



NORTHERN COLLEGE

B A N G L A D E S H
Department of Computer Science & Engineering (CSE)

Structured Programming Language (Course Code: 510201)

Time- 3 hours

Model Test (10th Batch)

Full marks- 80

N.B. Answer any four question(4 X 20 =80)

1. a) What is SPL? Write down the basic coding structure of a C program. 1+4=5
b) What is flow chart? Draw the flow chart of finding a number is even or odd. 1+4=5
c) What is pseudo code? Write down the pseudo code of finding average of five integer numbers. 1+4=5
d) Write down the differences between flowchart & algorithm. 5
2. a) Write down the input-output statement of C program with example. 5
b) Write a c program to check a number is prime or not. 5
c) What is operator? Discuss about different type of operators. 6
d) Write down the differences between variable and constants. 4
3. a) What is token? Discuss different header files with their functionality. 1+4=5
b) What is an expression? Write the differences between local & global variable. 1+4=5
c) What is memory allocation? Write a c program on memory allocation. 1+5=6
d) Write an algorithm to find out a year is leap year or not. 4
4. a) What is a function? Describe its classification. 1+4=5
b) What is data-type? Describe its classification. 1+4=5
c) Write a c program to find out current time. 5
d) Write down the differences between c and c++. 5
5. a) What is pointer? How does a pointer works in a program? 1+4=5
b) What is a string? How to take input from user in a c program? 1+4=5
c) Write a c program to find out the greatest number from 3 numbers. 5
d) How a one dimensional array is allocated in memory? 5
6. a) What is array? How an array is represented in a c program? 1+5=6
b) Write down the procedure and rules of variable declaration. 4
c) Write a c program showing function declaration & definition. 5
d) What is preprocessor? What are the ways to define a constant value in a program? 1+4=5

*****Best of Luck*****





NORTHERN COLLEGE

B A N G L A D E S H

Department of Computer Science and Engineering

Model Test

Subject: Electrical and Electronic Circuits

CSE 10th Batch

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CSE 510203

Time 3 hours

Full Marks 80

1. a) What do you mean by extrinsic semiconductor? Describe energy levels with diagram. 2+5=7
b) Discuss forward and reverse characteristics of a general purpose diode. 3+3=6
c) What is ideal diode? Differentiate between LED and Zener diode. 2+5=7
2. a) What is a barrier voltage of a diode? Explain how the barrier voltage is develop in it. 1+4=5
b) Explain the formation a p-type semi-conductor. 4
c) Define the following terms:- 6
i) Depletion layer
ii) Breakingdown voltage
iii) Light emitting diode (LED)
d) Draw the circuit diagram of a half-wave and full-wave rectifier and describe their operation. 5
3. a) Determine the output waveform of the network of figure and calculate the output dc level and the required PIV of each diode. 5
b) Why DC biasing is necessary for transistor operation? 5
c) Draw a voltage divider bias circuit and explain its operation. 3+5=8
d) What is doping? 2
4. a) What is FET ?compare FET & BJT. 4
b) Draw the transfer characteristic curve of a BJT and explain. 5
c) What are the differences between the depletion and enhancement MOSFET? 4
d) What is Fixed Biased circuit ? 2
e) Discuss drain the characteristic of JFET. 5
5. a) What is an operational amplifier? What are the salient features of an op-amp? 4
b) Define CMRR. Determine the output voltage of an op-amp for input voltage of $v_{i1} = 150\mu V$ and $v_{i2} = 140\mu V$.the amplifier has a differential gain of $A_d = 4000$ and the value of CMRR is 100. 4
c) Show that the op-amp works as the following :- 8
i) Inverting amplifier ;
ii) Integrator;
iii) Summing amplifier;
iv) voltage follower.
d)What do you mean by active filter? Describe low pass, high pass and pass filters. 4
6. a) Define the negative feedback. Explain how negative feedback reduces noise and non-linear distortion. 4
b) Calculate the gain, input & output impedance of a voltage series feedback amplifier having $A = -300$, $R_1 = 1.5 k (\text{ohm})$ and $R_0 = 50 k (\text{ohm})$ for feedback of $\beta = -0.5$. 6
c) Explain the working principle of an oscillatory circuit. 6
d) Explain Bankhausen criterion. Describe the piezoelectric property of crystal. 4



NORTHERN COLLEGE

B A N G L A D E S H

Department of Computer Science and Engineering

Model Test-2018

Subject: Calculus

CSE 10th Batch

Time: 3 hours

Full Marks: 80

Answer any four (20*4=80)

1. A. Define continuity and differentiability with examples. 5

b. By $(\delta - \epsilon)$ definition, prove that $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3} = 6$.

5

- c. A function $f(x)$ is defined as follows: 10

$$f(x) = \begin{cases} x^2 & \text{when } x < 0 \\ x & \text{when } 0 \leq x \leq 1 \\ \frac{1}{x} & \text{when } x > 1 \end{cases}$$

Test the continuity and differentiability of $f(x)$ at $x=0$ and $x=1$.

