B. Tech 3, 4, 6, 7, 8 Sem

CSE

Roll No. | | | | | | | | | | | |

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech. (AI&DS/ML/Block Chain/CSE/Cyber Security/ CS/EEE/EE/IT/IOT) (Sem.–3)

MATHEMATICS-III (PROBABILITY AND STATISTICS)

Subject Code : BTAM-302-23

M.Code : 94630

Date of Examination : 04-06-2025

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 do you mean by Kurtosis?

b) Define sample space and an event of a random experiment. Also, give example.

c) A die is thrown at random. Find the probability that the number on it is even.

d) Define binomial distribution.

e) Write down the mean and variance of Poisson distribution.

f) What do you mean by Regression?

g) Give an example of a positive correlation.

h) Define Standard Error of a sampling distribution of a statistic.

i) Give an example of a small sample.

j) What are the uses of Chi-square test?

SECTION - B

2. **Calculate the first four moments about the mean for the following data :**

x :	1	2	3	4	5	6	7	8	9
f :	1	6	13	25	30	22	9	5	2

3. A random variable X has the following probability distribution

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

Find : a) the value of k b) $P(X \geq 4)$ and $P(2 < X \leq 5)$.

4. If X is a normal variate with mean 30 and standard deviation 5, find the probabilities that

a) $26 \leq X \leq 40$ b) $X \geq 45$.

5. **By using the method of least squares, find the straight line of the form $y = a + bx$ that fits the following data :**

x :	100	120	140	160	180	200
y:	0.45	0.55	0.60	0.70	0.80	0.85

6. A sample of 20 items has mean 42 units and standard deviation 5 units. Test the hypothesis that it is a random sample from a normal population with mean 45 units.

SECTION - C

7. **Define Poisson distribution. Fit a Poisson distribution to the following data :**

x :	0	1	2	3	4
f :	123	59	14	3	1

8. **Calculate the coefficient of correlation for the ages of husbands and wives :**

Age of husband (Years)	23	27	28	29	30	31	33	35	36	39
Age of wife (Years)	18	22	23	24	25	26	28	29	30	32

9. **What is Chi-square test? A dice is thrown 90 times with the following results :**

Face :	1	2	3	4	5	6	**Total**
Frequency :	10	12	16	14	18	20	90

Use Chi-square test to test whether these data are consistent with the hypothesis that the dice is unbiased. Given that $\chi^2_{0.05} = 11.07$ for 5 degrees of freedom.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE /AI&DS /AI & ML/Cyber Security/DS/ CSE (IOT and Cyber Security including Block chain Technology)) (Sem.–4)

DESIGN & ANALYSIS OF ALGORITHMS

Subject Code : BTCS-403-18

M.Code : 77629

Date of Examination : 19-05-2025

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) What is a recurrence relation?

   b) How the worst case behavior of an algorithm is mentioned?

   c) What is brute force technique?

   d) What is bin packing problem?

   e) Compare BFS vs. DFS.

   f) What is transitive closure?

   g) Write about the different computability classes.

   h) Differentiate between tractable and intractable problems.

   i) What is an approximate solution?

   j) What is a random variable?

SECTION - B

2. **Look at the following recurrence when n is a power of 2 :**

$$T(n) = \begin{cases} T(1) & n = 1 \\ T\left(\frac{n}{2}\right) + c & n > 1 \end{cases}$$

Solve the above recurrence relation for the following choices of a, b and $f(n)$ (c being a constant) $a = 5$, $b = 4$ and $f(n) = cn^2$.

3. What are different elements of greedy strategy?

4. Write the algorithm for breadth first search. Take a suitable example to show its working.

5. What are non deterministic algorithms? Give an example of non-deterministic search algorithm.

6. Explain heuristics and its characteristics.

SECTION - C

7. **Consider the traveling salesperson instance defined by the cost matrix :**

∞	7	3	12	8
3	∞	6	14	9
5	8	∞	6	18
9	3	5	∞	11
8	14	9	8	∞

Obtain the reduced cost matrix.

8. What is Kruskal's algorithm? Explain its steps. Analyze its time complexity too.

9. **Write a short notes on :**

a) Network Flow Algorithm

b) Branch and bound methodology.

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Roll No. | | | | | | | | | | | | |

Total No. of Pages :02

Total No. of Questions : 09

B.Tech. (AI&ML/AI&DS/IT/CS/DS/IOT/CSE (Internet of Things and Cyber Security including Block Chain Technology)) (Sem.–4)

DISCRETE MATHEMATICS

Subject Code : BTCS-401-18

M.Code : 77626

Date of Examination : 02-06-2025

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) Prove that the inverse of a bijective function is unique.

b) Find GCD (119, 884) using Euclid Algorithm.

c) In a group of 150 people how many friends are there who have an identical number of friends in that group?

d) A and B are two sets such that n (A – B) = 14 + x, n (B – A) = 3x and n (A $\cap$ B) = x. Find X such that n (A) = n (B).

e) Make the truth table of $p \wedge (\neg q)$ of two statements p and q.

f) Prove that $\neg (\neg p) \equiv p$.

g) In a Boolean algebra B, simplify the Boolean expression $x.(x' + y)$.

h) Prove that the group $\{1, -1, \iota, -\iota\}$ under multiplication is a cyclic group.

i) Prove that the maximum degree of any vertex in a simple graph having n vertices is $n-1$.

j) Give an example of a perfect graph.

SECTION - B

2. Suppose R and S are symmetric relations on a set A. Show that $R \cap S$ is also symmetric.

3. In a group of 50 persons, 14 drink tea but not coffee and 30 drink tea. Find

   a) How many drink tea and coffee both?

   b) How many drink coffee but not tea?

