

Roll No.

IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
 Department of Applied Science and Humanities
 Sessional Test - 2 (2023-24)

Sem & Year: 1st / 1st

Session: 2023-24

Subject: Energy Science & Engg.

Code: TMC-102

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(1×5=5 Marks)

1. Which form of energy is associated with the motion of an object?
 d) Thermal energy e) Mechanical energy
 f) Chemical energy d) Nuclear energy
2. Atom bomb is based on the phenomena of
 e) Nuclear fission f) Nuclear fusion
 g) Radioactivity h) None of these
3. Why is a transparent cover used in a flat plate collector?
 e) To entirely reflect the incident sunlight back f) To minimize transmission of the incident sunlight into the box
 g) To maximize transmission of the incident sunlight into the box h) To ensure partially transmission of the incident sunlight into the box
4. Wind mill called as 'Darrieus' mill is
 e) Flexible boom mill f) Vertical axis mill
 g) Horizontal axis mill h) None of these
5. Bio ethanol is mixed with _____ to generate transportation fuel.
 e) Oil f) Diesel
 g) Kerosene h) Petrol

Part B

Attempt any five Questions

(2×5=10 Marks)

1. What is Biomass energy?
2. Classify the different forms of Energy.
3. Differentiate between Conventional and Non-conventional source of energy with examples.

4. What are the different components of the Hydroelectric energy?
5. Explain the working of Nuclear energy.
6. What is Fossil fuel? Discuss the advantages and disadvantages of using it.

Part C

Attempt any one Question

($1 \times 5 = 5$ Marks)

1. Describe in brief the working of a Solar cell.
2. Explain the different types of Geothermal source of energy production.

solar cell
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Institute of Engineering and Technology

Dr. Shakuntala Misra National Rehabilitation University, Lucknow
Department of Mechanical High-strengthessional Test-1

Sem & Year: Ist & Ist

Session: 2023-24

Subject: Manufacturing Process

Code: TES-104

Duration: 1:30 hours + 15 min per hour Extra time for VI students and
examinees with writer.

Max. Marks: 20

Section - A

Objective Questions

1. Answer all Questions.

(1×5=5Marks)

1. Which allowance is not provided on the "pattern" made for a casting?
a) Machining allowance b) Solidification allowance
c) Draft allowance d) Shrinkage allowance
2. The strength of steel increases with increasing carbon %age in the range:
a) 0-0.8% b) 1.2-2%
c) 0.8-1.2% d) all of these ranges
3. Aluminum alloys find use in aircraft industry because of:
a) High strength b) low sp. Gravity
c) good corrosion resistance d) good weldability.
4. "Alligatoring" is a defect associated with:-
(a) Forging process (b) casting process
(c) extrusion process (d) rolling process
5. Mild steel is an alloy of iron and carbon with % of carbon ranging from:
a) Up to 0.2% (b) 0.15-0.3% (c) 0.3-0.5 (d) above 0.5%

Section - B

Short Answer Questions

2. Answer any five Questions.

(2×5=10Marks)

1. Define Strength, & Malleability.

1. Define Manufacturing, & Manufacturing Process.
2. Define Resilience and Creep.
3. What is Pig iron & Cast Iron?
4. Define Casting. Write three advantage of Casting.
5. Define Pattern and Pattern Allowances.

Section - C
Descriptive Questions

3. Answer any one Questions.

(5×1=5Marks)

1. What do you understand by Engineering Materials? Classify Engineering materials and also Define Metal and Non Metals.
2. Define moulding sand and its types.

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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
Department of
Sessional Test - 1

Sem & Year: I & I

Session: 2023-2024

Subject: PPS

Code: TES-101

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions Attempt all questions (1×5=5 Marks)

1. Which of the following are components of central processing unit(CPU) ?

- a) Arithmetic logic unit ,mouse
- b) Arithmetic logic unit, control unit
- c) Arithmetic logic unit, integrated circuited circuits
- d) Control unit,monitor

2. High level language is assembly language?

- a) High level programming language
- b) Medium level programming language
- c) Low level programming language
- d) Machine language

3. In which of the following form,data is stored in computer?

- a) Decimal
- b) Binary
- c) Hexadecimal
- d) octal

4. 1 Mega byte is equal to

- a) 1024 Bytes
- b) 1024 kilo bytes
- c) 1024 giga bits
- d) 1024 bits

5. Who is father of c language

- a) Bjarne stroustrup
- b) Dennis Ritchie

- 2) James A gosling
3) Dr E F Codd

Part B

Attempt any Five Questions (2×5=10 Marks)

1. Explain types of error in c.
2. Explain data types in c.
3. Explain storage classes in c.
4. Explain the concept of compiler assembler interpreter loader and linker.
5. WAP that accepts the marks of 5 subjects and find the sum and percentage of students.
6. Explain the operator in c.

