's function for the equation.

9. (a) Solve the Abel integral equation

9. (b) Solve the Hilbert Schmid equation.

Section II

8. Prove that

\[ \int_{-\pi}^{\pi} \frac{f(x)}{x} \, dx = 0 \]

8. Prove the integral equation

\[ \int_{-\pi}^{\pi} \frac{f(x)}{x} \, dx = 0 \]

8. Solve the integral equation

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Section I

From each section and the compulsory question,

Note: Attempt five questions in all selecting one question

Maximum Marks: 80

Functional Analysis

MGF101

Mathematics

MGF201-7

Total Pages: 82
Section II

8. Show that a bounded linear operator \( P : H \rightarrow H \) on a Hilbert space \( H \) is invertible if and only if it is one-to-one.

9. Show that every Hilbert space is reflexive.

Section III

10. Prove that every bounded linear operator is a bounded linear operator on a complex vector space.

11. Prove that every bounded linear operator is a bounded linear operator on a complex vector space.

Section IV

12. Prove that every bounded linear operator is a bounded linear operator on a complex vector space.

13. Prove that every bounded linear operator is a bounded linear operator on a complex vector space.

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60. Prove that every bounded linear operator is a bounded linear operator on a complex vector space.
1. [V.P.1-5093]
8

Find the geodesic on the surface of sphere of radius R depending upon \( n \), dependent variables.

Find the Euler's equation for the functions:

\[
0 = \left[ \frac{d}{ds} \left( \frac{1}{2} (1(t), \dot{r}(t)) \right) + \frac{1}{2} \frac{d}{dt} \left( \frac{1}{2} \frac{d}{ds} \left( \frac{1}{2} (1(t), \dot{r}(t)) \right) \right) \right]_{r(t)}
\]

Problem

Section I

Question

Each question from each section and the compulsory

Note: Attempt five questions in all sections at least one

Maximum Marks: 80

Time: Three Hours

MINI-502

CALCULUS OF VARIATIONS

ANALYTICAL MECHANICS AND

MGA/D-17

P.T.O.

8

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Problem

Section I

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Problem

Section I

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Each question from each section and the compulsory

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Problem

Section I

Question

Each question from each section and the compulsory

Note: Attempt five questions in all sections at least one

Maximum Marks: 80

Time: Three Hours

MINI-502

CALCULUS OF VARIATIONS

ANALYTICAL MECHANICS AND

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\]

Problem

Section I

Question

Each question from each section and the compulsory

Note: Attempt five questions in all sections at least one

Maximum Marks: 80

Time: Three Hours

MINI-502

CALCULUS OF VARIATIONS

ANALYTICAL MECHANICS AND

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\]
Section II

8. Prove the following:

\[ \psi \left( \frac{d^2 \psi}{dt^2} - \left( \frac{d\psi}{dt} \right)^2 \right) = \frac{\hbar}{2} \]  

or

\[ \psi \left( \frac{d^2 \psi}{dt^2} - \left( \frac{d\psi}{dt} \right)^2 \right) = \frac{\hbar}{2} \]

\[ \psi \left( \frac{d^2 \psi}{dt^2} - \left( \frac{d\psi}{dt} \right)^2 \right) = \frac{\hbar}{2} \]

Section III

8. Prove that for a conservative system

\[ \frac{d^2 \chi}{dt^2} = \frac{\hbar}{\lambda^2} \]

9. Prove that the form of equilibrium of a helical pendulum in a vertical plane.

8. Derive Lagrange's equation of motion of a double pendulum in a vertical plane.

\[ \frac{\hbar^2}{\lambda^2} - \left( \frac{\hbar^2}{\lambda^2} \right)^2 = \frac{\hbar}{\lambda^2} \]

\[ \frac{\hbar^2}{\lambda^2} - \left( \frac{\hbar^2}{\lambda^2} \right)^2 = \frac{\hbar}{\lambda^2} \]

Section IV

8. Derive Lagrange's principle of least action.

\[ \frac{\partial}{\partial \phi} \left( \frac{\partial L}{\partial \phi} \right) + \frac{\partial L}{\partial \phi} = 0 \]

\[ \frac{\partial}{\partial \phi} \left( \frac{\partial L}{\partial \phi} \right) + \frac{\partial L}{\partial \phi} = 0 \]
Define the invariants of a tensor of order 2 and scalar product and vector product of two tensors. Verify each as a tensor. Use these tensors to represent

\[ (a) \text{ Define substitution tensor and alternating tensor and} \]

\[ (b) \text{ Symmetric and skew-symmetric tensor} \]

\[ (c) \text{ order of a tensor} \]

\[ (d) \text{ covariant and contravariant tensors} \]

\[ (e) \text{ tensor transformation} \]

\[ (f) \text{ used in tensor analysis} \]

1. Define and explain with examples the following terms as

Section 1

marks:

Section V is compulsory. All questions carry equal

Note : Attempt one question from each of the Section I to V.

Time : Three Hours

Maximum Marks : 80

(1) PHYSICS

ETASTICITY

5094

MDA/D-17

Total Pages : 03
Define Saint-Venant principle.

Write stress-strain relations for an orthotropic medium.

