Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Agriculture Engineering)/ (AI&ML)/ (AI and Data Science)/ (Automation & Robotics)/(AI)/(Automobile Engineering)/ (CE)/ (CSE)/(Cyber Security/(Data Science)/(Electrical & Electronics Engineering)/ (EE)/ (ECE) (Electronics & EE)/ (Food Technology)/ (IT)/ (ME)/ (Robotics & Artificial Intelligence)/ CSE (Internet of Things and Cyber Security including Block Chain Technology) (Sem–1,2)

ENGINEERING GRAPHICS & DESIGN
Subject Code : BTME101-21
M.Code : 91335
Date of Examination : 24-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

I.   Write briefly :

a) Explain the following terms with a suitable drawing: Apex, Slant Height, Base Rim and Generator.

b) Differentiate between Isometric Projections and Isometric View.

c) Explain with the help of an example the Aligned system of placement of dimensions.

d) What do you mean by Representative Fraction (RF)?

e) Explain the types of dimensions with a suitable drawing.

f) Draw projections of a line inclined to VP and parallel to HP with a suitable freehand drawing. Assume suitable dimensions. Also, show traces.

g) How will you represent Liquid and Concrete on a drawing sheet?

h) Show by means of traces, a plane perpendicular to VP and inclined to HP.

(S1)-2854

i) Write the following statement using single stroke capital vertical letters of 12 mm size:

"THE FUTURE BELONGS TO THOSE WHO BELIEVE IN THE BEAUTY OF THEIR DREAMS"

j) Draw a regular Pentagonal Lamina of side 55mm.

SECTION-B

2. A map is to be drawn with RF 1:50. Construct a scale to read meters, decimeters and centimeters and long enough to measure up to 6 m. Show on it a distance of 4.78 m.

3. A point "P" is 48mm in front of VP and 58 mm above HP. Draw its projections and find out its shortest distance from the reference line.

4. A line "AB" 70mm long is inclined at 45° to HP and 30° to VP. Its midpoint "P" is 30mm below the HP and 25mm behind the VP. Draw the projections of the line.

5. End "A" of line AB is 18mm above HP and 40mm in front of VP and end "B" 15mm behind the VP and 25mm below the HP. The end projectors are 45mm apart. Draw the projections and find TL, θ, φ, HT and VT.

SECTION-C

6. A regular hexagonal lamina of side 48mm having a central circular hole of diameter 48mm is resting on one of its corners on HP such that one of its base edges is perpendicular to HP. Draw its projections when the said lamina is parallel to VP.

7. A right regular Pentagonal pyramid of base edge 48mm, axis 65mm is resting on HP on one of its base edges such that axis is parallel to both HP & VP.

8. A right regular square pyramid of base edge 54mm and axis 68 mm long; rests on its base on HP with its base edges equally inclined to VP. Draw its projections assuming the pyramid in 1st quadrant.

9. A cone of diameter 40mm and axis 60mm is placed centrally on the top of a square block of 40mm edge and 15mm thick. Draw the isometric drawing of the two solids.

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Roll No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem–7,8)

DATA MINING AND DATA WAREHOUSING

Subject Code : BTCS702-18

M.Code : 90488

Date of Examination : 21-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Define Data Warehouse.

   b) Name some open source data mining tools.

   c) Write some data cube operations.

   d) Differentiate between Classification and clustering.

   e) Define Information Gain.

   f) Let us suppose that there are 200 pages available on internet for machine learning. The search on this term returns total 210 pages, out of which 190 belongs to Machine Learning, calculate precision and recall for our algorithm.

   g) What is density based methods in clustering?

   h) What is enterprise search?

   i) What are different challenges in clustering the data?

   j) What is web usage mining?

SECTION-B

2. What is Data Mining and explain the knowledge discovery process.

3. What is classification? Explain decision tree induction by taking a suitable example.

(S2)-2831

4. What is web content mining? Write its different steps.

5. The distance between some Indian cities are given below, Apply the clustering algorithm to make three clusters. Indicate intermediate steps.

	Bathinda	Patiala	Delhi	Amritsar	Mathura
Bathinda	0	190	400	250	460
Patiala	190	0	240	225	300
Delhi	400	240	0	450	60
Amritsar	250	225	450	0	510
Mathura	460	300	60	510	0

6. Explain Naive Bayes Classification.

SECTION-C

7. Explain the association rule mining problem. Consider an example with the following set of transactions. There are 10 items.

TID	Items bought
001	B, M, T, Y
002	B, M
003	A, T, S, P
004	A, B, C, D
005	A, B
006	T, Y, E, M
007	A, B, M
008	B, C, D, T, P
009	D, T, S
010	A, B, M

Assume that we wish to find association rules with at least 30% support and 60% confidence. Find the frequent itemsets and then the association rules.

8. Explain the architecture of search engine in detail. Draw suitable diagrams.

9. What is OLAP? Explain its architecture, characteristics and multi dimensional view.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 03

Total No. of Questions : 05

B.Tech. (AI&ML)/ (Artificial Intelligence (AI) and Data Science)/ (Automation & Robotics)/ (CE)/ (CSE)/ (CSE) (AI&ML)/ (CSE) (Data Science)/ (Data Science)/ (Electrical & Electronics Engineering)/ (EE)/ (ECE)/ (Electronics & EE)/ (Food Technology)/(IT)/ (ME)/ (Robotics & Artificial Intelligence)/ (Internet of Things and Cyber Security including Block Chain Technology)/(Sem–1,2)

ENGLISH

Subject Code : BTHU-101-18

M.Code : 75349

Date of Examination : 21-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. All Questions Are COMPULSORY.
2. Question No. 1, 2, 3 carry TEN marks each.
3. Question No. 4 and 5 carry FIFTEEN marks each.

1. a) Use the following phrases in sentences :

   Get along, Roll up sleeves, Bash about, Good wine needs no bush, A white elephant.

   b) State whether the following sentences are simple, compound or complex :

   i) However hard work she may do she cannot pass the examination.

   ii) The shopkeeper quarrels with every customer therefore nobody likes him.

   iii) She cannot attend her office today as she is feeling unwell.

   iv) You will repent if you do not keep quiet.

   v) Visualizing a danger ahead, the traveller became cautious.

