

НННН

Maximum marks: 20

 $[8 \times 1 = 8]$

- $[3 \times 2 = 6]$

- [2 x 3 = 6]

12. What is non-inertial frame of reference? Show that observed force in Non-inertial frame is given as- $\vec{F}_N = \vec{F}_i + \vec{F}_0$. Also give an example of it.
13. (a) A particle on which a force $\vec{F} = -3\hat{i} - \hat{j} + 2\hat{k}$ Newton acts is displaced from point (4, -3, -5) m to point (-1, 4, 3) m. Calculate the work done by the force.
- (b) Find grad (log r).

-----XX-----

UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY,
CSJM UNIVERSITY, KANPUR

ENGG. CHEMISTRY (CHM-S101) (CSAI)

Semester: I (Odd Semester)

Year: 1st Year (2K23)

First Mid. Semester Examination-2023-24

Time: 1.5 h

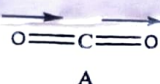
Max. Marks: 30

Note: All questions are compulsory

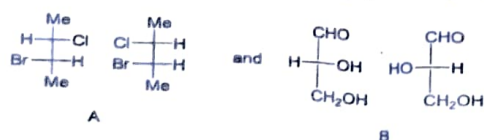
Section A

(1x9 = 9)

- On increasing the conjugation, the λ_{\max} ----- (increases/decreases).
- Type of vibration (A), given below is ----- (Unsymmetrical stretching/Unsymmetrical bending).

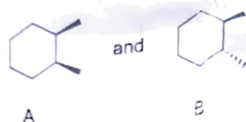


- Organic isomer which rotates the plane of polarized light is called optically inactive isomer. (true/false)
- Which of the following is correct regarding to Pairs (A & B)?



- Pairs A & B are enantiomers
 - Pairs A & B are diastereomers
 - Pairs A is enantiomers and B is diastereomers
 - Pairs B is enantiomers and A is diastereomers
- What are active nuclei in NMR?
 - Aldehyde, ketone and Nitro groups are chromospheres. (true/false)

7. Acetaldehyde molecule has ($n-\pi^*/\pi-\pi^*$ transition)
8. O-nitro phenol has (Intra-/inter-molecular hydrogen bonding)
9. Which of the following is correct regarding to these molecules?



- a. Compound A has a plane of symmetry, b. Compound B has a plane of symmetry
- b. Compound A & B both have plane of symmetry, d. None of these

Section B

(3x3 = 9)

1. Explain inter and intra-molecular hydrogen bonding with suitable examples.
2. Discuss the various methods of determination of order of reaction.

3. Draw the MO diagram of CO and O₂.

Section C

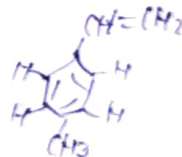
(2x 6=12)

1. An organic compound having C₉H₁₀, shows following ¹H-NMR data,

a. $\delta = 1.2$ quintet (2H)

b. $\delta = 2.3$ triplet (4H)

c. $\delta = 7.1$ singlet (4H), on the basis of above information, deduce the structure of compound.



2. Discuss bathochromic, hypsochromic, hyperchromic and hypochromic shift in UV-spectroscopy with suitable graph and examples.

DEPARTMENT OF MECHANICAL ENGINEERING
UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY, CSJM UNIVERSITY, KANPUR

Subject Name-WORKSHOP CONCEPT (TCA-S 102) CS-AI

Semester: (Even Semester)

Mid Semester-1 Examination

Time: 1.5 h

Maximum marks: 30

Section A

(9 questions of 1 mark each)

1. The purpose of a riser is to-

- a. Deliver molten metal b. Act as a reservoir for molten metal c. Compensate for shrinkages d. none

2. Cast iron and steel pipes are produced by-

- a. Centrifugal casting b. investment casting c. Die casting d. forge casting

3. Which of the following is not a requirement of a good pattern?

- (a) It should be light in weight to handle easily (b) It should be smooth to make casting surface smooth
(c) It should have low strength to break it and to remove casting easily (d) none of the above

4. Which of the following is not true for gas welding?

- a. Heat affected zone and distortion are less as compare to arc welding b. It is suitable for thin sheets
c. It is slower than arc welding d. There are safety problems in storing and handling the gases

5. The pattern used for mass production is

- a. match plate pattern b. split pattern c. skeleton pattern d. single plate pattern

6. The plastic deformation of metal takes place when the stress induced in the metal, due to the applied forces, reached the

- (a) Yield point (b) Proportional limit (c) Fatigue strength (d) Ultimate strength

7. Which of the following pattern is used to produce a number of castings?

- a. loose piece pattern b. split pattern c. gated pattern d. match plate pattern

8. The flame suitable for welding of ferrous metals, Cu and Al alloys is -

- a. Oxidising flame b. Carburising flame c. Neutral flame d. None of the above

9. A model of casting, constructed to use for forming a mould in damp sand, is called as

- a. sand construction b. pattern c. cover d. none of the above

P.T.O

Section B

(3 questions of 3 marks each)

- Q 1. Discuss the classification of manufacturing process.
- Q 2. Explain soldering and brazing process with example.
- Q 3. Define (i) pattern (ii) Arc blow (iii) casting

Section C

12 marks (6 marks each)

- Q 4. Define plant layout. Explain its types with example.
- Q 5. Explain Resistance welding and its types with example.

