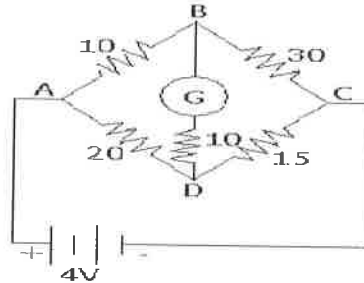


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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: **Basic Electrical and Electronics Engineering**Branch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. a) Derive Star to Delta and Delta to Star Transformation (8)
- b) State and explain KCL and KVL (6)

OR

2. a) Determine the current in 15Ohm resistor of the circuit as shown in fig.(all resistances are in ohms).



- b) Write short notes on Resistance, Inductance and capacitance.
3. a) Explain analysis of single phase RC series circuit. (9)
- b) A resistance of 20Ω , Inductance of $0.05H$ and capacitance of $50\mu F$ are connected in series. A supply voltage $230V$, $50Hz$ is connected across series combination. Calculate i) Impedance ii) Current drawn by circuit iii) Phase difference iv) Power factor. (5)

OR

4. a) Define the following: i) RMS value ii) Average value and iii) Power factor with respect to an AC circuit. [6]
- b) A coil having a resistance of 10Ω and an inductance of $0.2H$ is connected in series with a $100\mu F$ capacitor across a $230V$, $50Hz$ supply, Calculate: i) Impedance ii) Current iii) Active and Reactive power. [8]
5. a) Explain principle of operation of Three-phase Induction motor? (7)
- b) A 4-pole motor is fed at $440V$ and takes an armature current of $50A$. The resistance of armature circuit is 0.28Ω . Armature winding is wave connected with 880 conductors and useful flux/pole is $0.023wb$. Calculate speed of motor. (7)

OR

6. a) Explain working principle of DC motor. (7)
- b) A 6 pole induction motor is fed by three phase $50Hz$ supply and running with a full load slip of 3% . Find the full load speed of induction motor and also the frequency of rotor emf. (7)
7. a) Explain forward and reverse bias of P-N Junction Diode with VI Characteristics (10)
- b) Define static and dynamic resistances (4)

OR

8. a) How is zener diode used as a voltage regulator? (6)
- b) Differentiate between ideal and practical diode. [6]
- c) Define diode and draw its symbol. (2)
9. Explain Briefly about CB connection. Draw input and output characteristics and explain how they are obtained (14)

OR

10. a) Explain Briefly about CC connection. Draw input and output characteristics and explain how they are obtained (10)
- b) Comparison between CE and CB configuration (4)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019Subject: Engineering GraphicsBranch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. Construct a Parabola when the distance of the focus from the directrix is equal to 80 mm.

OR

2. A circle of 50mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference for one complete revolution of the circle. Name the curve. Draw a tangent to the curve at a point on it 40mm from the line.
3. Draw the projections of a circle of 75 mm diameter having the end A of the diameter AB in the horizontal plane and the surface inclined at 30° to HP and perpendicular to VP.