2. Find the differential co-efficient of the following with respects to x 20

* $y = \log_a x + \log_x a$

* $y = x^x + x^{\frac{1}{x}}$

3. A. State and prove Cauchy's mean value theorem. Verify mean value theorem for the function $f(x) = 3 + 2x - x^2$ in the interval $(0,1)$. 10

b. Evaluate $\lim_{x \rightarrow 0} \left(\frac{1}{x^2} - \frac{1}{\sin^2 x} \right)$

10

4. A. State and prove Leibnitz's theorem. 10

b. If $y = e^{a \sin^{-1} x}$ then show that, $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + a^2)y_n = 0$. 10

5. Evaluate any four of the following integral: 20

• $\int \frac{(1+x)e^x}{\cos^2(xe^x)} dx$

• $\int \frac{dx}{3+2\sin x}$

• $\int \sin^5 x \cos^3 x dx$

• $\int \frac{d\theta}{3\sin\theta + 2\cos\theta + 5}$

• $\int \frac{dx}{(1+x^2)\sqrt{1-x^2}}$

6. A. State and prove Fundamental theorem of integral calculus. 10

b. Find the value of $\int_a^b e^x dx$ as a limit of a sum. 10



NORTHERN COLLEGE

B A N G L A D E S H

B.Sc (Honors) in CSE Part -1 First Semester Examination-2018

CSE-510105

Physics (Electricity & Magnetism)

Model test, August-2018

Time- 3 hour

Full marks- 80

[N.B- The figures in the right margin indicate full marks. Answer any four.]

1. a) What do you understand by intrinsic & extrinsic semiconductor? 4
- b) Describe zener breakdown. 3
- c) Describe how n type and p-type semiconductor are performed. 7
- d) What is semiconductor materials. Classify semiconductor materials 6
2. a) Describe the mass energy relation $E=mc^2$. 5
- b) What is length contraction? Derive the equation 6

$$L = L_0 \sqrt{1 - \frac{v^2}{c^2}}$$

- a) An astronaut at the age of 35 years went to observe the galaxy with a velocity 2.5×10^8 by a space ship and to return to earth after 50 years (as per earth's calendar). What is the age of astronaut? 4
- d) With necessary circuit diagram drive an expression for current pass through an RC circuit and show it graphically. 5
3. a) Define simple harmonic Motion. 3
- b) Describe the differential equation of simple harmonic motion. 7
- c) Note down the characteristics of simple harmonic motion. 4
- d) A particle executing simple harmonic motion has a maximum displacement of 4 cm and its acceleration at a distance of 1 cm from its mean position is 3 cm/sec^2 . What will its velocity be when it is at a distance of 2 cm from its mean position? 6
4. a) Define superposition and interference. 4
- b) Show the relationship of phase difference and path difference. 4
- c) Prove that the distance between two successive bright fringes formed in young's experiment is given by $\beta = \frac{D\lambda}{d}$ by this experiment. 7
- d) Two straight and narrow parallel slits 1 mm apart are illuminated by monochromatic light. Fringes formed on the screen held at a distance of 100 cm from the slits are 0.50 mm apart. What is the wave length of light? 5
5. a) How fringes are produced by a wedge shaped thin film. Find out the equation $x = \frac{m\lambda}{2\theta}$ by this experiment. 7
- b) Describe a method for the measurement of the wave length of light using Newton's rings. Describe the formula you use. 7
- c) In a Newton's rings experiment the diameter of the 15th ring was found to be 0.590 cm and that of the 5th ring was 0.336 cm. If the radius of the Plano-convex lens is 100 cm, calculate the wave length of light used. 6
6. a) Define magnetic field strength and flux density. 2
- b) Find out the expression for magnetic force acting on a current carrying wire of certain length. 6
- c) What is the dielectric? Deduce the expression of Gaus's law, when a dielectric is present in the electric field. 6
- d) A rectangular carbon block has dimension 1.0 cm x 1.0cm x 50 cm (i) What is the resistance measured between the two squares ends? 6
- (ii) Between two opposing rectangular faces the resistivity of carbon at 20°C is $3.5 \times 10^{-5} \text{ ohm-m}$ 6



NORTHERN COLLEGE

B A N G L A D E S H
CSE FIRST YEAR FIRST SEMESTER EXAMINATION, 2018

Model Test Batch-10

Subject Code: 510209

(CSE-English)

Time-----3 hours

Full Marks----- 80

(N.B.-The figures in the right margin indicate full marks . Answer four questions including question 1 and 6)

Part-A

Q.1.Read the passage carefully and answer the questions that follow:

The changing role of young people in the family contrasts vividly with the experience of the growing numbers of elderly people who are becoming isolated from their families . Studies of traditional societies show how old people are respected for their wisdom and experience . By contrast , our old society increasingly sees the elder's as out of touch and in the way . Increased life expectancy and better welfare and medical facilities have led to a large increase in the number of old people . The increasing numbers of elderly people will cause major problems for society in the easy part of next century . A smaller than ever proportion of the working force will be struggling to support the dependent population of both young and old .

