

Programme: B.Tech
Branch: CSE
Course Code:- BT ME105A
Course Title: **Engineering Graphics and Design**

Semester: I
Time: 3 Hr
Max. Marks: 30

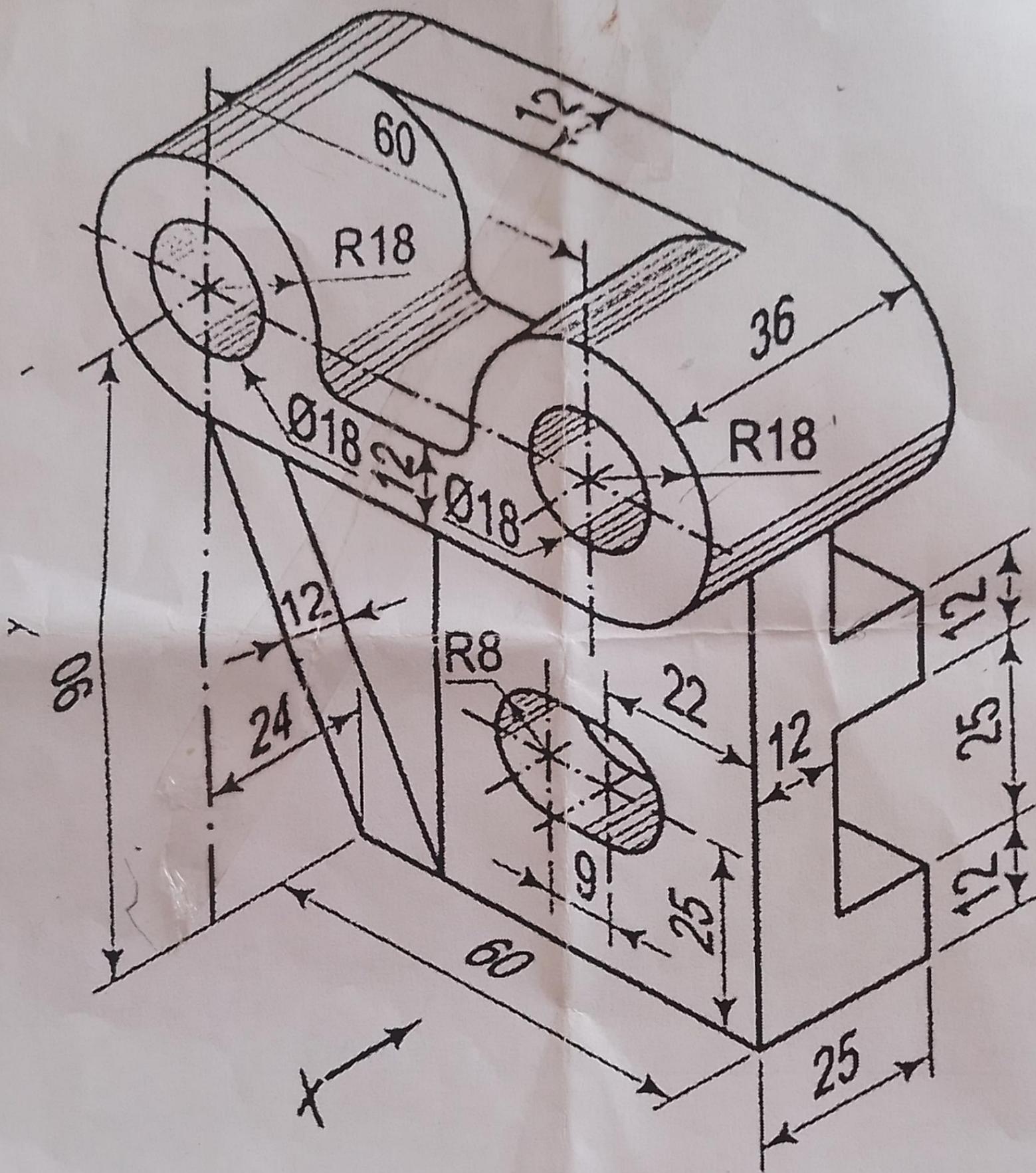
Note:- Draw title box and boundary.

Write name and roll no by pen all other things are done by pensile.

All The dimension in mm.