OR

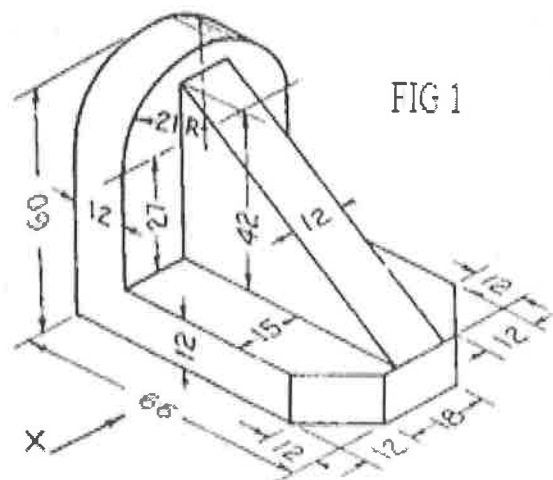
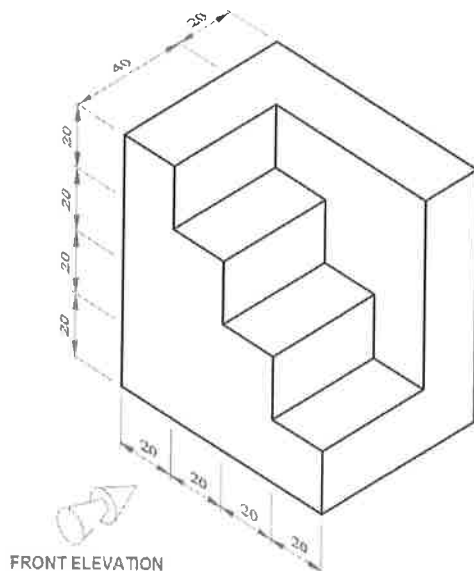
4. A line AB 75mm long is inclined at 45° to HP and 30° to the VP. Its end B is in the HP & 40mm in front of VP.
5. Draw the projections of a cone of base 75 mm diameter and axis 100 mm long, lying on the ground on one of its generators with the axis parallel to the VP. Draw its projections

OR

6. A Square pyramid, base 40mm side & axis 65mm long, lies on HP on its slant edge, axis parallel to VP, draw the projections.
7. Draw the isometric view of right regular cylinder of 120 mm long and 30 mm base radius, when the
i). Axis is vertical ii). Axis is horizontal

OR

8. A) A pentagonal pyramid of base of side 30mm and axis 50mm long is resting on its base on HP. Draw the development of solid.
B) A pentagonal prism of base of side 30mm and axis 60mm long is resting on its base on HP. Draw the development of lateral surface.
9. Draw the orthographic front view, top view and left side view of the given casting.

**OR**

10. Draw the Orthographic view's (front view, top view and right side view) of the following FIG 1.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: Engineering MechanicsBranch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. a. State and prove Lami's theorem [4]
- b. Find the resultant of the force system acting on the hook shown Fig.1. [10]

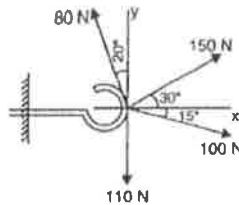
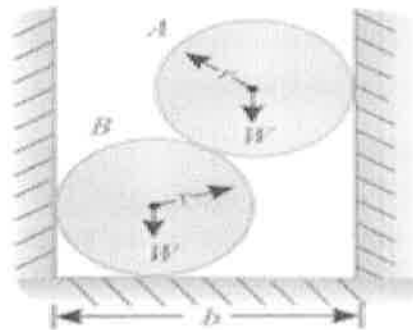


Fig.1.

OR

2. Two smooth spheres of weight W and radius r each are in equilibrium in a horizontal channel of A and B vertical sides as shown in Fig. 2. Find the force exerted by each sphere on the other. Calculate these values, if $r=250\text{mm}$, $b=900\text{mm}$ and $w=100\text{N}$.

**Figure 1**

3. a. State the laws of static and dynamic friction. [4]
- b. A ladder of length 6 m and weight 300 N is placed against a vertical wall such that the inclination with the wall is 30° . A man weighing 720 N climbs the ladder. At what position will the ladder slip? The coefficient of friction for both the contact surface is 0.2. If the bottom of the ladder is held by a horizontal string tied to the wall, what would be the tension in the string when the man is at top of the ladder? [10]

OR

4. a. Differentiate between center of gravity and centroid. [4]
- b. Determine the centroid of the shaded area shown in the Figure.1 [10]

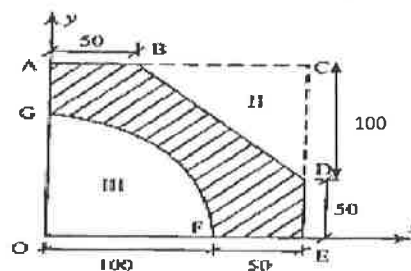


Figure.1

5. a. Prove that moment of inertia of a triangular section about the base of the section is $\frac{bh^3}{12}$.
 b. Determine the moments of inertia with respect to the centroidal axes of the wide-flange beam section shown in Fig.4.