Specify the general anisotropy of an elastic medium.

Discuss the number of coefficients required to determine strains and stress components.

What is the difference between Hookean strain and stress in an elastic medium?

Use an example to explain the role of hydrostatic stress.

Discuss the relation between stress vector and stress tensor.

Explain Cauchy-Hamilton theorem for tensors.

Section A

16

body force

isotropically elastic body

Explain changes with the kinds of

Definitely possible

Definitely impossible

Equation of compatibility for an elastic body.

Section II

5

Interpretation of the components.

Definitely possible

Definitely impossible

Definitely possible

Definitely impossible

Definitely possible

Definitely impossible

Definitely possible
Given stress tensor as
\[
\begin{pmatrix}
4 & -2 & 0 \\
0 & 5 & 0 \\
2 & 0 & 7
\end{pmatrix}
\]
\(b\)
\((e)\) Given stress tensor as
de fine the vorticity vector
\[
\begin{pmatrix}
\partial_x \psi \\
\partial_y \psi \\
\partial_z \psi
\end{pmatrix}
\]
\((d)\) Given fluid particle velocity
path hence.
\(\psi\)
\((c)\) What is the difference between stream lines and
the vorticity vector justify your answer.
\((b)\) What is the relation between the potential flow and
is based upon.
\((a)\) State the principle on which equation of continuity
the compulsory questions.
select at least one question from each section and
Note : (a) N.1 is compulsory. Answer five questions in all.

Maximum Marks : 80

Time : Three Hours

FLUID MECHANICS-1

MDC/D-17

Total Pages : 4

Roll No. : 1400

1-5098

Section A

\[
\begin{pmatrix}
8 & 0 & 0 \\
0 & 9 & -3 \\
0 & -3 & 9
\end{pmatrix}
\]

\((e)\) Determine the three stress invariants for the stress

tensor.
12. Obtain relations between stress and rate of strain.

8. Describe steady flow through a pipe of uniform circular cross-section.

where symbols have usual meaning.

\[
(b \Delta) \times \Delta \cdot \left( b \frac{z}{v} \Delta + \frac{d}{dp} \right) \Delta = \frac{\Delta}{\Delta} \cdot \left( \left( b \frac{z}{v} \right) \Delta + \frac{d}{dp} \right)
\]

6. Derive the equation:

Section III

8. State and prove Kelvin's minimum energy theorem.

8. Prove that the value of \( \phi \) at the center of the sphere is equal to the value of \( \phi \) on the surface through any point on the sphere.

5. Prove that the mean value of \( \phi \) over any spherical surface will be equal to the value of \( \phi \) at any one point.

4. Derive Lagrange's equations of motion.

Section II

2. Derive general analysis of fluid motion.

The equation of continuity is satisfied.

\[
\left( \frac{\partial x}{\partial t} + x \frac{\partial x}{\partial x} \right) = \left( \frac{\partial x}{\partial t} + x \frac{\partial x}{\partial x} \right) = n
\]

8. Steady flow through velocity components. Show that in a two dimensional incompressible fluid:

\( \phi = h(\Delta b) \)

where \( U, \), \( \eta \), and \( \mu \) are constants. Show that:

\[
0 = \eta = \left( \frac{h}{\lambda} - 1 \right) \left( \frac{h}{\lambda} \left( \frac{dp}{d} \right) \right) + \frac{h}{\lambda} = n
\]

3. Velocity components are given as:

\[
\frac{\xi}{1 + \frac{\xi}{\xi}} = \frac{\xi}{1 + \frac{\xi}{\xi}}
\]

at a point. \( P \), determine stress vector on a plane at
Classify each differential equation and explain its behavior. (q)

Show that the differential equation:

\[ \gamma + (s) \delta = (s) \delta \]

and that the eigenvalues:

\[ \int \gamma + (s) f = (s) \delta \]

are algebraic equations.

1. Explain the method of reduction to a system of

Section

Section

Question.

from each section including the compulsory

Note: Answer five questions in all, selecting at least one

Maximum Marks: 80

Time: Three Hours

MIN-203 (I)

INTEGRAL EQUATIONS

MDG-417

ROLL No. 04

1. Define the convolution integral.

\[ \int \gamma + (s) f = (s) \delta \]

2. Invert the equation:

\[ \int \gamma + (s) f = (s) \delta \]

Prove that:

\[ \int \gamma (x, t) \frac{\gamma}{(x, t)} dx = (s) \frac{\gamma}{t} \]

3. Give the necessary and sufficient condition for the existence of a solution of the equation.

\[ 1 = \left\| \phi \right\|^2 \left( \phi \cdot \phi \right) \max = \frac{|1 \gamma|}{1} \]

4. If the kernel is symmetric then:

\[ \int \gamma \frac{1}{\gamma} \]

Note: All units should be in SI units.

Total Pages: 04
Complementary Question

\[ \frac{(s-1)\gamma}{(s)^\beta} \int \frac{\gamma(z^2)}{1} = (s)^\beta \int \frac{e^{(s-1)z}}{1} \]

Prove the relation exists.

