Khulna University of Engineering & Technology
B. Sc. Engineering 1st Year 2nd Term Examination, 2015
Department of Biomedical Engineering

CSE 1215
Computer Programming

Time: 3 hours   Full Marks: 210

N.B.   i) Answer **ANY THREE** questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.

Section A
(Answer **ANY THREE** questions from this section in Script A)

1. a) What is structured programming? Why C is called structured programming   (05)
language?

b) What is library function? Draw the process of computing and running C program.   (10)

c) What are escape sequence characters? State differences between the declaration of   (10)
a variable and the definition of a symbolic name.

d) Write a program using while loop to print the digits of a number in reverse order.   (10)

2. a) Differentiate keywords & identifiers with example in perspective of C language.   (05)

b) What do you mean by decision making & branching? What are the various   (20)
decision making statements supported by C? Give examples for each of them.

c) Write a C program that will open files "File-1" & "File-2" and append the contents   (10)
of "File-2" to "File-1".

3. a) Write a brief discussion about basic data types of C. How could you extend the   (10)
ranges of different data types?

b) Write a program which will calculate the prime numbers within a given range.   (12)

c) Write a mechanism to bypass a part of a loop.   (05)

d) How to use pointer to access the elements of an array? Show with example.   (08)

4. a) What is array? Why array is used in program? How can we declare and initialize   (10)
two-dimensional array?

b) Write a program which will find the largest and smallest numbers within an array   (15)
of data.

c) What do you mean by run time and compile time initialization of an array? Give   (10)
examples.

Section B
(Answer **ANY THREE** questions from this section in Script B)

5. a) What is actual and formal argument? Write the benefits of using functions. (10)

   b) What is Recursion function? Using recursive function, write a program which will calculate factorial of any given number. (15)

   c) What is function prototyping? Discuss call by value and call by reference with examples. (10)

6. a) What is user-defined data type? Explain with example. (08)

   b) What do you mean by automatic, external and register variable? Explain with example. (15)

   c) Write down the outputs of the following code segment. Write "error" for the corresponding erroneous output (if any). (12)

   ```
   int i=10;
   void ABC(){
       auto int j=1000;
       printf("%d", j);
   }
   void main(){
       static int k=10.000;
       ABC();
       printf("%d", i);
       int i=100;
       printf("%d", j);
   }
   ```

7. a) What is pointer? What are the advantages of using pointers? How a pointer is declared? (10)

   b) Write a program which will have a swap function that will take two variable addresses as argument and will exchange these values. (15)

   c) Write the output of the following program. (05)

   ```
   main(){
       int *p, x[4] = {1,2,3,4};
       int q=4;
       for(p=x; p<q; p++)
           printf("%d", ++(*p));
   }
   ```

   d) Distinguish between (*m)[5] and *m[5]. (05)

8. a) What is file? Describe how to open a file in different modes? (10)

   b) What are the ways to access the members of a structure variable? Explain with example. (10)

   c) Write a C program using any loop that will print the following pattern. (10)

   ```
   *
   * *
   * * * *
   * * * * * * * *
   ```
   [You can use library functions if necessary]

   d) What do you mean by dangling else problem? (05)

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EEE 1215
Analog Electronics

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Section A
(Answer **ANY THREE** questions from this section in Script A)

1. a) What is PN junction diode? Draw and explain the characteristics of PN junction   (10)
        diode.

    b) Explain the operation of a full-wave bridge rectifier. Show that in full-wave   (15)
        rectification, a maximum of 81.1% of ac power is converted into dc power.

    c) A half-wave rectifier using silicon diode has a secondary emf of 14.14V (rms)   (10)
        with a resistance of 0.2Ω. The diode has a forward resistance of 0.05Ω and a
        threshold voltage of 0.7V. If load resistance is 10Ω, determine: (i) dc load current,
        (ii) dc load voltage, (iii) voltage regulation and (iv) efficiency.

