Roll No.									

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 $Ca(HCO_3)_2$ 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 $Mg(HCO_3)_2$ and 60 ppm MgCl2s impurities.
3. Arrange in increasing order of bond dissociation energy and Calculate bond orders of C_2^{2-}, O_2^{2+} and Ne_2^+

(134)

Part C

Attempt any two Questions **(2×5=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.

Roll No.									

IET, Dr. ShakuntalaMisra 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 bytyes
c) 1024 giga bits
d) 1024 bits

5. Who is father of c language
a) Bjarne stroustrup
b) Dennis ritchie
c) James A gosling
d) 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.									

Institute of Engineering and Technology
Dr. Shakuntala Misra National Rehabilitation University, Lucknow
Department of Mechanical High-strengthessional Test–1

Sem & Year: Ist & 1st **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.

2. Define Manufacturing, & Manufacturing Process.
3. Define Resilience and Creep.
4. What is Pig iron & Cast iron?
5. Define Casting. Write three advantage of Casting.
6. 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.

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?

a) Thermal energy b) Mechanical energy
c) Chemical energy d) Nuclear energy

2. Atom bomb is based on the phenomena of

a) Nuclear fission b) Nuclear fusion
c) Radioactivity d) None of these

3. Why is a transparent cover used in a flat plate collector?

a) To entirely reflect the incident sunlight back b) To minimize transmission of the incident sunlight into the box
c) To maximize transmission of the incident sunlight into the box d) To ensure partially transmission of the incident sunlight into the box

4. Wind mill called as 'Darrieus' mill is

a) Flexible boom mill b) Vertical axis mill
c) Horizontal axis mill d) None of these

5. Bio ethanol is mixed with _____ to generate transportation fuel.

a) Oil b) Diesel
c) Kerosene d) 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 **(1×5=5 Marks)**

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

Roll No.									

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 sectio are compulsory.
- Section A- Each question will carries **01** mark. All questions are compulsor
- Section B- Answer any **5 out of 6** in the given questions with maximum **fi (50) words**. Each question will carries **2 marks**.
- Section C- Answer any **1 out of 2**in the given questions in maxim **onehundred fifty (150) words**. Each question will carries **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) $A^2 = O$

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

a) $rank(AB) = mn$ b) $rank(AB) \geq rank(A)$
c) $rank(AB) \leq rank(B)$ d) $rank(AB) \leq \min\{rank(A), rank(B)\}$

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

a) $A' = A$ b) $A' = -A$
c) $AA' = I$ d) $AA' \neq I$

(iv) $\lim_{x-0} \frac{sinx}{x}$:

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. Answer any five of the following questions in maximum 50 words. 5×2=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 $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$.

Section – C

(Descriptive Questions)

3. Answer *any one* question in maximum 150 words. 1×5=05

(i) If $y = e^{\cos^{-1}x}$, show that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + m^2)y_n = 0$.

(ii) Find the characteristic equation of the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and hence, compute A^{-1}. Also find the matrix represented by $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$.

Roll No. | | | | | | | | | | |

IET, Dr. ShakuntalaMisra National Rehabilitation University, Lucknow

Department of Applied Science and Humanities

Sessional Test – 1

Sem & Year: I & I **Session: 2023-24**

Subject: Basic Electrical Engineering **Code: TES 102**

Duration: 90 Minutes **Max. Marks: 20**

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer allthe following questions. **5×1=05**

(i) A passive element in a circuit is one which.....
   a. receives energy
   b. supplies energy
   c. both supplies and receives energy
   d. none of the above

(ii) A linear circuit is one whose parameters (e.g. resistances etc.) .....
   a. do not change with voltage and current
   b. change with change in current
   c. change with change in voltage
   d. none of the above

(iii) KCL is based on the fact that
   a. There cannot be an accumulation of charge at a node.
   b. There is a possibility for a node to store energy.
   c. Charge accumulation is possible at node
   d. Charge accumulation may or may not be possible.

