Pre-Board Exam

Tribhuvan University

Institute of Science and Technology

2081

Bachelor Level/First Year/First Semester/Science — Full Marks: 60

Bachelor in Information Technology — Pass Marks: 24

Course: BIT151 Microprocessor and Computer Architecture — Time: 3 hours

Section-A

Long Answer Questions

Attempt any two questions. (2 × 10 = 20)

1. Draw the block diagram of SAP-1 and explain the function of each block diagram in brief. [5+5]
2. What is Flag Register? Explain different types of 8085 Flags with example. [2+8]
3. What is instruction code formats. Explain with example.
   A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has three parts: **an indirect bit, an operation code,** and an **address part.** [5+5]
   a. How many bits are there in the operation code and the address part?
   b. Draw the instruction word format and indicate the number of bits in each part.
   c. How many bits are there in the data and address inputs of the memory?

Section-B

Short Answer Questions

Attempt any eight questions. (8 × 5 = 40)

4. What is Microprocessor? State the three main functions of Microprocessor. [1+4
5. What is an addressing mode?? Explain why an instruction STA 2000H is direct addressing mode? [2+3
6. Explain different types of registers in 8085. [5]
7. What is micro operation? Draw the block diagram for the hardware that implements the following statements:
   x + yz : AR ← AR + BR where AR and BR are two n-bit registers and x, y, and z are control variables. Include the logic gates for the control function. [1+
8. Explain the difference between main memory and control memory of microprogrammed controlled Computer.
9. State the algorithms for addition and subtraction of signed magnitude data. Perform the arithmetic operations (-35) + (-40) using binary numbers with signed magnitude data. Use seven bits to accommodate each number together with its sign.
10. What is DMA and why it is used?,
11. What is memory Address Map? Explain with example
12. Explain the Data Dependency in Pipelining?

Patan Multiple Campus

Pre-Board Examination-2081

Subject: Discrete Structure F.M.: 60

Faculty: BIT P.M.: 24

Semester: I/II Time: 3 hrs.

SET-1

Group 'A'

Long Answer Questions

Attempt any **two** questions. (2 x 10 = 20)

1. Explain tautology, contradiction and contingency with example.
2. Define linear homogeneous recurrence relation. What is the solution of the recurrence relation $a_n=6a_{n-1}-9a_{n-2}$ with initial conditions $a_0=1$ & $a_1=6$? (2+8)
3. What is undirected graph? How graph can be represented? Explain with example.(2+8)

Group "B"

Attempt any **eight** questions (8*5=40)

4. What is implication and biconditional with truth table? (5)
5. Explain any two rule of inference. (5)
6. What is congruent modulo? Determine whether 20 is congruent to 8 modulo 6 and 25 is congruent to 17 modulo 5. (3+2)
7. Use mathematical induction to show that the sum of first n positive integers is n^2+1. $\frac{n(n+1)}{2}$
8. Explain trial division with example? Using trial division, show that 101 is prime. (2+3)
9. What is Euler path? Compare it with Hamilton path. (2+3)
10. How many strings are there of four lowercase letters that have the letter x in them?
11. Explain Travelling salesman problem with example.
12. Explain existential and universal quantifiers with example.

Pre-Board Exam

Tribhuvan University

Institute of Science and Technology

2081

Bachelor Level/First Year/Second Semester/Science — Full Marks: 60

Bachelor in Information Technology — Pass Marks: 24

Course: BIT153 Object Oriented Programming — Time: 3 hours

Section-A

Group 'A'

Attempt any two questions: **[2×10=20]**

1. What is constructor? Explain different types of constructor with suitable examples. **[2+8]**
2. What is operator overloading? What are the benefits of operator overloading? Write a program that overloads unary operator (++). **[2+[illegible]+4]**
3. Create a base class called Shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class data members and another member function get_data() and to initialize base class data members and another member function display_area() to computer and display the area of figures. Make display_area() as virtual function and redefine this function in the derived classes to suit their requirements. Using three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the rectangle and as base and height in triangles and used as follows:
   Area of rectangle = x*y Area of triangle = 1/2 * x*y **[10]**

Group 'B'

Attempt any eight questions: **[8×5=40]**

4. Discuss the use of inline function with example. **[5]**
5. Write a program to find largest item from array using function template. **[5]**
6. Explain private, protected and public access specifier in terms of inheritance? **[5]**
7. In what order are the class constructors are called when a derived class object is created? Explain with suitable example. **[5]**
8. What is abstract base class? How can you make a class abstract? Explain with example. **[1+4]**
9. What is friend function? Write a program to multiply any two private numbers of two different classes using friend function. **[1+4]**
10. Write a program that overloads unary operator (++). **[5]**
11. Write a program to count and display total number of a word in a text file. **[5]**
12. What is exception? What are the keywords used in C++ exception handling? Describe their uses with suitable example. **[5]**

PATAM MULTIPLE CAMPUS
Pre-board Exam – 2081

Bachelor Level / First Year / Second Semester / Science
Bachelors in Information Technology
Subject: Basic Statistics (STA154)

Full Marks: 60
Pass Marks: 24
Time: 3 hrs.