2. a) Condense the following passage retaining the main idea and using the minimum number of words :

   We call anything beautiful that gives us pleasure and that depends as much upon ourselves as upon what is outside us. Perhaps the majority of people find the sea

beautiful when it is blue. If someone has lived in Italy as a child and has to live beside the grey northern seas when he is grown up, he will think that the grey seas are ugly: and that nothing can be so beautiful as the blue Mediterranean. But suppose a Scottsman who loves Scotland has to go and live in Italy. He might find the blue sea after a little while very uninteresting. Only when he went home and saw the grey sea again would he find the sea beautiful. We are made in different ways and grey may be just as beautiful as blue, just as the cry of a baby may be found sweeter in someone's ears than the finest note of the finest singer that ever lived. Nothing is beautiful or ugly in itself, but thinking makes it so.

b) **Use the following transitional/ connecting devices in sentences of your own :**
Furthermore, Even if, However, Despite, Consequently

3. **Read the following passage and answer the questions that follow:**

Marie was born in 1867 in Warsaw, Poland, where her father was a Professor of Physics. At an early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics. Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heart-breaking anguish. Despondently, she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress. Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at a world-famous university. In 1911, she received the Nobel Prize in chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.

Questions :

a) Describe briefly the personality of Marie Curie.

b) What was her state of mind when she learned that she could not attend the university in Warsaw?

c) *"Marie Curie continued with her struggle regardless of her circumstance"*, how does the passage illustrate this statement?

d) **Give the meaning of the following words and use these in the sentences of your own :**
Disillusioned, Exuberance, Despondently, Blithe

4. Write an essay in about 500 words on *"The Communication Revolution: Blessing or Burden"*.

5. With summer approaching, you intend to purchase electric water dispensers for your office at Safdarjung Road, New Delhi. Assuming yourself to be the Maintenance Officer of Pervasive Technologies Pvt. Ltd, New Delhi, write a letter of enquiry to Hi-life Appliances and Equipment, Mumbai, seeking information about the availability and price of the product. Invent the necessary details.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI&ML/(AI) and Data Science/CSE/Data Science/Robotics &
Artificial Intelligence/IT/Internet of Things and Cyber Security including
Block Chain Technology/) (Sem–1,2)

SEMI-CONDUCTOR PHYSICS

Subject Code : BTPH-104-18
M.Code : 75360
Date of Examination : 15-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write briefly :

   a) Explain the terms : (i) Drift velocity and (ii) Carrier mobility.

   b) What are the basic assumptions of classical free electron theory?

   c) What do you understand by wave function?

   d) Why are we not aware of quantization in the daily experience?

   e) Explain it. What is the density of states? Discuss briefly.

   f) Give the physical basis of effective mass and explain its physical significance.

   g) Write a short note on the band theory of solids.

   h) Define the following terms : (i) Population inversion (ii) Pumping.

   i) What is Fermi level and Fermi energy?

   j) What is exciton?

SECTION-B

2. Obtain an expression for the electrical conductivity of metal on the basis of the free-electron theory. Hence prove Ohm's law.

3. Discuss with suitable mathematical expressions, the motion of an electron in a periodic potential. Explain how the above theory leads to the concept of the band structure of solids.

4. Derive an expression for Fermi energy in an intrinsic semiconductor. What is the effect of temperature on Fermi level in an intrinsic semiconductor?

5. a) Differentiate the n-type and p-type semiconductors with their Fermi level diagram.

   b) For an intrinsic semiconductor having a band gap $E_g = 0.7$ eV, calculate the density of holes and electrons at room temperature ($= 27°C$).

SECTION-C

6. Explain the term 'spontaneous' and 'stimulated' emission of radiation. Obtain a relation between transition probabilities of spontaneous and stimulated emission.

7. Describe the construction and working of a semiconductor laser with necessary diagrams. Discuss its merits over other lasers.

8. Explain the concept of directionality and monochromaticity as applied to lasers.

9. a) What is the Hall effect? Give an experimental method of calculating concentration and type of charges in a given semiconductor.

   b) Assume that there are 5×10^{28} atoms/m^3 in Cu, find the Hall coefficient.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. (AE/AI&ML/AI&DS/DS/AR/AE/CE/CSE/IOT/EEE/EE/ECE/
FT/IT/ME/ Robotics & AI/Internet of Things and Cyber Security including
Block Chain Technology)   (Sem–1,2)

CHEMISTRY-I

Subject Code : BTCH-101-18

M.Code : 75343

Date of Examination : 12-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1.   **Answer briefly :**

   a)   Enlist the important features of crystal field theory.

   b)   Why ionisation energy of Nitrogen is higher than that of Oxygen?

   c)   Assign R/S configuration to the following :

   d)   Discuss Diel-Alder Reaction.

   e)   Calculate the number of signals for the following compounds:

      i) $CH_3-CH_2-O-CH_3$

      ii) $CH_3-CH_2-CH_2-OH$.

   f)   Name the various types of intermolecular forces with an example of each.

g) What type of molecules show IR Spectra?

h) How free energy decides the spontaneity of a process?

i) Which out of the conjugated dienes or non-conjugated dienes are more stable and Why?

j) Differentiate between dry and wet corrosion.

SECTION-B

2. a) Discuss the Schrodinger wave equation for particle in one dimensional box and relate important results from it.

b) Differentiate between Bonding and Antibonding molecular orbital.

3. a) Explain Crystal field splitting in octahedral complexes.

b) What is role of doping on Band structures?

4. a) Give important applications of UV-visible spectroscopy with proper examples.

b) Explain chemical shift in NMR.

c) Differentiate between Scattering and Diffraction.

5. a) How and why do real gases deviate from ideality?

b) What do you mean by critical phenomenon in gases? How are critical constants related to vander Waal's constants?

SECTION-C

6. a) Derive Nernst Equation for the calculation of cell E.M.F.

b) Using Ellingham Diagram to explain carbon monoxide is a suitable reducing agent for oxide ore.

7. **Write short notes on the following :**

    a) Polarizability

    b) Penetration of molecular orbitals

    c) Atomic radius

    d) Co-ordination number.

8. a) Draw all the stereoisomers of 3-chloro-2-pentanol

    $CH_3CH(OH)CHClCH_2CH_3$

    b) Give conditions for a compound to show enantiomerism.

    c) Define linkage Isomerism.

9. a) Compare SN_1 and SN_2 substitution reactions.

    b) **Write short notes on the following organic reactions :**

        i) Oxidation Reactions

        ii) Ring Opening Reactions

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B.Tech. (AI&ML / Artificial Intelligence (AI) and Data Science /
Automation & Robotics / Automobile Engineering / CE / (AI&ML) / (CSE)
(Data Science) / (CSE) (IOT) / Data Science / EEE / EE / ECE / FT / IT /
ME / Robotics & Artificial Intelligence / CSE (Internet of Things and
Cyber Security including Block Chain Technology) /
PIT B.Tech Computer Engg.)   (Sem-1, 2)

PROGRAMMING FOR PROBLEM SOLVING

Subject Code : BTPS-101-18

M.Code : 75346

Date of Examination : 09-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

I. Answer briefly :

a) What are different types of memories?

b) What is a flowchart and how it is used in programming?

c) What is a variable?

d) What is for loop, and how it is different from a while loop?

e) What is a 2-D array? Give an example.

f) What is the complexity of bubble sort and why?

g) What is user-defined function?

h) Using recursion, define Fibonacci series.

i) What is Structure?

j) What is a pointer and why it is used?