Part C

Attempt any one Questions (5×1=5 Marks)

1. What do you mean by algorithm and flowchart explain with example.

2 WAP to find weather a given number is even or odd.

Roll No 2 3 8 3 3 0 1 2 2

**IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow
Applied Science and Humanities Department
Sessional Test- I (2023 - 24)**

Sem & Year: 2nd & 1st

Session: 2023-24

Subject: Engineering Mathematics-II

Code: TBS-202

Duration: 90 Minutes

Max. Marks: 20

Part - A

Attempt all questions.

(4×1=4)

- 1) Find the partial differential equation of this equation $z = f(x^2 - y^2)$
 - a) $pq = z$
 - b) $yp = xq$
 - c) $yp = -xq$
 - d) None of these
- 2) Which of the following represents the steady state behavior of heat flow
 - a) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$
 - b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = c^2$
 - c) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = c$
 - d) NOTA
- 3) Inverse Laplace transform of a function $F(t)$ is $\frac{s}{s^2+4}$ then $F(t)$ is
 - a) $\sin 2t$
 - b) $\sin h 2t$
 - c) $\cos 2t$
 - d) $\cos h 2t$
- 4) $L\{u(t-2)\} = \dots$
 - a) e^{-2s}/s
 - b) $e^{-2s}/2s$
 - c) e^{-2s}/s^2
 - d) $e^{-2s}/4s^2$

Part - B

Attempt any two questions.

(2×3=6 Marks)

- | | |
|----|---|
| 1. | Solve $r + 2s + t + 2p + 2q + z = 0$. |
| 2. | Find the Laplace transform of $t^2 e^t \cos 4t$. |
| 3. | Classify the PDE $t \frac{\partial^2 u}{\partial t^2} + 2 \frac{\partial^2 u}{\partial x \partial t} + x \frac{\partial^2 u}{\partial x^2} + \frac{\partial u}{\partial x} = 0$. |

Part - C

Attempt any two questions.

(2 x 5 = 10 Marks)

- | | |
|----|---|
| 1. | Solve the equation by using Laplace transform
$\frac{d^3 y}{dt^3} + 2 \frac{d^2 y}{dt^2} - \frac{dy}{dt} - 2y = 0$, where $y = 1, \frac{dy}{dt} = 2$, at $t = 0$. |
| 2. | Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$, where $u(x, 0) = 6e^{-3x}$. |
| 3. | Solve $(D^3 - 3D^2 D' - 4DD'^2 + 12D'^3)z = \sin(y + 2x)$ |

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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
 Department of Electronics and Communication Engineering
 Mid Semester

Sem. & Year: 1st & 1st

Session: 2023-24

Subject: Fundamental of Electronics Engineering Code: TES-205

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions (1×4=4 Marks)

1. A semiconductor is formed by _____ bonds

(a) Covalent	(c) Electrovalent
(b) Co-ordinate	(d) None of the above
2. The most commonly used semiconductor is _____

(a) Germanium	(c) Sulfur
(c) Carbon	(d) Silicon
3. A semiconductor generally has _____ valence electrons

(a) 2	(c) 3
(b) 3	(d) 4
4. An n-type semiconductor is

(a) Positively charged	(c) Electrically neutral
(b) Negatively charged	(d) None of the above

Part B

Attempt any three Questions (2×3=6 Marks)

1. What do you understand the word electronics, write down its applications and advantages? Classify active and passive component? What is mass action law?
2. What is semiconductor, write down advantage of semiconductor? Classify the semiconductor based on conductivity and energy band gap.
3. Write down about Hall effect and its applications? Define charge neutrality principle?
4. What is reason behind manufacturer mostly prefer n-type Silicon semiconductor? Write down Einstein relationship between mobility and diffusion constant?

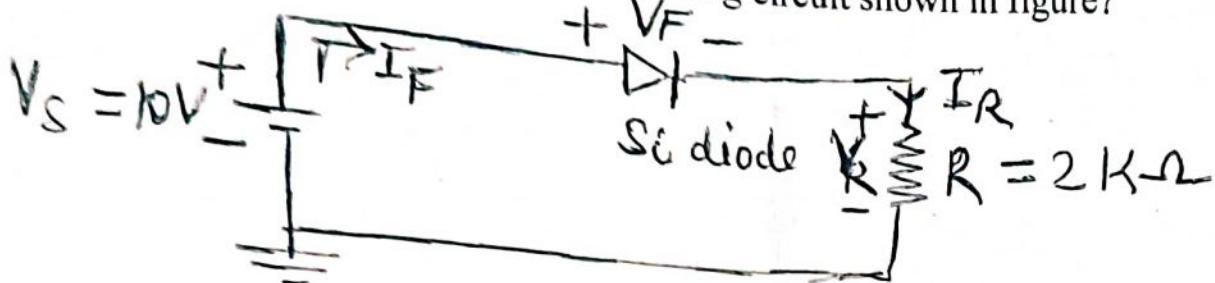
Attempt any two Questions

Part C

(5×2=10 Marks)

1. (a) Write down about pn junction mechanism, draw and Draw Voltage-current characteristics and its applications? Also write diode equations.

(b) What is current in the following circuit shown in figure?