4. Prove that $p \rightarrow q \equiv (\neg p) \vee q$.

5. Prove that finite integral domain is a field.

6. Prove that in any non-trivial tree, there are at least two vertices of degree 1.

SECTION - C

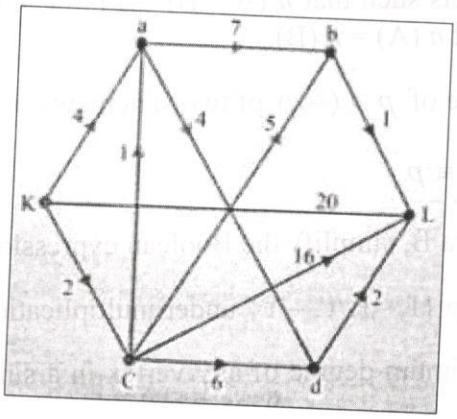
7. Find the Boolean expression that defines the function f by $f\ (0,\ 0,\ 0) = 0$; $f\ (0,\ 0,\ 1) = 0$; $f\ (1,\ 0,\ 0) = 1$; $f\ (1,\ 1,\ 0) = 0$: $f\ (0,\ 1,\ 0) = 1$: $f\ (0,\ 1,\ 1) = 0$; $f\ (1,\ 0,\ 1) = 1$; $f\ (1,\ 1,\ 1) = 1$.

8. a) If S is a set containing finite number of elements and f is a function from S into S, then prove that f is one-one, then f is onto.

   b) Show that $p \wedge q$ logically implies $p \leftrightarrow q$.

9. a) Find n if ${}^{n}C_4$, ${}^{n}C_5$ and ${}^{n}C_6$ are in AP.

   b) Find the shortest distance between K and L in the following graph :



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

Total No. of Questions : 9

B.Tech. CSE (IOT & Cyber Security Including Block Chain Tech.)

(Sem.–4)

UNIVERSAL HUMAN VALUES - II

Subject Code : HSMC-122-18

M.Code : 91979

Date of Examination : 22-05-2025

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 the following questions : (2 × 10 = 20)

a) Explain harmony in family.

परिवार में तालमेल के बारे में बताएं।

ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

b) What is Utility-Value?

उपयोगिता-मूल्य क्या हैं?

ਉਪਯੋਗਿਤਾ-ਮੁੱਲ ਕੀ ਹੈ?

c) How the value "Guidance" is related with Self?

मूल्य ''मार्गदर्शन'' स्वयं के साथ कैसे संबंधित है?

ਮੁੱਲ ਅਗਵਾਈ ਸਵੈ ਦੇ ਨਾਲ ਕਿਵੇਂ ਸਬੰਧਤ ਹੈ?

d) Explain Natural Acceptance.

सहज स्वीकृति समझाओ।

ਕੁਦਰਤੀ ਮੰਜ਼ੂਰੀ ਸਮਝਾਓ।

e) What is value of any unit in the larger order?

बड़े आदेश में किसी भी इकाई का क्या मूल्य है?

ਵੱਡੇ ਆਦੇਸ਼ ਵਿੱਚ ਕਿਸੇ ਵੀ ਇਕਾਈ ਦਾ ਕੀ ਮੁੱਲ ਹੈ?

f) What is Material Order?

सामग्री आदेश क्या है?

ਸਾਮਗਰੀ ਆਦੇਸ਼ ਕੀ ਹੈ?

g) What is Mutual Fulfilment?

पारस्परिक पूर्ति क्या है?

ਆਪਸ ਦੀ ਪੂਰਤੀ ਕੀ ਹੈ?

h) What is innateness?

स्वाभाविकता क्या है?

ਸਵਾਭਾਵਿਕਤਾ ਕੀ ਹੈ?

i) What do you mean by values or human values?

मूल्यों या मानवीय मूल्यों से आप क्या समझते हैं?

ਕਦਰਾਂ-ਕੀਮਤਾਂ ਜਾਂ ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਭਾਵ ਹੈ?

j) What is Holistic System?

समग्र प्रणाली क्या है?

ਸਰਬਭੌਮਿਕ ਪ੍ਰਣਾਲੀ ਕੀ 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 ਦੱਸੋ।

3. What are the five dimensions of Human Endeavour in society?

समाज में मानव प्रयास के पांच आयाम क्या हैं?

ਸਮਾਜ ਵਿੱਚ ਮਨੁੱਖ ਕੋਸ਼ਿਸ਼ ਦੇ ਪੰਜ ਪਹਿਲੂ ਕੀ ਹਨ?

4. What do you mean by Animal Consciousness and Human Consciousness? How is the transformation possible form Animal Consciousness to Human Consciousness?

आपका पशु चेतना और मानव चेतना से क्या मतलब है? पशु चेतना से मानव चेतना के लिए परिवर्तन कैसे संभव है?

ਤੁਹਾਡਾ ਪਸ਼ੂ ਚੇਤਨਾ ਅਤੇ ਮਨੁੱਖੀ ਚੇਤਨਾ ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ? ਪਸ਼ੂ ਚੇਤਨਾ ਤੋਂ ਮਨੁੱਖੀ ਚੇਤਨਾ ਤੱਕ ਦੀ ਤਬਦੀਲੀ ਕਿਸ ਤਰ੍ਹਾਂ ਸੰਭਵ ਹੈ?

5. Explain competence in Professional Ethics.

पेशेवर नैतिकता में क्षमता समझाओ।

ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਸਮਰੱਥਾ ਸਮਝਾਓ।

6. Self-exploration is a process of dialogue between. 'What are you' and 'What you really want to be' explain and illustrate.

आत्म अन्वेषण 'आप क्या हैं' और 'आप वास्तव में क्या बनना चाहते हैं' में आपस संवाद की एक प्रक्रिया है। समझाओ और स्पष्ट करें।

ਸਵੈ-ਖੋਜ 'ਤੁਸੀਂ ਕੀ ਹੋ' ਅਤੇ 'ਤੁਸੀਂ ਅਸਲ ਵਿੱਚ ਕੀ ਬਣਨਾ ਚਾਹੁੰਦੇ ਹੋ' ਵਿੱਚ ਆਪਸ ਸੰਵਾਦ ਦੀ ਇੱਕ ਪ੍ਰਕਿਰਿਆ ਹੈ'। ਸਮਝਾਓ ਅਤੇ ਵਿਆਖਿਆ ਕਰੋ।

SECTION-C

$(10 \times 2 = 20)$

7. What are the implications of value based living at various levels?

मूल्य आधारित जीवन यापन के विभिन्न स्तरों पर अच्छे परिणाम क्या हैं?