Group-A

Attempt any **ONE** questions. **2x10=20**

1. Define measure of central tendency. J.J. Thomson discovered the electron by isolating negatively charged particles for which he could measure the mass-charge ratio. This ratio appeared to be Constant over a wide range of experimental conditions and, consequently, could be characteristics of new particles. The observations, from two different Cathode- ray tubes that used air as the gases:

Tube I	0.57	0.34	0.43	0.32	0.48	0.40	0.40
Tube II	0.53	0.47	0.47	0.51	0.63	0.61	0.48

2. Define regression. The technician now varies the temperature (^{0}C) while keeping other conditions as constant as possible and obtain the following results:

Yield (Y)	127	128	130	131	133
Temperature (X)	70	75	80	85	90

(i) Using least square method and construct the regression line of yield on temperature (ii) Predict the yield when temperature is 95. (iii) Interpret the regression coefficients.

3. Define normal and standard distribution. The breakdown voltage X of a randomly chosen diode of a particular type is known to be normally distributed with mean 40 volts and variance 2.25 volts. What is the probability that the breakdown voltage will be; (i) between 39 and 42 volts, (ii) more than 42 volts, and (iii) less than 39 volts.

Group-B

Attempt any **SIX** questions. **6x5=30**

4. What is measurement of scale? Describe different types of measurement scale.

5. Plot the histogram, frequency curve and frequency polygon for the following frequency distribution and locate the mode with the help of histogram.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
No. of students	5	11	17	15	10	8

6. Define correlation. A school teacher believes that there is a linear relationship between the verbal test score (y) for eighth graders and the number of library books checked out (x). Following are the data collected on 8 students.

X	12	15	3	7	10	5	22	9
Y	77	85	48	59	75	41	94	65

Compute the correlation coefficient r between X and Y. Interpret the meaning of r^2.

7. Define probability. A new computer virus can enter the system through e-mail or through the internet. There is a 30% chance of receiving this virus through e-mail. There is a 40% chance of receiving it through the internet. Also, the virus enters the system simultaneously through e-mail and the internet with probability 0.15. What is the probability that the virus does not enter the system at all?

8. Define discrete and continuous random variable. A random variable X has following probability mass function

X	0	1	2	3	4	5	6
P (x)	k	3k	5k	7k	9k	11k	13k

Find (i) k, and, (ii) mean and variance of X.

9. Define Poisson distribution. An office switchboard receives telephone calls at a rate of 3 calls per minute on an average. Find the probability of receiving; (i) no calls in one minute interval, (ii) at least 3 calls in an one minute interval, and, (iii)at most 2 calls in a five minute interval.

10. Define estimation. Systolic blood pressure of a sample of 400 males was taken. Sample mean blood pressure was found to be 128 mm and standard deviation 13.05 mm. Find 95% confidence limits of blood pressure within which the population mean would lie?

11. Define skewness and kurtosis. The standard deviation of a symmetric distribution is 7. Compute the possible value of fourth central moment for the distribution to be (i) mesokurtic (ii) platykurtic, and (iii) leptokurtic.

12. Write short notes on the following:

(a) Box and whisker plot.

(b) Census survey and sample survey.

BEST OF LUCK!!!

Patan Multiple Campus

Pre-Board Examination-2081

Bachelor in Information Technology
Course Title: Economics
Code No: ECO 155
Semester: II

Full Marks: 60
Pass Marks: 30
Time: 3.00 hrs

Group A (Attempt any TWO) (10x2 = 20)

1. Explain the Price and Output determination in Perfect Competition market at short period with equilibrium of the firms.
2. Defined demand and explain the types of price elasticity of demand with numerical example.
3. What do you mean by national income? Explain the component of income method of measurement of national income.

Group B (Attempt any EIGHT) (5x8 = 40)

4. Explain the importance Micro Economics.
5. Point out the major eight features of Mixed Economy.
6. Explain about the price effect with the help of Indifference curve.
7. What are the returns to scale under law of returns to scale? Explain with its causes.
8. Suppose there are 50 identical consumers in the market for the commodity X, each with demand function $Qd_x = 300 - 5P_x$ and 25 identical producers of that commodity X, each with a supply function $Qs_x = 50 + 2P_x$.
   I. Find the market demand and market supply function and determine the equilibrium price and equilibrium quantity in the market.
   II. What happens in the market equilibrium price and quantity if income of the all the consumer increases equally?
   III. What will be the effect of increase in indirect taxes imposed by government to the producers on the market equilibrium?
9. Let production function realized by the Noodle factory is $Q=AK^{0.5}L^{0.5}$, wage rate =Rs100 and rate of interest =Rs80
   i. Compute marginal productivities of two inputs.
   ii. What will be the optimal employment of labor and capital in order to maximize output under given total cost outlays Rs 1000?
10. A firm has demand function $P = 100 - 2Q$ and cost function $C= 100 + 0.5Q^2+ 4Q$.
    Find i. Equilibrium output, price and maximum profit.
    ii. AC, MC, AR and MR at equilibrium price and quantity.
11. Calculate nominal GDP, real GDP, GDP deflator and rate of inflation with the help of the given table.

Year	Px	Qx	Py	Qy
2015	10	800	20	500
2016	20	1200	30	700
2017	30	1800	40	1200

12. How you solve the economic problems like unemployment and economic depression with fiscal and monetary policies.