Singularity integral: Prove that if (s)f is H"older continuous then the

\[ \frac{\gamma(s-1)}{\Gamma(s)^\beta} \int = cS \]

Find a solution of the integral equation.

Section I

4. State and prove Fredholm's second theorem in its

\[ \phi = \int f \phi \int \frac{(s)^\beta}{(s)^\beta} \int + (s)f = (s)^\beta \]

Find the resolvent kernel for

\[ \int \phi f = \int (s)^\beta \phi \int + (s)f = (s)^\beta \]

Discuss the iterative scheme for the solution of linear

Section II

5. Show that the eigenvalues of a symmetric kernel

Section III

6. State and prove Hilbert-Schmidt theorem and hence prove

non-negative if all its eigenvalues are positive.

Prove that a non-null, symmetric L2-kernel is orthogonal.

corresponding to different eigen values are

8. Show that the eigen values of a symmetric kernel

classification form.

4. State and prove Fredholm's second theorem in its

\[ \psi = \int f \psi \int \frac{(s)^\beta}{(s)^\beta} \int + (s)f = (s)^\beta \]

Find the resolvent kernel for

\[ \int \phi f = \int (s)^\beta \phi \int + (s)f = (s)^\beta \]

\[ \int \psi f = \int (s)^\beta \psi \int + (s)f = (s)^\beta \]

Discuss the iterative scheme for the solution of linear
Chapter 1

Subject: Interpersonal Group Communication

Questions:

1. Discuss the role of communication in group behavior.

2. Explain the concept of interdependence in group settings.

3. Describe the effects of group size on communication patterns.

4. Analyze the impact of leadership style on group behavior.

5. Evaluate the influence of group norms on individual behavior.

6. Discuss the role of group cohesiveness in facilitating communication.

Note: Each question carries 4 marks. Total marks: 15

Time: Three Hours

Maximum Marks: 80
1. Explain the various types of group coherence.
2. Define personality. What are the major determinants of personality?
3. Explain the different approaches to organizational behavior.
4. Explain the various internal and external factors affecting organizational behavior.
5. Explain the classical conditioning, operant conditioning, and social learning theories of learning.
6. Also explain different types of groups.
7. What is transactional analysis? Explain various ego states.
8. Why do Type B personalities get into senior positions rather than Type A?
9. Be prepared to explain the various types of strokes and their relevance.
10. Explain the various types of strokes and their relevance.
I. Write short notes on the following:

- Environmental Scanning
- Social Responsibility of Business
- Business Ethics
- Corporate Governance
- Industrial Licensing Policy
- Industrial Sickness

II. Describe the following:

III. Explain the following:

Note: Q. No. 1 is compulsory. Attempt any four questions out of remaining seven questions.

Maximum Marks: 80

Time: Three Hours

MC-102
BUSINESS ENVIRONMENT
ME-D-17
4412
Roll No. ..........................
Total Pages: 03

5. Differentiate between Fiscal and Monetary Policy of India.


3. Give the highlights of latest EXIM Policy of India.

2. Explain the main provisions of the Environment Protection Act.
8. Define inflation. How does inflation affect the production structure and income distribution in economy?

9. Explain the concept of cross elasticity of demand. How does such elasticity differ in case of substitutes and complements? Goods?

2. (i) Why average cost initially falls, there after rises?

(ii) What are essential conditions for practice of price discrimination?

(iii) What is the concept of sunk cost?

(iv) What are features of iso quant?

5. Zara Ltd. produces razor and blades. Propose a pricing scale implying increasing long run average cost function.

4. Why do increasing returns to scale imply a decreasing long run average cost function and decreasing returns to scale imply an increasing long run average cost function?


1. Write explanatory notes in 150 words each:

(i) What is the name of Managerial Economics?

(ii) Distinguish between autonomous demand and derived demand.

(iii) What is the essential condition for practice of price discrimination?

(iv) What are the essential conditions for practice of price discrimination?

(v) What is the concept of sunk cost?

(vi) What are features of iso quant?

(vii) What is the concept of cross elasticity of demand? How does such elasticity differ in case of substitutes and complements? Goods?

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

Maximum Marks: 80

Time: Three Hours

MCQ/DE-17

MANAGERIAL ECONOMICS

ROLL NO. ..................................................
1. Describe important methods of winding up of companies.
2. Describe the process of incorporation of a company.
3. Describe the process of alteration in name clause of the company.
4. Write a critical note on Dissolution of a company.
5. Describe important provisions for allotment of shares.
6. Describe the powers and legal position of directors.
7. Differentiate between ordinary resolution and special resolution and explain the process of passing these resolutions.
8. Describe the process of passing these resolutions.