Many families now face the problems of coping with elderly members . Inevitably these demands will be met with mixed feelings . An old person may seem a nuisance if they are living with a family in a relatively small house . Equally the old person may deeply regret the loss of independence that family brings .

The popular view is that modern families no longer offer the dependent elderly the care they once did . However some studies show that families give immense amounts of assistance and support to elderly relative. Much of the burden of this care falls on the wife . Nevertheless , there are two complicating issues . First , many wives now return work when their children go to school . Their income is often essential to the family economy . In this situation can the family afford to help an elderly relative? Second , there are many old people with no relatives: perhaps a third of old people have no family members who can help them . In either of these two cases , the burden of care for the elderly may have to fall on society .

Q.A. Answer the following of the questions below :

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- i) What is the relationship between the elderly people and their families ?
- ii) Why do the traditional societies respect old people ?
- iii) Why has the number of the elderly people increased ?
- iv) What is the popular view about the care for the elderly people ?
- v) Why can't many of the wives look after the elderly anymore ?

Q.B. Change any five of the following words as directed words as directed and make sentences with them.: (any five)

05

Dependent (noun), Regret (adjective), Assistance (verb), Deeply(verb), Proportion (adverb), Essential (adverb), Respect (adjective)

Q.C. Write the summery of the passage .

05

Part-B (Grammar)

Q.2.a) Correct the following sentences (any five):

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- i) He speaks English like English.
- ii) I insisted him to go .
- iii) His mother prevented him to go to cinema .
- iv) Look up the word in the dictionary book.
- v) Dickens is a populous novelist.
- vi) Walk fast lest you can miss the train.
- vii) He is more superior than me .

Q.b.Combine each of the following groups of sentences into one sentence:

05

- i) The criminal saw the police . He ran away . He escaped arrest .
- ii) It was morning . He went to a field . It was open . He look at her own reflection.
- iii) He answered me . His answer was correct . His answer was clear and brief .
- iv) The train was very late . That is usual . The passengers were late too . Still they could avail themselves of the train.
- v) He was obstinate . He refused to listen to advice . Yet , he did not lose heart . We knew that he would at last obey us .

Q.c. Frame Wh-questions from the following sentences. (any five)

05

- i) You are fond of playing foot ball .
- ii) I expected you to cooperate me .
- iii) She was reported to be a spy .
- iv) She put on the blue dress .
- v) His father named him Asif .
- vi) We are annoyed with our neighbors.
- vii) The town is five kilometers from our house.

Q.d. Use the correct form of the verb in the following sentences. (any five)

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- i) He studied sincerely lest he (fail).
- ii) While they (play) , the rain came .
- iii) He did nothing but (sing) all day long.
- iv) The prime minister as well as the other ministers (be) present.
- v) He dared not (drive) at night .
- vi) Would you mind (open) the door .
- vii) One should not say anything without (know) .

Part-C

Q.3. (a) Amplify the following :-

- i) Rome was not built in a day .

or

- ii) Slow and steady wins the race .

(b) Translate into English :-

(i) আমরা বাংলাদেশে বাস করি। ইহা একটি সুন্দর দেশ। এখানে প্রায় সর্বত্র ধান জন্মে। নদী, খাল ও পুকুরে প্রচুর মাছ পাওয়া যায়। তাই আমাদের প্রধান খাদ্যও ভাত মাছ। বাংলাদেশের অনেক জেলায় পাট জন্মে। সিলেট ও পার্বত্য চট্টগ্রামে প্রচুর চা জন্মে। বাংলাদেশ পাট, চা, চিংড়ি ও চানড়া রপ্তানি করে। নিজ দেশকে আমাদের ভালবাসা দ্যায়।

অথবা

(ii) আমাদের দেশের আর্থিক লোক নিরক্ষর। তারা পড়তে কিংবা লিখতে পারে না। অথচ লেখাপড়া না জানলে মানুষ উন্নতি করতে পারে না। আমাদের সরকার নিরক্ষরতা দূর করতে চেষ্টা করছেন। বর্তমানে আমাদের দেশের শিক্ষার হার দৃষ্টি পাচ্ছে। ইহা আমাদের জন্য অত্যন্ত আনন্দের সংবাদ।

Q.4. Write an essay on any one of the following topics :-

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- i) Digital Bangladesh ;
- ii) Unemployment Problem;
- iii) Contribution of Computer in Modern life ;
- iv) Female education

Q.5. (a) Write a dialogue between to friends about a visit to a place of historical interest .

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(b) Suppose, you are a reporter of a national daily . Now write a report on "The students of SSC & HSC levels are struggling Safety Road for all ."

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Q.6. a. Write a paragraph on any one of the following:-

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- i) Right of Children ;
- ii) Global warming;

Write an application in the principal of your college praying the permission to go on an excursion.

10

Or,

Write a letter to the editor of a newspaper about "price hike and public sufferings."

10