ALIAH UNIVERSITY

Regular End Semester Examination (Spring Semester)2024

(B. Tech 2nd Year 4th Semester)

Subject Name: Object Oriented Programming Systems
Full Marks: 80
Time: 3 Hours
Subject Code: CSEUGPC05

Group A
Answer all *5* questions

1. Answer the following briefly 5 X 2= 10

a. What do you mean by a multithreading in Java?
b. How do you initialize a String variable in Java?
c. How do you create a class in Java?
d. What do you mean by an exception?
e. What is the difference between String and StringBuffer in Java?

Group- B
Answer *any 6* questions

6X 5 = 30

2. Explain the difference between == and equals() in Java?
3. What is the difference between final, finally, and finalize in Java?
4. Write a Java Program with output to explain what will happen if we call the run () method directly without calling the start () method in a thread.
5. Explain the importance of "**static**" in Java.
6. Explain the difference between Abstract Class and Interface.
7. Draw and explain the different types of inheritances in an Object-Oriented Programming System.
8. Write a Java program input five city names taken as a String using command line argument. Using compareTo() method sort these cities alphabetically.

Group- C
Answer *any 4* questions

4X 10 =40

9. Explain the concept of Exception Handling in Java with a suitable example. Define Applet with an Example. 5+5
10. Explain with example the concepts of Overloading, Overriding and Dynamic Method Dispatch in Java. 3+3+4
11. With a help of a neat diagram explain the life cycle of a thread. 10
12. What do you mean by "**this**"? Discuss some of the features of Object-Oriented Programming. 3+7
13. Write a program in Java to create two threads such that the first thread will print all odd prime numbers in a range and the second one will print all prime numbers in a range. 10

Aliah University Even (Spring) Semester Examination, 2024 Course Title: Biology for Engineers Course Code: BIOUGBS01	Marks: 80 Time: 3Hrs

A. Answer the following question by selecting the correct options. 1×30=30

1. The percentage of human genome which encodes proteins is approximately
A. Less than 2%, B. 5%, C. 25%, D. 99%

2. On the Origin of Species was written by _____
A. Charles Darwin, B. Ludmila Kuprianova, C. Mikhail, D. Fedonkin

3. The EMP pathway in eukaryotes usually takes place in
A. nucleus, B. lysosome, C. Golgi apparatus, D. cytosol

4. Plasma membrane is
A. Permeable, B. Selectively permeable, C. Impermeable, D.Semi-permeable

5. Where is DNA present in the eukaryotic cells?
A. Inside the nucleus, B. With other cellular contents, C. Inside the ribosomes, D. Not present

6. Which of the following is the function of lysosomes?
A. Autophagy, B. Autolysis, C. Digestion, D. All of the above

7. Which of the following immunity is present from our birth?
A. Innate Immunity, B. Active immunity, C. Passive immunity, D. Acquired immunity

8. Which of the following cells is involved in humoral immunity?
A. T-cells, B. B-cells, C. Mast cells, D. Both T and B cells

9. Name the RNA molecules which is used to carry genetic information copied from DNA?
A. tRNA, B. mRNA, C. RRNA, D. snRNA

10. Glycolysis is the conversion of
A. Fructose into phosphoenolpyruvate, B. Fructose into pyruvate, C. Glucose into phosphoenolpyruvate, D. Glucose into pyruvate

11. The jawless vertebrate is
A. Crocodile, B. zoris, C. Hyla, D. Petromyzon

12. The genetic materials of Viruses can be _____
A. ssDNA, B. ssRNA, C. dsDNA, D. All of the above

13. Which of these is a characteristic of prokaryotic cells?
A. Absence of cell organelles, B. Absence of nucleus, C. Presence of 70S ribosomes, D. All of these

14. Which of the following is a flightless bird?
A. Pigeon, B. vulture, C. Parrot, D. ostrich

15. Book lungs are respiratory organs in
A. Insects, B. Aarachnids, C. Molluscans, D. Echinoderms

16. This is the largest phylum of Animal on the earth.
A. Mollusca, B. Amphibia, C. Arthropoda, D. Aves

17. Which of the following nitrogenous base is not present in DNA?
A. Thymine, B. Adenine, C. Guanine, D. Uracil

18. Who is known as the "Father of Genetics"?
A. Morgan, B. Mendel, C. Watson, D. Bateson

19. Which substrate is used in the last step of glycolysis?
A. Glyceraldehyde 3-phosphate, B. Pyruvate, C. Phosphoenolpyruvate, D. 1, 3-bisphosphoglycerate

