END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024

Paper Code: ES-101	Subject: Programming In C
Time: 3 Hours	Maximum Marks:60

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

Q1   Answer following in brief. (**Any five**)   (5x4=20)

a. What is a token? What are different types of tokens available in Clanguage? Explain.

b. Evaluate the following expressions:
    i) 22 + 3 < 6 && !5 || 22 = =7 && 22 – 2 > +5
    ii) a + 2 > b || !c && a = = d *a – 2 < = e Where a=11, b=6, c=0, d= 7 and e=5.

c. Explain formatted input and output statement with examples.

d. Show how break and continue statements are used in a C-program, withexample.

e. What is an array? How a single dimension and two dimension arraysare declared and initialized?

f. Explain local variable, global variable, static variable, auto variable and register variable and clearly differentiate among them.

g. Differenatiate between static memory allocation and dynamic memory allocation. What is the difference between the function malloc() and calloc()?

Q2. (a) An electricity board charges the following rates for the use ofelectricity: for the first 200 units 80 paise per unit: for the next 100units 90 paise per unit: beyond 300 units Rs 1 per unit. All users arecharged a minimum of Rs. 100 as meter charge. If the total amount ismore than Rs 400, then an additional surcharge of 15% of total amountis charged. Write a program to read the name of the user, number ofunits consumed and print out the charges.   **(5)**

(b) Write an algorithm and develop a C program that reads N integernumbers and arrange them in ascending order using any Sorting algorithm of your choice.   **(5)**

Q3 (a) Explain string manipulation library functions with their syntaxes. Writea program to check whether a string is palindrome or not.   **(5)**

(b) Write an algorithm and develop a C program to search an integer fromN numbers in ascending order using binary searching technique.   **(5)**

Q4 (a) What is function? Explain different classification of user definedfunctions based on parameter passing and return type with example.   **(5)**

(b) Write a c-program using functions to generate the Fibonacci series.   **(5)**

P.T.O.

Q 5 (a) What is recursion? Explain. Write a c-program using recursive function for Binary to Decimal Conversion. **(5)**

(b) Write a program in C using functions to swap two numbers usingglobal variables concept and call by reference concept. **(5)**

Q6 (a) What is structure? Explain C syntax of structure declaration with example. **(5)**

(b) Differentiate between Array, Structure and Union with example. **(5)**

Q7 (a) Write a c-program using structures to read, write, compute average -marks and display the students scoring above and below the averagemarks for a class of N students. **(5)**

(b) What is a pointer? Explain how the pointer variable declared andinitialized. If one pointer points to character and another pointer points to integer, will they take same space or different? Justify your answer and explain the concept of pointer airthmetic. **(5)**

Q8 (a) Write a program in C to find the sum and mean of all elements in anarray using pointers. **(5)**

(b) What are pre-processor directives? Explain different categories of pre-processor directives used in C. **(5)**

Q9 (a) Why we use "File in 'C' Language? Explain the Operating modes of files. **(5)**

(b) Explain the following file function with example: **(5)**

(i) fopen( )   (ii) fclose( )

(iii) feof( )   (iv) fseek( )

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END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024

Paper Code: BS-103

Time: 3 Hours

Subject: Applied Chemistry

Maximum Marks: 60

Note: Attempt all questions as directed. Internal choice is indicated.

Q1. Attempt **any four** of the following questions: (4x5 =20)

a) Differentiate between octane HCV and LCV. Explain the condition when

b) HCV becomes equal to LCV.

c) Calculate the weight and volume of air required for the combustion of 1 Kg carbon?

d) Distinguish between congruent melting point and incongruent melting point.

e) Why are enzymes highly specific in their actions. How it affects rate of chemical reactions.

f) Why Phosphate conditioning is better than Calgon conditioning?

g) 100 ml of water sample has hardness equivalent to 12.5 ml of 0.08 NMgSo4.

h) What is the hardness in ppm?

i) Explain anodic protection with the help of an example.

j) Differentiate between wet corrosion and dry corrosion.

Q2. (a) How calorific value of fuel can be determined by Boy's calorimeter.