2. a) Draw symbol and write two applications of each of the following diodes: (i) LED,   (08)
        (ii) Photo diode, (iii) Tunnel diode and (iv) Varactor diode.

    b) How can you use a Zener diode as voltage regulator? For the Zener diode network   (17)
        shown in Fig. 2(b), determine V_L, V_R, I_Z and P_Z. Repeat problem with $R_L = 3K\Omega$.
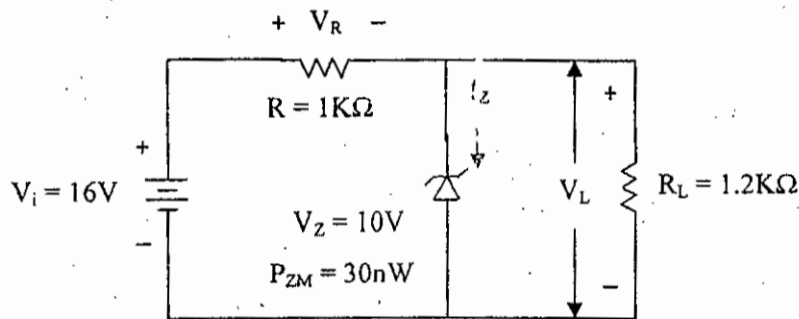

Fig. 2(b)

    c) What are the limitations of ordinary dc power supply? Draw and explain the   (10)
        schematic diagram of a regulated dc power supply with related waveforms.

3. a) What do you mean by BJT? How can you use CE arrangement as an amplifier?   (16)
        For CE configuration, show that, $I_C = \beta I_B + I_{CEO}$, where symbols have their usual
        meanings.

    b) Define stabilization. Show that the collector current in emitter bias method is: (11)

$$I_C = \frac{V_{EE} - V_{BE}}{R_E + \frac{R_B}{\beta}}$$

        Where symbols have their usual meanings.

    c) Calculate the emitter current in the voltage divider circuit shown in Fig. 3(c). Also   (08)
        find the value of V_{CE} and collector potential V_C.

4. a) Write down the differences between BJT and FET. Classify FET with their   (10)
        specific symbols.

    b) Explain the operation and characteristics of an n-channel JFET.   (14)

    c) Determine the followings for the network shown in Fig. 4(c):   (11)
        (i) V_{GSQ} (ii) I_{DQ} (iii) V_{DS} (iv) V_D (v) V_G (vi) V_S
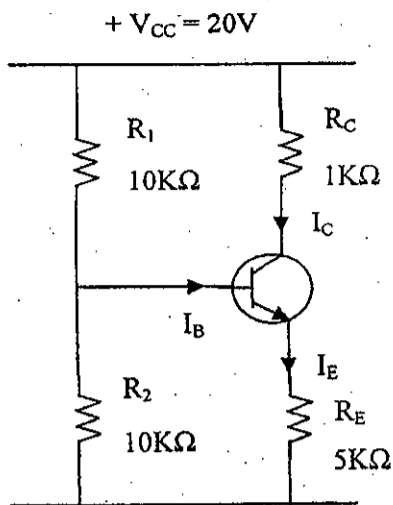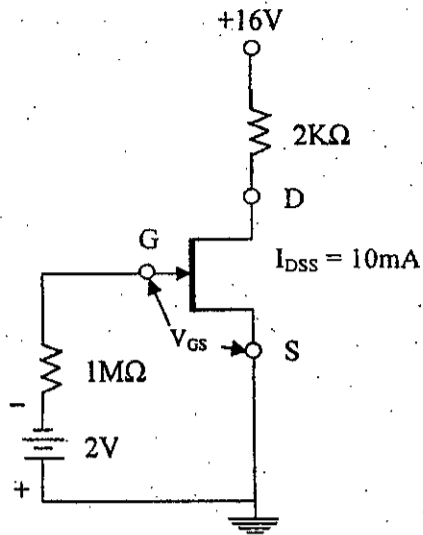
Fig. 3(c)

Fig. 4(c)

Section B

(Answer **ANY THREE** questions from this section in Script B)

5. a) Why germanium is not used as controlled rectifier? Draw the two transistor model (13) of a SCR and explain the principle of operation in brief.

    b) Describe V-I characteristics of a SCR. From which define holding current and (10) latching current.

    c) How UJT act as a relaxation oscillator? Show the characteristics curve of a UJT (12) and mention each section.