20. Anticodon is present in
A. DNA, B.tRNA, C. rRNA, D. mRNA

21. From which structure is a mesosome derived from?
A. Plasmid, B.Cell-wall, C. Ribosome, D. Cell membrane

22. The percentage of human genome which encodes proteins is approximately
A.Less than 2%, B. 5%, C. 25%, D. 99%

23. The scaleless vertebrate is
A. Snake, B. Rohu, C. Shark, D. rat

24. Phylum of Taenia Solium is
A. Aschelminthes, B. Annelids, C. platyhelminths, D. Mollusca

25. Sickle cell anemia is caused
A. When valine is replaced by glutamic acid in beta polypeptide chain
B. When glutamic acid is replaced by valine in beta polypeptide chain
C. When glutamic acid is replaced by valine in alpha polypeptide chain
D.When valine is replaced by glutamic acid in alpha polypeptide chain

26. In prokaryotes, the hair-like outgrowths which attach to the surface of other bacterial cells are
A. Flagella, B. Pili, C. Capsule, D. Plasmids

27. Phylum of Taenia Solium is
A. Aschelminthes, B. Annelids, C. platylyelminthes, D. mollusca

28. The jawless vertebrate is
A. crocodile, B. zoris, C. Hyla, D. Petromyzon

29. Which of the following features are common among prokaryotes and eukaryotes?
A. Golgi apparatus, B. Flagella, C. Endoplasmic reticulum, D. All of the above

30. In a fetus, where are lymphocytes produced?
A. In the spleen, B. In the bone marrow, C. In the liver, D.In the heart

B. Answer any 5 questions from the following. (2×5=10)

1. What is Codon? ,
2. Write down the two characteristic features of Phylum Arthropoda.
3. What is Coelom? Where is it found?
4. What is Nephridia? Where it is found?
5. Mention two difference between Adaptive Immunity and Innate Immunity.
6. What is chromosome?
7. What is tRNA? Mention its one function.

C. Answer any 4 questions from the following. (5×4=20)

1. What is Coelom? Write down the characteristics features Phylum Porifera.
2. Short note on B-cell and T-cell.
3. Write down the structure of Plastid and mention its function.
4. Describe the Oparin and Haldane theory on the chemical basis of origin of life.
5. What is notochord? Write down the characteristics features of class Reptilia.
6. What is immunity? Mention the different types of antibody. Mention its function in immunity.

D. Answer any 2 question from the following **10×2=20**

1. What is the TCA cycle? Describe the Kreb cycle. Mention its importance. **(2+5+3)**
2. Describe the structure of DNA with a suitable diagram. What are the different forms of DNA? **(6+4)**
3. Mention the difference between Prokaryotic and Eukaryotic Cells. Write down the general features of Phylum Annelida. **(5+5)**

Nucleotide:-
nucleotide

Aliah University

End Semester Examination (Spring Semester) 2024

(For 2nd Year 4th Semester B.Tech(CSE))

Paper Name: Computer Organization and Architecture **Full Marks: 80**

Paper Code: CSEUGPC06 **Time: 3 hours**

Group A (Answer all the questions) **5X2=10**

1. Explain tristate buffer and its purpose.
2. What is Register Indirect Addressing mode? Give an example.
3. What is Virtual memory?
4. What is locality of reference?
5. What is the function of MAR and IR?

Group B (Answer any 5 questions) **5x6=30**

1. What is instruction cycle? Briefly explain with the help of state diagram. (2+4)

2. Explain the use of addressing modes with the help of an example. Differentiate based and indexed addressing modes. (3+3)

3. Analyse the memory hierarchy in terms of speed, size and cost. Define Access Time and Latency. (4+2)

4. With a neat sketch explain the working principle of DMA. Write its advantages. (4+2)

5. Differentiate : i) CISC vs RISC ii) SRAM vs DRAM. (3+3)

6. Differentiate Hardwired and Microprogrammed Control units. (6)

7. Explain Flynn's classification with suitable examples. (6)

Group C (Answer any 4 questions) **4X10**

1. a) Describe any two addressing modes where effective address is not provided as a part of the instruction.
   b) Classify CPU organization. Give one example of each.
   c) Describe the different types of instructions with examples. [4+3+3]

2. Evaluate the following arithmetic statement using three address, two address, one address and zero address instructions:

$$X = \frac{(A+BXC)}{D}$$ [2.5x4]

3. a) Explain the merits and demerits of the floating point and fixed-point representations for storing real numbers.
   b) What is biased exponent?

c) Convert -32.75 to IEEE 754 single precision format.

d) Perform the subtraction with the following unsigned decimal numbers by taking the 10's complement of the subtrahend i)5250-1321 ii) 1753-8640 [3+2+3+2]