(b) A coal sample has the following compositions by weight: C=92%, O= 2.0%, S=0.5%, N= 0.5% and ash= 1.5%. Net calorific value of the coal was found to be 9,430 k cal/kg. Calculate the percentage of hydrogen and HCV. (10)

OR

Q3. Explain phase diagram of sulphur system and discuss significance of triple point. (10)

Q4. Explain Pattinson's process of desilverisation using phase diagram. (10)

OR

Q5. (a) Explain Langmuir -Hinshelwood mechanism of negative catalysis with example.

(b) Discuss the Michaelis -Menten equation of heterogeneous catalytic reaction. (10)

Q6. (a) Explain Zeolite process for softening of water.

(b) Explain Reverse Osmosis. What happen when a freshwater fish is kept in sea water? (10)

OR

Q7. Describe lime soda method for water softening. Report its merit over other processes. (10)

Q8. Explain the mechanism of hydrogen evolution and oxygen absorption in electrochemical corrosion. (10)

OR

Q9. What is concentration cell corrosion? Briefly explain drop corrosion and waterline corrosion. (10)

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END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024-JANUARY 2025

Paper Code: BS-105	**Subject: Applied Physics-I**
Time: 3 Hours	**Maximum Marks: 60**

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 **Attempt all of the following:-**
- (a) What are inertial and non-inertial frames of reference? Is an aircraft in steady flight an inertial frame or non-inertial frame? **(4)**
- (b) Give the physical significance of divergence and curl of a field. **(4)**
- (c) What is optic axis and principal section of a doubly refracting crystal? **(4)**
- (d) Why population inversion is necessary for laser action? **(4)**
- (e) Calculate the change in entropy when 2 gm of ice melts into water at the same temperature. Latent heat of ice = 80 Cal/gm. **(4)**

UNIT-I

Q2 (a) Write down the zeroth law of thermodynamics. Explain how it is introduces the temperature of a system as a function of state. **(5)**
- (b) What do you understand by indicator diagram? Draw indicator diagram for isochoric and isobaric processes. **(3)**
- (c) What is Carnot's theorem? Give its significance. **(2)**

Q3 (a) Define the term 'Entropy'. Derive an expression for change of entropy for following process. **(7)**
1. Isochoric process
2. Isobaric process
3. Isothermal process
4. Adiabatic process
- (b) A cyclic heat engine operates between a source temperature of 800 0C and A Sink temperature of 300C.What is the least rate of heat rejection per KW net output of the engine? **(3)**

UNIT-II

Q4 (a) Discuss in brief the inconsistencies in the Ampere's law and describe how Maxwell fixed up this. Further discuss in brief the characteristics of transient and displacement current. **(5)**
- (b) Write down the three dimensional wave equation and obtain its solution. **(5)**

Q5 (a) Derive the equation for Electric and Magnetic field intensities for an electromagnetic wave propagating in the z-direction in charge and current free region. Find the following: **(7)**
(i) Refractive index   (ii) Poynting vector   (iii) Intrinsic impedance
- (b) State and deduce Poynting theorem for the flow of energy in an electromagnetic field. **(3)**

P.T.O.

UNIT-III

Q6 (a) Give the construction and theory of plane transmission grating. Explain theformation of spectra by it. **(4)**

(b) Show that the radius for nth dark ring formed in a Newton's rings experiment is proportional to $\sqrt{\lambda}$. **(4)**

(c) What are coherent sources? **(2)**

Q7 (a) Describe construction and working of a Nicol prism. **(3)**

(b) What do you mean by optical activity? Give Fresnel's theory of optical activity and derive the necessary expression for the optical rotation. **(3)**

(c) Find the thickness of a quarter wave plate of quartz for light of wavelength 5893 Å. The refractive indices for ordinary and extraordinary rays are 1.544 and 1.553 respectively. **(4)**

UNIT-IV

Q8 (a) State the fundamental postulates of special theory of relativity and deduce the Lorentz transformation equations from them and discuss how these equations account for the phenomenon of length contraction. **(8)**

