K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: BASIC ELECTRICAL ENGINEERING (ECE & CSE)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) State and explain Kirchoff's laws.
   (b) Determine v_x for the circuit shown in figure 1.
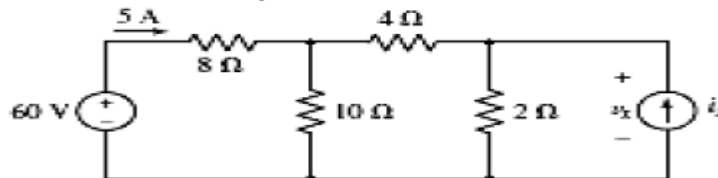

Figure 1

(OR)

2. (a) List out different types of sources and explain them in detail.
   (b) A resistance of R ohm is connected in series with a parallel circuit comprising of two resistors of 12 ohm and 28 ohm respectively. The total power dissipated in the circuit is 70 W when the applied voltage is 20 V. Find the value of R.

UNIT – II

3. (a) Define and derive the expression for average value of a sinusoidal voltage wave form.
   (b) An inductor of 50 mH is connected across 220 V, 50 Hz single phase supply. Calculate the reactance of the inductor rms value of current and maximum current.

(OR)

4. (a) Show that power dissipated by a pure inductive circuit excited by a sinusoidal source is zero.
   (b) A pure capacitance C = 10 μF passes a current I = 10Sin 2000t Amps. Find the voltage across the element.

UNIT – III

5. (a) Derive the emf equation of DC generator.
   (b) An 8-pole lap wound dc generator has 960 conductors, a flux of 40 mWb and is driven at 400 rpm. Find induced emf.

(OR)

6. (a) Derive the torque equation of a DC motor
   (b) A 110 V, shunt motor takes 3A on no load. The resistance of the armature including the brushes is 0.2 ohm and the field current is 0.5 A. Estimate the output and the efficiency when the input current is 10 A.

UNIT – IV

7. (a) Explain the losses that occur in transformers.
   (b) A 3300/220 V, 30 KVA, 1- transformer takes a no load current of 1.5 A when the low voltage winding is open. The iron loss component is 0.4 A. Find (i) no load input power (ii) Magnetizing component (iii) power factor

(OR)

8. (a) Explain with the help of diagram how a rotating magnetic field is produced in a 3- phase Induction Motor.
   (b) A 3-phase, 6 pole, 50HZ induction motor develops 4 KW including friction and windage losses at 950 rpm. If the stator loss is 250w. find the rotor frequency.

UNIT-V

9. (a) What is fuse? Differentiate between fuse and circuit breaker.
   (b) Explain about different types of cables and significance of Earthing

(OR)

10. (a) Explain about series and parallel connection of batteries.
    (b) Explain about miniature circuit breaker and power converters.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: PROGRAMMING FOR PROBLEM SOLVING (CE, EEE & ME)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is an Algorithm? Explain different categories of Algorithms?   7M
   (b) Define Input and Output Devices? Mention any four I/O Devices?   7M

(OR)

2. (a) What is a Flow chart? Explain different symbols used in Flow chart?   7M
   (b) Draw the flowchart for the following   7M
       The average score for three tests has to be greater than 80% for a candidate to qualify in interview. Representing conditional logic for generating reject letters for all candidates who do not get the required average and interview call letters for others?

UNIT – II

3. (a) What is an Expression? Evaluate an arithmetic expression **x = a-b/3+c*2-1.**   7M
       Let a = 9, b =12, and c=3.
   (b) Explain the difference between = and == ? Explain with an example?   7M

(OR)

4. (a) What is a loop? Why it is necessary in a program? What happen if you create a loop that never ends?   7M
   (b) Write a C program to reverse the digits of a number.   7M

UNIT – III

5. (a) What is an Array? How an array is differing with an ordinary variable?   7M
   (b) Explain Binary search working principle with suitable example?   7M

(OR)

6. (a) Explain declaration and initialization of arrays of strings   7M
   (b) Write a C program to find whether a given string is Palindrome or not?   7M

UNIT – IV

7. Explain Different parameter passing techniques with suitable example?   14M

(OR)

8. Explain Different Storage classes available in C Language?   14M

UNIT-V

9. (a) How structure elements are accessed using pointers ?Which operator is used? Give example?   7M
   (b) Define a structure type Struct KSRM that contains name, age, designation and salary. Using this structure write a C program to read this information for one person from the keyboard and print the same on the screen.   7M

(OR)

10. (a) What is structure within structure? Give an example for it?   7M
    (b) list out the difference between structure and union?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: MATHEMATICS-I (Common to all Branches)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.