2. Short notes on:

Figure

Conduction Band, Valence Band, Energy band gap, Diffusion, Concentration gradient, Doping, Mobility, drift velocity, Depletion width and Potential barrier

Or

An electric field of $100V/m$ is applied to a specimen of N-type semiconductor for which the hall co-efficient is $0.0145 m^3/coulomb$. Determine the current density in the specimen?

3. Short notes on:

Break down Voltage, Knee Voltage, drift current, diffusion current, thermal zig-zag current, Diffusion capacitance, Space Charge capacitance, Static resistance, dynamic resistance and charge neutrality principle.

Or

A piece of silicon at room temperature is doped with $2 \times 10^{16} /cm^3$ Concentration of boron atoms and $5 \times 10^{15} /cm^3$ of phosphorous atoms.

(a) Find the hole & electron concentration in this material.

(b) Is the silicon p or n type?

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**IET, Dr. Shakuntala Misra National Rehabilitation University,
Lucknow,
Department of Applied Science
Sessional Test - 1**

Sem & Year: 2nd Sem & 1st Year

Session: 2023-24

Subject: Engineering Physics

Code: Bas 201

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(4×1=4 Marks)

1. As the speed of a particle approaches the speed of light, the momentum of the particle
 - a) Increases
 - b) Decreases
 - c) Remains the same
 - d) Approaches to zero
2. What happens to the kinetic energy of a speedy proton when its relativistic mass doubles?
 - a) It doubles
 - b) It more than double
 - c) It less than doubled
 - d) Remains unchanged
3. The mass (m) of two particles X and Y are such that $m_X > m_Y$. If both the particles have the same de-Broglie wavelength, then
 - a) Their energies are not same
 - b) Their velocities are same
 - c) Their momentum are same
 - d) X has less energy than Y
4. which of the following is not the Maxwell equation for EM wave?
 - a) $\nabla \cdot \vec{D} = \rho$
 - b) $\nabla \cdot \vec{B} = -\mu_0 \vec{J}$
 - c) $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$
 - d) $\nabla \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$

Part B

Attempt any two Questions

(2 x 3=6Marks)

5. Show that the time dilation effect is a real effect.
6. Give Heisenberg uncertainty relation. Using the Heisenberg Uncertainty relation Find the radius of first Bohr's orbit.

7. State and prove the Pointing Theorem.

Part C

Attempt any two Questions (2 x 5=10Marks)

8. State and prove Einstein's Mass-Energy equivalence relation. Give any two experimental evidence that verify Einstein's Mass-Energy Equivalence relation.

9. Give Physical Significance of wave function ψ . Prove Schrödinger time-dependent wave equation.

10. Give the concept of displacement current. Show that EM waves in free space move with the speed of light.

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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
Department of
Sessional Test - 1

Sem & Year: 1st SEM (1st Year)

Session: 2023-24

Subject: Engineering Chemistry

Code: TBS 103

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(1×4=4 Marks)

1. A commonly used trivalent and pentavalent material is:
- a) Ga & Ge
 - b) Si & Ga
 - c) Al & As
 - d) Sb & Al
2. Value of 510 ppm in degree clark is
- a) 357
 - b) 35.07
 - c) 0.357
 - d) 3.57
3. F- Centre developed in case of
- a) Anion vacancy
 - b) cation vacancy
 - c) Schottky defect
 - d) Impurity defect
4. 40.5 ppm of $\text{Ca}(\text{HCO}_3)_2$ and 33.33 ppm CaCl_2 together produces hardness around ----- ppm
- a) 61
 - b) 57
 - c) 55
 - d) 64

Part B

Attempt any two Questions

(2×3=6 Marks)

1. Draw MO Diagrams of N_2^{+} and F_2^{-}
2. Calculate temporary and Permanent hardness of a water sample having 50 ppm CaSO_4 and 40 ppm $\text{Mg}(\text{HCO}_3)_2$ and 60 ppm MgCl_2 impurities.
3. Arrange in increasing order of bond dissociation energy and Calculate bond orders of C_2^{2-} , O_2^{2+} and Ne_2^{+}

Part C

Attempt any two Questions

($2 \times 5 = 10$ Marks)

- (i) Explain the setup and working of Zeolite Permutit method for water softening in detail.
- (ii) Discuss the %Composition, Manufacturing and setting of cement
- (iii) Write short notes on liquid Crystals and its type with examples.

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IET, Dr. Shakti Nalata Misra National Rehabilitation University, Lucknow,
 Department of Applied Science and humanities
 Sessional Test - 1

Sem & Year: 2nd SEM (1st Year)

Session: 2023-24

Subject: Engineering Chemistry

Code: TBS 203

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(1×4=4 Marks)

1. A commonly used pentavalent material is:

- a) Ga b) Si c) Al d) Sb

2. Value of 10 degree french in degree clark is

- a) 0.7 b) 0.07 c) 0.007 d) 7.0

3. F-Centre developed in case of

- a) Anion vacancy b) cation vacancy
 c) Schottky defect d) Impurity defect

4. Temporary and Permanent hardness of a water sample having 50 ppm CaCl₂ and 40 ppm Ca(HCO₃)₂ as impurities.

- a) 40.61 & 63.54 b) 45.04 & 24.69 c) 53.92 & 34.37 d) 64.23 & 31.76

Part B

Attempt any two Questions

(2×3=6 Marks)

1. Draw MO Diagrams and of N_2^+ , F_2^- and Ne_2^{2+}
 2. Explain Zeolite/ Permutit method for water softening in detail.
 3. Calculate bond orders CN^- , CO , B_2 , O_2^{2+} , N_2^- , O_2^{2-}

Attempt any two Questions Part C

(2×5=10 Marks)

- (i) Explain Phase rule based on water system.
 (ii) Discuss the %Composition, Manufacturing and setting of cement with equations.
 (iii) Write short notes on corrosion and its affecting factors.