ਕਦਰਾਂ ਕੀਮਤਾਂ ਆਧਾਰਿਤ ਜੀਵਨ ਜੀਉਣ ਦੇ ਵੱਖਰੇ-ਵੱਖਰੇ ਪੱਧਰਾਂ ਤੇ ਚੰਗੇ ਨਤੀਜੇ ਕੀ ਹਨ?

8. 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 ਵਿਆਪਕ ਸੰਪੂਰਨ ਮਾਪਦੰਡ ਕੀ ਹਨ? ਕਿਵੇਂ ਉਹ ਵਿਆਪਕ ਮਨੁੱਖ ਲਕਸ਼ ਦੇ ਨਾਲ ਮੇਲ ਖਾਂਦੀ ਹੈ?

9. 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 ਜ਼ਰੂਰਤਾਂ ਦਾ ਵਰਣਨ ਕਰੋ?

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Roll No. | | | | | | | | | | | | | Total No. of Pages : 04

Total No. of Questions : 9

B.Tech.(AI&DS/AI&ML/CS/DS/ETE) (CSE)/(ECE) (Sem.–4)

UNIVERSAL HUMAN VALUES

Subject Code : HSMC-122-18

M.Code : 77630

Date of Examination : 22-05-2025

Time : 3 Hrs. Max. Marks :60

INSTRUCTIONS TO CANDIDATES :

1. Section-A is compulsory.
3. Section-B contains FIVE questions of FOUR marks each attempt all the questions.
4. Section-C contains FIVE questions of SIX marks each aattempt all the questions.

SECTION-A (10 × 1 = 10)

1. Fill in the blanks :

a) Self-exploration 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 में मूलभूत मूल्य है।

..... ਰਿਸ਼ਤਿਆਂ ਵਿੱਚ ਮੁੱਢਲਾ ਮੁੱਲ 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।

True and False :

f) Existence is nature submerged in space.

अस्तित्व अंतरिक्ष में डूबे हुए प्रकृति है।

ਅਸਤੀਤਵ ਖਲਾਅ ਵਿੱਚ ਸਮਾਈ ਹੋਈ ਕੁਦਰਤ ਹੈ।

g) There is no self-regulation in nature.

प्रकृति में कोई आत्म नियमन नहीं है।

ਕੁਦਰਤ ਵਿੱਚ ਕੋਈ ਆਤਮ ਨਿਯਮਤਾ ਨਹੀਂ ਹੈ।

h) Developing ethical competence in individual ensures professional ethics.

व्यक्ति में नैतिक क्षमता का विकास पेशेवर नैतिकता सुनिश्चित करता है।

ਵਿਅਕਤੀ ਵਿੱਚ ਨੈਤਿਕ ਸਮਰੱਥਾ ਦਾ ਵਿਕਾਸ ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਪੱਕੀ ਕਰਦਾ ਹੈ।

i) Holistic technologies should be eco-friendly and people-friendly.

समग्र प्रौद्योगिकियों पर्यावरण के अनुकूल और लोगों के अनुकूल होना चाहिए।

ਸਰਬਾਂਗੀ ਤਕਨੀਕਾਂ ਪਰਿਆਵਰਣ ਦੇ ਅਨੁਕੂਲ ਅਤੇ ਲੋਕਾਂ ਦੇ ਅਨੁਕੂਲ ਹੋਣੀਆਂ ਚਾਹੀਦੀਆਂ ਹਨ।

j) The value "care" is related with body.

मूल्य ''ध्यान'' शरीर के साथ संबंधित है।

ਮੁੱਲ ਧਿਆਨ ਸਰੀਰ ਦੇ ਨਾਲ ਸਬੰਧਤ 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. Explain harmony in family.

परिवार में तालमेल के बारे में बताएं।

ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

4. What are the basic guidelines of value education ?

मूल्य शिक्षा की बुनियादी दिशानिर्देश क्या हैं?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਬੁਨਿਆਦੀ ਦਿਸ਼ਾਨਿਰਦੇਸ਼ ਕੀ ਹਨ?

5. What is prosperity? What is the difference between prosperity and wealth?

समृद्धि क्या है? समृद्धि और धन के बीच क्या अंतर है?

ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ? ਖੁਸ਼ਹਾਲੀ ਅਤੇ ਪੈਸੇ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ?

6. Differentiate between intention and competence. How do we come to confuse between the two ?

इरादा और क्षमता के बीच क्या अंतर है? कैसे हम गलती करते हैं?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

SECTION-C

(5 × 6 = 30)

7. What are the broad holistic criteria for evaluation of technologies, management models and production systems ?

प्रौद्योगिकी, प्रबंधन मॉडल और उत्पादन प्रणालियों के मूल्यांकन के लिए व्यापक समग्र मापदंड क्या हैं?

ਸਰਬਾਂਗੀ ਤਕਨੀਕੀ, ਪਰਬੰਧਨ ਮਾਡਲ ਅਤੇ ਉਤਪਾਦਨ ਪ੍ਰਣਾਲੀਆਂ ਦੇ ਲੇਖੇ ਜੋਖਾ ਲੀ ਇਵਆਪਕ ਮਾਪਦੰਡ ਕੀ ਹਨ?

8. What are the four orders in nature ? Explain.

प्रकृति में चार आदेश क्या हैं? समझाओ।

ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਅਵਸਥਾਂਵਾਂ ਕੀ ਹਨ? ਸਮਝਾਓ।

9. What do you mean by universal human order ? What could be your role in moving towards it ?

आप सार्वभौमिक मानवीय आदेश से क्या समझते हैं? इसमें आपकी भूमिका क्या हो सकती है?