SECTION-B

2. What is the difference between call by value and call by reference? Explain with an example.

3. What is recursion, and how it is different from other functions? Give an example.

4. What is the difference between String and Arrays? Also, explain how you will decide when to use which data type?

5. Explain how we can use if-else statements and how they differ from switch statements.

SECTION-C

6. Explain any two sorting algorithms and how they differ from searching algorithms.

7. Write a program for Quick sort. Also, explain how recursion is useful in this scenario.

8. Write a program to find the roots of an equation entered by the user.

9. Write a program using loops to find the sum of numbers from 1 to 10.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI&ML)/ (AI) and Data Science)/ (CSE)/ (Data Science)(ECE)/ (Internet of Things and Cyber Security including Block Chain Technology) (Sem–3)

DEVELOPMENT OF SOCIETIES

Subject Code : HSMC101-18

M.Code : 76439

Date of Examination : 24-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What is Clan system?

   b) Who explored Social System?

   c) To what extent is an individual shaped by a society?

   d) Give two major views about Social structure.

   e) Describe main ideas of political systems.

   f) Nature of Governing system.

   g) What are Socialism's essential features?

   h) Throw light on the concept of development in Pre-British Time.

   i) Examine idea of development in current context.
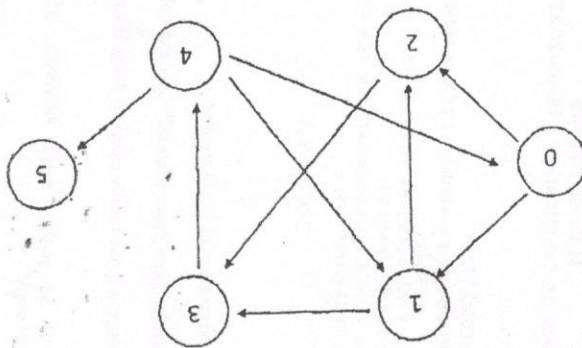
   j) Define Swaraj.

SECTION-B

2. Throw light on the role of family in a society.

3. What is Human being in a society?

4. Examine importance of political system in history.

5. Describe main features of Capitalism.

6. Critically examine Gandhian approach to Decentralized planning.

SECTION-C

7. Write a detailed note on the four concepts of origin of society.

8. Critically examine the best practices of Governing system.

9. Discuss in detail about the relevance of Gandhian model of development.

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Total No. of Questions : 09   Total No. of Pages : 03

B.Tech. (AI&ML) / (Artificial Intelligence (AI) and Data Science) / (CSE) / (CSE) (AI&ML) / (CSE) (Data Science) / (CSE) (IOT) / (Data Science)/ CSE (Internet of Things and Cyber Security including Block Chain Technology) (Sem–3)

DATA STRUCTURE & ALGORITHMS

Subject Code : BTCS-301-18

M.Code : 76436

Date of Examination : 16-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Give any two disadvantages of Big O notation.

   b) What do you mean by Time-Space trade off? Give example.

   c) Give one advantage and one disadvantage of using Binary search over linear search techniques.

   d) What is Big O for push(), pop(), isempty(), isfull() operations for array implementation of stack?

   e) What is the disadvantage of simple queue over circular queue in array implementation of queue? Give example.

   f) Give any two applications of circular linked list.

   g) What are AVL trees? How they are different from Binary search tree?

   h) What is the advantage of merge sort over quick sort?

   i) Define complete graph, strongly connected graph.

   j) Give adjacency list and adjacency matrix representations of graph data structures.

SECTION-B

2. Give the algorithm of Tower of Hanoi problem with n disks. Derive the total number of moves in this problem.

3. The keys 12, 18, 13.2, 3.23, 5 and 15 are inserted into an initially empty hash-table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table (also show intermediate tables)?

4. Write algorithms to insert and delete an element from array implementation of circular queue.

5. Illustrate execution of quick-sort (in increasing order) in the sequence

           44 33 11 55 77 90 40 60 99 22 88

6. Find the time complexity of the following code and mention it in Big O

   ```
   int fun(int n)
   {
   int count = 0;
   for (int i = n; i > 0; i /= 2)
   for (int j = 0; j<i;j++)
   for (int k = 0; k <j; k++)
   count+= 1;
   return count;
   ```

SECTION-C

7. Write an algorithm to delete all the occurrences of an element say 'n' from given linear linked list.

8. Define B tree. Draw the B tree of order 5 of the following data :

           92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78

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9. What is DFS and BFS traversal of graph? Give the DFS and BFS traversal (starting with node 0) of graph. Show all intermediate steps

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Total No. of Questions : 09

B.Tech. (CSE/IT) (Sem–3)
MATHEMATICS – III
Subject Code : BTAM-302
M.Code : 70808
Date of Examination : 02-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) State Dirichlet's conditions for expansion of F*(x)* in Fourier series

   b) Find the Laplace transform of $e^{-2t} \sin 4t$.

   c) Form partial differential equation by eliminating constant from following relation.

   $$z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$$

   d) Differentiate between Type I error and Type II error.

   e) Explain Null Hypothesis and Alternative Hypothesis.

   f) Write formula of Modified Euler's method for ordinary differential equation.

   g) Write necessary and sufficient condition for F(z) to be analytic.

   h) Determine the Binomial distribution whose mean is 9 and standard deviation is 3/2.

   i) Define Eigen Value and Eigen Vectors.

   j) Define first shifting theorem in Laplace transform.

SECTION-B

2. Find the Fourier series for the function $f(x) = x + x^2, -\pi < x < \pi$: Hence show that

$$\frac{\pi^2}{6} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + ----$$

3. Evaluate using Laplace transform $\int\limits_{0}^{\pi} t^3 e^{-t} \operatorname{Sin} t \, dt$.

4. Find the general solution of partial differential equation :

$$\frac{d^2 z}{\partial x^2} - 3\frac{\partial^2 z}{\partial x \partial y} + 2\frac{\partial^2 z}{\partial x^2} = e^{2x-y} + \operatorname{Cos}(x + 2y).$$

5. Two independent sample of sizes 7 and 6 had the following values:

Sample A	28	30	32	33	31	29	34
Sample B	29	30	30	24	27	28	

Examine whether the samples have been drawn from normal populations having the same variance.