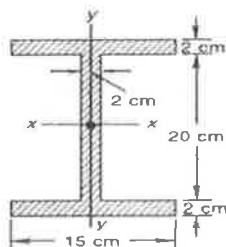


Fig.4.

OR

6. a. Find the mass moment of inertia of a thin rod of length L about its centroidal axes.
 b. Calculate the moment of inertia for an area shown in the Fig.2.

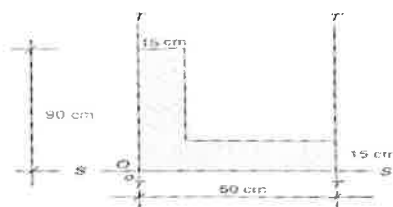
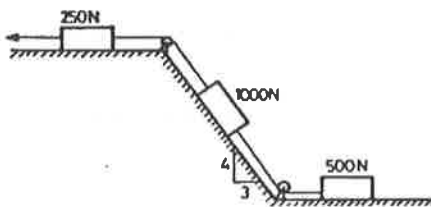


Fig.2.

7. The motion of a particle moving along a straight line is expressed as $s = t^3 - 8t^2 - 3t + 15$. Find (i) the time at which the velocity of particle will be zero. (ii) the distance travelled by the particle at that time. (iii) the acceleration of the particle at that time. (iv) the net displacement of the particle from $t=2$ seconds to $t=4$ seconds.

OR

8. a) Define kinetics and kinematics. [4]
 b) A bullet leaves the muzzle of a gun with velocity $v = 750$ m/s. Assuming constant acceleration from breech to muzzle, find the time t occupied by the bullet in travelling through the gun barrel, which is 750 mm long. [10]
 9. a. Explain the principle of conservation of energy. [4]
 b. Determine the constant force P that will give the system of bodies shown in Fig. a velocity of 3m/sec after moving 4.5 m from rest. Coefficient of friction between the blocks and the plane is 0.3. Pulleys are smooth. [10]



OR

10. a. What do you understand by free vibrations? [4]
 b. A body oscillates with a simple harmonic motion along x -axis. Its displacement varies with time according to $x = 8 \cos(\pi t + \pi/4)$, where t is in seconds and angle in radians. (i) Determine amplitude, frequency and period of vibration. (ii) Calculate the velocity and acceleration of the body at any time ' t '. (iii) Using results of (b), determine the position, velocity and acceleration of the body at $t = 1$ [10]

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019Subject: Programming for Problem SolvingBranch: **Common to ECE, EEE, CSE & IT****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. a) Explain different types of translators.
b) Write a program to determine the real roots of a quadratic equation $ax^2+bx+c=0$.
OR
2. a) Write an algorithm and draw flowchart for finding greatest among three given numbers. [4]
b) Briefly explain about the basic data types that C language supports. [5]
c) Convert decimal 725 to binary, octal and hexadecimal number systems. [5]
3. a) Explain about break and continue with an example.
b) Write a C program to find Fibonacci series of a given number 'N' by using iteration and recursion separately.
OR
4. a) Write a C program to generate all prime numbers between 1 and n, when the value for n is given by user.
b) Explain about the iterative statements with examples.
5. a) How pointer can be used for accessing multi dimensional arrays? Discuss.
b) Explain about dynamic memory management.
OR
6. a) Write a C program to find substring in a given string.
b) Write a C program to check whether the given number is Armstrong or not.
7. a) What is recursion? Explain. Write a recursive function to generate Factorial of a given number.
b) Discuss about array of structures.
OR
8. a) Explain how to pass one dimensional arrays to functions.
b) Differentiate between array of structure and pointer to structure.
9. a) How to read from and write to a file? Explain with examples. [5M]
b) Explain binary search method with an example. [5M]
c) List the advantages of using files. [4M]
OR
10. a) What is file? Explain different types of files with examples.
b) Write a program for insertion sort and explain with an example.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad**I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: Engineering Mathematics -IBranch: **Common to CE, ME, EEE, ECE, CSE, IT & MINING****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. (a) Investigate for what values of λ and μ , the system of equations
 $2x + 3y + 4z = 16$, $x + 3y + 3z = 10$, $x + 2y + \lambda z = \mu$
 have (i) no solution, (ii) a unique solution, (iii) an infinite number of solutions.
 b) Solve the system of equations
 $3x + 2y + 7z = 4$, $2x + 3y + z = 5$, $3x + 4y + z = 7$
 by LU decomposition method.

