

SASTRA DEEMED UNIVERSITY

(A University under section 3 of the UGC Act, 1956)

End Semester Examinations

July 2022

Course Code: CSE316

Course: SOFTWARE DESIGN WITH UML

Question Paper No. :U1282

Duration: 3 hours

Max. Marks:100

PART – A

Answer all the questions

10 x 2 = 20 Marks

1. What are the different interaction diagrams? What is the difference in the information conveyed by both of them?
2. How to specify the software version control information in the UML diagram?
3. Differentiate between aggregation and generalization for online mobile shopping system classes.
4. State the software development activities.
5. Illustrate the various states for fully automatic washing machines.
6. Create a UML model for payment through Google pay.
7. What are the different component types?
8. How is the deployment model useful in software development?

9. Give the hint to identify the relationship between classes as aggregation.
10. List out any four reasons for the software crisis.

PART – B

Answer all the questions

5 x 4 = 20 Marks

11. Draw a deployment diagram for the student project portal system.
12. Illustrate the use case diagram for the E-classroom.
13. Write a scenario to draw various UML diagrams using the RUP tool.
14. Draw a component diagram for the online food ordering system.
15. Describe the analysis concepts for E-library.

PART – C

Answer all the questions

5 x 12 = 60 Marks

16. Outline the following software development models phases and describe the difference between these models.
- (a) Sequential (5)
- (b) Iterative. (7)

(OR)

17. Model the Class timetable management system using the following things in UML.
- (a) Structural (7)
- (b) Relationships. (5)
18. Identify the actors, use cases and their relationships for an online examination system. Write a scenario for five identified use cases.

(OR)

19. Draw a sequence diagram for the following banking system use cases (4)
(a) Fund transfer (4)
(b) Open deposit (4)
(c) View transactions.
20. Apply the analysis activities and draw a dynamic model for ATM system.

(OR)

21. Draw a UML class diagram that models the relationships between the college, department, programme, student, professor, course and hostel classes. Identify attributes, operations, multiplicity, association name, relationships such as aggregation, association, composition and inheritance relationships.
22. Draw a collaboration diagram for the five identified use cases in the following problem statement. Online elective course registration includes preliminary registration and registration confirmation. Course registration must be completed by the stipulated deadlines, and no changes are permitted after registration closes. In this system, preliminary registration does not confirm with a student's course selections, the student can make changes in course selections. Course registration status of preliminary registration and confirmation can be viewed in the online course registration system. It allows students to select a priority list of preferred courses.

(OR)

23. Draw a package diagram for online car rental software owned by ABC cabs providing prompt service to customers such as car details, enquiry, booking, payment and cancellation etc. Describe the visibility, imports, exports and generalization in packages.
24. Illustrate state diagram for the following

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- (a) Online bank loan processing (4)
 - (b) Google meet (4)
 - (c) Courier tracking (4)

(OR)

25. Draw an activity diagram for the following

- (a) E-Aadhaar system provides online services such as E-Aadhaar download and address update. In addition, security features such as captcha, One-Time-Pin (OTP) on mobile, etc. are implemented. Once input is verified, residents are allowed to access the online services. (7)
- (b) Select postpaid/prepaid. Enter mobile number. Select state. Select operator. Enter amount or browse plans. Make payment (wallet, credit card, debit card, mobile banking). Recharge successful/unsuccessful. (5)

SASTRA DEEMED UNIVERSITY

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End Semester Examinations

Dec 2023

Course Code: CSE316

Course: SOFTWARE DESIGN WITH UML

QP No. :UD368-5

Duration: 3 hours

Max. Marks:100

PART - A

Answer all the questions

10 x 2 = 20 Marks

1. Differentiate characteristics of software and hardware engineering.
2. Identify the functional and non-functional requirements of Canteen/Mess menu booking system.
3. Compare static and dynamic models by its nature.
4. Expand UML, SRS, CASE, OSI and write each one of its advantage.
5. Distinguish application domain, technical domain and domain modeling with one example.
6. Justify the spiral model is the best one than v-model, water fall model with proper reason.
7. Categorize the risks of software. How does the risk play a major role of software failure?
8. Define: GoF, GRASP.
9. What are the two important characteristics of component? Is it reusable or replaceable? How?