6. Consider an ordinary differential equation $\frac{dy}{dx} = x^2 + y^2$, $y(1) = 1.2$. Find $y(1.05)$ using the fourth order Runga - Kutta Methods.

SECTION-C

7. a) Prove that the function f(z) defined by $f(z) = \dfrac{x^3(1+\iota) - y^3(1-\iota)}{x^2 + y^2}$, $z \neq 0$ & f(0)=0 is continuous and the Cauchy-Riemann equations are satisfied at the origin yet f'(0) does not exist.

b) Determine the analytic function $w = u + \iota v$ if $v = \log(x^2 + y^2) + x - 2y$

8. a) Fit a Poisson distribution to the following data and calculate theoretical frequencies.

X	0	1	2	3	4
Y	122	60	15	2	1

(given $e^{-0.5} = 0.61$)

b) Show that Poisson distribution is a limiting case of Binomial Distribution.

9. Find the largest Eigen value of the matrix by power method

$$\begin{bmatrix} 1 & -3 & 2 \\ 4 & 4 & -1 \\ 6 & 3 & 5 \end{bmatrix}$$

(S2)-1768

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI&ML / AI&ML and Data Science / CSE / Cyber Security / IOT / Data Science / Internet of Things and Cyber Security including Block Chain Technology)   (Sem–3)

MATHEMATICS-III
Subject Code : BTAM304-18
M.Code : 76438
Date of Examination : 01-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write Briefly :

    a) Examine for saddle points $f(x,y) = xy$.

    b) Change order of integration for $\int_{y=0}^{1} \int_{x=y^2}^{\sqrt{y}} f(x,y)\, dxdy$.

    c) Prove that convergent sequence has a unique limit.

    d) Discuss convergence of $\sum \frac{2n^2 - 2}{2^n + 1}$.

    e) State Cauchy integral test.

    f) Prove that if $M(x, y)dx + N(x, y)dy = 0$ is exact then $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$.

    g) Define Bernoulli's equation.

    h) Solve $(D^3 + D)y = 0$.

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i) Define Legendre's .differential equation

j) Solve $(x-1)^2 y'' - (x-1)y' + y = 0$.

SECTION-B

2. If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, show that $\left(\dfrac{\partial^2}{\partial x^2} + \dfrac{\partial^2}{\partial y^2} + \dfrac{\partial^2}{\partial z^2}\right)^2 u = -9(x+y+z)^{-2}$.

3. Test for convergence the series $\sum \dfrac{n!}{(n+1)^n} x^n$.

4. Discuss uniform convergence of $\sum \dfrac{a^n x^n}{n^2 + 1}$.

5. Solve $(xy^3 + y)dx + 2(x^2 y^2 + x + y^4)dy = 0$.

6. Using the method of variation of parameters, solve $\dfrac{d^2 y}{dx^2} + y = \tan x$.

SECTION-C

7. Find the volume bounded by the paraboloid $x^2 + y^2 = az$, the cylinder $x^2 + y^2 = 2ay$ and the plane $z = 0$.

8. Solve $\dfrac{dy}{dx} - \dfrac{dx}{dy} = \dfrac{x}{y} - \dfrac{y}{x}$.

9. Solve $\dfrac{d^2 y}{dx^2} + \dfrac{1}{x}\dfrac{dy}{dx} = 12\dfrac{\log x}{x^2}$.

Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 9

B.Tech. (CSE/ECE) (Sem.–3)

OBJECT ORIENTED PROGRAMMING USING C++

Subject Code : BTCS-305

M.Code : 56595

Date of Examination : 24-05-23

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

    a) Data hiding

    b) Class

    c) Constructor

    d) Dangling pointer

    e) Generic function

    f) Abstraction

    g) Template

    h) Call by reference

    i) Garbage collection

    j) Type conversion

SECTION-B

2. Write a program to illustrate abstract class and friend class.

3. Discuss the features of Constructors

4. Differentiate between victual-and pure virtual functions

5. Write a program to overload "-" operator.

6. Explain the concept of abstraction and data hiding

SECTION-C

7. Write a note on templates

8. What are the implications of public, protected and private visibility modes?

9. How constructor and destructor work in case of inheritance? Discuss with example.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Artificial Intelligence (AI) and Data Science / CSE /
(CSE)(AI&ML) /(CSE)(Data Science) /(CSE)(IOT)/(Data Science)/ IT / CSE
(Internet of Things and Cyber Security including Block Chain
Technology)) (Sem.–3)

DIGITAL ELECTRONICS

Subject Code : BTES301-18

M.Code : 76435

Date of Examination : 24-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What is the need of digital electronics? Discuss.

   b) List the various disadvantages of Boolean algebra.

   c) Differentiate between combinational and sequential circuits.

   d) What is the need of a flip flop? Discuss.

   e) What do you mean by MUX? Discuss.

   f) What do you mean by excitation table? Discuss.

   g) What do you mean by race around condition? Discuss.

   h) Discuss the significance of D flip-flop.

   i) Write down the need of sample and hold circuit.

   j) What do you mean by memory cycle? Discuss.

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SECTION-B

2. Implement the half adder using :

   a) AOI

   b) NAND gates only .

3. In an industry four operations Temperature, Pressure, Level and Humidity are to be encoded. Design a priority encoder in which Temperature must have the highest priority then Pressure followed by Level and Humidity is having the lowest priority.

4. Explain the working of a JK flip-flop. Also, discuss how the problem of SR flip flop is solved in JK flip flop?

5. Draw the diagram and discuss the working of R-2R type D/A converter in detail.

6. Explain the ROM organization and its comparison with RAM.

SECTION-C

7. Draw and explain the working of Successive approximation and dual slope A/D converters.

8. a) Reduce the following expression to simplest form using K map method $F(A,B,C,D) = \sum m \, (0,2,5,6,7,10,11,12)$

   b) Draw the logical diagram and explain the working of BCD adder.

9. Explain :

   a) FPGA

   b) Gray and Excess 3 codes

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(S2)- 984

Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 22

Total No. of Questions : 09

B.Tech. (AI&ML)/ (Artificial Intelligence (AI) and Data Science)/ (Artificial Intelligence)/ (Computer Engineering)/ (CSE)/(AI&ML)/(Cyber Security)/ (Data Science)/(IOT)/(Data Science)/ (Internet of Things and Cyber Security including Block Chain Technology) (Sem–4)

COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code : BTES-401-18

M.Code : 77627

Date of Examination : 28-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Explain in brief about register transfer language.

   b) Explain in brief about the main memory.

   c) What is a write-through cache?

   d) What is Interprocessor communication?

   e) What is Microprocessor?

   f) What is the difference between machine and instruction cycles?

   g) Why does increasing the capacity of the cache tend to increase its hit rate?

   h) How many 128x8 ROM memory chips are needed to provide a memory capacity of 4096x16?

   i) Differentiate between Computer Architecture and Organization.

   j) What is a microprogram sequencer?