(b) Drive an expression for time dilation. A clock measures the proper time. With what speed it should move relative to an observer so that it appears to go slow by 30s in 24 hours. **(4)**

Q9 (a) What do you understand by 3 and 4 levels LASER? What are the advantages of 3 level over 4 level LASER? **(2)**

(b) Describe the construction and working of a Ruby laser with the help of a well labeled diagram. **(5)**

(c) Describe Einstein coefficients for laser action. **(3)**

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END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024-JANUARY 2025

Subject: Electrical Science

Paper Code: ES-107	Maximum Marks: 60

Time: 3 Hours

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

(6x2=12)

Q1 Attempt all parts:-
  (a) Write limitation of Maximum Power Transfer Theorem.
  (b) Compare series and Parallel Resonance.
  (c) Write applications of moving iron instruments?
  (d) Write name of four parts of DC machine?
  (e) Write applications of SynchronousMotor.
  (f) Find condition for maximum efficiency of Transformer.

UNIT-I

Q2 (a) State and Prove Super Position Theorem. **(6)**
  (b) Calculate current in 6ohm resistance in the circuit shown below using mesh current analysis and verify the answer using Norton's Theorem. **(6)**
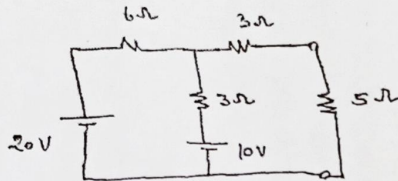
Q3 (a) State and prove Maximum Power Transfer Theorem. **(6)**
  (b) Calculate current in 2 ohm resistance in the circuit shown below using node voltage analysis and verify the answer using Thevenin's Theorem. **(6)**
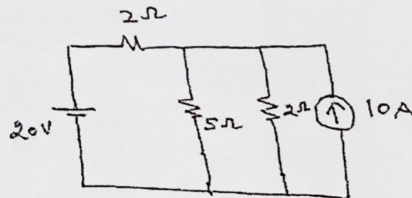
UNIT-II

Q4 (a) Calculate impedance, power factor, quality factor of coil, active power, reactive power and apparent power consumed by electric load which is connected with voltage v = 200 sin 314t and it draw current i = 20 sin (314t-30⁰). **(6)**
  (b) In RLC series circuit draw curve of reactance, impedance, current and voltages along elements as a function of frequency. **(6)**

Q5 (a) Calculate overall current and power factor of the circuit which has two parallel branches and connected with 200V ac supply. The impedance of one branch is (3+j4) ohm and impedance of second branch is (5-j5)ohm. **(6)**

(b) A three-phase delta connected circuit has per phase impedance of Z = (5 + j5) ohm and connected with 440V supply. Calculate the line voltage, phase voltage, line current, and phase current and complex powerofcircuit. **(6)**

UNIT-III

Q6 (a) Explain constructional features, working principals and applications of Three Phase Induction motor. **(6)**

(b) Draw the circuit diagram and discuss speed control of DC shunt motor. **(6)**

Q7 (a) Explain constructional features, working principals and applications of DC shunt motor. **(6)**

(b) Draw the circuit diagram and discuss working of star delta starter used for three phase induction motor. **(6)**

UNIT-IV

Q8 (a) With the help of circuit diagram explain working of autotransformer, also write its applications. **(6)**

(b) A 200 kVA, 1000/200V transformer has 2 kW hysteresis loss and 2 kW eddy current loss. When it is working at fullload, the copper losses are 8 kW. Calculate maximum efficiency of transformer and the loadat which maximum efficiency occurs. **(6)**

Q9 Explain constructional features, working principal and applications of the following:- **(2x6=12)**

(a) Moving iron volte meter.

(b) PMMC instruments.

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END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024-JANUARY 2025

Paper Code: BS-109   Subject: Environmental Studies

Time: 3 Hours   Maximum Marks: 60

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data.