OR

2. (a) Find the rank of a matrix $\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$ by reducing it to Echelon form.
 (b) Solve completely the system of equations $x + y - 2z + 3w = 0$,
 a. $x - 2y + z - w = 0$, $4x + y - 5z + 8w = 0$, $5x - 7y + 2z - w = 0$
3. (a) Find the inverse of the matrix $\begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ by using Cayley Hamilton theorem. Also find the
 matrix represented by $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$. (10)
 b) If λ is an eigen value of the matrix A , then show that λ^m is an eigen value of A^m . (4)

OR

4. (a) Diagonalize the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ -4 & 4 & 3 \end{bmatrix}$ and hence find A^8 . (10)
 (b) Show that the determinant of a square matrix A is equal to the product of the eigen values of A . (4)

5. Test the convergence of the series

(i) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n} + \sqrt{n+1}}$, (ii) $\sum \frac{1.3.5 \dots (2n-1)}{2.4.6 \dots 2n(2n+2)}$

OR

6. Test the convergence of the series

(i) $\frac{x}{1+x} - \frac{x^2}{1+x^2} + \frac{x^3}{1+x^3} - \dots$, (ii) $\sum_{n=1}^{\infty} \frac{(x-1)^n}{n^2}$

7. (a) If $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in the range 0 to 2π , find Fourier series of $f(x)$.

(b) Find the Fourier series of $f(x) = 2x - x^2$ in $(0, 3)$

and hence evaluate $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$

OR

8. (a) Express the function $f(x) = x$ in $-\pi < x < \pi$ as Fourier series

(b) Obtain a half range cosine series for $f(x) = \begin{cases} kx, & 0 < x < 1/2 \\ k(1-x), & 1/2 < x < 1 \end{cases}$

9. (a) Verify Taylor's theorem, for $f(x) = (1-x)^{\frac{5}{2}}$ with Lagrange's form of remainder upto two terms in the interval $[0, 1]$.

(b) Show that $\int_0^{\infty} \sqrt{x} e^{-x^3} dx = \frac{\sqrt{\pi}}{3}$, using Gamma integral.

OR

10. (a) Verify Cauchy's mean value theorem for $\log_e x$ and $\frac{1}{x}$ in the interval $[1, e]$.

$$\int_a^b (x-a)^m (b-x)^n dx = (b-a)^{m+n+1} \beta(m+1, n+1)$$

(b) Show that

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1. a) State and explain Heisenberg's uncertainty principle. (5)
b) Using uncertainty principle find the uncertainty in the frequency of light emitted by an atom. The life time of an electron in the excited state is of 10^{-8} s, ($h = 6.625 \times 10^{-34}$ J-s). (5)
c) Calculate the wavelength associated with an electron accelerated in a potential 1600 V (4)

OR

2. a) Explain the concept of the Photoelectric effect. (4)
b) How the black body spectrum problem initiated a foundation to quantum mechanics. (5)
c) Calculate the de-Broglie wave length associated with a proton moving with a velocity of $1/10^{\text{th}}$ of velocity of light (Mass of proton = 1.67×10^{-27} Kg). (5)
3. a) Discuss the theory behind the electron in a periodic potential. (8)
b) Explain the concept of Brillouin zones. (6)

OR

4. a) Discuss about the salient features of Classical free electron theory of metals (6)
b) Write notes on E-K curve. (6)
c) Define Fermi level. (2)
5. a) Distinguish between the intrinsic and extrinsic semiconductors. (6)
b) Derive the expression for electron density in conduction band of an intrinsic semi conductor. (8)