**Note:** Attempt five questions in all. No. 1 consisting of [MCQ: 10] MCE: 04

**COMPANY LAW**

**Total Marks: 80**
I. Write short notes on the following:

(a) Value Chain Analysis
(b) Labor Costing
(c) Material Price Variance
(d) Expense Centre
(e) Information Report

Note: Question paper consists of eight questions. Answer five questions. Maximum Marks: 80

Time: Three Hours

MC 105
DECISION
ACCOUNTING FOR MANAGERIAL
MDE/D-17

Rail No. 04

(lv) Break-even sales

(vi) Fixed expenses

(iv) Profit/volume ratio

The two half year periods, calculate for the year 2015 is the percentage of margin of salery

(3) assuming that there is no change in prices and variable

(3) if the fixed expenses are incurred equally in cost and that the fixed expenses are incurred equally in

(3) if the fixed expenses are incurred equally in
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<th>Standard</th>
<th>Actual</th>
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<td>100</td>
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<td>V</td>
<td>30</td>
<td>100</td>
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7. Given the following particulars, compare the labour variance:

| Hours | No. of Men | Actual
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8. As LID, a multi-divisional company, you are required to...
1. Discuss the Social and Ethical Issues in Marketing

5. Discuss the Marketing Techniques applicable to FMC

8. Write notes on the following:

8.1 When is Distribution Channel? Explain the pattern of channels and decisions involved in designing the various channels.

6.4 What are the Various Types of Marketing Mix?

5. (v) What is Sales Promotion?

5. (vi) What are the Various Elements of the Marketing Mix?

2. Write any four questions.

Section B

1. Answer all parts:

Compulsory

Section A

[Time: Three Hours] [Maximum Marks: 80]

MC-106

MARKETING MANAGEMENT

4416 4416

MDE/D-17

Rollo No. 02
P.T.O.

Explain the various barriers to effective communication in modern time period.

Elaborate the stages of planning process.

Mention the importance of conflict management techniques.

Throw light on the some of the most effective of decentralization to take place.

Examine the conditions appropriate for principles.

Briefly discuss the various aspects of control.

Elucidate hierarchical management perspective.

Organisational behaviour.

Identify the relationship between management and organisational behaviour.

Describe David McClelland's theory of needs.

I. Short Answer Type : (4 each)

Time: Three Hours

Maximum Marks: 100

MC-501

ORGANISATIONAL BEHAVIOUR

MANAGEMENT CONCEPTS &

4060

MDE/D-17

Roll No.:

Total Pages: 04

7. Differentiate between Group and a Team. Figure out the
6. Define Organisational Change. Why do individuals and organisations resist change?

5. Elaborate the concept of Perception. Also throw light on the different stages of the perceptual process.

4. Describe the phenomenon of Attitudes. How attitudes are employed and organisational employees, and organisations.

3. What is Personality? Enlist its key determinants. Explain the Psychodynamic theory of Personality.

2. Compare Classical Management Perspective, with those of the Contemporary business environment.

1. What are OD Innovations? Enlist the major types. What are OD Innovations? Enlist the major types of OD Innovations.
PART A

Write short notes on the following:

(a) What constitutes international business?

(b) How does foreign investment affect competition?

(c) What is the difference between principle of right and principle of justice?

(d) How monetary policy helps in reducing the inflation?

(e) Discuss the challenges faced by private sector in corporate governance.

(f) Discuss the difference between corporate management and firm.

PART B

Complete the following questions from Part B carrying 10 marks each

Note: Attempt the questions in all. Q.No. 1 in Part A is compulsory which carries 40 marks. Answer four.

Maximum Marks: 80

MC-502

BUSINESS ENVIRONMENT

MDE/D-17

ROLL NO: 03

TOTAL PAGES: 03
8. Write a note on international economic institutions. What role is played by these institutions?

7. Is India's export performance satisfactory in relation to

6. Discuss the major challenges facing SIS. Do you think India seeks to achieve in India?

5. What are the broad objectives of an industrial policy? How does industrial policy contribute to industrial growth?

4. How do producers and sellers define profit? Explain the sense of the term. Explain sense just as its social activities should make a business concept. Activities of a firm should make a social

3. How do production decisions of business firms affect issues and preferences? How do these changes affect changes in consumer attitudes?

2. When recessions hit about changes in consumer attitudes.

1. How do marketers differ international

0. Write note on Foreign Exchange Management Act

1. How does the marketing and labour problem of SIS.

2. Does the power of consumer court

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3. How do production decisions of business firms affect issues and preferences? How do these changes affect changes in consumer attitudes?

2. When recessions hit about changes in consumer attitudes.
I. Write short notes on the following:

(a) Cross elasticity of demand
(b) Managerial Economics as a science
(c) Profit Maximization as aim objective
(d) Scenario Process
(e) Meaning of returns to scale
(f) Long run average cost curve
(g) Price of monopolistic competition
(h) International Price Dumping
(i) Price of韦格 model

Note: Attempt five questions in all. No. I carry 4 marks each. Each is compulsory.

Time: Three Hours

Maximum Marks: 80

MANAGERIAL ECONOMICS

4062-S

Roll No. ..........................................

Total Pages: 04
1. Derive the consumer equilibrium conditions using indifference curve approach.

2. Discuss the role of a managerial economist in the present competitive world.

3. Discuss the determinants of demand using a general demand function.

4. Write a note on types and classification of demand.

5. Write a note on types and classification of demand.

6. Discuss the steps involved in estimation of a production function of an industry or the following form:

\[ Q = A L^\alpha N^\beta K^\gamma \]

where:

\[ Q = \text{Output (production)} \]

\[ A, \alpha, \beta, \gamma = \text{constants} \]

\[ L, N, K = \text{inputs} \]
(b) Sample point and sample space.