(a) Reduce the matrix $\begin{bmatrix} 3 & -2 & 0 & -1 \\ 0 & 2 & 2 & 1 \\ 1 & -2 & -3 & 2 \\ 0 & 1 & 2 & 1 \end{bmatrix}$ to canonical form and hence find its rank.   7M

(b) Find the Eigen values and the corresponding Eigen vectors of the matrix   7M
$\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$

(OR)

2. (a) Find the values of a and b for which the equations x + ay + z = 3,   7M
x + 2y + 2z = b, x + 5y + 3z = 9 are consistent. When these equations has a unique solution.

(b) Diagonalize the matrix A = $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ and also find A^4.   7M

UNIT – II

3.

(a) Test the converge of the series $\frac{\sqrt{2}-1}{3^2-1} + \frac{\sqrt{3}-1}{4^2-1} + \frac{\sqrt{4}-1}{5^2-1} + \cdots$ 7M

(b) Test the convergence of the series $\frac{2}{3.4}x + \frac{3}{4.5}x^2 + \frac{4}{5.6}x^3 + \cdots$ 7M

(OR)

4.

(a) Test the convergence of the series $\sum \left(1 + \frac{1}{\sqrt{n}}\right)^{-n^{3/2}}$.   7M

(b) Test the convergence of the series $\left(\frac{2^2}{1^2} - \frac{2}{1}\right)^{-1} + \left(\frac{3^3}{2^3} - \frac{3}{2}\right)^{-2} + \left(\frac{4^4}{3^4} - \frac{4}{3}\right)^{-3} + \cdots$ 7M

UNIT – III

5. (a) Obtain the Maclaurin's series expansion of $f(x) = cosx$.   7M
   (b) Find the envelope of a family of straight lines $cos^3\theta + y\, sin^3\theta = c$, where c is the   7M
   parameter.

(OR)

6. (a) Show that the evolute of the ellipse $x = a\, cos\theta$, $y = b\, sin\theta$ is $(ax)^{2/3} + (by)^{2/3} = (a^2 - b^2)^{2/3}$ 7M

(b) Find the radius of curvature at the point $(\frac{3a}{2}, \frac{3a}{2})$ of the curve   7M
   $x^3 + y^3 = 3axy$.

UNIT – IV

7. (a) Find the maximum and minimum values of   7M
   $sinx . siny . sin(x + y)$, where $0 < x < \pi, 0 < y < \pi$.
   (b) Show that $u = xy + yz + zx$, $v = x^2 + y^2 + z^2$, $w = x + y + z$, are   7M
   functionally dependent and find the relation.

(OR)

8. (a) Find the maximum and minimum values of   7M
$$f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2 \ (x > 0, y > 0).$$
   (b) If $z = f(x, y)$, where $x = u + v$ and $y = uv$ then show that   7M
$$u\frac{\partial z}{\partial u} + v\frac{\partial z}{\partial v} = x\frac{\partial z}{\partial x} + 2y\frac{\partial z}{\partial y}.$$

UNIT-V

9.
   (a) Evaluate $\iint_R dxdy$, where R is the region bounded by $x - axis$, $x^2 = 4ay$ and   7M
$x = 2a$.
   (b) Find Fourier series of $f(x) = \begin{cases} -K, & if -\pi < x < 0 \\ K, & if\ 0 < x < \pi. \end{cases}$ And hence deduce that   7M
$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \cdots = \frac{\pi}{4}.$$

(OR)

10.
   (a) Show that $a^m b^n \int_0^\infty \frac{x^{m-1}}{(ax+b)^{m+n}} dx = \beta(m, n).$ 7M
   (b) Find half range Fourier Sine and Cosine series of $f(x) = x^2$ in $[0, \pi]$.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: ENGINEERING PHYSICS (ECE)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Mention the important characteristics of Simple harmonic motion with necessary expressions. 5M
   (b) Describe the linear superposition of two waves of same frequency. 6M
   (c) A particle executives simple harmonic motion with a period of 0.002 sec with an amplitude of 0.2 m. Find its acceleration when it is at a distance of 0.04 m from its mean position. 3M

(OR)

2. (a) Derive the expression for the energy of a simple harmonic motion. 4M
   (b) Describe the damped harmonic oscillator with necessary damping conditions. 10M

UNIT – II

3. (a) Derive the conditions to obtain bright and dark fringes due to interference in thin film by reflection. 5M
   (b) Describe the formation of Newton's rings with necessary theory. 6M
   (c) Find the thickness of air film at 10th dark ring in a Newton's rings system viewed normally by a reflected light of wavelength 600nm. Given diameter of 10th dark ring is 2 mm and radius of curvature 0.2 m. 3M