H7H1

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY, CSJM UNIVERSITY, KANPUR

(Subject Name: Basic Electrical & Electronics Engineering)
(Subject Code: ESC-S101) [Branch: ~~EC&E~~ CSAI]

Semester: 2022-23 (Odd Semester)

Year: 1st Year (2K23)

First mid Semester Examination Aug - 2023

Time: 1.5 h

Maximum marks: 30

All questions are compulsory

Section A

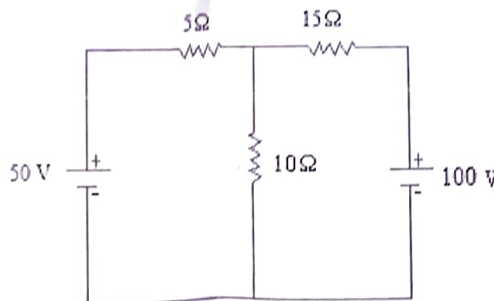
Note: 9 marks (9 questions of 1 mark each)

1. Define Active element & passive elements?
2. What is maximum power transfer theorem?
3. Define Active element & passive elements.
4. State KCL & KVL?
5. What is source transformation
6. State Norton Theorem.
7. Why do we use network theorems and techniques to solve electrical circuits?
8. Explain ohm's Law.
9. Explain open circuit and short circuit.

Section B

Note: 9 marks (3 questions of 3 marks each)

1. Explain Maximum power transfer theorem and derive the condition for maximum power transfer.
2. Determine the current through the 10 ohm resistance by using thevenin theorem.

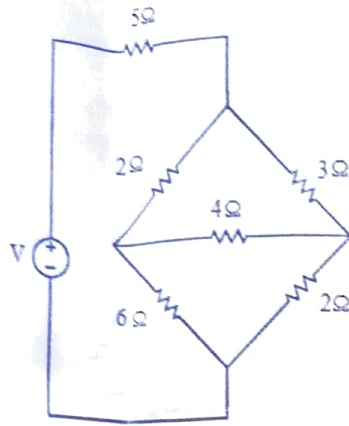


3. Derive the expression for converting a delta network to a star equivalent network.

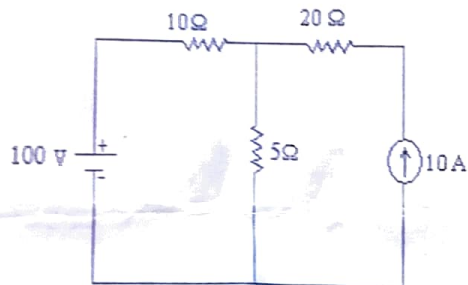
Section C

Note: 12 marks (2 questions of 6 marks each)

1. Find the current drawn from the source for a circuit given in the figure.



2. Find the currents in all the resistive branches of the circuit shown in below figure by using nodal theorem.



Semester: 23-24 (Odd Semester)

Year: I year (2K23)

Maximum marks: 30

Time : 90 min.

First MID SEMSTER EXAMINATION

SECTION-A

Attempt all question

Question 1.

1*9

- a. If $u = \frac{x^2+y^2}{x^2-y^2} + 4$, then find $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$?
- b. Two functions u and v are functionally dependent. Find their Jacobian with respect to x and y .
- c. Fill in the blank: $f(x, y) = f(2, 3) + \dots$
- d. If u is the composite number of t , defined by the relation $u = f(x, y)$, $x = \phi(t)$, $y = \psi(t)$, then total derivative $\frac{du}{dt}$
- e. Find the minimum value of $\sqrt{x^2 + y^2}$.
- f. For maximum value of the function $f(x, y) = x^3 + y^3 - 3axy$ write the sign of $\frac{d^2f}{dx^2}$.
- g. Show that the $\lim_{(x,y) \rightarrow (0,0)} \frac{xy}{x^2+y^2}$
- h. Write the definition of the continuity of function of two variables.
- i. Find the degree of the following homogenous function $\log y - \log x$.

SECTION-B 3*3

Question 2. Find the maximum and minimum value of the

function $f(x, y) = x^4 + y^4 - x^2 - y^2 + 1$.

Question 3. Find the Taylor series expansion of the function

$f(x, y) = \cos x \cos y$ at $(0, \pi)$ up to six terms.

Question 4. Calculate $\frac{\partial(u,v)}{\partial(x,y)}$ for $x = e^u \cos v$ and $y = e^u \sin v$.

$\log x = \cos 9$

SECTION C 4*3=12.

Question 5.

- (a) State and Prove Euler Homogenous Theorem.
- (b) Show that the following function is discontinuous at the given point

$$f(x, y) = \begin{cases} \frac{x-y}{x+y}, & (x, y) \neq (0, 0) \\ 0, & (x, y) = (0, 0) \end{cases}$$

At the point $(0, 0)$.

Question 6.

- (a). Find the maximum value of the function $x^m y^n z^p$, subject to the condition $x + y + z = a$.

- (b). Find $\frac{du}{dt}$ as a total derivative and verify the result by direct substitution if $u = x^2 + y^2 + z^2$ and $x = e^{2t}$, $y = e^{2t} \cos 3t$, $z = e^{2t} \sin 3t$