4. a) Discuss the concept of associative memory using suitable examples.

b) A computer has a main memory of 64KX16 and a cache memory of 1K words. The cache uses direct mapping with a block size of four words.

i) How many bits are there in the tag, index, block and word fields of the address format?

ii) How many bits are there in each word of the cache?

iii) How many blocks can the cache accommodate? [4+6]

5. Discuss the asynchronous mode of data transfer with its merits and demerits. What are the different modes of data transfer between CPU and I/O devices. Explain them with their merits and demerits. [4+6]

ALIAH UNIVERSITY
END TERM EXAMINATION, SPRING 2024
PAPER: MATUGBS05 (Probability and Statistics)

Full Marks: 80
Time Allowed: 3 Hours
All symbols have their usual meanings
Use different answer script for different group

Use different answer script for different group

GROUP - A (40 marks)

Attempt question number 1 and any **SIX** from the rest.

1. Answer any **FIVE** from the following questions: $2 \times 5 = 10$

   (i). Let A and B are two independent events. Prove that $\bar{A}$ and $\bar{B}$ are also independent events. 2

   (ii). Let A and B are two events with $P(A) = \frac{3}{8}, P(B) = \frac{5}{8}$ and $P(A \cup B) = \frac{3}{4}$. Find out $P(A|B)$. Are A and B independent? 2

   (iii). For any two events A and B prove that $P(A \cap \bar{B}) = 1 - P(B) + P(A \cap B)$. 2

   (iv). Find the standard deviation of the following distribution 2

X	-5	-4	1	2
$P(X = k) = f(x)$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$

   (v). Prove that $Var(X) = E(X^2) - \{E(X)\}^2$. 2

   (vi). If $\mu'_r = E\{(X - a)^r\}$, where a is a real number 2

   and $\mu_r = E\{(X - m)^r\}$, where $m = E(X)$, then prove that $\mu_2 = \mu'_2 - (\mu'_1)^2$.

   (vii). The mean and variance of a binomial distribution are 4 and $\frac{8}{3}$ respectively. Find the values of n and p. 2

2. In an examination 35% of the student failed in mathematics, 20% in chemistry and 10% in both chemistry and mathematics. A student is selected at random. Find the probability that

   (i). the student has passed in Chemistry, if it is known he has passed in Mathematics. $2\frac{1}{2}$

   (ii). the student has passed at least one of the two subjects. $2\frac{1}{2}$

3. A random variable X has the following probability mass function

X	0	1	2	3	4	5	6	7
$P(X = k) = f(x)$	0	$2k$	$k^2 + 2k$	k	$3k^2$	$2k^2 + k$	$k^2 + k$	$5k^2 + 4k$

   Determine the constant k and hence find out $P(3 < X | X \leq 6)$. $2\frac{1}{2} + 2\frac{1}{2}$

4. The spectrum of the random variable X consists of the points $1, 2, 3, \cdots, n$ and $P(X = i)$ is proportional to $\frac{1}{i(i+1)}$. Determine the probability mass function of X and hence find out $P(X > 5)$. 3+2

5. The first three moments of X about 2 are 3, 15 and 32 respectively. Obtain the first three moments about zero. Hence find the variance of X. 4+1

6. If X has Binomial Distribution with parameter n and p, then prove that its variance is $np(1-p)$. 5

7. The probability that a pen manufactured by a company will be defective is $\frac{1}{20}$. If 15 such pens are manufactured, find the probability that
(i). Exactly three will be defective $2\frac{1}{2}$ (ii). at least three will be defective. $2\frac{1}{2}$

8. Define Poisson Distribution. Prove that Poisson Distribution is a limiting case of Binomial Distribution under following conditions:
(i). $n \to \infty$ (ii). $p \to 0$ (iii). $np \to \lambda$. 1+4

9. Six coins are tossed 6500 times. Using the Poisson Distribution find the approximate probability of (i). getting six heads 8 times. $2\frac{1}{2}$ (ii). getting three tail 12 times. $2\frac{1}{2}$

GROUP - B (40 marks)

Attempt question number **1** and any **THREE** from the rest.

$2 \times 5 = 10$

1. Answer any **FIVE** of the following questions:
(i). What do you know about sampling distribution of a statistic?
(ii). Define unbiased estimator.
(iii). Define critical region in hypothesis testing.
(iv). Define Stochastic process.
(v). Define power of a test.
(vi). If $X \sim Bin(n, p)$, find the unbiased estimator of p^2.
(vii). Explain type I error.
(viii). Define Markov chain with an example.