SECTION-B

2. What are the various types of interrupts? Explain.

3. List and explain the steps involved in the execution of a complete instruction.

4. **Discuss :**

    a) Hardwired and micro programmed design control unit.

    b) Hierarchical Memory Organization.

5. Explain direct and indirect register addressing mode with a suitable example.

6. Discuss the role of cache coherency in parallel processors.

SECTION-C

7. Explain the vector processor and array processors in detail.

8. What is meant by associative memory? Explain briefly the hardware organization of such a memory.

9. What are the ways in which peripheral devices can transfer data to a computer system? Write features of each of these ways and compare the pros and cons of each type of data transfer.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. ((AI&ML)/(AI and Data Science)/(Artificial Intelligence)/(CSE)
(IOT)/(Data Science)/(Cyber Security)/(ECE)/(Sem–4)

UNIVERSAL HUMAN VALUES

Subject Code : HSMC-122-18

M.Code : 77630

Date of Examination : 26-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A Fill in the Blanks/ True/False.
2. SECTION-B contains FIVE questions in this section. Attempt ANY FOUR questions
3. SECTION-C contains THREE questions in this section. Attempt any two question.

SECTION-A

1. Fill in the blanks / True / False :   (2 × 10 = 20)

   a) Self-exporation is the process for ....Education.

      आत्म-अध्ययन ....शिक्षा के लिए प्रक्रिया है।

      ਸਵੈ-ਅਧਿਐਨ.............ਸਿੱਖਿਆ ਲਈ ਪ੍ਰਕਿਰਿਆ ਹੈ।

   b) .... is a feeling of having more than required physical facilities.

      .... भौतिक सुविधाओं की आवश्यकता से अधिक होने की भावना है।

      ....ਭੌਤਿਕ ਸਹੂਲਤਾਂ ਦੀ ਲੋੜ ਵਲੋਂ ਜਿਆਦਾ ਹੋਣ ਦੀ ਭਾਵਨਾ ਹੈ।

   c) .... is the foundational value in relationships.

      .... रिश्तों मे मूलभूत मूल्य है।

      ....ਰਿਸ਼ਤਿਆਂ ਵਿੱਚ ਮੁੱਢਲਾ ਮੂਲ ਹੈ।

   d) Justice is Harmony in ....

      न्याय............... में सामंजस्य है।

      ਨਿਆਂ ....ਵਿੱਚ ਤਾਲਮੇਲ ਹੈ।

   e) There are..................orders in Nature.

      प्रकृति में ....आदेश हैं।

      ਕੁਦਰਤ ਵਿੱਚ .... ਆਦੇਸ਼ ਹਨ।

   f) All the needs of Self are called Happiness.

      स्वयं की सभी जरूरतों को खुशियाँ कहा जाता है।

      ਸਵੈ ਦੀ ਲੋੜਾਂ ਨੂੰ ਖ਼ੁਸ਼ੀ ਕਹਿੰਦੇ ਹਨ।

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g) Giving all the priorities to Physical Facilities is living with Animal Consciousness.

भौतिक सुविधाओं को सभी प्राथमिकताएं देना पशु चेतना के साथ रहना है।

ਸਰੀਰਕ ਸਹੂਲਤਾਂ ਨੂੰ ਹੀ ਸਾਰੀਆਂ ਪਹਿਲਾਂ ਦੇਣੀਆਂ ਪਸ਼ੂ ਬਿਰਤੀ ਨਾਲ ਰਹਿਣਾ ਹੈ।

h) Respect is right evaluation.

सम्मान सही मूल्यांक है।

ਆਦਰ ਤੋਂ ਭਾਵ ਸਹੀ ਮੁਲਾਂਕਣ ਹੈ।

i) There are four orders in Nature.

प्रकृति में चार आदेश हैं।

ਪ੍ਰਕਿਰਤੀ ਨੂੰ ਚਾਰ ਅਵਸਥਾਵਾਂ ਵਿਚ ਵੰਡਿਆ ਜਾ ਸਕਦਾ ਹੈ।

j) Ethical Human Conduct leads to Mutual Fulfilment.

नैतिक मानव आचरण से परस्पर पूर्ति हो जाती है।

ਨੈਤਿਕ ਮਨੁੱਖੀ ਵਿਉਹਾਰ ਪਰਸਪਰ ਪੂਰਕਤਾ ਵੱਲ ਲੈ ਜਾਂਦਾ ਹੈ।

SECTION-B (5 × 4 = 20)

2. Explain self-organisation and health.

आत्म संगठन और स्वास्थ्य के बारे में बताएं।

ਆਤਮ ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

3. What do you mean by SVDD, SSDD and SSSS? How is the transformation possible from SSDD to SSSS?

आपका SVDD, SSDD और SSSS से क्या मतलब है? SSDD से SSSS के लिए परिवर्तन कैसे संभव है?

ਤੁਹਾਡਾ SVDD, SSDD ਅਤੇ SSSS ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ? SSDD ਤੋਂ SSSS ਤੱਕ ਦੀ ਤਬਦੀਲੀ ਕਿਸ ਤਰ੍ਹਾਂ ਸੰਭਵ ਹੈ?

4. What are the implications of value based living?

मूल्य आधारित जीवन यापन के अच्छे परिणाम क्या हैं?

ਕਦਰਾਂ ਕੀਮਤਾਂ ਆਧਾਰਿਤ ਜੀਵਨ ਜੀਉਣ ਦੇ ਚੰਗੇ ਨਤੀਜੇ ਕੀ ਹਨ?

5. Explain Competence in Professional-Ethics.

पेशेवर नैतिकता में क्षमता समझाओ।

ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਸਮਰੱਥਾ ਸਮਝਾਓ।

6. What are the fove dimesions of Human Endeavour in society?

समाज में मानव प्रयास के पांच आयाम क्या हैं?

ਸਮਾਜ ਵਿੱਚ ਮਨੁੱਖ ਕੋਸ਼ਿਸ਼ ਦੇ ਪੰਜ ਪਹਿਲੂ ਕੀ ਹਨ?

7. Describe basic human aspirations. What are the requirements to fulfill basic human aspirations?

बुनियादी मानवीय आकांक्षाएं क्या हैं? बुनियादी मानवीय आकांक्षाओं को पूरा करने के लिए आवश्यकताओं का वर्णन करें?