(OR)

4. (a) Describe Fraunhofer diffraction due to single slit with necessary expressions**.** 10M
   (b) For a grating the angle of diffraction for the second order principal maximum for the wavelength 550nm is 30^{0}. Find the number of lines per centimetre of the grating surface. 4M

UNIT – III

5. (a) Mention various excitation mechanisms to obtain population inversion 3M
   (b) Describe the construction and working of Nd:YAG laser with neat energy level diagram. 7M
   (c) Distinguish between Spontaneous and stimulated emission of Radiation. 4M

(OR)

6. (a) Mention the significance of population inversion in laser emission. 3M
   (b) Explain the construction and working of He-Ne laser with neat diagrams. 8M
   (c) Mention the few applications of laser. 3M

UNIT – IV

7. (a) Explain the concept of wave nature of matter. 4M
   (b) Derive time independent Schrodinger's wave equation. 6M
   (c) Explain uncertainty principle. 4M

(OR)

8. (a) Mention the important characteristics of matter waves. 3M
   (b) Describe the behavior of a free particle in a one dimensional Potential box. 8M
   (c) An electron is bound in a one dimensional potential box of width 0.1nm. Find its ground state energy. Given h=6.63x10^{-24}JS and m=9.1x10^{-31}Kg. 3M

UNIT-V

9. (a) Describe the behavior of electron in a periodic varying potential field using Kronig-Penny model. 10M
   (b) Describe the classification of metals, semiconductors and insulators based on energy band structure. 4M

(OR)

10. (a) Describe the effect of carrier concentration on Fermi level of a semiconductor. 5M
    (b) Distinguish between direct and indirect band gap semiconductors 5M
    Explain the diffusion of charge carriers in a semiconductors. 4M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: ENGINEERING PHYSICS (CSE)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Describe Young's double slit experiment and derive the expression for the fringe width. — 10M
   (b) A light source emits light of two wavelengths $\lambda_1 = 4250$ A^0 and $\lambda_2 = 5050$ A^0 in young's double slit experiment. The distance between the slits and the screen is 1.5 m and the distance between the slits is 0.025 mm. Find the separation between the third bright fringes due to these two wavelengths. — 4M

(OR)

2. (a) Describe Fraunhofer diffraction due to single slit by obtaining the condition for principal maxima, minima and secondary maxima and mention the intensity distributions. — 10M
   (b) The first diffraction minima due to single slit is occurred at an angle of 60^0 for a light of wavelength 6000 A^0. Find the width of the slit. — 4M

UNIT – II

3. (a) Mention the role of population inversion in laser emission. — 3M
   (b) Explain the construction and working of He-Ne laser with neat diagrams. — 8M
   (c) Mention the few applications of laser. — 3M

(OR)

4. (a) Explain the interaction of radiation with matter. — 3M
   (b) Derive the relation between various Einstein's coefficients related to Absorption and emission of radiation. — 8M
   (c) Mention the important characteristics of laser light. — 3M

UNIT – III

5. (a) Mention the merits of free electron theory. — 4M
   (b) Describe the behavior of an electron in periodical varying potential Crystal lattice using Kronig Penney model resulting in E-K diagram. — 10M

(OR)

6. (a) Explain the origin of energy bands in solids. — 5M
   (b) Describe the classification of metals, semiconductors and insulators based on energy band structure. — 5M
   (c) Mention the significance of effective mass concept. — 4M

UNIT – IV

7. (a) Describe the effect of carrier concentration on Fermi level of a semiconductor. — 5M
   (b) Explain the drifting of charge carriers in a semiconductor with relevant expressions. — 5M
   (c) Explain the formation of p-n junction. — 4M

(OR)

8. (a) What are intrinsic and extrinsic semiconductors? — 4M
   (b) Explain the diffusion of charge carriers in a semiconductor with relevant expressions. — 6M
   (c) Mention the semiconductor materials used for optoelectronic devices. — 4M

UNIT-V

9. (a) Explain the role of nanoscale on the properties of Nanomaterials. — 4M
   (b) Explain how Ball milling method is used for the synthesis of nanomaterials. — 6M
   (c) Mention the important applications of nanomaterials. — 4M

(OR)

10. (a) Mention the various types of nanomaterials with examples. — 4M
    (b) Explain the Chemical vapour deposition method used for the synthesis of nanomaterials. — 10M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: ENGINEERING CHEMISTRY (CE, EEE & ME)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Explain the band structure of solids and illustrate the role of doping with one example on band structure.   14M

(OR)