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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow
Department of Mechanical Engineering

Sessional Test - 1

Sem & Year: IInd & Ist

Session: 2023-24

Subject: Manufacturing Science

Code: TES-204

Duration: 90 Minutes

Max Marks: 20

Part - A

Attempt all questions

(1x4=4 Marks)

1. In how many groups, cutting tool can be divided?
a) 2 b) 3
c) 4 d) none of the mentioned
2. Which type of job motion is there in drilling operations?
a) rotary b) translating
c) fixed d) none of the mentioned
3. Which of the following is not a part of carriage of the centre lathe?
a) Tool Post b) Compound rest
c) Apron d) Gear box Control
4. Aluminum alloys find use in aircraft industry because of:
a) High strength b) low sp. Gravity
c) good corrosion resistance d) Good weldability

Part - B

Attempt any two Questions

(2x3=6 Marks)

1. Define Ductility, Creep & Malleability.
2. Explain Manufacturing Process and Manufacturing system.
3. What is pig iron, cast iron & wrought iron?

Part - C

Attempt any two Questions

($2 \times 5 = 10$ Marks)

1. What do you understand by Engineering material? Classify each type of material used in manufacturing.
2. Describe casting and casting terms with neat sketch and application.
3. What is Pattern? Describe types of Patterns.

Roll No.

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Dr. Shakuntala Misra National Rehabilitation University, Lucknow
 Institute of Engineering and Technology
 Department of Applied Science and Humanities
 1st Sessional Examination- (2023-24)

Course Name: B.Tech.

Semester: 1st

Subject Name: Engineering Mathematics-I

Paper Code: TBS 102

Time - 1.5 Hrs + 15 minutes per hour extra time for V.I. & examinees with writer.
 Max Marks-20**Instructions:**

- The question paper consists of three sections namely A, B, and C. All sections are compulsory.
- Section A- Each question will carry 01 mark. All questions are compulsory.
- Section B- Answer any 5 out of 6 in the given questions with maximum fifty (50) words. Each question will carry 2 marks.
- Section C- Answer any 1 out of 2 in the given questions in maximum one hundred fifty (150) words. Each question will carry 5 marks.

Section - A**Objective Questions****1. Answer all the following questions**

5×1=05

(i) The A matrix A is said to be nilpotent if

a) $A^2 = 0$

b) $A^2 = I$

c) $A^2 = A$

d) $A^2 = 0$

(ii) If rank of matrix A is m and rank of matrix B is n then rank of matrix AB

a) $\text{rank}(AB) = mn$

b) $\text{rank}(AB) \geq \text{rank}(A)$

c) $\text{rank}(AB) \leq \text{rank}(B)$

d) $\text{rank}(AB) \leq$

$\min\{\text{rank}(A), \text{rank}(B)\}$

(iii) A square matrix A is called orthogonal matrix if (A' is called Transpose of matrix A)

a) $A' = A$

b) $A' = -A$

AA' = I

d) $AA' \neq I$

(iv) $\lim_{x \rightarrow 0} \frac{\sin x}{x} :$

a) 0

b) -1

c) 1

d) None of These

(v) Find $\frac{d^3y}{dx^3}$, when $y = 4x^3 + 4x + 2$

a) 24

b) 24x

c) 0

d) None of These

Section - B
Short Answer Type Questions

2

2. Answer any five of the following questions in maximum 50 words. $5 \times 2 = 10$

- (i) Find the nth differential co-efficient of $\cos(ax + b)$.
- (ii) State the Rolle's theorem and also write the Physical Significance.
- (iii) Investigate, for what value of λ and μ do the system of the equations have no solution $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$.
- (iv) Expand e^x in power of x by Maclaurin's theorem.
- (v) Difference between singular and non-singular matrix.

(vi) Find the rank of matrix
$$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$$
. (2) ✓

Section - C
(Descriptive Questions)

3. Answer any one question in maximum 150 words.

$1 \times 5 = 5$

- (i) If $y = e^{\cos^{-1} x}$, show that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + m^2)y_n = 0$. {55555555}
- (ii) Find the characteristic equation of the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and hence, {555} compute A^{-1} . Also find the matrix represented by $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$. {555}

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IET, Dr. Shakuntala Misra National Rehabilitation University,
Lucknow,

Department of Applied Science & Humanities
Sessional Test - 1 .