ਬੁਨਿਆਦੀ ਮਾਨਵੀ ਇੱਛਾਵਾਂ ਕੀ ਹਨ? ਬੁਨਿਆਦੀ ਮਾਨਵੀ ਇੱਛਾਵਾਂ ਨੂੰ ਪੂਰਾ ਕਰਨ ਲਈ ਜਰੂਰਤਾਂ ਦਾ ਵਰਨਣ ਕਰੋ?

OR

What is the meaning and purpose of Self-Exploration?

स्वयं-अन्वेषण के अर्थ और उद्देश्य क्या हैं?

ਆਤਮ ਅਧਿਐਨ ਦੇ ਮਤਲੱਬ ਅਤੇ ਉਦੇਸ਼ ਕੀ ਹਨ?

8. Compare the Four Orders in Nature on the basis of their salient aspects.

मुख्य पहलुओं के आधार पर प्रकृति में चार आदेशों की तुलना करें।

ਮੁੱਖ ਪਹਿਲੂਆਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਤੁਲਨਾ ਕਰੋ।

OR

How is a human-being co-existence of Self and Body? Explain Pre-Conditioning, Sensation and Natural-Acceptance.

इंसान स्वयं और शरीर का सह-अस्तित्व कैसे है? पूर्व-मान्यता, संवेदना और प्राकृतिक-स्वीकृति समझाओ।

ਮੁੱਖ ਪਹਿਲੂਆਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਤੁਲਨਾ ਕਰੋ।

9. What are the broad holistic criteria for evaluation of technologies, production systems and management models? How do they map with the comprehensive human goal?

प्रौद्योगिकी, उत्पादन प्रणाली और प्रबंधन मॉडल के मूल्यांकन के लिए व्यापक समग्र मापदंड क्या हैं? कैसे वे व्यापक मानव लक्ष्य के साथ मेल खाती है?

ਤਕਨਾਲੋਜੀ, ਉਤਪਾਦਨ ਸਿਸਟਮ ਅਤੇ ਪ੍ਰਬੰਧਨ ਮਾਡਲ ਦੀ ਪੜਤਾਲ ਕਰਨ ਲਈ ਵਿਆਪੂਕ ਸਪੂੰਰਨ ਮਾਪਦੰਡ ਕੀ ਹਨ? ਕਿਵੇਂ ਉਹ ਵਿਆਪਕ ਮਨੁੱਖ ਲਕਸ਼ ਦੇ ਨਾਲ ਮੇਲ ਖਾਂਦੀ ਹੈ?

OR

What are salient unethical practices in the profession at present? Analyze the root cause and possible solution.

मौजूदा समय में पेशे के मुख्य अनैतिक तरीके क्या हैं? मूल कारण और संभव समाधान का विश्लेषण करें।

ਮੌਜੂਦਾ ਸਮਾਂ ਵਿੱਚ ਪੇਸ਼ੇ ਦੇ ਮੁੱਖ ਅਨੈਤਿਕ ਤਰੀਕੇ ਕੀ ਹਨ? ਮੂਲ ਕਾਰਨ ਅਤੇ ਸੰਭਵ ਸਮਾਧਾਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਨ ਕਰੋ।

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI&ML)/ (Artificial Intelligence (AI) and Data Science/ (Artificial Intelligence)/ (Computer Engineering)/ (CSE)\(Cyber Security)/ (IOT)/Data Science/ (Internet of Things and Cyber Security including Block Chain Technology) (Sem–4)

DESIGN & ANALYSIS OF ALGORITHMS
Subject Code : BTCS-403-18
M.Code : 77629
Date of Examination : 22-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

   a) Describe Big 'O' notation used in algorithms.

   b) What is flow network?

   c) How is an algorithm's time efficiency measured?

   d) What is recursive call?

   e) What is Knapsack problem?

   f) What are the advantages of topological sorting?

   g) Define state space of the problem.

   h) What is best-case efficiency?

   i) What are dynamic trees?

   j) What is approximate solution?

SECTION-B

2. What do you mean by time complexity and space complexity of an algorithm?

3. Write the general procedure of dynamic programming.

4. What are heuristics? What are their characteristics?

5. What do you mean by Asymptotic Notations? Explain.

6. Find the longest common subsequence for the following two sequences using dynamic programming. Show the complete process.

   $X = 100101001$

   $Y = 101001$.

SECTION-C

7. What are NP-hard and NP-complete problems? Explain with example.

8. **Write a detailed note on the following :**

   a) Substitution Method

   b) Network Flow Algorithm.

9. Explain fractional knapsack problem with example.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI&ML/AI and Data Science/AI/CE/CSE/Cyber Security/ Data Science/ Internet of Things and Cyber Security including Block Chain Technology) SBS - B.Tech. (CSE)   (Sem.–4)

OPERATING SYSTEM

Subject Code : BTCS-402-18

M.Code : 77628

Date of Examination : 19-06-23

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Define kernel.

   b. What is purpose of fork() and exec() system call?

   c. Define long term scheduler.

   d. What is the difference between turnaround time and response time?

   e. Why do we need multithreading?

   f. When the race condition occurs?

   g. Define RAG.

   h. Why do we need device drivers?

   i. What is the impact of page size on overall system performance?

   j. State Belady's anomaly.

(S2)-1891

SECTION-B

2. Difference between multiprogramming, multitasking and multiprocessing OS.

3. Discuss the Dinning Philosopher problem in process synchronization.

4. Discuss the necessary and sufficient condition for a deadlock to occur in system.

5. Compare and contrast the different disk space or file allocation methods.

6. What is virtual memory? Discuss the benefits of virtual memory techniques.

SECTION-C

7. What is IPC? Discuss the producer consumer problem using Semaphores.

8. What is page replacement? Discuss different page replacement algorithms and by using a reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. Assume there are three frames. Apply LRU and find out how many page faults occurs.

9. Write a Short note on :

   a. Demand Paging

   b. SCAN *vs.* C-SCAN disk scheduling algorithm

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem.–5)
WEB TECHNOLOGIES
Subject Code : BTCS 520-18
M.Code : 78326
Date of Examination : 28-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

    a) How would you define the role of Java Script? Write in brief about its versions.

    b) Write down the full form of PHP? List all the data types supported by PHP?

    c) What is the purpose of XMLHttpRequest?

    d) Why proxy servers are used?

    e) Write HTML code for creating a hyperlink.

    f) Comment on the Case-sensitivity of CSS.

    g) Write the real web applications of AJAX currently running in the market?

    h) Why one should prefer JSON over XML? Justify.

    i) Differentiate between = = and = = =.

    j) How can you use CSS to control image repetition?

SECTION-B

2. **Write CSS code for the following :**

   a) Set the background color of a page.

   b) Position the background image on top left.

   c) Set and apply four borders around text.