(a) Random experiment.

(viii) Explain the terms: chance and chance experiment.

Find the chances of winning first to draw 9 being awarded the prize. Find their

(iv) If A and B are two dice, the summed

(iii) Explain the concept of skewness.

(ii) For the distribution with 4 are 1, 4, 10 and 15, discuss the K'th

(i) The first four moments of a distribution about the

(iv) When is Mean, Median & Mode in support of other measures

Compulsory Question

Questions

and answer four questions out of remaining seven

Note: Attempt five questions in all. 0. No. 1 is Compulsory

Maximum Marks: 80

Time: Three Hours

NC-504

ADVANCED STATISTICS

MDE/D-17

ROLL NO. ............................

TOTAL PAGES: 03
6. Explain F-test for equality of population variance. Applying the test show that the following samples come from the same normal population.

7. Describe Wald-Wolfowitz run test for independence of two populations.

8. Describe z-test for difference of means.

9. Explain the following: 
   \[ \text{Given that } P(9.44) = 0.05, \quad (a) = 2.98, \quad (b) = 1.96, \quad X = 9.44. \]

10. The lines of regression of \( y \) on \( x \) and \( x \) on \( y \) are of the form \( y = ax + b \) and \( x = cy + d \), respectively. Find \( a, b, c, d \) if \( X = 10, X = 15, \) and \( Y = 10, Y = 5 \).

11. Why should the non-parametric methods be preferred in the following cases?

12. Why should one not use the law of large numbers in the following cases?

13. State and prove the multiplicative law of probability.

14. State, prove, and give the multiplicative law of probabilities.

15. Calculate the mean and variance of the following data:

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
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<td>10</td>
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16. Explain the chi-square test of goodness of fit.

17. Describe the chi-square characteristics of Poisson distribution.
(i) Differentiate the return on investment and residual income approaches of performance measures.

(ii) How will you calculate the cash from operation

(iii) What are the limitations of financial statement

management accounting system.

1. (i) List the steps involved in the installation of

Note: Attempt five questions in all. 0, No. 1 is compulsory.

Maximum Marks: 80

MCQ 506

DECISIONS

ACCOUNTING FOR MANAGERIAL

ME/D-17

ROLL No. 05

Total Pages: 05
6. From the following information compute:

\[ \text{Net Profit} \]
\[ \text{Cost of Goods Sold} \]
\[ \text{Gross Profit} \]
\[ \text{Total Revenue} \]
\[ \text{Total Expenses} \]

5. Describe the various ratios that are likely to help the management account of a financial institution in forming an opinion on the financial position of the borrower.

4. The aim of responsibility accounting is not to blame.

3. Explain the role of reporting system in effective management. Discuss the various kinds of reports prepared.

2. Management accounting aspires to provide financial decision. Explain by bringing out advantages of results of the business in the management for taking

1. Describe the activity based costing.

(ix) Describe the angle of incidence.

(vii) Write short note on performance benchmarking.

(vi) What are the steps involved in zero-bases

(v) What do you mean by market based transfer

(c) (d) (e) (f) (g) (h) (i) (j) (k) (l)
8. Discuss briefly the contemporary issues in management.

| Material | Quantity | Standard Price (RS) | Actual Price (RS) | Price (RS) | Total | Material Cost
|----------|----------|---------------------|-------------------|-----------|-------|----------------
| A        | 4        | 0.00                | 3.00              | 9.00      | 6     | 18.00
| B        | 4        | 0.40                | 0.00              | 4.00      | 2     | 8.00
| C        | 2        | 0.00                | 0.00              | 0.00      | 2     | 0.00
| D        | 2        | 2.00                | 4.00              | 8.00      | 4     | 18.00

The selling price can be assumed as RS. 100 per unit. The ending work-in-progress inventory includes 9,000 units at standard cost of Rs. 1000 and 7,000 units at standard cost of Rs. 1000, respectively.
What is an Operating system?
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6. What do you understand by data and information? Where does it arise?

5. What is the difference between application software and system software? Explain.

4. What is Internet? What is the difference between Internet, internal, internal and external? Explain.

3. What do you understand by local area network (LAN)?

2. Draw the block diagram of a computer system and discuss it in detail.

1. What are the different network topologies? Discuss them with their merits and demerits.

8. (a) What do you understand by Electronic Excise?

(b) Explain what is Multimodal ? Discuss.

7. Write notes on the following:

(a) Information Technology Act

(b) Video Conferencing
(v) State and explain term structure of interest rates.

(vi) Participles.

(vii) State the eligibility criteria for a depositary

(viii) Define investment rate and describe its components.

(i) Explain

When do you understand by investment analysis?

10 marks each.