Sem & Year: 2nd / 1st

Session: 2023-24

Subject: Environmental Science

Code: TMC-201

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(1×4=4 Marks)

1. Which of these layers of the atmosphere consists of the ozone layer that is responsible for absorbing the Ultra-Violet (UV) light?
a) Troposphere b) Mesosphere
c) Stratosphere d) None of these
2. _____ is an example of an ex-situ conservation.
a) Sacred groves b) Seed bank
c) Wildlife sanctuary d) National park
3. Who discovered the term 'ecosystem'?
a) E P Odum b) Elton
c) Arthur G Tansley d) Norman Myers
4. How many total numbers of biodiversity hotspots are there in the world?
a) 36 b) 32
c) 28 d) 18

Part B

Attempt any two Questions

(2×3=6 Marks)

1. What do you understand by Environmental Science?
What is the scope of studying Environmental Science?
2. Differentiate between food chain and food web.
3. What is Green Chemistry? Give in details about its goals.

21

Part G

Attempt any two Questions

($2 \times 5 = 10$ Marks)

1. What are the different segments of the Earth? Explain
2. Explain the ecosystem and its basic concept.
3. Name the ten biogeographic zones of India.

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ET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
Department of Applied Science and humanities
Sessional Test - 1

em & Year: 2nd SEM (1st Year)
ubject: Professional Communication
uration: 90 Minutes

Session: 2023-24
Code: THS 201
Max. Marks: 20

Part A

Attempt all questions (1×4=4 Marks)

1. Communication with self is called-

- a) Interpersonal Communication b) Intrapersonal Communication
c) Extrapersonal Communication d) Intercultural Communication

2. Communication by Eyes is called-

- a) Oculistics b) Chronemics c) Self-respect d) Kinesics

3. What does a foreign word, "coup d' grace" mean in English.

- a) At whatever cost b) Finishing stroke c) Homogenous d) Spoiled child

4. What is the synonym of the word, "Abhor".

- a) Hate b) Receive c) Achieve d) Endure

Part B

Attempt any two Questions (2×3=6 Marks)

1. What is Listening and how does it differ from Hearing?

2. What are the barriers of Communication? Elucidate

3. Define the following-

- a) Kinesics b) Proxemic

↓

facial expression

Part C

Attempt any two Questions

(2×5=10 Marks)

1. What is Word Formation and its methods?

2. What is LSRW and the role communication in our lives. How does it affect us professionally?

3. What are different types of communications? Explain

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IET, Dr. Shakuntala Misra National Rehabilitation University,
Lucknow,
Department of Applied Science & Humanities
Sessional Test - 1

Sem & Year: 2nd / 1st

Session: 2023-24

Subject: Energy Science & Engineering

Code: TMC-202

Duration: 90 Minutes

Max. Marks: 20

Part A

Attempt all questions

(1×4=4 Marks)

1. Which reactor consists of both fertile and fissile material?
a) Fast breeder reactor b) Pressurize water reactor
c) Boiling Water reactor d) Converter reactor
2. Which is the type of energy where the energy is harnessed by the heat accumulated on the surface of water?
a) Wind energy b) Wave energy
c) Ocean thermal energy conversion d) Solar energy
3. What type of energy is biomass energy?
a) Conventional energy b) Non renewable
c) Commercial energy d) Sustainable energy
4. Which kind geothermal plant is most common type?
a) Dry steam b) Flash
c) Binary d) Wet steam

Part B

Attempt any two Questions

(2×3=6 Marks)

1. Classify between primary and secondary source of energy.
2. What is Fossil fuel? Discuss its advantages and disadvantages.
3. Explain the difference between nuclear fission and fusion process.

Part C

Attempt any two Questions

1. What are the different forms of Energy? Explain with example. $(2 \times 5 = 10 \text{ Marks})$
2. How the energy is produced from the biomass source.
3. Explain the working of a solar cell.

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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow
 Department of Mechanical Engineering
 Sessional Test - 1

Semester & Year: 2nd & 1st Year
 Subject: Engineering Mechanics
 Duration: 90 Minutes

Session: 23-24
 Code: TES 203
 Max. Marks: 20

Part A

Attempt all questions

(1×4=4 Marks)

1. If a body weighing 200 N rests on a plane inclined at 45° to the horizontal, the component parallel to the plane is
 - a) 50 N
 - b) 86.6 N
 - c) 141.4 N
 - d) 60 N
2. In a simply supported beam of 8m span an 80 KN-m moment is acting at a distance 2m from support A. In this beam reaction at support A is
 - a) 10 KN
 - b) 16 KN
 - c) 30 KN
 - d) 75 KN
3. On a simply supported beam of span L load varies linearly from zero at end A to P at end B. Then the reaction at A is
 - a) $\frac{1}{3} PL$
 - b) $\frac{1}{6} PL$
 - c) $\frac{1}{3} PL^2$
 - d) $\frac{1}{6} PL^2$
4. The law stating that the algebraic sum of moments of a system of coplanar forces about a moment center is equal to the moment of their resultant force about the same moment center is known as
 - a) Lami's theorem
 - b) D'Alembert's principle
 - c) Varignon's theorem
 - d) Law of transmissibility

Part B

Attempt any two Questions

(2×3=6 Marks)

1. Determine the reactions at A, B and D of the compound beam shown in Fig.1. Neglect the self-weight of the members.

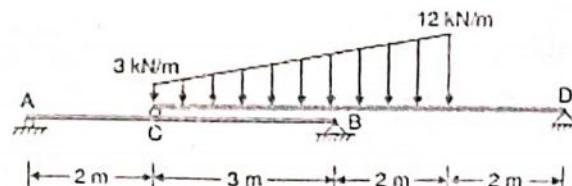


Fig.1

Q2.