ਤੁਸੀ ਸਾਰਵਭੌਮਿਕ ਮਾਨਵੀ ਆਦੇਸ਼ ਵਲੋਂ ਕੀ ਸੱਮਝਦੇ ਹੋ ? ਇਸ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਕੀ ਹੋ ਸਕਦੀ ਹੈ?

10. What have been your achievements through this course ? List the achievements in your thought, behaviour and work.

इस पाठ्यक्रम से आपकी क्या उपलब्धियाँ रही हैं? अपने विचार, व्यवहार और कार्य की उपलब्धियों को सूचीबद्ध करें ।

ਇਸ ਕੋਰਸ ਰਾਹੀਂ ਤੁਹਾਡੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਕੀ ਹਨ? ਆਪਣੇ ਵਿਚਾਰ, ਵਿਹਾਰ ਅਤੇ ਕੰਮ ਵਿੱਚ ਪ੍ਰਾਪਤੀਆਂ ਦੀ ਸੂਚੀ ਬਣਾਓ ।

11. List some suggestions to make value education more effective in the present scenario.

वर्तमान परिदृश्य में मूल्य शिक्षा को और अधिक प्रभावी बनाने के लिए कुछ सुझाव सूचीबद्ध करें ।

ਮੌਜੂਦਾ ਸਥਿਤੀ ਵਿੱਚ ਮੁੱਲ ਸਿੱਖਿਆ ਨੂੰ ਹੋਰ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਬਣਾਉਣ ਲਈ ਕੁਝ ਸੁਝਾਵਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ।

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Roll No. | | | | | | | | | | | | | Total No. of Pages : 04

Total No. of Questions : 9

B.Tech.(AI&DS/AI&ML/CS/DS/ETE) (CSE)/(ECE) (Sem.–4)

UNIVERSAL HUMAN VALUES

Subject Code : HSMC-122-18

M.Code : 77630

Date of Examination : 22-05-2025

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Section-A is compulsory.
3. Section-B contains FIVE questions of FIVE marks each attempt any FOUR questions.
4. Section-C contains FIVE questions of SEVEN AND A HALF marks each attempt any FOUR questions.

SECTION-A

(10 × 1 = 10)

1. Fill in the blanks :

a) Self-exploration 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 में मूलभूत मूल्य है।

..... ਰਿਸ਼ਤਿਆਂ ਵਿੱਚ ਮੁੱਢਲਾ ਮੁੱਲ 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।

True and False :

f) Existence is nature submerged in space.

अस्तित्व अंतरिक्ष में डूबे हुए प्रकृति है।

ਅਸਤੀਤਵ ਖਲਾਅ ਵਿੱਚ ਸਮਾਈ ਹੋਈ ਕੁਦਰਤ ਹੈ।

g) There is no self-regulation in nature.

प्रकृति में कोई आत्म नियमन नहीं है।

ਕੁਦਰਤ ਵਿੱਚ ਕੋਈ ਆਤਮ ਨਿਯਮਤਾ ਨਹੀਂ ਹੈ।

h) Developing ethical competence in individual ensures professional ethics.

व्यक्ति में नैतिक क्षमता का विकास पेशेवर नैतिकता सुनिश्चित करता है।

ਵਿਅਕਤੀ ਵਿੱਚ ਨੈਤਿਕ ਸਮਰੱਥਾ ਦਾ ਵਿਕਾਸ ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਪੱਕੀ ਕਰਦਾ ਹੈ।

i) Holistic technologies should be eco-friendly and people-friendly.

समग्र प्रौद्योगिकियों पर्यावरण के अनुकूल और लोगों के अनुकूल होना चाहिए।

ਸਰਬਾਂਗੀ ਤਕਨੀਕਾਂ ਪਰਿਆਵਰਣ ਦੇ ਅਨੁਕੂਲ ਅਤੇ ਲੋਕਾਂ ਦੇ ਅਨੁਕੂਲ ਹੋਣੀਆਂ ਚਾਹੀਦੀਆਂ ਹਨ।

j) The value "care" is related with body.

मूल्य ''ध्यान'' शरीर के साथ संबंधित है।

ਮੁੱਲ ਧਿਆਨ ਸਰੀਰ ਦੇ ਨਾਲ ਸਬੰਧਤ ਹੈ।

SECTION-B

(4 × 5 = 20)

2. Explain self-organisation and health.

आत्म संगठन और स्वास्थ्य के बारे में बताएं।

ਆਤਮ ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

3. Explain harmony in family.

परिवार में तालमेल के बारे में बताएं।

ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

4. What are the basic guidelines of value education ?

मूल्य शिक्षा की बुनियादी दिशानिर्देश क्या हैं?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਬੁਨਿਆਦੀ ਦਿਸ਼ਾਨਿਰਦੇਸ਼ ਕੀ ਹਨ?

5. What is prosperity? What is the difference between prosperity and wealth?

समृद्धि क्या है? समृद्धि और धन के बीच क्या अंतर है?

ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ? ਖੁਸ਼ਹਾਲੀ ਅਤੇ ਪੈਸੇ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ?

6. Differentiate between intention and competence. How do we come to confuse between the two ?

इरादा और क्षमता के बीच क्या अंतर है? कैसे हम गलती करते हैं?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

SECTION-C

(4 × 7.5 = 30)

7. What are the broad holistic criteria for evaluation of technologies, management models and production systems ?

प्रौद्योगिकी, प्रबंधन मॉडल और उत्पादन प्रणालियों के मूल्यांकन के लिए व्यापक समग्र मापदंड क्या हैं?