6. a) Define sinusoidal oscillator. How oscillation is produced in an oscillatory circuit? (10)

    b) How will you get undamped oscillation in tank circuit? Explain the operating (13) principle of a Hartley oscillator.

    c) Show the voltage gain of a negative feedback amplifier. Write down the (12) advantages of a negative feedback amplifier.

7. a) Define operational amplifier. Write down the ideal characteristics of an Op-amp. (08)

    b) How Op-amp can act as a differential amplifier and instrumentation amplifier? (15)

    c) Define CMRR and slew rate of an Op-amp. A 5mV, 1KHz sinusoidal signal is (12) applied to the input of an Op-amp integrator for which R = 100KΩ, C = 1μF. Find the output voltage.

8. a) What is power amplifier? Classify power amplifiers. What are the differences (10) between voltage amplifiers and power amplifiers?

    b) Explain the operation of a Push-Pull amplifier. Show that the maximum collector (17) efficiency of class B power amplifier is 78.5%.

    c) Define active filter. Show the Gain vs. Frequency curve of different types of active (08) filter.

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Hum 1215
Technical English

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Section A
(Answer **ANY THREE** questions from this section in Script A)

1. a) Make sentence with each of the following modals as asked in brackets.   (14)

i.	Used to (*To express past regular habit*)	v.	Dare (*To express indulgence*)
ii.	Would (*To express past irregular habit*)	vi.	Be + to (*To express order*)
iii.	Would rather (*To express preference*)	vii.	Would (*To express polite request*)
iv.	Ought to (*To express the present duty*)		

   b) Change the following words as asked in brackets and make sentence with the changed forms.   (12)

i.	Break (*into noun*)	iii.	Arrogance (*into adjective*)	v.	Intrusion (*into verb*)
ii.	Allure (*into noun*)	iv.	Wisdom (*into adjective*)	vi.	Brilliant (*into noun*)

   c) Write two antonyms for each of the following words and make sentence with the antonyms.   (09)

          i. Tension   ii. Lively   iii. Despair

2. a) Make sentence with the following structures using the words given in brackets.   (14)

   i.   Subject, + appositive, + linking verb + adjective component. (*Look as verb*)
   ii.   Subject + intransitive verb + adverb of manner. (*Sleep as verb*)
   iii.   Subject + verb + object + what + subject + verb. (*Call and name as verb*)
   iv.   Subject + modifier + verb + that + subject + verb + object. (*is and help as verb*)
   v.   Subject + verb + not only + object + but also + object. (*Eat as verb*)
   vi.   Since + subject + verb + adverb of manner, subject + verb + adverb of place. (*Work and prosper as verb*)
   vii.   Before + subject + verb + adverb of place, subject + verb + adverb of place. (*Come and leave as verb*)

   b) Make WH-question from each of the following sentences.   (12)

i.	The plan worked suitably.	iv.	The room is 12ft in length.
ii.	He always obeys his parents.	v.	He weighs 100 pounds.
iii.	The research runs with great care.	vi.	The road is 20ft wide.

   c) Fill in the gaps of the following sentences with appropriate prepositions.   (09)

   i.   The boy abstains .... alcohol.
   ii.   He is .... to complete his course at varsity.
   iii.   The man is .... Fifty.
   iv.   He acted .... her suggestion.
   v.   I am amazed .... her knowledge of English literature.
   vi.   He finally bowed .... pressure from the authority.