Three bars, hinged at A and D and pinned at B and C as shown in Fig. 2 form a four-linked mechanism. Determine the value of P that will prevent movement of bars.

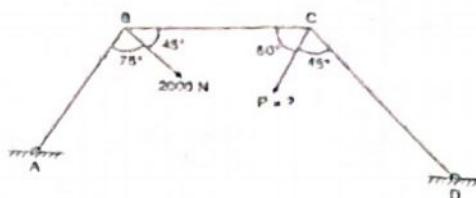


Fig.2

3. Differentiate between center of gravity and centroid. Under what conditions will they coincide? State triangle law and polygon law of forces.

Attempt any two Questions

Part C

(2×5=10 Marks)

1. Analyse the truss shown in Fig.3. All members are 3m long.

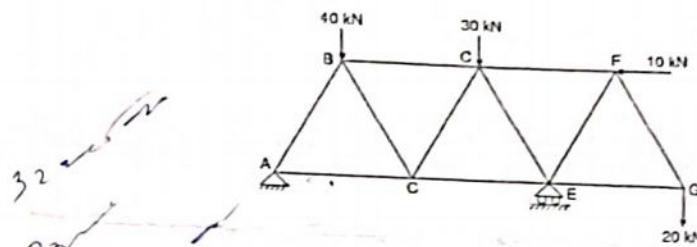


Fig.3

2. The bar shown in Fig.4 is tested in universal testing machine. It is observed that at a load of 40 KN and the total extension of the bar is 0.280 mm. Determine the Young's modulus of the material.

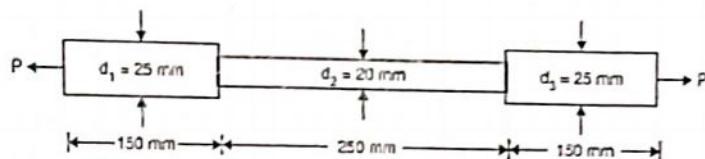


Fig.4

3. Explain the method of section and method of joint for pin connected plane frames.

Roll No. _____

NET, Dr. Shakuntala Mishra National Rehabilitation University, Lucknow
Department of Applied Science and Humanities
MID SEMESTER EXAMINATION

Sem & Year: III A

Duration: 30 Min

Subject Code: Programming for Problem Solving /TES-201

Session: 2023-24

Max Marks: 20

Part - A



(4x1=4 Marks)

1. Attempt all questions.

(i) Who is the father of C language?

- a) Steve Jobs b) James Gosling c) Dennis Ritchie d) Rasmus Lerdorf

(ii) What is the result of logical or relational expression in C?

- a) True or False b) 0 or 1
c) 0 if an expression is false & any positive number if an expression is true d) None of the mentioned

(iii) What is #include <stdio.h>?

- a) Preprocessor directive b) Inclusion directive
c) File inclusion directive d) None of the mentioned

(iv) scanf() is a predefined function in _____ header file.

- a) stdlib.h b) ctype.h c) stdio.h d) stdarg.h

Part - B

(2X3=6 Marks)

2. Answer any two questions.

(i) What is C programming? Write the basic structure of C program in detail.

(ii) Explain arithmetic operator and relational operator with help of program.

(iii) Explain Storage class. Also describe various data types with their memory size.

Part - C

(2X5=10 Marks)

3. Attempt any two questions.

(i) What is Computer? Explain various Components of Computer.

(ii) What do you understand by language processor? Differentiate between Assembler, Compiler and Interpreter.

(iii) Explain the concept of Algorithm, Flow Chart and Pseudo code with the help of example.

Dr. Shakuntala Misra National Rehabilitation University, Lucknow
1st Sessional examination 2022-23

Course Name: - B.Tech (1st Year)
Paper Name: -Basic. electrical engg.