ਸਰਬਾਂਗੀ ਤਕਨੀਕੀ, ਪਰਬੰਧਨ ਮਾਡਲ ਅਤੇ ਉਤਪਾਦਨ ਪ੍ਰਣਾਲੀਆਂ ਦੇ ਲੇਖੇ ਜੋਖਾ ਲੀ ਇਵਆਪਕ ਮਾਪਦੰਡ ਕੀ ਹਨ?

8. What are the four orders in nature ? Explain.

प्रकृति में चार आदेश क्या हैं? समझाओ।

ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਅਵਸਥਾਂਵਾਂ ਕੀ ਹਨ? ਸਮਝਾਓ।

9. What do you mean by universal human order ? What could be your role in moving towards it ?

आप सार्वभौमिक मानवीय आदेश से क्या समझते हैं? इसमें आपकी भूमिका क्या हो सकती है?

ਤੁਸੀ ਸਾਰਵਭੌਮਿਕ ਮਾਨਵੀ ਆਦੇਸ਼ ਵਲੋਂ ਕੀ ਸੱਮਝਦੇ ਹੋ ? ਇਸ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਕੀ ਹੋ ਸਕਦੀ ਹੈ?

10. What have been your achievements through this course ? List the achievements in your thought, behaviour and work.

इस पाठ्यक्रम से आपकी क्या उपलब्धियाँ रही हैं? अपने विचार, व्यवहार और कार्य की उपलब्धियों को सूचीबद्ध करें ।

ਇਸ ਕੋਰਸ ਰਾਹੀਂ ਤੁਹਾਡੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਕੀ ਹਨ? ਆਪਣੇ ਵਿਚਾਰ, ਵਿਹਾਰ ਅਤੇ ਕੰਮ ਵਿੱਚ ਪ੍ਰਾਪਤੀਆਂ ਦੀ ਸੂਚੀ ਬਣਾਓ ।

11. List some suggestions to make value education more effective in the present scenario.

वर्तमान परिदृश्य में मूल्य शिक्षा को और अधिक प्रभावी बनाने के लिए कुछ सुझाव सूचीबद्ध करें ।

ਮੌਜੂਦਾ ਸਥਿਤੀ ਵਿੱਚ ਮੁੱਲ ਸਿੱਖਿਆ ਨੂੰ ਹੋਰ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਬਣਾਉਣ ਲਈ ਕੁਝ ਸੁਝਾਵਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ।

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Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (CSE) (Sem.–6)

ARTIFICIAL INTELLIGENCE

Subject Code : BTCS602-18

M.Code : 79250

Date of Examination : 06-06-2025

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. Express Modus Ponen's rule in propositional logic.

   b. Find the output of the following :

```
father(jack, susan).        /* Fact 1 */
father(jack, ray).          /* Fact 2 */
father(david, liza).        /* Fact 3 */
father(david, john).        /* Fact 4 */
father(john, peter).        /* Fact 5 */
father(john, mary).         /* Fact 6 */
mother(karen, susan).       /* Fact 7 */
mother(karen, ray).         /* Fact 8 */
mother(amy, liza).          /* Fact 9 */
mother(amy, john).          /* Fact 10 */
mother(susan, peter).       /* Fact 11*/
mother(susan, mary).        /* Fact 12 */

parent(X, Y) :- father(X, Y). /* Rule 1 */
parent(X, Y) :- mother(X, Y). /* Rule 2 */
```

   c. Major reasons for the growth of rational agents.

   d. What is the Horn Sentence?

e. What are the five causes of uncertainty?

f. Need of heuristic functions.

g. *"A rule is sound if its conclusion is true whenever the premise is true".* Write inference rule for this statement.

h. Express in universal quantification formula *"There is a fox that is faster than all snails".*

i. What is state space search?

j. Illustrate with the help of suitable example, FOPL.

SECTION - B

2. Explain with the help of suitable example Markov decision process.

3. Write an algorithm for calculating minimax decisions. What is the role of alliances in the multiplayer games?

4. What is the concept of fuzzy sets and fuzzy logic? Explain with the help of suitable example.

5. Differentiate between perfect decision game and imperfect decision game.

6. Write the alpha-beta search algorithm. Explain the role of it with the help of suitable example.

SECTION - C

7. What is A* algorithm and How it is different from other search strategies? Explain with the help of suitable example.

8. Write the various components of natural language processing. Describe syntactic analysis and semantic analysis in brief.

9. Compare and contrast Expert Systems and Knowledge Acquisition. Illustrate with the help of suitable example.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (AI & ML/ AI & DS/CSE/Cyber Security/DS/IOT and Cyber Security including Block chain Technology) (Sem.–4)

COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code : BTES-401-18

M.Code : 77627

Date of Examination : 06-06-2025

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) CPU

   b) Memory transfer instruction

   c) Control Unit

   d) Three address instruction

   e) DMA

   f) Cache memory

   g) SCII

   h) USB

   i) I's complement

   j) Carry look ahead adder

SECTION - B

2. Explain any 5 addressing modes with example.

3. Discuss the various representations of positive and negative number. Which representation is used by computer and why?

4. Differentiate between synchronous and asynchronous data transfer.

5. What is virtual memory? What is the concept of page replacement?

6. Write a note on cache coherency and concurrent access to memory.

SECTION - C

7. Explain how addition and subtraction takes place in computer system.

8. Differentiate between privileged and non-privileged instructions, hardware and software interrupts.

9. Describe memory hierarchy and memory interleaving in detail.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CSE) (Sem.–6)

MOBILE APPLICATION DEVELOPMENT

Subject Code : BTCS620-18

M.Code : 79258

Date of Examination :10-06-2025

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) Mobility Landscape

   b) Bytecode

   c) SQLite

   d) Layouts

   e) SDK

   f) Service

   g) Broadcast Receiver

   h) Context

   i) Notifications

   j) User Interface

SECTION - B

2. Discuss the Activity life cycle in detail.

3. Explain and differentiate between various App development approaches.

4. Build an app to differentiate between checkbox and radio button.

5. Write a note on telephony and SMS APIs.

6. Discuss the process of database connectivity using SQLite.

SECTION - C

7. Describe with the help of diagram Android Architecture.

8. Explain Threads, Async task and shared preferences.

9. Discuss the various factors in developing up Mobile Apps.

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

Total No. of Questions : 09

B.Tech. (CSE) (Sem.–6)