Que. 1. To construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is $\frac{2}{3}$. **(10 Marks)**

Que-2 Draw the front view, top view and side view of following figure using 3^{rd} angle projection. All The dimension in mm. X will be the front view direction. (**Note- No need to draw isometric view (3D View) in the drawing sheet**) **[20 Marks]**





Central University of Haryana
Term End Examinations, March 2023 B.Tech. Programmes

Course Code: : BT PHY 117 A

Max Time: 70

Branch: CSE

Course Title: Semiconductor Physics

Instructions:

Question Number one (**PART-I**) is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- (a) What is Laser?
- (b) Describe the differences between Stimulated Emission and Spontaneous Emission
- (c) what are the important applications of solar cells
- (d) what are the main drawbacks of free electron theory
- (e)What are the differences between intrinsic and extrinsic semiconductor
- (f) Define fermi energy
- (g) What is the need to achieve population inversion?

PART -II

Q. No.2 Discuss in detail the Kronig – Penny model for a linear lattice. How does it lead to the formation of energy band in solids?

OR

Q. No.2

The Fermi energy of copper is 7 eV. Calculate (a) The Fermi momentum of electron in copper. (b) de Broglie wavelength of the electron and (c) the Fermi Energy ~~velocity~~

Q. No.3

Discuss the effect of donor and acceptor impurities in semiconductors. Explain the action of a P-N junction diode and mention its important applications.

OR

Q. No 3

Mobilities of electron and holes in a sample of intrinsic germanium at room temperature are $0.37 \text{ m}^2/\text{V.s}$ and $0.18 \text{ m}^2/\text{V.s}$, respectively. If each electron and hole densities is equal to $2.5 \times 10^{19}/\text{m}^3$, calculate the electrical conductivity and the resistivity of germanium.

Q. No.4

What is Hall effect? Explain the terms, mobility of charge carriers and Hall effect. Obtain the expression of Hall coefficient in terms of current density and electronic charges.

OR

Q. No .4

Explain Fermi-Dirac distribution function. Plot this function for various temperatures including 0K. Determine the resistivity by Four Probe Method.

Q. No.5 ✓

Describe the density of states for 3D, 2D, 1D and 0D systems.

OR

Q. No.5

Describe the Quantum Wells/Dots and Nanowires and its application in Nanoscience.

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Central University of Haryana
Term End Examination March 2023

B.Tech. Programmes

Branch: Civil Engineering, Computer Science Engineering

Course Code: BT EE 103A
Course Title: Basic Electrical Engineering

Max Time: 3 Hours
Max Marks: 70

Instructions:

Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice (Each sub-question carries seven marks)

PART -I

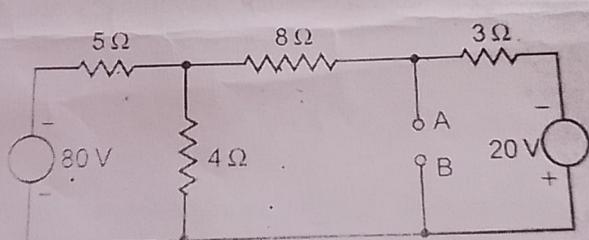
Q. No.1

- (a) Define form factor.
- (b) State and draw power triangle.
- (c) State superposition theorem.
- (d) State most important application of Thevenin's theorem.
- (e) What do you mean by exciting resistance and exciting reactance?
- (f) Why is a commutator needed in dc motor?
- (g) Define ampere-hour efficiency of a battery.

PART -II

Q. No.2

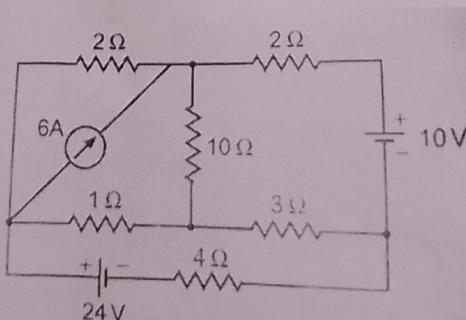
- a) Obtain Thevenin's equivalent circuit at AB, in the given network



- a) State and explain Norton's theorem and draw its equivalent circuit.

OR

- Q. No.2 Determine the current in the 4 ohm resistance of the circuit shown in given network.



Q. No.3

- a) When sinusoidal AC voltage is applied across a pure inductor, show that power consumed in the circuit is zero. Further, draw the phasor and wave diagram for voltage and current.
- b) Derive the Time domain analysis of the first order series RL circuit.

OR

Q. No 3

- a) Explain the behaviour of parallel R-L-C circuit with sinusoidal input.
- b) Explain series resonance. Why it is called the voltage resonance?

Q. No.4 What are the various losses in a transformer? Where do they occur and how do they vary with load? How to minimize them and how to measure these losses? Explain in detail with digram.