(iv) All _____ are loops but _____ are not meshes
   a. Meshes, loops
   b. Loops, Meshes
   c. Branches, loops
   d. Nodes, Branches

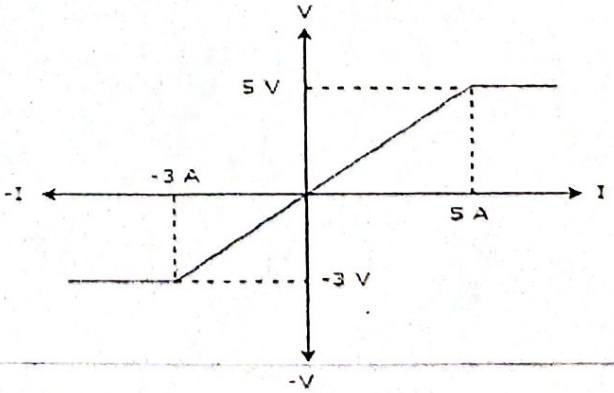
(v) Resistance of a wire is yΩ. The wire is stretched to triple its length, then the resistance becomes _
   a. 3y
   b. 6y
   c. y/3
   d. y/6

Section – B (खण्ड–ब)

Short Answer Questions (लघुउत्तरीय प्रश्न)

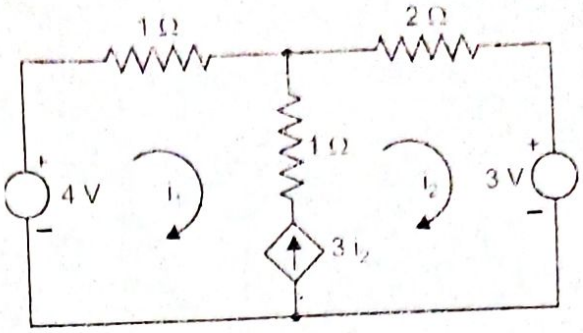
2. Answer any five of the following questions in maximum 50 words. **5×2=10**

(i) The V-I characteristics of a network element is shown here. Verifying the network element on the basis of Active Elements and Passive Elements; Linear Elements and Non-linear Elements; Bilateral Elements and Unilateral Elements; Lumped Elements and Distributed Elements.



(ii) Explain and discuss in detail the Star–to-Delta and Delta-to-Star Transformations equations for Resistive Networks.

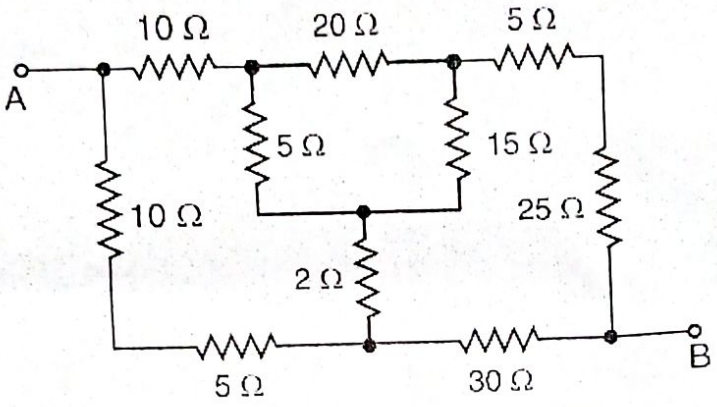
(iii) Find mesh currents i_1 and i_2 in the electric circuit shown in Fig.



(iv) Write down the statement and procedure of Norton theorem.

(v) Write down the statement and procedure of Superposition theorem.

(vi) Determine the resistance between the terminals A and B of the network shown in Fig.

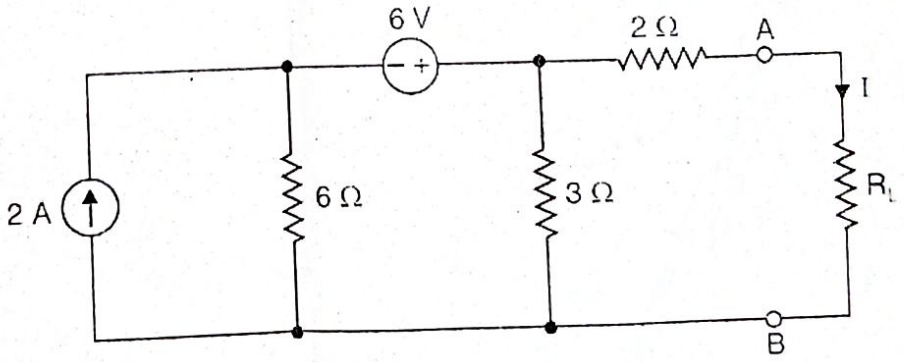


Section – C (खण्ड–स)