MACHINE LEARNING

Subject Code : BTCS618-18

M.Code : 79257

Date of Examination :12-06-2025

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 machine learning differs from traditional programming approaches?

b) Describe feature selection and its importance. List at least two feature selection methods.

c) Discuss the concept of data normalization and its impact on model training and performance.

d) What is regression analysis in the context of machine learning, and how does it differ from classification?

e) Define support vector machines (SYMs) and discuss their role in classification in brief.

f) What is logistic regression, and how is it used for binary classification?

g) Define the terms "feature vector" and "feature space" in the context of classification.

h) Explain the purpose of a decision boundary in a classification problem.

i) Define the terms "class" and "label" in classification tasks and explain their significance.

j) Define sensitivity.

SECTION - B

2. Analyze the impact of feature selection on classification performance. Provide a step- by-step explanation of how feature selection can improve model efficiency and discuss a practical example where feature selection would be crucial.

3. Explain the Apriori algorithm, its core principles and how it contributes to association rule mining.

4. Explain Naïve algorithm with its role and applications.

5. Explain the potential benefits of using association rule learning in recommendation systems and its impact on user experience and business performance.

6. Explain the various performance measures used in regression.

SECTION - C

7. Describe the function of a split algorithm in the construction of a decision tree. How does it identify the optimal feature and split point for data partitioning?

8. Provide a detailed explanation of multiple and polynomial linear regression models, including their respective algorithms.

9. Explain multiple and polynomial linear regression models in detail with its algorithm.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI & ML) (Sem.–6)

BIG DATA ANALYTICS

Subject Code : BTDS-603-20

M.Code : 93675

Date of Examination : 14-06-2025

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) List out the best practices of big data analytics.

b) Name some final deliverables in big data.

c) Define Big Data Analytics.

d) What is a symbol map?

e) Differentiate between classification and clustering.

f) What is web usage mining?

g) What are the measures of similarity and dissimilarity?

h) What is data preprocessing?

i) What is a text mining?

j) List some big data platforms.

SECTION-B

2. Write down the characteristics of big data analytics.

3. Explain in detail about HDFS.

4. Briefly discuss about MapReduce and YARN.

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. Write in detail the steps in operationalizing analytics model.

SECTION-C

7. **Write short notes on :**

   a) Naïve Bayes

   b) Association Rule Mining.

8. a) Map Reduce Framework.

   b) What is web content mining? Write its different steps.

9. **Explain :**

   a) Core deliverables in big data.

   b) Big data visualization.

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Total No. of Pages : 02

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B.Tech. (AI&ML) (Sem.–6)

RECOMMENDER SYSTEM

Subject Code : BTAIML-605-20

M.Code : 93679

Date of Examination : 03-06-2025

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 Collaborative filtering technique?

b. What are the challenges in recommender systems?

c. Define Matrix factorization.

d. What is THE need of feature dimensionality reduction?

e. Define hybrid recommender system.

f. How do recommender systems utilize user preferences?

g. List few ethical considerations in the recommender systems.

h. What is the impact of the popularity bias in recommender systems?

i. What is the difference between precision and recall?

j. What is the meaning of diffusion in the social networks?

SECTION - B

2. Discuss the role of machine learning in recommendation systems.

3. Explain different methods for learning user profiles.

4. Discuss the role of mathematical optimization in recommender systems.

5. What are the challenges associated with user preference modeling in the dynamic environments?

6. Explain the concept of utility theory in choice models. How does it relate to user preferences and decision-making?

SECTION - C

7. Discuss the applications of recommender systems in e-commerce. How do recommender systems contribute to personalized product recommendations, cross-selling and improving the overall shopping experience?

8. How do collaborative filtering techniques work in the recommender systems, and what are some of the popular algorithms used to implement them?

9. **Write short note on :**

   a. Serendipity and Diversity in recommender systems.

   b. Dynamic Recommendation Systems.

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Total No. of Pages : 02

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B.Tech. (CSE) (Sem.–6)

COMPILER DESIGN

Subject Code : BTCS601-18

M.Code : 79249

Date of Examination : 23-05-2025

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) What are the techniques behind the code optimization phase?

b) What is compiler? Explain at least 4 classifications of Compilers.

c) What is LL(1) parser? What are the necessary conditions for a grammar to be in LL(1).

d) What do you mean by Context free grammar? List its 4 components.

e) Eliminate Left Recursion from the grammar :

E-> E + T| E - T|T

T-> T * F| T / F|F

F -> (E) | id

f) Define preprocessor. What are its functions?

g) What is front-end and back-end of the compiler?

h) Differentiate between stack allocation and static allocation.

i) Write a brief note on symbol tables.

j) What is left Factoring? What are the rules to make a grammar free from left Factoring?

SECTION - B

2. Explain the working and algorithm of LR parser.

3. Explain the various phases of a compiler in detail. Also write the output for the following expression after each phase a=b*c-d.