2. Write the difference between SRSWR and SRSWOR in simple random sampling method. A simple random sample of size 64 is drawn from a finite population consisting of 122 units. If the population standard deviation is 16.8, find the standard error of sampling mean when the sample is drawn without replacement. $5+5$

3. Suppose $x_1, x_2, ..., x_n$ be a random sample from an infinite population with variance σ^2 and $\bar{x}$ is the sample mean. Show that $\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2$ is a biased estimator of σ^2. Can you give an unbiased estimator of σ^2? 10

4. Define minimum variance unbiased estimator. If the variance of three unbiased and independent estimates T_1, T_2 and T_3 of θ are same, which of $\frac{T_1+T_2}{2}$, $\frac{T_1+2T_2}{3}$ and $\frac{3T_1+T_2}{4}$ is the minimum variance unbiased estimate of θ? $3+7$

5. Define maximum likelihood estimator. In random sampling from normal population $N(\mu, \sigma^2)$, find the maximum likelihood estimator of μ when σ^2 is known. $3+7$

6. Let p be the probability that a coin will fall head in a single toss in order to test $H_0 : p = \frac{1}{2}$ against $H_1 : p = \frac{3}{4}$. The coin is tossed 5 times and H_0 is rejected if more than 3 heads are obtained. Find the probability of type I error and power of the test. 10

B.Tech. Examination-2024
Department of Electronics and Communication Engineering
(Even Semester Regular & Supplementary)
Course Title: Principle of Communication System, Course Code: ECEUGOE02

Full Marks: 80 **Time: 3.00 Hrs**

- ***Answer all parts of a question in same place.***
- ***Figures on the right hand side margin indicate full mark***
- ***Symbols have their usual meaning***

Answer Question No. 1 and any 7 from Question No. 2 to 12

1.	**Answer any five questions from the following questions.**		
	(a)	What do you mean by baseband transmission?	2
	(b)	Define modulation index for AM signal.	2
	(c)	What is frequency deviation in FM signal?	2
	(d)	State Carson's rule.	2
	(e)	What is Nyquist rate?	2
	(f)	Define quantization error.	2
2.	(a)	Draw the block diagram of a communication system and explain the function of each bock.	6
	(b)	Explain the need of modulation in communication.	4
3.	(a)	What is amplitude modulation?	2
	(b)	Derive an expression of single tone amplitude modulated signal.	5
	(c)	What are different types of amplitude modulated signals based on modulation index? Show with waveform.	3
4.	(a)	Explain the generation of AM signal using Square Law Diode Modulation.	5
	(b)	A modulating signal $10\sin(2\pi \times 10^3 t)$ is used to modulate a carrier signal $20\sin(2\pi \times 10^4 t)$. Determine modulation index, frequencies of sideband and bandwidth of modulated signal.	3
	(c)	A 400 watts carrier is modulated to a depth of 75 %. Find the total power in amplitude modulated wave. Assume the modulating signal to be a sinusoidal signal.	2
5.	(a)	Explain the generation of DSB-SC signal using balanced modulator.	5
	(b)	Find an expression for transmission efficiency of AM signal.	3
	(c)	Derive an equation for SSB modulated wave for which upper sideband is retained.	2
6.	(a)	Explain with bock diagram generation of FM wave using PM and PM wave using FM.	6
	(b)	A single tone FM is represented by the voltage equation as $v(t)=12\cos(6\times10^8 t+5\sin 1250t)$. Determine the following – (i) carrier frequency (ii) modulating frequency (iii) the modulation index (iv) maximum deviation.	4
7.	(a)	Derive an expression for narrowband FM signal.	5
	(b)	Explain the generation of narrowband FM signal using suitable block diagram.	5
8.	(a)	Explain the demodulation of FM signal using Balanced Slope Detector.	5
	(b)	Define frequency deviation and carrier swing in FM signal.	2
	(c)	Compare between FM and AM.	3
9.	(a)	State and prove sampling theorem for band limited signals.	5
	(b)	Describe Flat Top sampling technique.	3
	(c)	What is aliasing and how is it removed?	2
10.	(a)	Explain how an analog is converted into digital signal using PCM.	5
	(b)	Derive an expression of transmission bandwidth in a PCM system.	3
	(c)	A television signal having a bandwidth of 4.2 MHz is transmitted using binary PCM system. Given that number of quantization level is 512. Determine codeword length and bit rate.	2

11. (a) Explain Delta modulation transmitter with suitable block diagram 5

(b) What is slope overload distortion and how it is removed? 2

(c) Given a sine wave of frequency f_m and amplitude A_m applied to a delta modulator having a step size Δ. Show that slope overload distortion will occur if $A_m > \frac{\Delta}{2\pi f_m T_s}$. Here T_s is the sampling period. 3