I. Attempt all the short answer type questions given below:

Maximum Marks: 80

Time: Three Hours

MC603

MANAGEMENT

SECURITY ANALYSIS AND PORTFOLIO

MD/DB-17

Page No. 01

Total Pages: 04

Page No. 02

Total Pages: 04
1. Define and explain the basic concepts of portfolio optimization. (xi)

What is portfolio optimization? Describe how it works. (xii)

2. Explain the concept of diversification in portfolio optimization. (xiii)

Describe the benefits and risks of diversification. (xiv)

3. What do you understand by stock markets? (xv)

Explain the different types of stock markets. (xvi)

4. Why is security market line (SML) important? (xvii)

Describe in brief the role of SML in asset pricing. (xviii)

5. What is the importance of beta in portfolio analysis? (xix)

Explain the concept of beta and its role in portfolio management. (xx)

6. Critically examine the validity of capital asset pricing model (CAPM). (xxi)

Discuss some criticisms of CAPM and the challenges it faces. (xxii)
What is Internal Reconstruction of Companies?

What do you mean by Loss of Profit Insurance?
1. Define the term "gains" and "losses." Discuss the principles for recognition of gains and losses in accounting.

2. Write notes on the following:

   i. What do you understand by the expression "consolidation of financial statements." (i)
   ii. What is Comparative Dividend Tax? (e)
   iii. Distinguish between expenses and losses. (e)
   iv. Define the term "profit" and "profit of a subsidiary company." (a)
   v. How will you calculate such acquisition profits relating to purchase of shares of
      post-

3. "Define Loss Account." (a)
B Company

Hyderabad also prepare opening entries in the books of $50,000 in cash. Close the books of the company in $10 each credited with $15 per share and up for $50,000 payable at $4.50 per share in equity shares for $50,000 payable at $2.00 per share and in capital $100,000 in capital and thus requires $9,000,000 in cash and other properties $9,000,000 in liquid assets in the books as follows:

8. A Led. Goes into Hyderabad on 31st March, 2015, having

9. When do you understand by "lease accounting"? When

10. Discuss the descriptive approach in financial accounting

10. Why are the limitations of this approach?
1. Explain the following by limiting the answer to half a page:

10 × 4 = 40

Note: Attempt five questions in all. Q. No. 1 is compulsory.
1. Explain your understanding of sales management.

2. Discuss the factors influencing the choice of advertising media.

3. Discuss the social aspects of advertising.

4. What is advertising? Discuss the objectives of advertising.

5. Discuss buying formula and behavioral cues of sales promotion.

6. What is the purpose of creating sales organization?

7. What are the requirements of a good sales compensation plan?

8. Write notes on the following:
   - Organization
   - Procedure of setting up a sales compensation plan

9. Explain advertising agency and client relationship
What is a Research Plan?

Marketing research

Mention the problems that can be investigated in

Any four questions from the remaining eight questions

each part's answer should not exceed half page. Attempt

Note: Q. 1. No. 1 is compulsory with ten parts (4 marks each).

Maximum Marks: 80

Time: Three Hours

Marketing Research
MC-606
COMMERCE

MDA/D-17

ROLL NO.

Total Pages: 04
8. What is the purpose of advertising research? How is it involved in the conduct of marketing research? Explain the steps involved in its conduct.

2. How is marketing research defined? Mention the steps involved in its conduct.

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and delayed organizations. Explain the concept of compensation management and its importance.

(vii) Define the concept of 'Work-place differential' and its purpose.

(viii) Define the concept of 'Minimum wage'.

(ix) What is the 'equal wage' doctrine?

(x) Outline the components of executive compensation.

5. Write a detailed note on future trends in compensation management.

MC-609

COMPENSATION MANAGEMENT

MDO/D-17

4223-S

RoH No. 04

Total Pages: 04

420

8. Explain the provisions of the Minimum Wages Act, 1948, etc., under the Compensation Act, 1948. Working hours and determination of wages and claims of employees.

7. What are the components of compensation package of special groups?

6. What factors should organizations take into consideration while deciding pay by performance (PPP system)?

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

Maximum Marks: 80

Time: Three Hours
1. What are the objectives of incentives in compensation management?

2. Explain the different perspectives on compensation management.

3. Why are reasons for introducing broad banding in compensation systems? Also discuss the benefits of broad banding.

4. What are the salient features of the Minimum Wage Act, 1948?

5. Explain the duty of employer to pay casual wage.

6. What are the main features of the Workers' Compensation Act, 1923?

7. What are the objectives of incentives in compensation management?
1. Answer the following in short:

Compulsory Question (4 marks)

Note: Question No. 1 is compulsory and carries 40 marks.

Maximum Marks: 80

Time: Three Hours
1. When concerning the power of personality traits to predict behavior, discuss...

2. What are the differences between group dynamics and group cohesion? Explain the determinants of cohesion.

3. What is the concept of T.A. How is T.A. helping...

4. What is the concept of O.B.? Critically discuss the determinants of O.B.

5. In perspective, explain the external factors of distinction.

6. What is the difference between group dynamics and group cohesion? Explain the determinants of cohesion.

7. What is the difference between group dynamics and group cohesion? Explain the determinants of cohesion.

8. What is the difference between group dynamics and group cohesion? Explain the determinants of cohesion.
1. Compulsory Question (All are compulsory)

(1) What is the social responsibility of business towards community?

(2) Discuss the penalty provision under the Environment (Protection) Act.

(3) Name the industries where licence is required.

(4) Differentiate between Revenue deficit and Fiscal deficit.