4. Write algorithm to convert NFA from Regular expression.

5. Explain in detail about run time storage management.

6. Explain about peep hole optimization.

SECTION - C

7. Construct the canonical LR parsing Table for the following grammar:

   $S \rightarrow L=R$

   $S \rightarrow R$

   $L \rightarrow *R$

   $L \rightarrow id$

   $R \rightarrow L$

8. What are the basic Blocks and Flow Diagram, explain Efficient Data Flow algorithm in detail.

9. Explain how different phases of Compilation will operate and convert the following statement Interest = principal * rate / 100 (assuming Rate data-type is Float)

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B.Tech. (Artificial Intelligence and Data Science) / DS (Sem.–6)

DATA ANALYTICS USING R

Subject Code : BTITCS 601-20

M.Code : 93954

Date of Examination : 20-05-2025

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. Discuss the prominent characteristics of data.

   b. Differentiate between structured and unstructured data.

   c. What is a factor in R? Give examples.

   d. Discuss the usage of the function randomForest() in R.

   e. Explain the process of giving names to the rows, columns and matrices in an array.

   f. Explain various ways of creating vectors in R.

   g. Discuss the usage of functions surv() and survfit().

   h. Explain the usage of the package "party" and the function ctree() in creating and analyzing decision tree.

   i. Discuss the various loop control statements available in R.

   j. How is data read from csv and xml files into R Illustrate?

SECTION - B

2. Define data analytics and explain its significance in modern business environments. Provide examples of real-world applications of data analytics.

3. Explain variables and data types in R programming. Provide examples of different data types and their usage in R.

4. Discuss various R charts and graphs used for data visualization, including histograms, boxplots, bar charts, line graphs, scatterplots and pie charts. Explain when to use each type of visualization.

5. Describe time series analysis techniques using R. Discuss how time series data is analyzed and interpreted in the context of data analytics.

6. Discuss reinforcement learning techniques for creating data for analytics.

SECTION – C

7. Define linear regression and logistic regression. Explain how the functions lm() and glm() are used to create linear regression model and logistic regression model, respectively in R. Discuss the applications of regression techniques in predictive modeling and provide examples of real-world scenarios where they are used.

8. Describe the concept of active learning and how it can be used to create data for analytics? Discuss the advantages and challenges of active learning approaches.

9. Discuss the characteristics of normal and binomial distributions. Discuss the built-in functions of R that are used to generate :

   a) normal distribution

   b) binomial distribution.

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B.Tech. (Computer Science & Engineering/AI & ML/ECE) (Sem.–6)

CLOUD COMPUTING

Subject Code : BTCS612-18

M.Code : 79254

Date of Examination : 20-05-2025

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) Challenges of Cloud Computing.

   b) Resources of Cloud Computing.

   c) Cloud Migration

   d) Hypervisor

   e) Hybrid Cloud

   f) Grid Computing

   g) SaaS

   h) Vision of Cloud Computing.

   i) IT as a Service

   j) Data security

SECTION - B

2. Explain the importance of Elasticity and Scalability in cloud computing.

3. Explain in detail about the various types of Hypervisors.

4. Define the role played by IaaS. Explain by taking suitable example.

5. What do you understand by user account and service Hijacking?

6. Compare existing available cloud platforms.

SECTION - C

7. Explain in detail the historical development and challenges of cloud computing in detail.

8. Illustrate Selection criteria for cloud deployment in detail.

9. List various measures to reduce cloud security breaches.

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B.Tech. (Artificial Intelligence (AI) and Data Science) (Sem.–6)

BIG DATA ANALYTICS

Subject Code : BTDS 603-20

M.Code : 93960

Date of Examination : 30-04-2025

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 short notes on :**

   a) Why is data science important in modern industries?

   b) What are the key challenges associated with big data?

   c) Differentiate between structured and unstructured data.

   d) What are the key deliverables in the deployment phase?

   e) Differentiate between Hadoop and traditional databases.

   f) Define feature engineering with an example.

   g) What are association rules in data mining?

   h) What is the significance of dashboards in data analytics?

   i) Explain supervised learning with the help of an example.

   j) Differentiate between descriptive and predictive analytics.

SECTION - B

2. Explain the Hadoop architecture with a neat diagram.

3. How is model evaluation performed in analytics?

4. Explain the k-means clustering algorithm with steps.

5. Explain the process of creating final deliverables in an analytics project.

6. Explain Linear and logistic regression with the help of examples.

SECTION -C

7. Discuss challenges in data preparation and how to address them with suitable techniques?

8. Describe the Apriori algorithm for association rule mining with the help of an example.

9. Discuss various data visualization techniques and their applications in analytics.

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B.Tech. (AI&ML) (Sem.–6)

COMPUTER NETWORKS

Subject Code : BTCS-504-18

M.Code : 93665

Date of Examination : 30-04-2025

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 do you mean by spread spectrum? Explain in brief.

b) What are the advantages of twisted pair as a transmission media?

c) Define the term Piggybacking.

d) Explain the term hamming distance in reference to error detecting codes.

e) Why IPv6 is required?

f) Explain the term sub-netting in brief.

g) Differentiate between Distance vector and Link State routing algorithms.

h) What are the advantages of User Datagram Protocol (UDP)?

i) Explain in brief about the term Firewall.

j) What do you mean by Domain Name Space? Discuss.

SECTION-B

2. **Explain the following in brief :**

   a) Frequency Division Multiplexing

   b) Time Division Multiplexing.

3. Write a detailed note on CDMA/CA .

4. Explain in detail about ARP protocol.

5. What is SCTP congestion control? Explain in detail.

6. Write a brief note on TELNET and FTP.

SECTION-C

7. Write a detailed note on the OSI reference model.

8. **Explain the following terms in detail :**

   a) Pure ALOHA

   b) Slotted ALOHA.

9. **Explain the following Algorithms in details :**

   a) Leaky Bucket Algorithm

   b) Token Bucket Algorithm .

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B.Tech. (IT) (Sem.–6)

BIG DATA

Subject Code : BTIT-601-18

M.Code : 79623

Date of Examination : 30-04-2025

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. **Explain the following in brief:**

   a) Big Data

   b) 3Vs of Big Data

   c) YARN

   d) CAP Theorem

   e) CRUD operations

   f) HQL

   g) Running Pig

   h) Vector in R

   i) Data Visualization

   j) Functions in R.