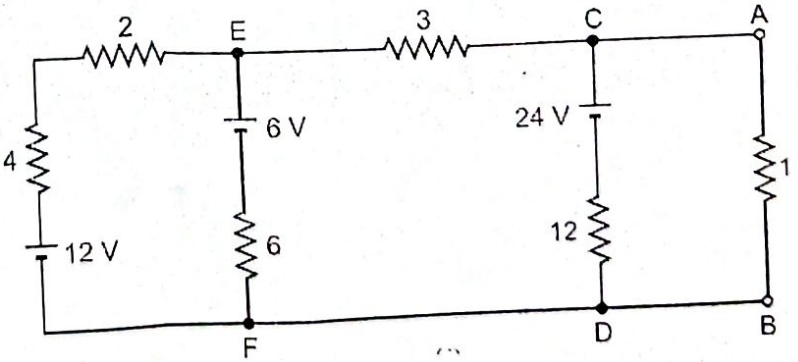
Descriptive Questions(विवरणात्मकप्रश्न)

3. Answer any 01 question of the following question in maximum 150 words. **1×5=05**

(i) Find Thevenin's equivalent circuit to the left of terminals AB in Fig.



(ii) Using Norton's theorem, find current through 1Ω resistor in Fig. All resistances are in ohms,



SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.Tech(CSE, ME, CE, EE, ECE) **Semester:- First**

Paper Name: - Engineering Mathematics-I **Paper Code: - TBS-102**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। **अधिकतम अंक–70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks.**

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**
निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) The 4^{th}differential co-efficient of the $sin(ax+b)$

a) $y_4 = a^4 sin(ax+b+\frac{n\pi}{2})$

b) $y_4 = a^4 \cos(ax+b+\frac{n\pi}{2})$

c) $y_4 = a^4 sin(ax+b+2\pi)$

d) $y_4 = a^4 \cos(ax+b+2\pi)$

ii) Find the rank of matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 7 \\ 3 & 5 & 10 \end{bmatrix}$

a) 1

b) 2

c) 3

d) None

iii) The value of $\Gamma\left(\frac{-1}{2}\right)$ is

a) $-2\sqrt{\pi}$

b) $2\sqrt{\pi}$

c) $-\sqrt{\pi}$

d) $\sqrt{\pi}$

iv) If $\vec{r} = x\hat{\imath} + y\hat{\jmath} + z\hat{k}$ then $grad\ r$ is

a) $\frac{\vec{r}}{r}$

b) $\frac{\vec{r}}{r^3}$

c) $-\frac{\vec{r}}{r}$

d) $-\frac{\vec{r}}{r^3}$

v) The degree and order of differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y = 0$

a) 2, 1

b) 1, 2

c) 1, 3

d) 3, 1

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. Find the rank of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{bmatrix}$; a, b, c being all real.

ii. Solve: $(D^2 - 2D + 1)y = xe^x \sin x$.

iii. If $\vec{F}(x, y, z) = xz^3\hat{\imath} - 2x^2yz\hat{\jmath} + 2yz^4\hat{k}$, find the divergence and curl of $\vec{F}(x, y, z)$.

iv. State the Rolle's theorem and expand $\tan x$ by Maclaurin's Theorem as for as x^5.

v. Show that $\beta(p, q) = \int_0^1 \frac{x^{p-1}+x^{q-1}}{(1+x)^{p+q}} dx$

vi. Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -1 & 0 \end{bmatrix}$.

vii. If $f(x) = \frac{x}{1+e^{1/x}}$, $x \neq 0$ and $f(0) = 0$, then show that the function is continuous but not differentiable at $x = 0$.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) (a) State and Proof Legendre's duplication formula.

(b) If $y = (\sin^{-1} x)^2$, prove that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - n^2y_n = 0$.

ii) Verify divergence theorem for $\vec{F} = 4xz\hat{\imath} - y^2\hat{\jmath} + yz\hat{k}$ taken over the cube bounded by the lines $x = 0, x = 1, y = 0, y = 1, z = 0, z = 1$.

iii) Find the characteristic equation of the symmetric matrix. $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and verify that is satisfied by A and hence obtain A^{-1}. Express

(a) $A^6 - 6A^5 + 9A^4 - 2A^3 - 12A^2 + 23A - 9I$

(b) $A^5 - 5A^4 + 3A^3 + 6A^2 - 6A + 2I$

as linear polynomial in A.

SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.Tech **Semester:- 1st**

Paper Name: - Engineering Chemistry **Paper Code:- TBS 103**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory**.
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks**.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न ***10 अंक*** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Correct Bond length increasing order is,

a) $O_2^- < F_2 < N_2 < C_2$

b) $N_2 < F_2 < O_2^- < C_2$

c) $N_2 < C_2 < O_2^- < F_2$

d) $F_2 < C_2 < O_2^- < N_2$

ii) No of Pi electrons , magnetic character, unpaired electrons and magnetic moment in F_2

a) 2, Paramagnetic,2 and 2.5

b) 1, Diamagnetic, 0 and $\sqrt{8}$

c) 2, Paramagnetic,2 and 2.8

d) 2, Diamagnetic,1 and $\sqrt{3}$

iii) Degree of hardness caused by 50 ppm $CaCl_2$ is

a) 45.0 mg/L permanent

b) 43.2 mg/L permanent

c) 50.7 mg/L temporary

d) 12.3 mg/L permanent

iv) Correct relation is,

a) Animal lubricant ↔ castor oil

b) Graphite ↔ 450 degree centigrade

c) Soda lubricant ↔ water repellent

d) MoS_2 and BN ↔ semisolid lubricant

v) Semiconductors used as electrically supportable materials, most likely because they have
   a) whole
   b) electrons
   c) p-n junction
   d) strength

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. Write the percentage composition of Portland cement.
ii. Explain electrochemical theory of corrosion and different types of corrosion.
iii. Give the structure of monomers of all listed polymers.
Nylon 6, Nylon 66, Buna-S, Buna-N, PAN, Bakelite, Polyethene.
iv. Give five difference between Addition and Condensation Polymers/ Polymerisation.
v. What are lubricants? How its uses can increase industry efficiency? What the properties of a good lubricant.
vi. Draw MO diagram and calculate bond order of O_2^+, F_2^{++}, N_2^{--}
vii. Calculate total hardness of a water sample containing 15 mg $CaCO_3$, 25 mg $MgCl_2$, 30 mg $MgSO_4$ and 50 mg $CaHCO_3$. Express hardness value in degree Clark and degree French.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) Draw phase diagram of water system as according to phase rule based on curve and area.
ii) What are liquid crystals? Classify them on the basis of properties owned by respective mesogens.
iii) Explain Zeolite and Ion exchange method for softening hard water with detail of softening and regeneration

.....

SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.Tech **Semester: - I**

Paper Name: - Basic Electrical Engineering **Paper Code: - TES 102**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks.**

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions (वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) KCL is based on the fact that

a. There is a possibility for a node to store energy.
b. There cannot be an accumulation of charge at a node.
c. Charge accumulation is possible at node
d. Charge accumulation may or may not be possible.

ii) The source of a magnetic field is

a. an isolated magnetic pole
b. static electric charge
c. magnetic substances
d. current loop

iii) Power factor of the following circuit will be zero

a. Resistance
b. Inductance
c. Capacitance
d. Both (b) and (c)

iv) What is the principle of torque production in a dc machine?

a. Lorentz's law
b. Lenz's law
c. Faraday's law
d. Self-inductance

v) What is the principal on which MCB (Miniature circuit breaker) works

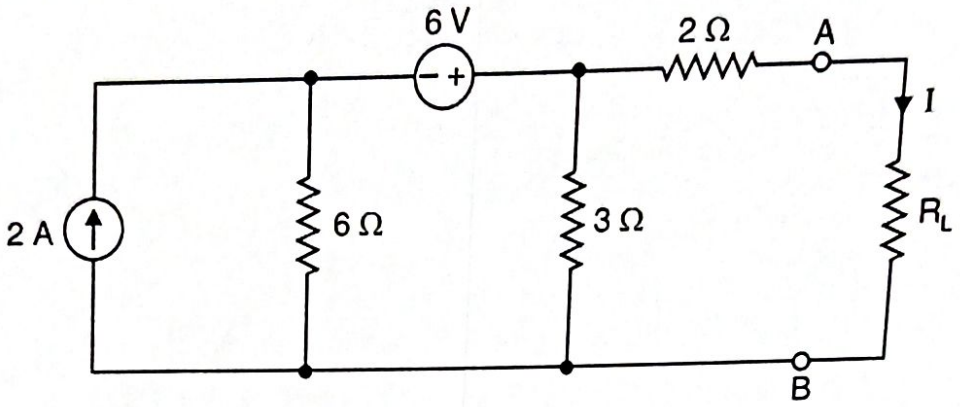
a. Lenz law
b. Faradays law of electric current
c. Magnetic effect of electric current
d. All of the above

Section - B (खण्ड–ब)