Semester: -I
Paper Code: -TES 102

Time - 1Hrs + 15 minutes per hour extra time for V.I. & examinees with writer. Max Marks-20

समय- 1 घण्टे+ 15मिनटप्रति घण्टेअतिरिक्त-दृष्टिबाधित एवंसहलेखकपरीक्षार्थियों के लिए। अधिकतम अंक-20

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 01 marks. All questions are compulsory.
- Section B- Answer any 5 out of 6 given questions in maximum hundred (50) words. Each question carries 2 marks.
- Section C- Answer any 1 out of 2 given questions in maximum onehundred fifty (150) words. Each question carries 5 marks.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व सा हैं। रामी खण्ड अनिवार्य हैं।
- खण्ड-अ में प्रत्येक प्रश्न 1 अंक का है। रामी प्रश्न अनिवार्य हैं।
- खण्ड-ब में 6 प्रश्नों में से किन्हीं 5 प्रश्नों के उत्तर अधिकतम पचास (50) शब्दों में दें। प्रत्येक प्रश्न 2 अंक का है।
- खण्ड-स में 2 प्रश्नों में से किरी 1 प्रश्न के उत्तर अधिकतम एक सौ पचास(150) शब्दों में दें। प्रत्येक प्रश्न 5 अंक का है।

Section – A (खण्ड-अ)**Objective Questions (वस्तुनिष्पत्ति)****1. Answer allthe following questions.****5×1=05**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

- (i) What is responsible for the current to flow?
 a) Protons b) Electrons
 c) Nucleus d) Protons and Electrons
- (ii) Internal resistance of ideal voltage source
 a) 0 b) infinite
 c) Constant d) none
- (iii) Internal resistance of the ideal current source
 a) 0 b) infinite
 c) Constant d) none
- (v) Transformer operate in case of
 a) AC b) DC
 c) both a & b d) none
- (v) Constant loss in transformer is
 a) Core loss b) copper loss
 c) Both a & b d) none

$$\begin{aligned} Z &= 1400 \\ P &= 4 \end{aligned}$$

Section – B (खण्ड-ब)

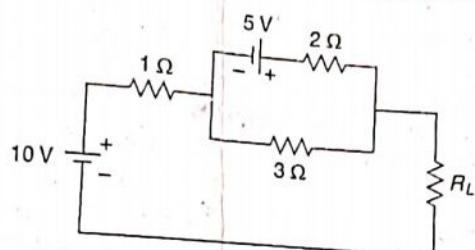
Short Answer Questions (लघुज्ञातीय प्रश्न)

2. Answer any five of the following questions in maximum 50 words.

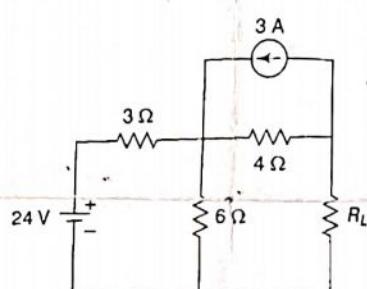
$5 \times 2 = 10$

निम्नलिखित में से किन्हीं 5 प्रश्नों के उत्तर अधिकतम 50 शब्दों में दें।

- (i) Write Practical voltage source and a practical current source with proper circuit notation.
- (ii) Define Kirchhoff's Current Law and Kirchhoff's Voltage Law.
- (iii) Write final equation for Star to Delta Transformation.
- (iv) Derive maximum power transfer theorem having a voltage source V and internal resistance R_1 and series load resistance R_2
- (v) State Thevenin's theorem and Find the Thevenin's equivalent circuit across R_L , in given below circuit.



(vi) State Norton's theorem and Find the Norton's equivalent circuit across R , in given below circuit



Section – C (खण्ड-स)
Descriptive Questions (विवरणात्मकप्रश्न)

3. Answer any 01 question of the following question in maximum 150 words.

$1 \times 5 = 05$

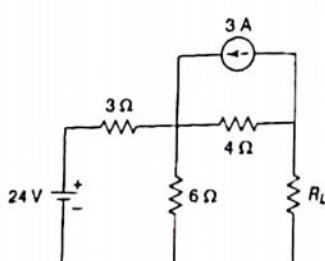
निम्नलिखित में से किन्हीं 1 प्रश्न के उत्तर अधिकतम 150 शब्दों में दें।

- (i) (a) Draw the equivalent circuit diagram of the transformer with proper nomenclature.

(b) Draw the BH curve and explain nonlinear and saturation.

- (ii) (a) Differentiate between the electrical circuit and magnetic circuit?

(b) Find the maximum power transfer through resistance RL



54 9
54 4
26.6 6.6
15.8 4
1.7 4.2 4
29.04

Roll No.	2	3	8	3	3	0	1	2	2
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IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
Department of Electrical Engineering
Sessional Test - I

Sem & Year: II & I

Subject: Basic Electrical Engineering

Duration: 90 Minutes

Session: 2023-2024

Code: TES 202

Max. Marks: 20

Part A

Attempt all questions

(4×1=4 Marks)

- A 10 watt resistor has a value of 120Ω . What is the rated current through the resistor?

a) 0.218 A
✓ b) 0.197 A
✓ c) 0.288 A
✓ d) 0.135 A
- Three 2 ohm resistors are connected to form a triangle. The resistance between any two corners is

a) 6Ω
✓ b) 2Ω
✓ c) $3/4\Omega$
✓ d) $4/3\Omega$
- Power factor of pure inductor is

a) 1
✓ b) 0
✓ c) depends on magnitude of L
✓ d) Infinite
- Form Factor is the ratio of

a) average value/ r.m.s. value
✓ b) average value/ peak value
✓ c) r.m.s. value/ average value
✓ d) r.m.s. value/ peak value