OR

6. a) Describe the drift and diffusion currents in a semiconductor. (5)
b) Derive the expressions for drift and diffusion currents. (5)
c) Discuss the voltage –current characteristics of a *pn*-junction diode with neat diagram. (4)
7. a) Explain absorption, spontaneous emission, and stimulated emission of radiation. (6)
b) Derive the relation Einstein relations. (8)

OR

8. a) Explain optical fiber communication system with block diagram. (8)
b) Explain the different methods used for pumping. (6)
9. a) Explain (i) Divergence (ii) Curl and their physical significance. (6)
b) The functions are given as, $V_a = x\hat{i} + y\hat{j} + z\hat{k}$, $V_b = \hat{k}$, $V_c = z\hat{k}$ and $V_d = y\hat{j}$ calculate their divergences. (8)

OR

10. a) Derive the electromagnetic wave equation for free space and deduce the expression for speed of light. (8)
b) What is Lenz's law and write its physical significance. (6)

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I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019Subject: Engineering ChemistryBranch: **Common to CE, ME & MINING****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. a) What is the principle of EDTA method?
b) Describe the estimation of hardness of water by EDTA method.

OR

2. a) Write a short note chlorination of water. **4M**
b) Calculate the amount of Lime Soda required for softening of 50000 liters of water containing the following salts per liter $\text{Mg}(\text{HCO}_3)_2=7.5 \text{ mg/l}$; $\text{Ca}(\text{HCO}_3)_2=8.1 \text{ mg/l}$; $\text{MgCl}_2=2.0 \text{ mg/l}$; $\text{CaSO}_4=13.6 \text{ mg/l}$; $\text{MgSO}_4=12.0 \text{ mg/l}$ and $\text{NaCl}=4.7 \text{ Mg/l}$. **10M**
3. a) Write the molecular orbital energy level diagram of N_2 . Calculate respective bond order and write the magnetic properties?
b) Explain crystal field splitting of octahedral complex by taking $[\text{Co}(\text{CN})_6]^{3-}$ as a complex.

OR

4. a) Describe the crystal field splitting of tetra hydral complexes by taking $[\text{Ni}(\text{CN})_4]^{2-}$ as an example.
b) Explain the Crystal field splitting of transition metal complexes in octahedral with an example.
5. a) Write Nernst equation; explain the terms in it and mention its applications.
b) Write a note on Hot dipping (Galvanization).

OR

6. a) Write a note on electrochemical series and its applications.
b) Write a short note on dry or chemical corrosion.
7. a) Define conformational isomerism. **2M**
b) Draw different conformational isomers of n-butane. Explain their stability with potential energy diagram. **12M**

OR

8. a) Describe the classification of isomers.
b) What is meant by chirality? Write examples.
9. a) Write synthesis and mechanism of Paracetamol.
b) Write the pharmaceutical applications of paracetamol.

OR

10. a) Write Diels-Alder reaction and its mechanism with suitable examples.
b) What are reaction Intermediates? Explain formation and stability of carbocations.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**I B.TECH I SEMESTER SUPPLEMENTARY END EXAMINATIONS, MAY-2019**Subject: **English**Branch: **Common to ECE, EEE, CSE & IT****Time: 3 hours****Max. Marks: 70**Answer **ALL** questions of the following**5x14 Marks= 70Marks**