Q1 Attempt all parts:-   **(12)**
(a) Differentiate between in-situ and ex-situ conservation principles.
(b) Write a short note on Eutrophication?
(c) What do you understand about the concept of sustainable development?
(d) Discuss the advantages of wasteland reclamation.
(e) Discuss the effects of secondary pollutants on the biosphere.
(f) Give differences between food chain and food web with examples.

UNIT-I

Q2 Write short notes on:-   **(12)**
(i)   Chipko movement
(ii) Cauvery Water Dispute
(iii) Desertification

Q3 (a) "Natural ecosystems are more stable than man-engineered ecosystems"   **(6)**
Explain this statement.   **(6)**
(b) Differentiate between Biopiracy and bioperspecting?

UNIT-II

Q4 (a) How is vermicomposting better than conventional composting used for
biodegradable solid waste?   **(6)**
(b) "Minerals are finite and declining resource". Comment.   **(6)**

Q5 (a) What are the causes of landslides? Discuss its consequences.   **(6)**
(b) What is a disaster? Briefly explain how human activities act as a catalyst
in a natural disaster?   **(6)**

UNIT-III

Q6 (a) Explain the role of nuclear energy for the betterment of human
civilization.   **(6)**
(b) Discuss the phenomenon of global warming, along with its effects and
control measures?   **(6)**

Q7 (a) Write an explanatory note on urban problems related to energy.   **(4)**
(b) What is an ozone hole? How is it formed? What are the causes of ozone
hole formation? What are the effects of the ozone layer? What remedial
measures do you suggest?   **(8)**

UNIT-IV

Q8 (a) Explain the term 'population explosion'. Enumerate its effects.   **(3)**
(b) What do you understand about 'human rights'? List the important
Articles of the 'Declaration of Human Rights, 1948' adopted and
proclaimed by the United Nations.   **(5)**
(c) Explain the objectives of the family welfare programme.   **(4)**

Q9 (a) What are the objectives of the universal Declaration of Human Rights by
the United Nations?   **(6)**
(b) Describe the various roles of Information technology in the protection of
human health and the environment?   **(6)**

END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024

Paper Code: BS-111	Subject: Applied Mathematics-I

Time: 3 Hours   **Maximum Marks: 60**

Note: Attempt any five questions including Q.No1 which is compulsory.
Internal Choice is indicated.

Q1. Attempt **any Four** of the following questions: (4x5=20)

a) For the transformation $x = a(u+v), y = b(u-v)$ and

$u = r^2 \cos 2\theta, v = r^2 \sin 2\theta$, Find $\dfrac{\partial(x,y)}{\partial(r,\theta)}$.

b) Test for consistency the following equation and solve them if consistent
$3x+7y+8z = -13, 2x+9z = 5, -4x+y-26z = 2$

c) If vector $\vec{v} = (x+3y)\hat{i} + (y-2z)\hat{j} + (x+az)\hat{k}$ is solenoidal vector, then find the value of a.

d) Find the directional derivative of $f(x,y,z) = xy^3 + yz^2$ at the point
(2, -1, 1) in the direction of vector $\hat{i} + 2\hat{j} + 3\hat{k}$

e) If $z = f(x+ay) + \phi(x-ay)$, then show that $z_{yy} = a^2 z_{xx}$

f) Solve $\dfrac{dy}{dx} = \dfrac{x(x^2+y^2-1)}{y(x^2+y^2+1)}$

g) Define Gamma Function and Prove that $\displaystyle\int_0^\infty e^{-x^2} dx = \frac{1}{2}\sqrt{\pi}$

h) Verify the vectors $(1,9,9,8), (2,0,0,3), (2,0,0,8)$ are linearly Independent or not?

Q2

a) If $\dfrac{x^2}{a^2+u} + \dfrac{y^2}{b^2+u} + \dfrac{z^2}{c^2+u} = 1$, show that $u_x^2 + u_y^2 + u_z^2 = 2(xu_x + yu_y + zu_z)$.   (5)

b) Show that the function $f(x,y) = x^3 \exp(-x^2 - y^2)$ has a maximum at the   (5)
point $(\sqrt{3/2}, 0)$. A minimum at $(-\sqrt{3/2}, 0)$ and a stationary point at the
origin whose nature cannot be determined.