10. How does the environment compatibility make a smooth success of deployment? Justify using python SDK download, path setting commands.

PART - B

Answer all the questions

2 x 40 = 80 Marks

11. a) Develop object model of University system with the following objects: (10 x 2 = 20)
Office, Departments, Sports, Auditorium, Hostel, Canteen, Students, Staffs, Transport, Exam.
- b) Generate structural E-R diagram of following Product promoting system: (10 x 2 = 20)
Product, Producer, consumer, promoter, shipment, delivery with its attributes id, name, address, date and its relationships.

(OR)

12. a) Write all object oriented principles (5 x 2) and software design principles (5 x 2) with examples.
- b) Explain the following design patterns (Creator, Controller, Information expert, Façade, Pure Fabrication, Abstract, Singleton, Adapter, observer and Factory) with examples. (10x2)
13. a) Differentiate object domain, analysis domain, application domain, technical domain with its characteristics, symbols and layers, descriptions with merits and demerits. (4 x 5)
- b) Describe the following architectural, control and interface patterns: box and line model, pipeline model, call and return model, data repository model, client-server model, layer model, reference model, Pyramid model, cubic model with its merits and demerits. (10 x 2)

(OR)

14. a) Design the following static and behavioral models for given scenarios: (5 x 4)

- i) Use case modeling of amazon online shopping system of Men, Women, Children wears and Home-appliances, stored shopping cart, online payment and scheduled Door delivery.
- ii) Class diagram for ticket booking system of bus(town, point-to-point, Omni) , train(metro, express) , flight (national, international), movie theatre and its morning and evening show timings, ticket_description with Source, Destination, ticket_cost, date_of_ticket, Date_of_journey and Number of tickets purchased.
- iii) Package diagram of subject and semester wise online elective course registration system.
- iv) Component diagram of Google 's- 1. Document component, 2. Excel sheet component, 3. Slideshow component, 4. Photos and album 5. Calendar component.
- v) Deployment diagram of Unmanned Library book return system using barcode scanning

b) Design the following dynamic models for the given scenarios:

(5 x 4)

- i) Swim lane diagram for swimming sports score board system for three competing teams using timer,
- ii) Sequence diagram of ticket cancelling system using chat bot, user id, ticket number and date, cancellation code, cancellation charges,
- iii) State chart diagram of forgot password recovery system using OTP,
- iv) Activity diagram of online Interview system with technical round1 on C / C++ / java / python then GK round2, GD round3, HR round 4, One after another with minimum 60% scores on each round else fail,
- v) Collaboration diagrams of the following a) online and b) offline activities then justify online apps shrinks the day to today manual work and eliminate the working places through software app.

Actions	ONLINE Collaborator	OFFLINE collaborators	Place
Wakeup()	Alarm app	Friend	Room met
Breakfast()	Swiggy app	Mother/Warden	Kitchen
Notes()	NPtel	Tutors	Class room
Tennis()	Rummy/ pubG app	Tennis Team	Play ground
Read()	Ebooks	Books	Library
Watch()	Netflix app	Movie	Theatre
Play()	Spotify app	Guitar	Auditorium
GD()	Whatsapp	Friends	ConferenceHall

SASTRA DEEMED UNIVERSITY

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End Semester Examinations

December 2022

Course Code: MGT132

Course: FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS

QP No. :U223R

Duration: 3 hours

Max. Marks:100

PART – A

Answer all the questions

10 x 2= 20 Marks

- 1/ As a manager what you should prefer, Effectiveness or Efficiency?
- 2/ Neer Ltd. has decided to become the market leader in selling water bottles. The company decides to take care of all the departments. The top management decides to set standards for all the business activities right from the purchase of raw material to manufacturing and packaging of the water bottles. Which scientific technique of management is used here? Name three advantages of this technique.
3. Vivid Sweets is a renowned name for quality sweets since 1935. Varsh the owner of Vivid Sweets was worried as the sales had declined during the last three months. When she enquired from the Sales Manager, the Sales Manager reported that there were some complaints about the quality of sweets. Therefore, Varsh ordered for sample checking of sweets. Identify the step taken by Harsh that is related to one of the functions of management.
4. List two types of interacting features of organizations.
5. Outline divisional departmentation (Grouping) based on your choice.