3. a) Transform the following sentences as asked in brackets.   (14)

   i.   He swung a foot at the ball, but missed completely. (*Simple*)
   ii.   That he is enthusiastic knows no bounds. (*Simple*)
   iii.   As you've done so much work - you're bound to pass the exam. (*Compound*)
   iv.   That's the best singer in the country. (*positive*)
   v.   Your writing is really difficult to read. (*Negative*)
   vi.   She, a doctor, was dressed in white velvet at hospital. (*Complex*)
   vii.   She not only sat on the wall, but also enjoyed the spring sunshine. (*Simple*)

b) Complete the following sentences with clauses as asked in brackets.

   i. The snow was melting .... (*Adverb clause of time*)
   ii. He develops a life long love .... (*Adjective clause*)
   iii. .... is certain. (*Noun clause*)
   iv. She's better at math .... (*Adverb clause of comparison*)
   v. He is so fine in manners .... (*Adverb clause of cause and effect*)
   vi. Some things are better .... (*Adverb clause of comparison*)

c) Define transitive verb, intransitive verb and infinitive with two examples for each of them. (09)

4. a) Correct the following sentences. (14)

   i. It was best day of our life.   v. Open in page 25.
   ii. The doctor ought to see your swellen ankle.   vi. He did the crime.
   iii. See the word in the dictionary.   vii. He talks good English.
   iv. Sound travels better in the water than in air.

   b) Express the following notion/functions in sentence. (12)

   i. Appreciation   iii. Intention   v. Good luck
   ii. Command   iv. Thanks   vi. Regret

   c) Change the following words as directed and make sentences with them. (09)

   i. Bless (into noun)   iii. Terror (into verb)   v. Base (into adjective)
   ii. Base (into noun)   iv. Weak (into verb)   vi. Amplify (into adjective)

Section B
(Answer **ANY THREE** questions from this section in Script B)

5. a) Read the passage and answer the questions. (20)

   Are you unhappy about the shape of your nose? Or do you feel that your ears are too big or your eyes too small? You don't need to despair about any of these things any longer. They can all be put right by the surgeon. Surgeons are doctors who make sick people well by operating on them. But some surgeons are beauty specialists. Their job is to make ugly or plain people beautiful. This work is called plastic surgery.

   Plastic surgeons are very popular in some countries. They make a lot of money by selling beauty to men and women. Plastic surgery is very expensive. A new nose may cost almost as much as a new car. Suppose I can afford to pay so much money and want to change my ugly nose for a more handsome one. I must consult a plastic surgeon. What will he do?

   First of all, he will ask me to enter a nursing home. I shall have to spend about three weeks there. The surgeon will give me an anesthetic. Then he will operate on my nose to give it the shape I want. He will put a plaster case over it to keep it in its new shape. I shall have to spend the next week or two anxiously wondering whether the operation has been successful or not. 'Will my nose really look better? Or shall I look uglier than before? Won't there be scars after the operation? What shall I do if my nose is not the shape I wanted?' And so on. And then the great day will come. The surgeon will take off the bandages and the plaster, and I shall see my expensive new nose! Will it be worth all the trouble and expense? Sometimes these operations go wrong, and then the patient comes away looking worse than before.

   i. What is the job of a plastic surgeon?
   ii. How much does a new nose cost?
   iii. What is the process of plastic surgery?
   iv. What do you think is the author's opinion about plastic surgery?

   b) Make a précis of the above passage with a suitable title. (15)

6. a) Write a contrast paragraph on college life and university life. (15)
   b) Amplify the idea contained in the following statement – "Time is money". (20)

7. a) Suppose there is a post of lecturer vacant in your department. Prepare your CV and apply for the post. (20)
   b) Write a report on the food quality of your residential halls. (15)

8. Write a composition on any one of the following: (35)

   a) Democracy: its prospects, but its realities
   b) Future of Biomedical Engineering