University Institute of Engineering and Technology, CSJM University, Kanpur

Mathematics I MTH-S101 (CHE) II Mid sem Exam

Semester: 23-24 (Odd Semester) Year: 1 year (2K23)

Maximum marks: 30 Time : 90 min.

First MiD SEMSTER EXAMINATION

SECTION- A

Attempt all question

Question 1

a. $\int_0^1 \int_0^x f(x,y)dydx = \cdots$

b. If a circle is positive quadrant is rotated about the y-axis find the volume generated.

c. What does the formula of the triple integral $\iiint_T dxdydz$.

d. Find the value of $\Gamma(-\frac{3}{2})$.

e. Evaluate $\int_0^{\pi/2} sin^{10}xdx$.

f. If $u = \frac{x^2+y^2+xy}{x+y}$, then find the value of $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$=..

g. Find the point for maximum value of the function $x^3y^2(1-x-y)$.

h. $\lim_{\substack{x\to 0 \\ y\to 0}} \frac{xy+2}{x^2+y^2} = \cdots$.

i. Write the definition of the continuity function of two variables.

SECTION- B 3*3

Question 2. Find the volume bounded by the xy-plan, the parboloid $2z = x^2 + y^2$ and the cylinder $x^2 + y^2 = 4$.

Question 3. State and proof Dirichlet's Integral.

Question 4. Show that the function $f(x,y) = x^3 + y^3 - 63(x+y) + 12xy$.

SECTION C 4*3=12.

Question 5. (a) Evaluate $\iiint \sqrt{x^2+y^2}dxdydz$ over the volume bounded by the right circular cone $x^2 + y^2 = z^2, z > 0$ and the planes $z = 0$ and $z = 1$.

(b) Find the volume of the tetrahedron bounded by the planes $x = 0, y = 0, z = 0, x + y + z = a$.

Question 6. (a) Given $u = x^2 - y^2, v = 2xy$, calculate $\frac{\partial(x,y)}{\partial(u,v)}$.

(b) Expand $z = e^{2x}cox3y$ in power series of x and y upto quadratic terms.

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UIET, CSJMU Kanpur
II Mid Semester Exam- 2023
HSS- 101, Professional Communication
Branch CHE, 1st yr

Time 1:30 hrs Max marks 30

Note: All the questions are compulsory

Section A (9 marks)

Q1. Fill in the blanks: (5)

a) Precis writing consists of _____ words of the original paragraph.
b) _____ proposals are individual proposals.
c) _____ format of writing letters, contains printed addresses on the middle of the page of letter heads.
d) _____ are short reports written for day-to-day activities in the department.
e) The mode of payment is discussed in _____ letters.
enq.

Q2. Answer in one word/sentence (4)

a) Write the full form of AIDA plan used in sales letter.
b) What do you understand by salutation?
c) What is Appendix in report writing?
d) What are Enclosures?

Section B (9 marks)

Q3. Differentiate between Informational and Interpretative reports

Q4. What are external and internal proposals?

Q5. Differentiate between notices and circulars.

Section C (12 marks)

Q6. Write a letter of complaint to the General Manager of Amul Dairy Products Ltd complaining about delivery of 50 stale dry milk cans, asking for the adjustment of the bill on the next order of purchase.

Q7. Write a memorandum to General Manager of your company informing about the latest deal of incoming raw material with the shipment company and that the production should be accelerated accordingly.

DEPARTMENT OF CHE

UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY, CSJM UNIVERSITY, KANPUR

Subject Name: Basic Electrical & Electronics Engg. (Subject code: ESC S-101)

Semester: I Sem

Year: Ist Year (2K23)

Second Mid Semester Examination

Time: 1.5h

Total Marks: 30

Note: All questions are compulsory.