(5) Explain the Transparency Principle of Corporate Governance.

(6) What are the objectives of Disinvestment?

(7) Elucidate Privatisation with example.

(8) Explain the economic objectives of Economic Environment.

Answer the following in brief (Not more than half page):

I. Compulsory Question (All are compulsory)

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

Maximum Marks: 80

Paper: MCIT-102

Business Environment

2. Discuss the major provisions of the Competition Act in detail.

6. What is Industrial Sickness? What are its causes? Discuss critically examining its role in the Indian economy.

5. What methods are being used in monetary policy? Also discuss the role of business ethics in the success of a business. Why there is ethical dilemma?

4. Define business ethics. Why there is ethical dilemma?

3. What is Globalisation? Discuss the initiatives taken by the government to liberalise the Indian economy.

2. Explain the name of business environment. Also discuss the interaction matrix of different environment factors.
Coefficient of Variation:

(d) Write down formulae of mean deviation and geometric mean is recommended for use.

(e) Give two examples of practical situations when mean

mean:

(f) Give specific examples when mode is preferred over

Mean of univariate analysis.

Explain/answer the following in up-to one page length each:

1. Compulsory Question (All marks)

Each question carries 10 marks.

Each part of the remaining seven questions carries 10 marks.

Note: The first question carries 10 marks instead of compulsory and maximum marks 80.

Paper: XG17-103

ADVANCED STATISTICS

10283

XG17-17

Total Pages: 5
Draw each red ball of Rs 6. Find the expected reward of the
(a) If each white ball drawn carries a reward of Rs 4 and
(b) Find the expected number of white balls drawn.

3. From a bag containing 4 white and 6 red balls, three balls
are drawn at random.

\[ P(0) = 0.16, P(1) = 0.40, P(2) = 0.40, P(3) = 0.04 \]

(i) Explain meaning and applications of Central Limit
Theorem.

(ii) Describe the terms precision and accuracy of a sample.

(iii) Distinguish

Give the properties of Normal and Binomial

mean \( \mu \) and variance \( \sigma^2 \) = 1.

Comment on the following: For a binomial distribution,

\[ P(4) = 0.40, P(5) = 0.20 \text{ and } P(6) \] and scale.

Show how correlation is independent of change of origin.
show how regression coefficients are calculated in a situation involving more than two variables by taking an illustration.

8. Explain maximum, minimax and minimax regret criterion as used in decision making. Also explain the expected regret and uncertainty with example.

9. Explain sampling, sampling and simple random sampling.

(c) Law of large numbers.

(d) Variance of the distribution.

4. In a normal distribution, 31 percent of the items are under 6 and 8 percent are over 6. Find the mean and standard deviation of the distribution.
What is the role of warranty in Marketing?

What is a New Product? Discuss.

Define routine consumer behavior with example.

Define Marketing Mix.

There is huge scope of Marketing. Discuss:

I. Compulsory Question (Maximum 10 marks)

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

Time: Three Hours

Maximum Marks: 80
7. When are different social, ethical and legal aspects of marketing discussed.

8. Define sales promotion. Discuss various tools of sales promotion.

9. Discuss in detail the Product Mix and Product Line Strategies.

10. Discuss the role of Supply Chain Management in product distribution.

11. Discuss how mass media be used as Direct Media.

12. What is the role of Supply Chain Management in building and maintaining long-term relationships with customers.


What is a public cloud?
What is a private cloud?
What is a cloud computing environment?
What are the benefits of cloud computing?
What are the challenges of cloud computing?
What are the different types of cloud computing models?
What are the different types of cloud computing services?
What are the different types of cloud computing deployment models?
What are the different types of cloud computing architectures?
What are the different types of cloud computing security models?
What are the different types of cloud computing governance models?
What are the different types of cloud computing performance models?
What are the different types of cloud computing cost models?
What are the different types of cloud computing reliability models?
What are the different types of cloud computing availability models?
What are the different types of cloud computing scalability models?
What are the different types of cloud computing maintainability models?
What are the different types of cloud computing portability models?
What are the different types of cloud computing sustainability models?
What are the different types of cloud computing interoperability models?
What are the different types of cloud computing observability models?
What are the different types of cloud computing manageability models?
What are the different types of cloud computing self-service models?
What are the different types of cloud computing self-service models?
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What are the different types of cloud computing self-service models?
6. Explain some of the topologies used for networking of computers. Which are the considerations in choice of these topologies?

5. Differentiate between OSI and TCP/IP protocols. What is the function of each of the layers of these protocols?

4. Define software and explain some of the operating systems used in computers. What role do the operating systems play in a computer?
1. Compulsory Question (3 marks each)

I. Explain the following:

[a] HTTP
[b] Frewill
[c] Domination
[d] DSS
[e] URL
[f] WWW
[g] System
[h] Internet
[i] WAIS

Note: Attempt five questions in all. Question No. 1 is compulsory. Maximum Marks: 80

Time: Three Hours

Paper-MCIT-106
Internet and MIS

10286

Role No. Total Pages: 3
1. Compulsory Question (30 marks)

Attempt all the following questions in full:

(i) Explain the functions of Regional Rural Banks.