2. (a) Explain molecular orbitals of a simple diatomic molecule with example.   7M

   (b) Write your understanding about a particle in one dimensional box.   7M

UNIT – II

3. (a) Explain hard, soft acids and bases and give examples. What is the significance of this concept?   7M

   (b) Write a note on the oxidation states   7M

(OR)

4. (a) What is Ionization potential and electron affinity? Explain the factors affecting them.   10M

   (b) Define penetration of orbitals. What do you understand by penetration effect of orbitals?   4M

UNIT – III

5. Engineer is asked to explore the suitability of KSRM Engineering College ground water to startup a steam power plant in the college campus. Water sample is observed to contain the following, $CaSO_4$, $MgCO_3$, O_2, HCl, SiO_2 and oil. Your answer should contain definition, disadvantages, reactions and removal methods for the predicted boiler operation troubles.   14M

(OR)

6. (a) Write the cause for corrosion? Explain electrochemical corrosion.   10M

   (b) Outline the Critical phenomena   4M

UNIT – IV

7. (a) Summarize the selection rules in spectroscopy   8M

   (b) List the applications of fluorescence   6M

(OR)

8. (a) Define spectroscopy   2M

   (b) Explain vibrational and rotational spectroscopy of diatomic molecules   12M

UNIT-V

9. (a) Distinguish SN^1 and SN^2 reactions   6M

   (b) Discuss the Clemensen reduction   8M

(OR)

10. (a) Write a note on absolute configuration   7M

    (b) Write the addition reactions involving Grignard reagent   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. I Sem. (R18) Regular Examinations of November 2018
SUB: ENGLISH (CE, EEE, ME)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions.
All questions carry Equal Marks.

1.　　**Correct any FOURTEEN of the following sentences if necessary.**　　14M
　　(i)　There was serious mistakes in the project report.
　　(ii)　She is not use to do the housework.
　　(iii)　I live here since August, 2018.
　　(iv)　I cutted my finger today.
　　(v)　At this time tomorrow, I will be fly to Nairobi.
　　(vi)　Last month I went on a travel with my friends.
　　(vii)　I prefer coffee than tea.
　　(viii)　Could you please repeat that again?
　　(ix)　The party was good, no?
　　(ix)　It was an amazed idea.
　　(x)　He said me that he was excited.
　　(xi)　My aunt goes to walk every day.
　　(xii)　He has been learning Japanese since four years.
　　(xiii)　She is the right person to the job.
　　(xv)　Both of my sons are professional football players.
　　(xvi)　This bag of books belong to Noah.
　　(xvii)　She is the best singer I have heard.

2.　(a)　Explain the concept of word formation in English language. Discuss any five types of word formation with one example each.　　7M

　　(b)　Give antonyms of the following:　　7M
　　　　(i) emancipate　　　　　　(ii) altruistic　　　　(iii) worthless
　　　Give synonyms of the following:
　　　　(i) bizarre　　(ii) comfort　　(iii) dedicated　　　(iv) formerly

3.　(a)　Draft a dialogue between two friends regarding the features of their mobiles.　　7M

　　(b)　Give the meanings of the following idioms and phrases and use them in sentences.　　7M
　　　(i)　piece of cake　　　　　(ii) bell the cat　　　　(iii) add fuel to the fire
　　　(iv) blessing in　disguise　(v) at the drop of a hat　(vi) a hot potato
　　　(vii) cut corners

4.　(a)　(i)　Make 5 meaningful sentences in the given pattern.　An example is given.　　7M

Subject +	Verb +	Object +	+ to infinitive
She	helped	Me	to settle in a new home

　　(ii) Punctuate the following sentence.
　　it is a truth universally acknowledged that a single man in possession of a good fortune must be in want of a wife(*Pride and Prejudice*, Jane Austen)

　　(b)　What are the features of paragraph writing?　　7M

5. (a) Rewrite the following sentences as directed. 7M
      (i) He gave me a piece of advice. (Rewrite the sentence using the verb form of 'advice')
      (ii) Her first attempt was met with success. (Rewrite the sentence using the verb form of 'success')
      (iii) The windows have been cleaned. (Change into active voice)
      (iv) The management called off the meeting. (Change into passive voice)
      (v) Van Gogh was painting Dr. Gatchet at that time. (Change into passive voice)
      (vi) "Do you belong to Persia? the Prince asked the girl." (Change into indirect speech)
      (vii)She asked him if she would see him again. (Change into direct speech)