Section (A)

Each question carries 1 mark: [9X1=9]

a) When a pure semiconductor is heated, its resistance goes down.(T/F)

b) What is an energy gap?

c) What is the range of energy band gap of semiconductors?

d) $(10101011111.1101010)_2 = (?)_{16}$

e) $(AB.ED1)=(?)_8$

f) In a series RLC circuit, the phase difference between the current in the circuit and the voltage across the resistor is……..

g) In a series RLC circuit, the phase difference between the current in the circuit and the voltage across the capacitor is?

h) Find 2's complement of $(A1BC)_{16}$

i) In a pure resistive circuit Current lags behind the voltage by 90^0(T/F)

Section (B)

Each question carries 3 marks: [3X1=9]

1) Using 2's complement method perform the substraction $(101010010101.101-10101010111)_2$

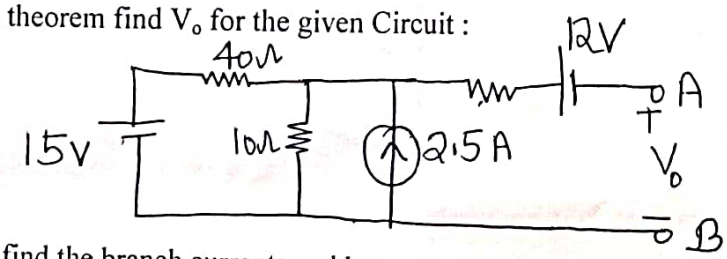
2) Explain about CRT.

3) Explain the working of PN junction diode.

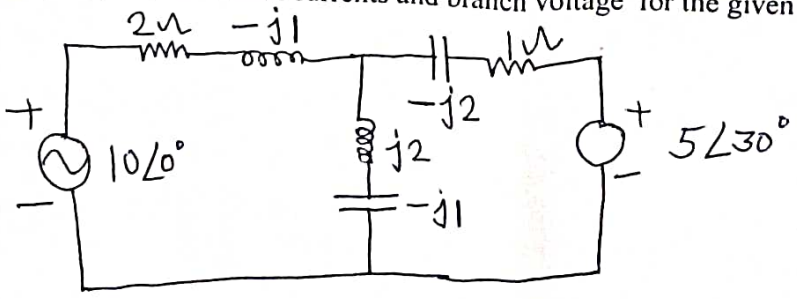
Section (C)

Each question carries 6 marks: [2X6=12]

1) Using Superposition theorem find V_o for the given Circuit :



2) Using mesh analysis find the branch currents and branch voltage for the given network:



*******All the best******

Department of Physics- Chemical Engineering, CHE
UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY, CSJM UNIVERSITY, KANPUR

Subject Name: Physics-I (CHE) **Subject Code: PHY-S101**

Semester: 2023-24 (First Semester) **Year: Ist Year (2K23)**

Mid Semester-II Examination

Time: 1.5 h **Maximum marks: 20**

All questions are compulsory

Section A [Total: 8 marks (1 mark each)]

1. **Write the necessary and sufficient condition for simple harmonic motion.**
2. **Differentiate between stable and unstable equilibrium.**
3. **Why the pendulum cannot keep on oscillating for a long time?**
4. **A rocket of mass 1000 kg is exhaust gases at a rate of 4 kg/s with a velocity 3000 m/s. The thrust developed on the rocket is?**
4. **A bomb of mass 12 kg at rest explodes into two pieces of masses 4 kg and 8 kg. The velocity of 8 kg mass is 6 m/s. The kinetic energy of the other mass is?**
5. **What is the basic principle of rocket propulsion?**
6. **What is the formula for rocket acceleration?**
7. **A body having 7 kg of mass moves slowly and covers a vertical height of 14 m. What is the work done in Joules and what force causes this work? Take g = 10 m/s^2.**
8. **If the fuel in the rocket is burned slower, then the acceleration will be slower or faster?**

Section B [Total: 6 marks (2 mark each)]

1. **Differentiate between linear and angular harmonic motion.**
2. **Explain with the help of diagram that at what point the energy of a harmonic oscillator is entirely potential and entirely kinetic?**
3. **A particle performing S.H.M. has a period of 6 s and amplitude of 8 cm. The particle starts from the mean position and moves towards the positive extremity. Find its displacement, velocity, and acceleration 0.5 s after the start.**

Section C [Total: 6 marks (3 mark each)]

1. **Prove that work done on a body is equal to the net change in its energy.**
2. **Prove that in the simple harmonic motion the potential energy in shape is parabolic.**