(ii) Discuss the importance of Govt. Securities Market.

(iii) Discuss the types of mutual funds.

(iv) What is merchant banking?

(v) Discuss the need of development banks.

(vi) What do you mean by secondary market?

(vii) Discuss the objectives for setting up SEBI.

(viii) Differentiate between money market and capital market.

(ix) What are the constituents of a financial system?

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

Maximum Marks: 80

Time: Three Hours

Paper: MCIT-301

Financial Institutions and Markets

10287 MDG/D-17

Total Pages: 4
1. What do you mean by Mutual Fund? Discuss its advantages. What problems are faced by Mutual Fund investors in India?


3. Differences between Primary and Secondary market. Discuss the recent developments in Indian Capital market.

4. What are the main functions of Development banks?

5. What is State Financial Corporation? Discuss the importance of State Financial Corporations.

6. Explain the role of Merchant bankers in the Corporate world.

7. Why are there primary and secondary markets? Discuss the importance of both.
I. Compulsory Question (15 marks each)
7. Write notes on the following:

(a) Fundamental Analysis
(b) Technical Analysis
(c) Company Analysis
(d) Valuation of Equity Share

5. What do you understand by the Efficient Market Hypothesis?

4. Describe stock trading mechanism in India. How are securities listed on exchanges? Explain.

3. Describe the guidelines in this regard. (5+5=10)

2. What do you mean by public issue of securities? Also approaches to investment analysis. (5+5=10)

(10)
7. Define Inventory Control. Discuss objectives and functions of inventory control and the role of inventory in the supply chain.
1. Define Material Requirements Planning. Explain its Benefits and Disadvantages.
2. Explain Fixed Order Cycle (FOC) System.
3. Write notes on : 
   (a) Forecasting Errors.
   (b) Assembly Line Balancing.
4. (a) Explain PERT.
   (b) Explain Statistical Quality Control.
5. (a) Discuss Developing New Products.
   (b) Explain Inventory Cost Concept.
6. Discuss Layout and Operations to Operations Management.

6. Discuss the following : 

(a) Scope and Objectives of Inventory Control.
(b) Schedule, Plans, and Schedules.
1. Compulsory Question

Answer the following short answer type questions:

2. Explain the meaning, features and importance of advertising.

3. What is advertising effectiveness? Explain various pre-testing plans.

4. Explain the meaning, importance and problems in media planning.

5. What is advertising appeal? Explain it various types with examples.

6. Are there ethics and truth in advertising?

7. Does advertising affect cultural values of a society?

8. Which method is considered as the most appropriate budget method in preparing different methods of preparing advertising?

9. What is advertising exposure of intra-advertising?

10. For increasing popularity of intra-advertising, critically examine various types of advertising. Give reasons.

Note: First question is compulsory. Attempt any four more

Time: Three Hours

maximum Marks: 80

Paper: MCT-304

ADVERTISING MANAGEMENT

MD01-17

Roll No.

Total Pages: 2
1. Compulsory Question (10 marks)

What do you mean by Event Driven Programming?

I.

= 80

Maximum Marks: 80

Paper: MCIT: 305

VISUAL BASIC AND SOL

10291

MDD/D.17

Total Pages: 4

Roll No. ..........................
Write a program to find factorial of any number using
WHILE loop.

5.

Write a program to find the smallest of three numbers
using if-else.

4.

Write a program to find the smallest of three numbers
DISPLAY (Display).

3. Submi (Submit) a table to display (clear) a list of
    first name, last name, age, and address. When you press submit button then display
clear button. When you press submit button then display text box for second number and submit button and
text box for first number and another

2. Design a form and add text box for first number and another

What is cursor? What is use of cursor data type and
near declaration.

(x) Cursor (Cursor) is a data type which is
application of integer.

(x) What is the application of integer

What does you mean by array data type. Write a program to

What is a query to create table about student and insert

What is key. Write a query to add primary key to the

What is difference between table and view also the

What is submi (Submit) table? What is view? What is advantage of view.

(a) numéro [1]....[10]

What is submi (Submit) table? What is view? What is advantage of view.

(a) numéro [1]....[10]
1. What is an integrity constraint? Explain the types of integrity constraints.

2. What is an ER model and write the symbol of attributes, key?

3. What is the difference between the types of constraints and domain relational calculus?

4. Write any two rules of domain relational calculus.

5. What is a database and write the symbol of attributes, key?

6. What is a network model and explain it with example?

7. What is the difference between data model and explain it?

8. What is a data model? Explain the types of data models.

9. What is a Record and explain Virtual Record?

10. What is an Integrated Algebraic Operations on Data?

11. What is the help of an example?

12. What is a Foreign key and Candidate key? Explain it with help of an example?

13. What is a primary key and also write the difference between a primary key and a foreign key?

14. What are the advantages of RDBMS over DBMS?

15. What is a DBA and what are the responsibilities of DBA?

I. Compulsory Question

Out of remaining seven questions, answer any four questions.

Note: Question No. 1 is compulsory. Attempt any four question.

Time: Three Hours

Maximun Marks: 80

Paper: MCIT-306

DATA BASE MANAGEMENT SYSTEM