OR

Q3 a) Evaluate $\displaystyle\int_0^\infty \frac{\sin x}{x} dx$ by applying differentiation under integral sign   (5)

b) Find the stationary points of $f(x,y,z) = x^3 + y^3 + z^3$ subject to constraint   (5)
$g(x,y,z) = x^2 + y^2 + z^2 = 1$

Q4 a) Solve $\dfrac{dy}{dx} - \dfrac{\tan y}{1+x} = (1+x)e^x \sec y$ (5)

P.T.O

b) Solve $\left(x^2 y - 2xy^2\right) dx = \left(x^3 - 3x^2 y\right) dy$ (5)

OR

(5)

Q5 a) Solve $\left(D^2 + 2D + 1\right) y = 2x + x^2$ (5)

(5)

   b) Apply the method of variation of parameters, to solve $\dfrac{d^2 y}{dx^2} + y = Co\sec x$

Q6 a) Solve the following system by Gauss Elimination method   (5)

$$2x_1 - x_2 + 3x_3 = 9$$
$$x_1 + x_2 + x_3 = 6$$
$$2x_1 - x_2 + x_3 = 2$$

(5)

   b) If $\begin{vmatrix} a & a^2 & a^3 - 1 \\ b & b^2 & b^3 - 1 \\ c & c^2 & c^3 - 1 \end{vmatrix} = 0$ in which a, b, c are different, show that abc=1.

OR

Q7 a) State Cayley-Hamilton Theorem and verify Cayley-Hamilton Theorem for   (5)

the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$

   b) Find the diagonalization for the matrix $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ (5)

Q8 a) Using Green's theorem find the line integral $\oint_c \left(x^2 - 2xy\right) dx + \left(x^2 y + 3\right) dy$ (5)

   where C is the boundary of the region defined by $y^2 = 8x$ and $x = 2$

   b) Find the directional derivative of $f(x, y, z) = xy^3 + yz^2$ at the point (2,-   (5)

   1,1) in the direction of vector $\hat{i} + 2\hat{j} + 3\hat{k}$

OR

Q9. a) Find the divergence and curl of $F = 2x^2 z\hat{i} - xy^2 z\,\hat{j} + 3yz^2\hat{k}$ at the point   (5)

   (1,1,1)

   b) Find the curvature and torsion for the curve   (5)

    $x = a\sin t,\ y = a\cos t,\ z = at \cot \alpha$

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$P-2/2$

END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2024–JANUARY 2025

Paper Code: HS-113	Subject: Communications Skills
Time: 3 Hours	Maximum Marks: 60

Note: Attempt five questions in all including Q. No.1 which is compulsory. Internal choice is indicated. Select one question from each unit.

Q1 Write short notes on the following:- (5x4=20)
- (a) Attributes of spoken and written communication?
- (b) 7C, s of effective communication?
- (c) Difference between verbal and Non-verbal communication?
- (d) What is 'memos and circular'?
- (e) Write a short note on 'Telephone Etiquette'?

UNIT-I

Q2 What is the meaning of communication? 'Communication is a two-way process". Elaborate this statement with examples. (10)

OR

Q3 Discuss the various barriers to communication? How can we do work on barriers during communication? Explain. (10)

UNIT-II

Q4 What is the differences between British and American English. Explain at least five differences with examples. (10)

OR

Q5 What are some basic principles of good manners in social settings? What is the proper way to handle a disagreement in a conversation? (10)

UNIT-III

Q6 What are the essentials of paragraph writing? Write any inductive paragraph. (10)

OR

Q7 What is the difference between a Notice and a Circular? Write a notice supposing you are Asma/Ashish, the head girl/boy of XYZ international school. Your school is soon going to publish the annual magazine next month. Write a notice for the notice board of your school inviting students to submit write-ups. (10)

UNIT-IV

Q8 (a) Do the following sentences:- (6)
1. He has an extreme and irrational fear of spiders.(one word substitution) Phobia
2. The act of speaking something aloud when thinking, without intending to address anyone.(one word substitution)
3. She is studying at a university for becoming a doctor.(Correct this sentence)
4. They are playing football every Saturday.
5. I have been to London twice in my life.
6. A cat is not liking water.
7. If I will have enough time, I will join you for lunch.
8. If she would have known, she will have come to the party.
9. If you will eat too much, you will feel sick.
10. If it will be sunny, we can have a picnic.
11. Let us call there teacher.
12. If he would have asked, I will have helped him.