Part B

Attempt any two Questions

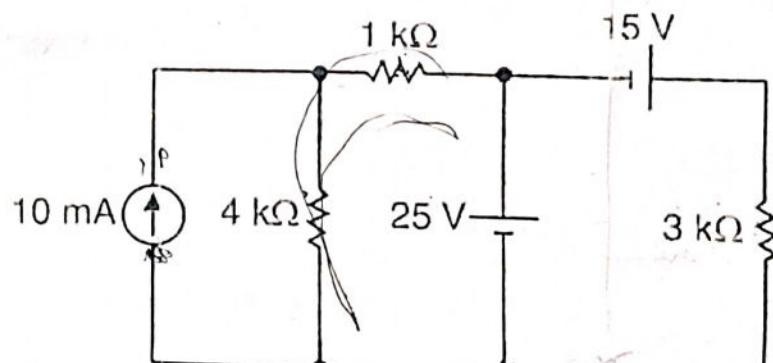
(2×3=6 Marks)

- Using the superposition principle, find the voltage across $1k\Omega$ resistor in Fig. Assume the sources to be ideal.

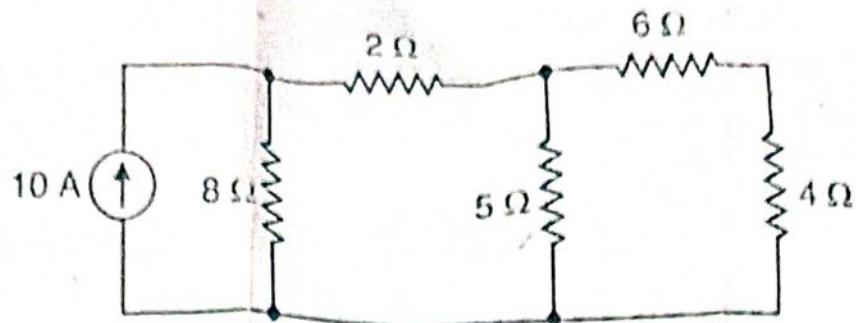
$$\left(\frac{4 \times 1}{4+1} \right) \times 10 = 8V$$

$$V_1 = IR = 8 \times 1 = 8V$$

$$V_2 =$$



2. Using Norton's theorem, calculate the current in the $5\ \Omega$ resistor in the circuit shown in Fig.



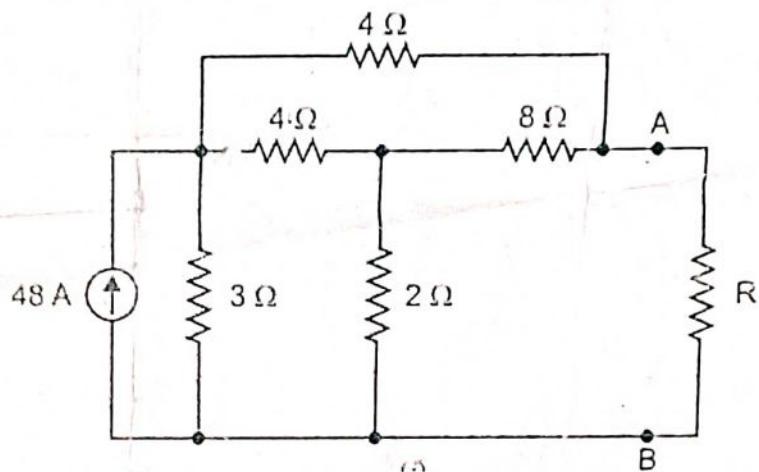
3. Three coils, each having a resistance of $20\ \Omega$ and an inductive reactance of $15\ \Omega$, are connected in star to a 400 V , 50 Hz supply. Calculate (i) the line current (ii) power factor and (iii) power supplied.

Part C

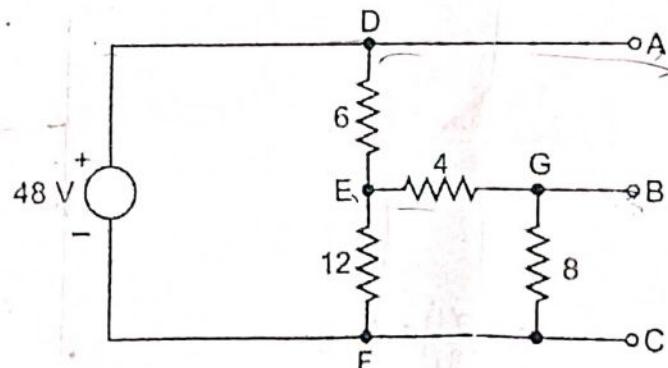
Attempt any two Questions

($2 \times 5 = 10$ Marks)

1. In the network shown in Fig. find Norton equivalent circuit at terminals AB, and the maximum power that can be provided to a resistor R connected between terminals A and B



2. Calculate the values of V_{Th} and R_{Th} between terminals A and B in Fig. All resistances are in ohms.



3. Explain the resonance in series A.C. circuit in terms of graphical explanation, resonance curve, Q-factor and bandwidth.