12. (a) The binary data 11010010 is transmitted over a baseband channel. Draw the waveform for the transmitted data using following format – (i) Unipolar NRZ (ii) Polar RZ (iii) Split phase Manchester coding (iv)Polar quaternary NRZ 4

(b) What do you mean by coherent and non-coherent digital modulation technique? 2

(c) Draw the block diagram for coherent detection of Binary Amplitude Shift Keying signal and explain its operation. 4

UCCUGMC02Environmental Science

4th Sem

Full marks-80 2021 **Time-3 Hours**

Group - A

Give tick (√) any 20 questions from the following. 20 x 1 = 20

1.Which is the current flow of energy in the ecosystem?
A) Producer->carnivores-> herbivores-> decomposer
B) Producer->herbivore ->carnivore ->decomposer
C) Herbivore-> carnivore ->producer-> decomposer
D) Herbivore->producer-> carnivore ->decomposer

2. A food chain start with
A) Nitrogen fixing organisms B) Photosynthesizing organisms C) Respiration D) Decomposers

3. Write the full form of IUCN
A) International Union for conservation of nature
B) International Union for convention of nature
C) Import Union for Council of nature
D) none of this.

4. What is the term for the variety of species that leave in a particular area
A) Genetic diversity B) Species diversity C) Ecosystem diversity D)None of this.

5. Which of the following is responsible for turning the TajMahalyellow-
A) Oxygen B) Nitrogen C)Sulphur DioxideD) Chlorine

6. DDT and plastics are example of-
A)Primary pollutant B) Secondary pollutant C) Biodegradable pollutant D) Non Biodegradable pollutant.

7.COD stands for-
A) Chemical oxygen demand B) Biochemical oxygen demand C) Biological oxygen demandD) None of these.

8. How many Sancturies are present in India
A)573 B)453 C)500 D)100

9. The age of the universe is –
A) 5.6 billion years B) 13.8 billion years C) 5000 years D) 6000 years

10. Name of one Terrestrial planets in our solar system is-
A)Jupiter B) Saturn C) Mars D)Neptune

11.The coal is formed in
A. Carboniferous period B. Ordovician period C. Silurian period D. Devonian period

12. One detrivorous animal is
A.Earthworm B. Snake C. Hawk D. Tiger

13. Example of one invasive species is
A. Parthenium species B.Neem plant C. coconut plant D. Tulsi plant

14. The full form of UNESCO is
A.The United Nations Scientific Educational Corporation
B. The United Nations Educational, Scientific and Cultural Organization
C.The United Nations Economic, Social ,Cultural Organisation
D. None of these

15. One ozone layer depleting component is
A) CFC B) CO_2 C) H_2O D) CH_4

16. The World Environment Day is celebrated on
A) 5th June B) 22nd April C) 5th September D) 1ST January

17. The lower layer of the atmosphere is
A. Stratosphere B. Ozonosphere C. Troposphere D. Magnetosphere

18. Which of the following is a waterborne disease?
A) Typhoid B)Cholera C)Diarrhoea D)All of the above.

19. What type of dominant organisms found on the earth now a days?
A) Carnivores B) Rodent C) Herbivores D)Marine mammals.

20. Which biome has the highest biodiversity?
A) Grassland B) Desert C)Tropical rainforest D)None of these.

21. Coal and natural gas are example of.....minerals
A) Non-metallic B)Energy C) Ferrous D) Non -ferrous.

22. In which galaxy our solar system is located?
A)Milky Way B)Andromeda C)Ursa Major D)Orion way

23. One living component of environment is
A)Atmosphere B) plants C) soil D) minerals

Group- B
Answer any 6 questions from the following.

1. What is Noise pollution?Discuss the sources of noise pollution. Mention a few processes to reduce noise pollution.2+4+4

2. What is photochemical smog?Discuss the environmental impacts of photochemical smog? What are Greenhouse gases? Why they are called so? 2+4+2+2

3. How many zones are the environment classified into? Briefly describe any one environmental zone. 2+8

4. What is ecosystem? Discuss briefly about all the biotic components of ecosystem. 2+8

5. Write any two short notes from the followings. [5+5]
A)Bhopal Gas disaster
B) Importance of Mangrove forests.
C)Evolution of Hydrosphere
D)Ecological pyramid

6. What is Mass extinction? Briefly discuss about the conservation of biodiversity. 5+5

7. Discuss briefly about the Silent Valley Movement. 10

8. What is the state of environmental governance and policies in India? write a short notes on environmental protection act. 5+5

9. Write a short notes on coal as a resource. Discuss the problems of coal mining industries in India. 4+6