P.T.O.

(b) Give 1 homophone of: Whether. **(4)**

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OR

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(6)

Q9   (a) **Do the following sentences;**
1. If it will snow tomorrow, we will build a snowman
2. If he would have asked, I will have helped him.
3. Mary said, "I have been studying all night."
4. This is the (taller/tallest) building in the city.

5. The Soup tastes (more delicious/more deliciously) with a pinch of salt.
6. This novel is (interesting/more interesting) than the one I read last week.
7. He runs (fast/faster) than anyone else on the team.
8. The music sounded (loud/louder) as the concert progressed.
9. This is the (expensive/more expensive) restaurant in the city.
10. The new laptop is (powerful/more powerful) than the old one.
11. This flower is (beautiful/more beautiful) than the one in my garden.
12. Of all the seasons, winter is (cold/colder) in this region.

(b) Give 1 homophone of: fare.   *fair*   **(4)**

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END TERM EXAMINATION

FIRST SEMESTER (B.TECH) DECEMBER-2024

Paper Code: ES-119	**Subject: Manufacturing Process**
Time: 3 Hours	**Maximum Marks: 60**

Note: Attempt any five questions in all including question no.1 which is compulsory. Select one question from each unit.

Q1   **(2x10=20)**

(a) Why riser is not used in pressure die casting?

(b) In welding a mild steel sheet using an oxy-acetylene flame, the total amount of acetylene consumed was 8.0 ltrs. Calculate the consumption of oxygen from the cylinder.

(c) What is directional solidification as applied in casting?

(d) What is strain hardening?

(e) Differentiate between blanking and punching in sheet metal operation.

(f) Why direct current straight polarity is preferred for welding thick metal?

(g) Name the process by which bottles and floatable objects are made fromthermoplastics.

(h) Differentiate between toughness and hardness?

(i) What is blending and mixing in powder metallurgy?

(j) Differentiate between forward and backward extrusion in the metal forming process.

UNIT-I

Q2 (a) What are the functions of a good gating system? Describe the elements of a gating system with a neat sketch. **(6)**

(b) Explain centrifugal casting with a neat sketch. **(4)**

Q3 (a) Explain any five casting defects with neat sketches along with causes and their remedies. **(3)**

(b) Explain the construction, and working of the cupola furnace with a neat sketch. **(7)**

UNIT-II

Q4 (a) Explain autogenous, homogeneous, and heterogeneous types of welding processes with suitable examples. **(6)**

(b) What do you mean by the selection of electrodes in Electric Arc welding? How electrode is specified? **(4)**

Q5 (a) Describe the principle of Electric resistance welding. Explain spot welding with a neat sketch. **(3)**

(b) What is the principle of heat generation in gas welding? Why acetone is mixed in an acetylene cylinder? Explain with neat sketches various types of flames and their applications. **(7)**

UNIT-III

Q6 (a) Differentiate between hot working and cold working processes with suitable example. **(6)**

(b) Compare the metal forming process with the casting and machining manufacturing processes. **(4)**

Q7 (a) Differentiate between closed die forging and open die forging operation. **(4)**

(b) Explain sheet metal cutting operations with neat sketches. **(6)**

Q8 (a) What is powder metallurgy? Write its advantages, applications, and limitations. **(6)**

(b) Explain the methods for metal powder production. **(4)**

Q9 (a) What are the various methods for moldingthermoplastic and thermosetting plastics? Describe injection molding with a suitable sketch. **(6)**

(b) Explain the compression and transfer molding processes in plastic manufacturing. **(4)**

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