OR

Q. No .4

- a) Explain the construction and working of the single phase capacitor start Induction motor.
- b) Draw and explain electrical and mechanical characteristics of the DC shunt and DC series motors.

Q. No.5 Write short note on following:

- a) MCCB
b) Earthing

OR

Q. No.5 Explain the working, characteristics, advantages and applications of nickel-iron alkaline cell.



Central University of Haryana
Odd Semester Term End Examination Mar 2023

B. Tech. Programme

Branch: Computer science & Engineering

Course Code: BT MAT 111B
Course Title: Mathematics-I

Max Time: 3 Hours
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries a total of 14 marks (Each sub-
Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q 1.

- a) Find the value of $\Gamma(4.5)$?
- b) If λ is an eigenvalue of a matrix A , then an eigenvalue of A^t and A^4 is ?
- c) If $x = (x_1, x_2, x_3)$ & $y = (y_1, y_2, y_3) \in \mathbb{R}^3$, then determine whether $\langle x, y \rangle$ is a real inner product for \mathbb{R}^3 if $\langle x, y \rangle$ defined by $\langle x, y \rangle = |x_1y_1 + x_2y_2 + x_3y_3|$.
- d) If the rank of a matrix $A = \begin{bmatrix} a & -1 & 0 \\ 0 & a & -1 \\ -1 & 0 & a \end{bmatrix}$ is 2, then value of a is equal to?
- e) Show that $\{(x, y, z) \in \mathbb{R}^3 : x + y - 2z = 5\}$ is not a subspace of \mathbb{R}^3 .
- f) Evaluate the integral $\int_0^\infty e^{-x} dx$.
- g) The set of vectors $\{(1,2,2), (2,1,2), (2,2,1)\}$ is linearly dependent or independent in \mathbb{R}^3 ?

PART -II

Q 2.

- a) Reduce the matrix A to the row-reduced echelon form and hence find its rank.

$$A = \begin{bmatrix} 1 & 2 & 1 & 2 \\ 0 & 1 & 0 & 1 \\ -1 & 2 & 0 & 3 \end{bmatrix}$$

- b) If $A = \begin{bmatrix} 2 & 3+2i & -4 \\ 3-2i & 5 & -6i \\ -4 & -6i & 3 \end{bmatrix}$, then prove that A is Hermitian and iA is skew-Hermitian.

Needs
Computation

OR

Q 2.

- a) Find the condition for which the system of equations has (i) unique solution (ii) no solution, and (iii) many solutions.

$$3x - 2y + z = b$$

$$5x - 8y + 9z = 3$$

$$2x + y + \lambda z = -1$$

- b) Use Gauss Jordan method to find the inverse of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$

Q3.

a) Find the eigenvalues and the corresponding eigenvectors of the matrix

$$A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & -2 & 4 \\ 3 & -3 & 6 \end{bmatrix}.$$

b) Use Gram-Schmidt process to obtain an orthonormal basis of the subspace of the Euclidean space \mathbb{R}^4 with standard inner product space generated by the linearly independent set $\{(1,1,0,1), (1,1,0,0), (0,1,0,1)\}$.

OR

Q 3.

a) Find a matrix P such that $P^{-1}AP$ is a diagonal matrix where $A = \begin{bmatrix} 1 & 1 & -2 \\ -1 & 2 & 1 \\ 0 & 1 & -1 \end{bmatrix}$.

b) Verify Cayley-Hamilton theorem for the matrix $\begin{bmatrix} 1 & 0 & 2 \\ 0 & -1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$ and find A^{-1} & A^9 .

Q 4.

a) Obtain the Taylor's series expansion of $f(x) = x^5 + 2x^4 - x^2 + x + 1$ about the point $x = -1$.

b) Determine the area between the curve $y = x^3$ and the parabola $y = 4x^2$.

OR

Q 4.

a) Determine the volume of the solid generated by revolving the plane area bounded by $y^2 = 4x$ and $x = 4$ about the line $x = 4$.

b) Evaluate the integral $\int_0^\infty x^4 e^{-x^4} dx$.

Q 5.

a) For a linear map $f: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ define by $f(x_1, x_2, x_3) = (2x_1 + x_2 - x_3, x_2 + 4x_3, x_1 - x_2 + 3x_3)$, $(x_1, x_2, x_3) \in \mathbb{R}^3$. Find the matrix of f relative to the ordered bases $(0,1,1), (1,0,1), (1,1,0)$ of \mathbb{R}^3 .

b) Show that the set $S = \{(1, 2, -1, -2), (2, 3, 0, -1), (1, 2, 1, 4), (1, 3, -1, 0)\}$ is a basis of \mathbb{R}^4 .