3. Write down 4 HTML audio/video methods and explain them using code.

4. Explain various string functions of PHP with example.

5. How will you generate a dialogbox using JavaScript? Give example.

6. Write down the advantages and disadvantages of AJAX.

SECTION-C

7. **Answer the following :**

   a) Write code to embed PHP code in an HTML page?

   b) List the main types of errors in PHP and explain their differences.

8. Write code of functionality of JSON with AJAX? How it improves the performance of a website. Explain with programming illustration.

9. **Answer the following :**

   a) How CSS3 is better than previous version? What are its features?

   b) How to include CSS in the webpage? How would you set margins, padding, positioning, and text formatting using CSS? Write code to justify your answer.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (CSE) (Sem–5)
SOFTWARE ENGINEERING
Subject Code : BTCS503-18
M.Code : 78322
Date of Examination : 17-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What are software components?

   b) What do you mean by requirement gathering?

   c) Define software engineering as defined in IEEE 610.12.1990 standard.

   d) Which SDLC model is best? Explain.

   e) What is Software prototyping and POC?

   f) What are software reliability metrics? Explain.

   g) What is SGL environment?

   h) Differentiate between white-box and black-box testing.

   i) Explain in detail about SEI CMMI.

   j) What is Domain Analysis in context of software reuse?

SECTION-B

2. Describe the Software Development process in brief.

3. Explain the concept of modularization.

4. Write a detailed note on Rayleigh-Norden results.

5. How test coverage is helpful in measuring the effectiveness of the testing?

6. What do you understand by the term Software Development Life Cycle? Why it is important to adhere to the life-cycle model while developing a large software product?

SECTION-C

7. Explain the following Software life cycle models in detail with suitable diagrams :

   a) Prototyping Model

   b) Spiral Model.

8. Write short notes on the following :

   a) Architectural Design

   b) Create a DFD on "Project Management"

   c) Decision trees

   d) LOC AND KLOC

9. What do you mean by project scheduling? How PERT charts are used to plan the scheduling of a project? How PERT Chart is different from GANTT Chart?

Roll No. ☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

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B.Tech. (CSE) (Sem–5)

ENTERPRISE RESOURCE PLANNING

Subject Code : BTES 501-18

M.Code : 78319

Date of Examination : 14-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) CRM

   b) SSA Global

   c) BPR

   d) TQM

   e) e-Commerce

   f) Data Mining

   g) Oracle

   h) Main characteristics of MIS

   i) Solutions offered by QAD

   j) Benefits of SAP.

(S2)-2625

SECTION-B

2. List the limitations and benefits of ERP.

3. What are the various tasks performed during pre-implementation?

4. What are the Business Modules present in an ERP package?

5. Write down functions of JD Edwards and its different product modules.

6. How ERP and E-Commerce are related? Explain it with examples.

SECTION-C

7. What are the 12 rules of OLAP? Explain direct and indirect benefits of ERP?

8. Explain various ERP modules and parameters of materials management in ERP system.

9. Explain the various ERP implementation strategies and how the performance of ERP model is maximised?

(S2)-2625

Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem–5)

FORMAL LANGUAGE & AUTOMATA THEORY

Subject Code : BTCS 502-18

M.Code : 78321

Date of Examination : 08-06-2023

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Define Formal Language.

   b. Write some applications of Automata theory.

   c. Write regular expression for strings begins with 00 and ends with 11.

   d. Why do we need lambda move in automata?

   e. Every Type grammar is a Type 3 grammar (T/F). Justify your answer.

   f. What is left recursion?

   g. What is ambiguity in CFG?

   h. Define LBA.

   i. What is NP complete problem?

   j. What is Church Turing thesis states?

SECTION-B

2. Explain the Chomsky hierarchy of grammars. Show the correspondence between the automation and types of Grammar.

3. Discuss the procedure to convert NDFA to DFA with the help of suitable example.

4. What is parsing? How Left most and right most derivation helps to find out the ambiguity in a CFG?

5. Discuss the concept of Pumping Lemma for regular grammars. How Pumping Lemma is used to prove weather a given grammar is not a regular grammar?

6. What do you understand by tractable and Intractable problems with reference to Turing Machines?

SECTION-C

7. What is Turing Machine? Explain the different variants of Truing Machines.

8. Discuss Push down Automation in detail. Design PDA for {wcwT | w={a,b}*}

9. **Write a Short note on :**

   a. Minimization of FA

   b. Cook Levin Theorem

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem–5)

COMPUTER NETWORKS

Subject Code : BTCS504-18

M.Code : 78323

Date of Examination : 05-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Define Bandwidth and Bandwidth Utilization for a communication channel.

   b) What is the purpose of sliding window protocol?

   c) What is wireless LAN. Which IEEE standard governs it?

   d) How is multiple access of a channel achieved? List the challenges.

   e) Define attenuation and latency of transmission channels.

   f) What are the components of data link layer and their respective roles?

   g) Discuss various types of framing techniques.

   h) What do you mean by routing? Define link state routing strategy.

   i) What factors lead to congestion in a network?

   j) Which protocol is used for multimedia transmission? Give its frame structure.

(S2)-2114

SECTION-B

2. What issues of OSI model led towards TCP/IP model development?

3. Compare and contrast various multiplexing techniques.

4. What do you mean by Cryptography? Discuss its types.

5. What are the challenges of CSMA / CD? How it is purposed to improve?

6. Compare UDP and TCP protocol giving their frame structure.

SECTION-C

7. **Write Short notes on :**

   a) DDNS

   b) TELNET

   c) HTTP.

8. Using suitable example, discuss two error correction techniques in data transmission.

9 What are the advantages of IPV6 addressing? Give frame structure of IPV6 header. Explain which network layer protocol is responsible for address resolution?

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B.Tech. (CSE) (Sem–7,8)

ADHOC AND WIRELESS SENSOR NETWORKS

Subject Code : BTCS-716-18

M.Code : 90507

Date of Examination : 30-05-2023

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

    a) Define Wireless sensor network.

    b) What is S-MAC protocol?

    c) Define proactive routing.

    d) What is contention-based protocol?

    e) List the classification of MAC .protocol

    f) List the services provided by IEEE 802.15.4.

    g) Define hybrid routing.

    h) What is flooding attack?

    i) What is tampering black hole attack?

    j) How is secure routing done in wireless channel?