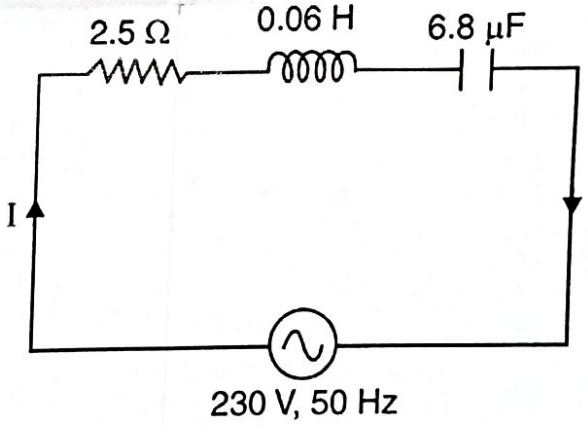
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. Find Thevenin's equivalent circuit to the left of terminals AB in Fig.



ii. In figure, 230 V, 50 Hz a.c. supply is applied to a coil of 0.06 H inductance and 2.5W resistance connected in series with a 6·8 μF capacitor. Calculate (i) impedance (ii) current (iii) phase angle between current and voltage, (iv) power factor and (v) power consumed.



iii. A series RLC circuit has R = 5 W, L = 0.2 H and C = 50 μF. The applied voltage is 200 V. Find (i) resonant frequency (ii) Q-factor (iii) bandwidth (iv) upper and lower half-power frequencies (v) current at resonance (vi) current at half-power points (vii) voltage across inductance at resonance

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

v. Explain the Ferromagnetism. Also explain the B-H hysteresis curve point by point with proper figure.

vi. Explain the autotransformer with proper figure in detail.

vii. Write down the working principle, operation, and advantages of Miniature Circuit Breaker (MCB).

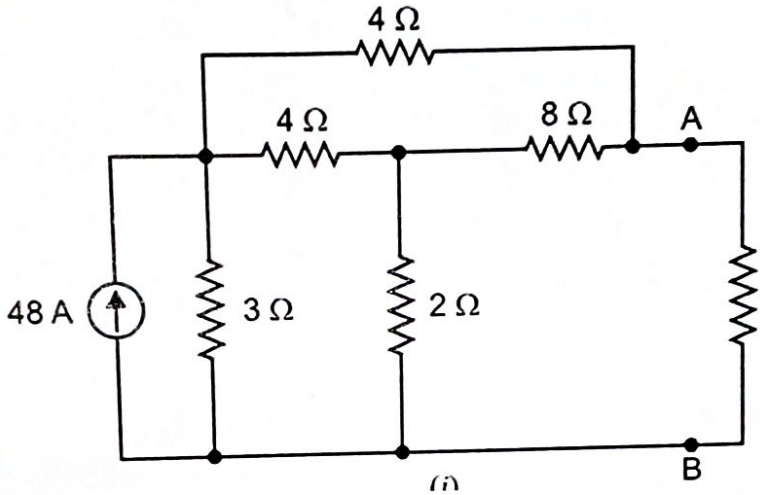
Section - C (खण्ड–स)

Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**

निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) In the network shown in below figure, find (i) Norton equivalent circuit at terminals AB (ii) the maximum power that can be provided to a resistor R connected between terminals A and B.



(i)

ii) Three coils, each having a resistance of 20 W and an inductive reactance of 15 W, are connected in star to a 400 V, 3-phase, 50 Hz supply. Calculate (i) the line current (ii) power factor and (iii) power supplied. Also, draw phasor diagram.

iii) Explain in detail the working or operating Principle of DC Motor along with all proper diagrams.

SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.Tech (CSE/CE) **Semester: - I[st]**

Paper Name: - Manufacturing Process **Paper Code: - TES-104**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। **अधिकतम अंक–70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark**. **All questions are compulsory**.
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks**.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Brass is an alloy of-

a) copper and zinc
b) tin and zinc
c) copper and tin
d) copper and Al.

ii) A "die" is used in-

a) casting process
b) extrusion process
c) forging process
d) all of these.

iii) What is 'swing' of a centre lathe?

a) It is the length of the bed
b) It denotes the diameter of the job being machined
c) It is the length of cross slide movement
d) None of these.

iv) For machining a mild steel work piece using carbide tool, the maximum material will be removed at a temperature of-

a) 50°C
b) 100°C
c) 175°C
d) 275°C

v) Thermit welding is a form of-
   a) fusion welding
   b) gas welding
   c) arc welding
   d) resistance welding

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i) Draw stress-strain curve for a ductile material and brittle material. Describe all the terms of both curve.