SECTION - B

2. Explain evolution and challenges with Big Data.

3. Describe the concept behind Map Reduce.

4. Discuss the use of array functions in MongoDB.

5. Write a note on user defined functions and execution mode of Pig in Hadoop Eco System.

6. How variables and expressions are handled in R?

SECTION - C

7. Explain Big Data Analytics, classification of analytics and Data Science.

8. Discuss the process of import and export in MongoDB.

9. Describe graphics analysis in R and techniques used for visual data representation.

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Total No. of Questions : 09

B.Tech. (Artificial Intelligence (AI) and Data Science) (Sem.–6)

DATA MINING AND DATA WAREHOUSE

Subject Code : BTCS 702-18

M.Code : 93953

Date of Examination : 06-05-2025

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 Mining.

b) What is Data cube computation?

c) MOLAP Versus HOLAP.

d) Discus Data Preprocessing.

e) Write about split algorithm.

f) What are decision trees?

g) Give an overview of Data warehousing.

h) Define cluster software.

i) Write about enterprise search.

j) What is Locality and Hierarchy in the web?

SECTION - B

2. Explain the main characteristics of OLAP systems.

3. What are some common challenges encountered in data mining?

4. Explain the concept of dynamic Item set counting.

5. Discus fundamental characteristics of search engine.

6. How does web mining help in website searching?

SECTION - C

7. Discuss the basic concept of the Apriori algorithm in rules mining?

8. What are the underlying assumptions of the Naïve Bayes method and how do they used in Data Mining?

9. Explain the concept of cluster analysis. Discuss the hierarchical method in cluster analysis.

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Total No. of Questions : 09

B.Tech. (AI & DS) (Sem.–6)

DEEP LEARNING

Subject Code : BTCS 704-18

M.Code : 93966

Date of Examination : 03-05-2025

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) Gradient Decent

   b) Maximum Likelihood

   c) Bagging

   d) Multi-task Learning

   e) Recurrent Neural Network

   f) Pooling

   g) Convolution Network

   h) Echo State Networks

   i) Directed Generative Net

   j) Auto-Encoders

SECTION - B

2. Differentiate between overfitting and underfitting.

3. Discuss the various characteristics of feed-forward networks.

4. Explain any two application areas of convolution networks.

5. Write a short note on bidirectional RNNs.

6. How deep generative models are used for image generation?

SECTION - C

7. Compare the characteristics of supervised learning with unsupervised learning technique.

8. Discuss the various application areas of computational graphs.

9. Discuss the convolution algorithm in detail.

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Total No. of Pages : 02

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B.Tech. (CSE) (Sem.–7,8)

DATA MINING AND DATA WAREHOUSING

Subject Code : BTCS702-18

M.Code : 90488

Date of Examination : 02-05-2025

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) Differentiate between Operational Data Store (ODS) and Data Warehouse.

b) Name at least 3 large IT giants which provide Data Warehousing solutions.

c) What is predictive modeling based Data Mining?

d) What is density based clustering?

e) How is database different from Data Warehouse?

f) What are the steps in Data Mining process?

g) What are Association rules, why are they used?

h) What do you mean by web content mining?

i) Mention the strategies of Data Mining.

j) What do you mean by ranking of web pages?

SECTION - B

2. Explain the 3 tier architecture of Data Warehouse.

3. Explain the concept of Data Mining, its strategies and classification.

4. Compare and contrast various clustering methodologies.

5. Explain search engine architecture.

6. Discuss Web content mining, Web usage mining and Web structure mining, compare each type with suitable example.

SECTION - C

7. a) Discuss Decision tree and rule induction as methods of Data mining with examples.

   b) Explain various types of OLAP servers.

8. How clustering helps for data mining in large databases? List clustering methods, explain any two.

9. What are most important factors for Page ranking on Internet? Explain in detail, what are methods to improve page ranking? List some tools helpful to improve page rank.

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B.Tech. (CSE) (Sem.–7,8)

NETWORK SECURITY AND CRYPTOGRAPHY

Subject Code : BTCS701-18

M.Code : 90487

Date of Examination : 28-04-2025

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) Security Threat

b) Passive Attack

c) Mod of an expression.

d) Cryptography

e) Access control

f) Need of Wireless Security.

g) Honeypot

h) Purpose of Firewall.

i) Message Authentication code

j) Content Integrity

SECTION - B

2. How conventional Encryption model works? Explain in detail.

3. Write a note on modular arithmetic.

4. Explain in detail principles of public-key cryptography.

5. How MD5 Message Digest Algorithm Works? Explain in detail.

6. Explain in detail design and Types of Firewalls.

SECTION - C

7. Explain in detail about Fermat and Euler's Theorem.

8. Write a short note on Elliptic Curve Cryptography.

9. Compare RSA Algorithm with AES Algorithm on different parameters. Explain their used cases also.

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Total No. of Questions : 09

B.Tech. (CSE) (Sem–7, 8)

ADHOC AND WIRELESS SENSOR NETWORKS

Subject Code : BTCS716-18

M.Code : 90507

Date of Examination : 19-05-2025

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) What are routing protocols?

   b) Explain fault tolerance issue in wireless sensor networks.

   c) Define transceivers in wireless sensor networks.

   d) List the type of nodes that distinguish on the MAC layer.

   e) What are the challenges posed by sensor network MAC protocol?

   f) What do you mean by proactive routing?

   g) How do you define the term flooding attack?

   h) Explain SPINS.

   i) What are security attacks in WSN?

   j) Enlist enabling technologies for WSN.

SECTION - B

2. Explain destination sequenced distance-vector routing protocol with the help of an example of 15 nodes in which all nodes maintain global topology information.

3. Draw and explain S-MAC protocol in detail.

4. Give classification of Transport layer solutions- TCP over Ad Hoc wireless.

5. Explain energy consumption of sensor nodes.

6. Describe Key distribution arid management in network security.

SECTION - C

7. Explain secure requirements issues and challenges in security provisioning network.

8. Describe MAC protocol for wireless sensor networks in detail.

9. Explain Table driven routing protocol - DSDV with suitable diagrams.

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