OR

Q 5.

a) For a linear map $f: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ define by $f(x_1, x_2, x_3) = (x_1 + x_2 + x_3, 2x_1 + x_2 + 2x_3, x_1 + 2x_2 + x_3)$, $(x_1, x_2, x_3) \in \mathbb{R}^3$. Show that f is a linear mapping. Find $Ker(f), Im(f), rank(f)$ & $nullity(f)$.

b) Let $S = \{(x, y, z) \in \mathbb{R}^3 : 3x - y + z = 0\}$. Show that S is a sub-space of \mathbb{R}^3 . Find a basis of S .

Central University of Haryana
Term End Examination March 2023
B.Tech. Programmes Civil/CSE
Branch: Civil/CSE

Course Code: BT HUM 101B

Course Title: English Language Skills

Max Time: 3 hrs

Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

- (a) What are three P's of professional writing?
- (b) Differentiate between CV, Resume and Bio-data.
- (c) Differentiate between BATNA and WATNA.
- (d) Define three kinds of Resume.
- (e) Give two advantages of Telephonic interview.
- (f) Mention any two personal gains that one gets on writing a report.
- (g) Define paragraph. Name the four components of a paragraph.

PART -II

Q. No.2 (a) Do as directed in brackets. (7 marks)

- i) Everyone of the prisons _____ full. (is/are)
- ii) Neither my friend nor I _____ to blame (is/am/was)
- iii) Three parts of the business _____ left for me to do. (are/is)
- iv) She called him a fool. (Identify the verb pattern)
- v) You have made your shirt dirty. (Identify the verb pattern)
- vi) I saw him crossing the bridge. (Identify the verb pattern)
- vii) We have paid him the money. (Identify the verb pattern)

(b) i) Complete the following passages with the most appropriate choices given in brackets.

Insects do not have (1) _____ (wings, vision, absorption) as sharp as that of mammals or birds.

The insect compound eye is more familiar to movement and so it cannot (2) _____ (hilariously, precisely, tangibly) position distant objects. So, insects tend to take a rather unsteady flight path to navigate to a particular object. (2 marks)

ii) You are HR of an ABC Publishing house. Interview is to be conducted for clerical staff. As the HR you need to inform the shortlisted candidates for details (venue, timings, etc.)

regarding the interview. Draft a NOTICE in 50 words covering all the necessary information
which is to be displayed at the Head Office. (5 marks)

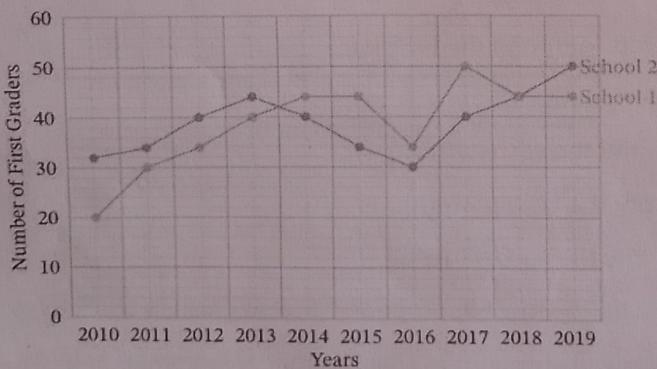
OR

Q. No.2 (a) Write an essay on "Soft Skills: Key to Success" in about 200 words. (7 marks)
(b) Arrange the following sentences in the correct order to construct a unified and coherent
paragraph. Give an appropriate TITLE to the paragraph. (7 marks)

- i) By passing the steam through specially designed turbines geared to the generator to be rotated, electric power can be produced.
- ii) In some countries an alternative source of heat energy is provided by the controlled nuclear fission of uranium and other fissile elements.
- iii) By the combination of such fuels in the boiler, high-pressure steam can be generated.
- iv) Coal, oil, and natural gas are the commonest prime sources of energy.
- v) The electric power thus produced is fed into the distribution network of power lines and cables radiating from the generation station.
- vi) The energy released by the nuclear reaction heats a stream of gas which is used to raise steam for driving the turbines and generators.
- vii) it is here from that the electric power is transmitted to its industrial customers.

Q. No.3 (a) The following line graphs compare the average number of first graders in two different schools for 10 years. The orange line represents school 1, and the blue line represents school 2. Compare the two line graphs with the use of proper comparatives in about 150 words.