ii) Define the following terms:
(*i*) Stiffness, (*ii*) Toughness, (*iii*) Hardness, (*iv*) Creep, and (*v*) Fatigue

iii) What is steel? How is it different from iron? Differentiate between plain carbon steels and alloy steels.

iv) Describe hot working and cold working with their advantage and Disadvantage.

v) Describe different types of welding joints and welding positions with neat sketch.

vi) What do you understand by the term 'Pattern'? Describe pattern allowances and their types.

vii) Define the term 'Machining' and also classify machining process. Describe machine tool and their types.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) Describe Construction of lathe machine with neat sketch. Write different operations that can perform on lathe machine.

ii) Define casting and explain the term used in casting with neat sketch. Write advantage and application of casting.

iii) Explain soldering and brazing methods with neat sketch. Also write seven difference between soldering and brazing methods.

SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.TECH **Semester:- I**

Paper Name: - Programming for Problem Solving **Paper Code:- TES-101**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। **अधिकतम अंक–70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark**. **All questions are compulsory**.
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks**.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**

(i) C language was invented in which laboratories.

(a) Uniliver Labs
(b) IBM Labs
(c) AT&T Bell Labs
(d) Verizon Labs

(ii) **An Identifier can start with.?**

(a) Alphabet

(b) Underscore (_) sign

(c) Any character that can be typed on a keyboard

(d) Option A & Option B

(iii) What is the default C Storage Class for a variable.?

(a) static

(b) auto

(c) register

(d) extern

(iv)What is the priority of operators *, / and % in C language.?

(a) * > / > %

(b) % > * > /

(c) Both % = / , * are same

(d) All three operators *, / and % are same.

(v).A function which calls itself is called a ___ function.

(a) Self Function

(b) Auto Function

(c) Recursive Function

(d) Static Function

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

(i) .Write a program to find Factorial of a number?

(ii). What is the difference between Compiler and Interpreter and also explain the concept of assembler?

(iii). Explain Data Types in C?

(iv).What do you mean by array? Explain the types , advantages and Limitations of Array?

(v).Write short notes on Storage class in c ?

(vi).Write Difference between the For ,While and do-While loop .?

(vii).Explain headers files in c ?

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

(i).Explain the concept of pointers?

(ii).Explain the concept of Flow chart and symbol used in flow chart? Also draw the flow chart to check the number is positive or negative.

iii).Explain dynamic memory allocation concept with proper example.

SEMESTER EXAMINATION DECEMBER-2023

Course Name: - B.Tech **Semester:- 1st**

Paper Name: - Energy Science & Engineering **Paper Code:- TMC-102**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय–3 घण्टे+ 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। **अधिकतम अंक–70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks.**
- SectionC- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks.**

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **तीन अंक** का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer allthe following questions. **5x3 =15**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) In ocean energy which of the following chemical/component act as fluid?
   a) Ammonia
   b) Mercury
   c) Water
   d) Propane

ii) What is Carbon sequestration?
   a) The process of converting carbon dioxide into oxygen
   b) The process of releasing carbon dioxide
   c) The process of capturing and storing carbon dioxide
   d) The process of using carbon dioxide to produce energy

iii) The less insolation occurs when the sun is _____
   a) At night
   b) Low in the sky
   c) High in the sky
   d) None of the above

iv) Which type of solar cell gives the highest efficiency?
   a) Monocrystalline
   b) Polycrystalline germanium
   c) Thin film
   d) Amorphous

v) Light water reactors (LWR) are nuclear reactors
   a) Which use heavy water as a coolant
   b) Which use graphite rod as moderator.
   c) Which use steam as moderator.
   d) Which use ordinary water as moderator

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum150 words. **5x7=35**
निम्नलिखित में से किन्ही पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. What is the current Energy scenario in India? Explain in Brief.

ii. Explain the different biomass conversion process.

iii. What do you understand by the Carbon credit and Carbon reduction emission(CER) certificate?

iv. Give general layout and working of Francis, Kaplan and Pelton types of turbines.

v. Outline the working principle of the tidal power plant. Discuss their advantages and limitations.

vi. Calculate Local Apparent time corresponding to 16:00 hours Indian standard time on 10th June, a location Ahmedabad (72.5714 E longitude). Also calculate the hour angle for the same. Take EOT=1.15 and Standard time longitude for IST is 82.5° E.

vii. What do you understand by LEED certification in green building concept?

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) Explain the advantages and disadvantage of the Surface mines and underground mines.

ii) Illustrate the concept of nuclear fission. Explain PWR and fast neutron type of fission reactor.

iii) What are the concepts behind the construction of a Green building?