**Q. P. Code: 38168**

**(2 ½ Hours)** **[Total Marks: 60]**

**N.B:** (1) **All questions are compulsory.**
(2) Figures to the **right** indicate full marks.
(3) **Assume additional data if necessary** but state the same clearly.
(4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
(5) Use of **calculators** and statistical tables are **allowed**.

Q.1 Attempt **any two** of the following **(12)**

a) Explain any two scheduling algorithms in detail. **6**
b) What is the difference between kernel mode and user mode? Why is the difference important to an operating system? **6**
c) Write a short note on monolithic and micro kernels. **6**
d) What is multiprogramming? **6**

Q.2 Attempt **any two** of the following **(12)**

a) Explain FIFO page replacement algorithm. **6**
b) Explain LRU page replacement algorithm. **6**
c) Explain the difference between internal fragmentation and external fragmentation. Which one occurs in paging systems? Which one occurs in systems using pure segmentation? **6**
d) Write a short note on Linux Memory Management. **6**

Q.3 Attempt **any two** of the following **(12)**

a) Write a short note on RAM Disks. **6**
b) Explain how deadlock can be avoided in operating system. **6**
c) Write a short note on File system implementation. **6**
d) Write a short note on Terminals. **6**

Q.4 Attempt **any two** of the following **(12)**

a) Write a short note on SQLite. **6**
b) Write a short note on content providers. **6**
c) Explain Android Activity Lifecycle. **6**
d) Write a short note on Android libraries. **6**

Q.5 Attempt **any two** of the following **(12)**

a) What are the five states that a process can be in? Describe the meaning of each one briefly. **6**
b) What is the difference between a physical address and a virtual address? **6**
c) Explain what DMA is and why it is used **6**
d) Write a short note on Location Manager. **6**

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# Q.P. Code: 21860

**(2 ½ Hours)** **[Total marks: 60**

**N. B.:** (1) **All questions** are compulsory
(2) **Figures** to the **right** indicate **full marks**.
(3) **Assume additional data if necessary** but state the same clearly.
(4) **Symbols have their usual meanings** unless stated otherwise.
(5) Use of **calculators** and statistical tables is **allowed**.

**Q.1** Attempt **any two** of the following **(12)**

**a)** What is a regular expressions? Write the regular expression for constructing identifiers used for C language consisting of characters and digits. Draw the transition diagram for the same. **6**

**b)** Briefly describe the role of lexical analyzer in compilation process. **6**

**c)** What is minimization of DFA? Give an example to explain the step by step minimization of DFA. **6**

**d)** What is shift reduce parsing? Parse the input **id-num*id$** using shift reduce parsing method for the following grammar. **6**

S→ E$
E→ E+T | E-T | T
T →T*F | T/F | F
F → num | id

**Q.2** Attempt **any two** of the following **(12)**

**a)** Write a note on types of LR parsers. **6**

**b)** Consider the grammar rules for simple expressions. Compute GOTO graph for the following: **6**

1. E → E + T
2. E → T
3. T → (E)
4. T → id

**c)** What are ambiguous grammars? Give an example to explain the concept. **6**

**d)** Write a note on automatic parser generators. **6**

**Q.3** Attempt **any two** of the following **(12)**

**a)** What is meant by syntax directed translation in compilation process? Explain. **6**

**b)** Why is type checking an important activity in syntax directed translation? Explain with suitable example. **6**

**c)** Write a note on activation records. **6**

**d)** What is an intermediate code? Why are they important? Give example. **6**

**Q.4** Attempt **any two** of the following **(12)**

**a)** What is DAG? Draw the DAG and syntax tree representations of the expression: y=x*3+x*3 **6**

**b)** Write a note on Induction variable elimination. Give example. **6**

**c)** Write a note on Optimizations of Basic Blocks. **6**

**d)** What are the principal sources of optimization? Explain. **6**

**Q.5** Attempt **any two** of the following **(12)**

**a)** What are predictive parsers? Give examples of predictive parsers. **6**

**b)** What is binding? What are its types? Explain the bindings for the Tiger compiler. **6**

**c)** Explain the term dominator using suitable example. **6**

**d)** Write a note on Reducible flow graphs. **6**

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**Q.P.Code: 50292**

**(2 ½ Hours)** **[Total Marks: 60**

**N.B:** (1) **All questions are compulsory.**
(2) Figures to the **right** indicate full marks.
(3) **Assume additional data if necessary** but state the same clearly.
(4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
(5) Use of **calculators** and statistical tables are **allowed**.