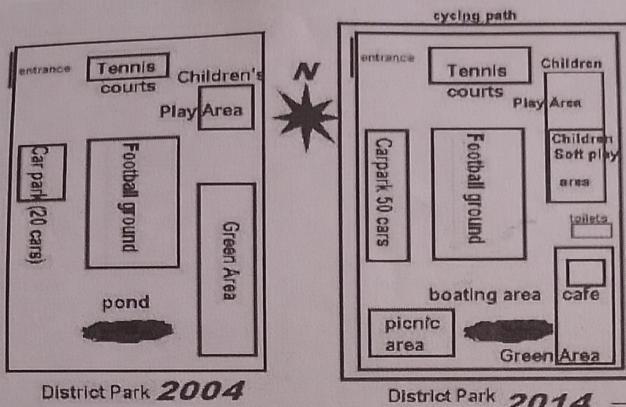
(7 marks)



- (b) (i) Differentiate between Bell and Belle by using them in sentences. (2 marks)
- (ii) Differentiate between Anonymous and Unanimous by using them in sentences (2 marks)
- (iii) Give one-word substitution of: One for whom the world is home. (1 mark)
- (iv) Construct a sentence for the Idiom: "Flash in the pan" (1 mark)
- (iv) Use the following phrasal verb "nod off" in your sentence

OR

Q. No 3 (a) Elaborate the changes seen in a District within 10 years in 150 words. Use appropriate comparatives. (7 marks)



The diagrams show how a District park looked ten years ago and how it looks now.

(b) Do as directed in brackets: (7marks)

- I want to find a gym that is not only close to my apartment but also I want to find a cheap one. (make the sentence parallel)
- Using twenty-one different instruments, they will collect data that scientists hope will help explain the origins of comets and other celestial bodies. (Delete the redundant word or phrase)
- Use the following phrasal verbs in sentences: call off; count on.
- Give one word substitution of : One who does not drink wine.
- Differentiate between Cease and Seize by using them in sentences.

Q. No.4 (a) do as directed in brackets: (7 marks)

- She wants a medical advice (change the adjective into adjective phrase)
- He tried hard (Change into adverb phrase)
- We enjoy cricket (change into noun phrase)
- All desire wealth and some acquire it (change to passive)
- He must work very hard to make up for the lost time (change into compound)
- I called him but he gave me no answer (into Simple)
- He replied to the best of his ability (into complex)

(b) Do as directed in brackets: (7 marks)

- If I had been there, I have helped. (would/could/either)
- Whatever you do, do well. (Identify whether Complex, compound or simple)
- They saw the storm approaching. (Change into passive)
- They saw the storm approaching. (Into passive)

Open the window (into passive)

- v) Alice was not much surprised at this. (into active)
vi) One should keep one's promises. (Into passive)
vii) Had I known in advance, I _____ enough money. (would take/ will take/ took/ would have taken)

OR

- Q. No 4 (a) Do as directed in brackets: (7 marks)
- i) He remarked how impudent the boy was. (into simple)
ii) Do as I tell you or you will regret it. (into complex)
iii) The Russians burnt Moscow. The French were forced to quit it. (into simple)
iv) He was my school fellow. He has become a great man. He has grown proud. He forgets his old friends. (into compound)
v) Do not insult the weak. (into passive)
vi) If I were you, I _____ him right away (will dismiss/ would dismiss/ would have dismissed)
vii) The melody has been composed wonderfully by A.R. Rahman. (change into active)
- (b) In modern times, working women are facing problems like eve teasing, sexual harassment, gender discrimination at the time of promotion, salary fixation etc. You, as the Head of Women Welfare Association, have been asked to write a report on Gender Discrimination at Work Places. Prepare a Questionnaire to be sent to women professionals working in various organizations in order to elicit the relevant information. (7 marks)
- Q. No.5 (a) The following advertisement was given in The Hindustan Times. Write a COVER letter with a detailed CV for the given post : Wanted a Plant Manager (Operations) at our new factory in Gaziabad, UP. Engineering Graduates with minimum 5 years experience in manufacturing industries as Plants Managers can apply. Salary is negotiable. Apply with particulars to Box 650, The Hindu, Chennai- 600004. (7 marks)
- (b) "Her only message of cheer to people who knew they had not much longer to live was Bhogoban Achhen". Discuss about Mother Teresa in the light of the above statement. (7 marks)

OR

- Q. No.5 (a) Define negotiation. Give the requisites of a negotiation process. (7 marks)
- (b) Lala Har Dayal in his book "Hints for Self Culture" discusses about five groups of natural phenomena. Name them and discuss them briefly. (7 marks)