SECTION-B

2. Explain the architecture of wireless sensor networks.

3. What are the design goals of a MAC protocol for Ad Hoc wireless networks?

4. How duty cycle approach is used to transit between listen state and sleep state in S-MAC protocol?

5. Explain note architecture in detail.

6. Why secure routing protocols are needed?

SECTION-C

7. **Write a note on**

   a) DSDV

   b) AODV

8. Explain TCP over Ad hoc wireless.

9. Explain key distribution and management scenario for sensor network security.

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B.Tech. (CSE / IT) (Sem.–7)

ROUTING AND SWITCHIG

Subject Code : BTEC-905A-18

M.Code : 90691

Date of Examination : 25-05-23

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Why should you use CLI?

   b) Why Rapid Spanning Tree protocol is faster than Spanning Tree Protocol?

   c) What is the difference between dynamic IP and static IP addressing?

   d) What is OSPF?

   e) What are the different network security techniques?

   f) Describe Flow Control and Buffering in Transport Layer.

   g) Define Ethernet.

   h) What is ADSL Internet service?

   i) Difference between host name and IP address

   j) List the advantages of IPv6 routing.

(S2)-1171

SECTION-B

2. Explain the term Authentication, Authorization and Accounting (AAA) used in network security.

3. What is Network Address Translation? Explain Translation method in brief.

4. Briefly explain the various fields of IPV6 address format.

5. What is Generic Routing Encapsulation? How does it work?

6. What are some of the possible services that a link-layer protocol can offer to the network layer? Which of these link-layer services have corresponding services in IP?

SECTION-C

7. An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it : 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. What are the valid allocation of address to A and B? Explain.

8. What are the services provided by application layer? Explain FTP and SMTP Application Layer Protocol in detail.

9. Explain the following :

   a) VRP Operating System Image Management.

   b) Establishing DSL/ADSL networks with PPPoE.

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B.Tech. (Computer Science & Engg.)   (Sem.–7)
AGILE SOFTWARE DEVELOPMENT
Subject Code : BTCS-710-18
M.Code : 90501
Date of Examination : 20-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Software and Software development.

   b) Role of team members in software development.

   c) Benefits of the Agile in software development.

   d) Kanban framework.

   e) Scrum framework.

   f) Product and Process.

   g) Interface segregation principle.

   h) Product backlog in agile.

   i) Basic tools of XP.

   j) Code refactoring.

SECTION-B

2. What are Artifacts? How do they affect the software development?

3. List down the design principle of agile software design in detail.

4. Explain the concept of 3 C's model in agile software development in detail.

5. What are the various agile manifesto's, principles that are followed in software development?

6. Explain Liskov Substitution Principle used in Agile design methodology.

SECTION-C

7. Explain in Software Development Life Cycle in detail.

8. What is the role of product owner, team member and scrum master for the success in the software development?

9. List down the differences between the following :

   a) Alpha testing and Beta testing.

   b) Waterfall Model and Incremental Model.

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B.Tech. (CSE)   (Sem.–7)

NETWORK SECURITY AND CRYPTOGRAPHY
Subject Code : BTCS-701-18
M.Code : 90487
Date of Examination : 17-05-23

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

    a. What is vulnerability analysis?

    b. Give example of few active threats.

    c. What is non-repudiation?

    d. State Fermat theorem.

    e. Why SHA is more secure than a hash function?

    f. What is the difference between firewall and antivirus?

    g. What is Kerberos?

    h. What are digital signatures?

    i. Why do we use captchas?

    j. What is port scan attack?

SECTION-B

2. Explain various active threats with the help of an example.

3. What is a block cipher? Discuss block ciphers modes of operations.

4. Discuss the different requirements for message authentication.

5. Why do we need digital signatures? How digital signature works?

6. How do honeypots work? Discuss the placement of honeypots in a network.

SECTION-C

7. Describe the steps in finding the message digest using SHA-512 algorithm. What is the order of finding two messages having the same message digest?

8. Explain the working of RSA algorithm with the help of a suitable example. Mention any one technique attacking RSA.

9. Write a short note on :

   a. Key distribution techniques

   b. Purpose of S-box in DES.

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Total No. of Questions : 09

B.Tech. (CSE/Information Technology)   (Sem.–7)

SOFTWARE TESTING AND QUALITY ASSURANCE

Subject Code : BTCS-905

M.Code : 71897

Date of Examination 18-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. What advanced process models have been proposed for software engineering work?

   b. Define Version Control.

   c. Write a short note on TQM.

   d. What is Baseline?

   e. Distinguish software faults and software failures.

   f. Differentiate between verification and validation.

   g. What is scaffolding in testing?

   h. Why do we need integration testing?

   i. Distinguish between alpha and beta testing.

   j. What is defect severity?

SECTION-B

2. Explain various black -box techniques used to design effective test cases.

3. Differentiate between the following :

    a) Equivalence partitioning and Boundary value analysis methods

    b) Verification and Validation

    c) White-Box and Black-Box Testing.

4. What is object oriented testing? Explain the various objects oriented testing strategies and issues in detail.

5. Explain product quality metrics.

6. Why do we need integration testing? Explain various approaches in integration testing.

SECTION-C

7. Write a short note on 'software quality assurance standards'.

8. Explain the following :

    a. Alpha and beta testing

    b. Fault based testing

    c. Software reliability.

9. Write short notes on the following :

    a) CMM

    b) Formal Technical Reviews

    c) BVA

    d) ISO 9126.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE)   (Sem.–7,8)
# THEORY OF COMPUTATION
Subject Code : BTCS-702
M.Code : 71894
Date of Examination : 11-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Answer briefly :

1. What is the meaning of statement *'acceptability of string by FA'*?

2. L is a subset of closure of alphabet (T / F).

3. List some applications of Theory of computation.

4. Every Type 2 grammar is a Type 3 grammar (T/F). Justify your answer

5. Define Regular Expression.

6. State Arden's theorem.

7. What is the meaning of halting problem in TM?

8. Define yield of a parse tree.

9. What are useless symbols?

10. What is the difference between FA and PDA?

(S2)-925

SECTION-B

11. Discuss the procedure to convert NDFA to DFA with the help of a suitable example.

12. What is parsing? How Left most and right most derivation helps to find out the ambiguity in a grammar?

13. What is a regular language? Explain the properties of regular languages.

14. Discuss the concept of Pumping Lemma for regular grammars. How Pumping Lemma is used to prove weather a given grammar is not a regular grammar?

15. Define regular expression. Find a regular expression corresponding to the language of strings of even lengths over the alphabet of {a,b}.

SECTION-C

16. What is a context free grammar and explain closure properties of Context free grammar?

17. Discuss Push down Automation in detail. Design PDA for $\{wcw^T \mid w=\{a,b\}*\}$

18. Write a short note on :

    a. LR(K) Grammars.

    b. Recursively enumerable language.

    c. CNF.

    d. Regular Grammar.

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