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|---|---|---|
| Q.1 | Attempt **any two** of the following | **(12)** |
| a) | Explain the annotations @WebParam and @WebResult used in JAX-WS with an example. | **6** |
| b) | What is Service Endpoint Interface and Service Implementation Bean? | **6** |
| c) | Explain the advantages and disadvantages of WSDL binding section RPC style attribute. | **6** |
| d) | Write a WebService with a @WebMethod to accept a number that returns its reverse. With @WebResult the return variable name should be made "Reverse" . | **6** |
| Q.2 | Attempt **any two** of the following | **(12)** |
| a) | Explain the structure of a SOAP message. | **6** |
| b) | Explain the run time ordering of SOAP and logical handlers | **6** |
| c) | Explain the different techniques for SOAP attachments. | **6** |
| d) | Explain SOAP Faults from the Application and Handler Levels. | **6** |
| Q.3 | Attempt **any two** of the following | **(12)** |
| a) | Explain any three annotations of JAX- RS. | **6** |
| b) | Differentiate between SOAP and REST web services. | **6** |
| c) | Explain the Principles of REST web service design | **6** |
| d) | Explain the concept of WS-Security. | **6** |
| Q.4 | Attempt **any two** of the following | **(12)** |
| a) | Explain the concept of cloud computing. | **6** |
| b) | Explain the concept of AWS Region. | **6** |
| c) | Explain the concept of Elastic Block Storage | **6** |

TURN OVER

| | | |
|---|---|---|
| d) | Write a short note on Amazon Virtual Private Cloud. | **6** |
| Q.5 | Attempt **any two** of the following | **(12)** |
| a) | Explain the features that distinguish web services from other distributed software systems. | **6** |
| b) | Explain the concept of WSDL. | **6** |
| c) | Explain the Interoperability of REST services with WCF. | **6** |
| d) | Write a short note on Elastic Load Balancing. | **6** |

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**Q.P. Code: 50671**

**(2 ½ Hours)** **[Total marks: 60**

**N. B.:** (1) **All questions** are compulsory
(2) **Figures** to the **right** indicate **full marks**.
(3) **Assume additional data if necessary** but state the same clearly.
(4) **Symbols have their usual meanings** unless stated otherwise.
(5) Use of **calculators** and statistical tables is **allowed**.

**Q.1** Attempt **any two** of the following **(12)**

**a)** What is meant by non-malicious program errors? List and briefly explain any four malicious program errors. **6**
**b)** Why is Operating System security important? Write a note on levels of share protection in Operating system. **6**
**c)** List various security requirements of database systems. **6**
**d)** What is data sensitivity? Give example. What are the factors defining data sensitivity? **6**

**Q.2** Attempt **any two** of the following **(12)**

**a)** Explain what is IP Spoofing attack? Explain the mitigation plan for IP Spoofing. **6**
**b)** What are packet filters? Explain packet filtering mechanism using suitable example. **6**
**c)** What is intrusion detection system? Compare between signature based and anomaly based intrusion detection and prevention systems. **6**
**d)** Explain briefly the Secure Electronic Transaction process. List various key element of the SET mechanism. **6**

**Q.3** Attempt **any two** of the following **(12)**

**a)** Why is cloud security important? What are the various factors that influence Cloud provider assessment? **6**
**b)** Write a note on ESX and ESXi security features. **6**
**c)** What is a public cloud? What are the security issues associated with public clouds? **6**
**d)** Write a note on security management through access control in clouds. **6**

**Q.4** Attempt **any two** of the following **(12)**

**a)** Explain the security features provided by GSM and UMTS. **6**
**b)** What is cellular jamming attack? Explain how we can resolve cellular jamming attacks. **6**
**c)** Highlight the security issues in VOIP. **6**
**d)** Write a note on Zigbee Security & Attacks. **6**

**Q.5** Attempt **any two** of the following **(12)**

**a)** Briefly describe about the access control and confidentiality attacks in Wi-fi networks. **6**
**b)** What is meant by multilevel security? Give example. What are its advantages? **6**
**c)** What is DMZ? How it helps in implementing network security? **6**
**d)** Write a note on Memory address protection technique. **6**

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**(2 ½ Hours)** **[Total Marks:60]**

N.B: (1) All questions are compulsory.
(2) Figures to the right indicate marks.
(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.