   (b) Rewrite the following sentences as directed. 7M
      (i) Cristiano Ronaldo is the best football player in the world. (Change into comparative degree)
      (ii) Gold is costlier than most other metals. (Change into positive degree)
      (iii) No sooner had he seen me than he ran away. (Change into positive degree)
      (iv) He tried his best, but he did not succeed. (Change into complex sentence)
      (v) He is a famous magician from London who has performed all over the world. (Change into compound sentence)
      (vi) Seeing the teacher, the students stopped fighting. (Change into complex sentence)
      (vii) She is a girl who is remarkable. (Change into simple sentence)

6. (a) (I) Fill in the blanks with suitable articles. 7M
      (i) _____ honour of this type is what everybody dreams to get.
      (ii) _____ hole in the boat will endanger its safety.
      (iii) _____ Quran is a book of wisdom.
   (II) Fill in the blanks with appropriate prepositions.
      (i) I was amazed _____ his dance performance.
      (ii)He congratulated me _____ my success.
      (iii)He suffers _____ asthma.
      (iv) I can always rely _____ my brother

   (b) (I) Fill in the blanks with correct verb forms. 7M
      (i) I have _____ (work) on the project all day.
      (ii) When was the last time you _____ (buy) a book?
      (iii) Stop _____ (talk) and listen to the lecture.
      (iv) It rarely _____ (snow) in India.
      (v) Newspapers _____ (deliver) in big trucks.

    (II) Fill in the blanks with suitable conjunctions.
      (i) I stayed an extra day _____ I can visit the historical places.
      (ii) _____ you need help, just let me know.

7. (a) **Read the following passage and answer the questions:** 7M
The pioneers of the teaching of science imagined that its introduction into education would remove the conventionality, artificiality, and backward-lookingness which were characteristic; of classical studies, but they were gravely disappointed. So, too, in their time had the humanists thought that the study of the classical authors in the original would banish at once the dull pedantry and superstition of mediaeval scholasticism. The professional schoolmaster was a match for both of them, and has almost managed to make the understanding of chemical reactions as dull and as dogmatic an affair as the reading of Virgil's Aeneid. The chief claim for the use of science in education is that it teaches a child something about the actual universe in which he is living, in making him acquainted with the results of scientific discovery, and at the same time teaches him how to think logically and inductively by studying scientific method. A certain limited success has been reached in the first of these

aims, but practically none at all in the second. Those privileged members of the community who have been through a secondary or public school education may be expected to know something about the elementary physics and chemistry of a hundred years ago, but they probably know hardly more than any bright boy can pick up from an interest in wireless or scientific hobbies out of school hours. As to the learning of scientific method, the whole thing is palpably a farce. Actually, for the convenience of teachers and the requirements of the examination system, it is necessary that the pupils not only do not learn scientific method but learn precisely the reverse, that is, to believe exactly what they are told and to reproduce it when asked, whether it seems nonsense to them or not. The way in which educated people respond to such quackeries as spiritualism or astrology, not to say more dangerous ones such as racial theories or currency myths, shows that fifty years of education in the method of science in Britain or Germany has produced no visible effect whatever. The only way of learning the method of science is the long and bitter way of personal experience, and, until the educational or social systems are altered to make this possible, the best we can expect is the production of a minority of people who are able to acquire some of the techniques of science and a still smaller minority who are able to use and develop them. (Source: https://www.majortests.com/sat)

    (i) What are the characteristics of classical studies according to the paragraph?

    (ii) What is the main claim of science in education?

    (iii) Suggest an appropriate title for the above passage.

    (iv) What is the author's view about 'scientific method' of education?

    (v) Write the meaning of the word 'palpable.'

    (vi) What actually happens in the examination system?

    (vii) According to the author, what is the only way of learning science?

(b) **Write a précis of the following paragraph.**   7M

When we survey our lives and efforts we soon observe that almost the whole of our actions and desires are bound up with the existence of other human beings. We notice that whole nature resembles that of the social animals. We eat food that others have produced, wear clothes that others have made, live in houses that others have built. The greater part of our knowledge and beliefs has been passed on to us by other people though the medium of a language which others have created. Without language and mental capacities, we would have been poor indeed comparable to higher animals.

We have, therefore, to admit that we owe our principal knowledge over the least to the fact of living in human society. The individual if left alone from birth would remain primitive and beast like in his thoughts and feelings to a degree that we can hardly imagine. The individual is what he is and has the significance that he has, not much by virtue of the individuality, but rather as a member of a great human community, which directs his material and spiritual existence from the cradle to grave. (Source: https://www.scribd.com/document/236566699/Precis-Writing)

8.   (a) Write an essay on the following topic in about 250 words.   7M

        Smart phones have become a bane rather than a boon.

    (b) Expand the following into a paragraph   7M

        "A friend in need is a friend indeed