1. a) Write short notes on the following 10m
 - i. Characteristics of effective writing
 - ii. Types of reading
 - b) Write meanings for the following roots and frame a word using the root. 4m
 - i. ion
 - ii. Ous
 - iii. ness
 - iv. Cord
- OR**
2. a) What are the events that made Mill burn to focus on life's most important aspects adapting to a minimalist lifestyle. 10m
 - b) Write appropriate prepositions for the following 2m
 - i. If you want to go ----- bus, you have to go to the bus stop.
 - ii. Are you the new student----- Portugal.
 - iii. We have been working -----the last six months
 - iv. Eyes are to see -----
 - c) Use Suitable articles for the following 2m
 - i. She was wearing -----ugly dress when she met him.
 - ii. I am crazy about reading ---- history books.
 - iii. She is ----- nice girl.
 - iv. Do you want to go to ----- restaurant where we first met?
 3. a) Interpret the lines from the poem 'Life' 'Wounded with fierce desire and worn with strife, Children, ye have not lived: for this is life. 5m
 - b) Write a paragraph on ' the use of solar energy' 5m
 - c) Complete the sentences with the right pair (s) of Homographs: 2m
 1. Wrest" and "rest" are homonyms. ?
You must -----victory from the jaws of defeat, but then you must --- your weary body.
 2. "Would" and "wood" are homonyms.
How would you like the -----cut?. -----you like to volunteer for it?
- Fill in the blanks with appropriate words given in the bracket. 2m
- a. The traveler walked across the dry-----(**plain/plane**)
 - b. The conductor charged more----- (**fare/fair**)
- OR**
4. a) According to APJ Kalam "becoming a knowledge super power is a very important mission for the nation". Discuss 10m
 - b) For each of the sentences, write another one using a **homonym** of the word in bold. 4m
 - (i) I **can** hit six sixes in an over.
 - (ii) The **bark** of that tree is brown.
 - (iii) Give me your **address**.
 - (iv) What do you **mean** by that?
 5. a) What kind of moral is conveyed through the character **Subbiah** as a rice merchant in R.K. Narayan's story. 10m
 - b). Fill in the blanks with suitable form of the verbs(s) given in brackets. 4m
 - a. We ----- her once. (have met/have been meeting)
 - b. Rakesh is tired. He-----for a week. (has travelled/ has been travelling).
 - c. The machine-----for almost ten hours.(has run/has been running)
 - d. He ----- here since 2010 (has been work)
- OR**
6. (a) Describe how Subbaiah's greed led to his tragic death in the story *Half a Rupee Worth*. 10m
 - (b) Give the meaning and make a sentence for each of the **idioms** given below. 4m
 - (i) Bell the cat.
 - (ii) By hook or by crook.
 - (iii) Red-letter day.
 - (iv) Black sheep.

7. a). Write about the early life and family of Jesse Owens 10m
 b). i) A Sword is not as strong as pen (Change it into comparative) 4m
 ii) Very few countries in the world are as rich as America (Change it into superlative)
 iii) The new boss is well known for his rigid approach to all problems
 a) Swift b) Logical c) Sympathetic d) Flexible
 iv) Provide one word substitutes to the following sentence.
 i. A person who hates women----- ii. Rule by a king-----

OR

8. a) Write a letter requesting the Director of the institute to provide efficient wi-fi internet connectivity on the campus, highlighting its need for studies. 8m
 b) Choose the correct one word substitute for a person who speaks two languages 1m
 a) Language b) Bilingual c) Trilingual d) Pheoneticians

Choose the correct one word substitute for

One who is sacred of spiders ' 1m

- A. Arachnophobia B. Acrophobia
 C. Agoraphobia D. Ophidiophobia

Choose the correct one word substitute for the phrase' one who has the fear of dogs. 1m

- A. Xenophobia B. Cynophobia
 C. Gynophobia D. Cacophobia

Choose question tags 3m

- i. He is gullible ----- ii. Tigers are ferocious ----- iii. Sita likes icecreams-----

9. a) "My friend... You can easily prove that you are as good as he is". Explain the Context and the significance of Barnum's advice. 7m
 b) According to Burnam what kind of people can attain ""pecuniary Independence"? 7m

OR

10. (a) What suggestions Barnum gives to achieve pecuniary independence. Discuss 10m
 (b) Convert the sentences given below to **indirect speech**: 4m
 (i) Ganesh said, 'Lend me your pen, Satish, for a minute.'
 (ii) Aravind said, "I prefer death to dishonor."
 (iii) "Shall I place the table now?"
 (i) "Don't speak until you are spoken to."