Q1. **Attempt the following (any Two):** **(12)**

(A) What is data warehousing? Discuss Decision Support System. **06**

(B) Explain business intelligence architecture in detail. **06**

(C) Write a short note on KDD process model. **06**

(D) Define and explain following **06**
1. Normalization 2. Smoothing

Q2**.** **Attempt the following (any Two):** **(12)**

(A) Discuss logical architecture of data warehouse and its components with neat labelled diagram. **06**

(B) How data marts helps in building data warehouse? **06**

(C) Explain data integration and transformation with an example. **06**

(D) How virtual warehouse is useful in today's environment. **06**

Q3**.** **Attempt the following (any Two):** **(12)**

(A) Differentiate between OLTP and OLAP **06**

(B) Write a short note on snow flex schema? Explain with an example. **06**

(C) Discuss different operations available on data cubes. **06**

(D) Discuss dimensional modelling in detail. **06**

Q4**.** **Attempt the following (any Two):** **(12)**

(A) What is data mining? How it helps in business intelligence. **06**

(B) Briefly explain various steps of data mining process. **06**

(C) The 'database' below has four transactions. What association rules can be found in this set, if the minimum support (i.e coverage) is 60% and the minimum confidence (i.e. accuracy) is 80% ? Trans_id Itemlist **06**
T1 {K, A, D, B}
T2 {D, A C, E, B}
T3 {C, A, B, E}
T4 {B, A, D}

(D) State and explain Apriori Algorithm. **06**

Q5**.** **Attempt the following (any Two):** **(12)**

(A) List out the advantages of information technology in business. **06**

(B) What do you mean by pre-processing? Why it is required? **06**

(C) What is noisy data? How to handle it? **06**

(D) Analyse the role of data mining and business intelligence applications in banking. **06**

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**Q. P. Code: 50821**

**(2 ½ Hours)** **[Total Marks: 60**

**N.B:** (1) **All questions are compulsory.**
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(3) **Assume additional data if necessary** but state the same clearly.
(4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
(5) Use of **calculators** and statistical tables are **allowed**.

Q.1 Attempt **any two** of the following **(12)**

a) What are prediction and inference in statistical learning? Explain with examples. **6**
b) What do you mean you mean by bias- variance trade off? Explain the issues attributed to this in learning. **6**
c) Distinguish between outliers and high leverage points. Illustrate with examples. **6**
d) Compare performance of linear regression and k nearest neighbor as two regression techniques. **6**

Q.2 Attempt **any two** of the following **(12)**

a) Briefly explain k fold validation. List the advantages of it over LOOCV and validation set approach. **6**
b) Compare ridge regression and lasso. **6**
c) Briefly explain the important features of partial least squares. **6**
d) Is principal component regression a feature selection technique? Justify your answer. **6**

Q.3 Attempt **any two** of the following **(12)**

a) Polynomial and piecewise-constant regression models are special cases of a basis function approach. Elaborate. **6**
b) What are generalized additive models? Briefly explain. **6**
c) Briefly discuss the following with respect to classification tree: **6**
(i) Classification error rate
(ii) Gini index
(iii) Cross entropy
d) Write a short note on each of the following: **6**
(i) Bagging
(ii) Boosting

**[Turn Over]**

**Q. P. Code: 50821**

Q.4 Attempt **any two** of the following **(12)**

a) How does a support vector classifier differ from a maximal margin classifier? Discuss with the help of an example. **6**

b) Explain how Support vector machines can be used for classification of more than two classes. **6**

c) What are principal components? What is the significance of principal component analysis? Briefly explain. **6**

d) What is a dendogram? How do you interpret it? Illustrate with an example. **6**

Q.5 Attempt **any two** of the following **(12)**

a) Briefly explain RSS, RSE and $R^2$. **6**

b) Write a note on boot strap. **6**

c) What are knots in regression splines? How do we fix the number and location of knots? Briefly explain. **6**

d) Discuss briefly the following types of linkages in hierarchical clustering: **6**
(i) Complete (ii) Single (iii) Average (iv) Centroid