6. As a manager, how would you create an organization with a high degree of relational coordination?

7. Compare power and authority.

8. Recognize stereotypes and understand how they function in organizational settings.

9. Compare and contrast four types of teams.

10. Define Cooptation with an example.

PART – B

Answer any **FOUR** questions

4 x 15 = 60 Marks

11. Discuss the application of Fayol's principles of management in any company of your choice.

12. Describe the three basic types of organizational structures and the challenges or crises faced by the organization as it moves through each stage of corporate development. In addition, describe the matrix and network organizational structures. Discuss when their use is appropriate.

13. Discuss some early theories of motivation? How applicable are they today?

14. Elaborate on the factors leading to job stress? What advice would you give to a co-worker experiencing job stress?

15. Demonstrate how organizational structures differ and contrast mechanistic and organic structural models.

16. Describe how culture is transmitted to employees.

PART - C

Answer the following

1 x 20 = 20 Marks

- 17/ When people think of a stereotypical leader, they often conjure up the image of a dynamic public speaker, a forceful and dominant personality, and someone who can cultivate relationships with a broad number of people. These are all hallmarks of the extroverted personality type, so it's often been the case that extroverts rise to leadership positions more readily than introverts.

However, some question whether the social dominance and ability to command attention shown by extraverts might make them less effective leaders in certain ways. In particular, extroverts may be less likely to take advice from followers. One study investigated how quickly groups of college students could fold shirts in 10 minutes. Each group had a leader who was cued to be either extroverted or introverted. The introverted leaders took more advice from their proactive followers, and this led the groups with introverted leaders to be more effective. Thus, even though there are cases where introverts are less successful as leaders, in some conditions they are more effective. Others note that introverted leaders can be better than extroverts at one-on-one interactions, empathy, and deliberate decision making.

Are there business executives who break the extroverted leader mold? One is Google co-founder Larry Page, well-known for developing a small number of close relationships and being an excellent listener. Colgate-Palmolive chief Ian Cook might feel uncomfortable in front of large groups of people he doesn't know, but he has learned to partner with more extroverted colleagues for presentations to offset his natural shyness. Wal-Mart Stores CEO

Mike Duke is famously low-key and reserved, but he has utilized his natural introvert skills of managing details and engineering solutions to maintain the retail giant's dominant market position. These examples show that although extroverts might get all the attention, introverts can still make effective leaders.

Questions

- a) Are you more of an introverted or extraverted leader? What can you do to leverage your personality to be a more effective leader?
- b) Under what conditions do you think extraverts make more effective leaders than introverts? What unique abilities of introverts could make them more effective in some situations?
- c) The case describes some problems introverts might have in leadership situations. What techniques might they employ to help them overcome these?
- d) What types of developmental experiences do you think would be especially valuable for introverted leaders?

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End Semester Examinations

Dec 2023

Course Code: MGT132

**Course: FUNDAMENTALS OF MANAGEMENT FOR
ENGINEERS**

QP No. :UD200-5

Duration: 3 hours

Max. Marks:100

PART-A

Answer all the questions

10 x 2 = 20 Marks

1. Distinguish between Administration and Management.
2. Identify the functions of a manager.
3. Define Bureaucracy.
4. List out any two differences between Formal and Informal groups.
5. Classify the various types of teams in an organization.
6. Name the meaning for the term Organizational Socialization.
7. Discuss the component of attitude.
8. Recall the term Corporate Social Responsibility.
9. How to identify stress in organization.
10. Summarize the term workforce diversity.

PART-B

Answer any FOUR questions

4 x 15 = 60 Marks

11. Elaborately discuss the process of controlling along with four important tools in controlling.
12. Elucidate the various types of Organizational structure in detail.
13. What are the foundations of Individual Behaviour.
14. Explain fourteen principles of Henry Fayol in detail.
15. Demonstrate the elements of Organizational Structure.
16. Describe the various approaches to leadership and also state its applications.

PART-C

Answer the following

1 x 20 = 20 Marks

Case study

17. a) IT software company Polaris Ltd is thinking of new facility in Mumbai with the capacity for 800 professionals. The company's CEO said that the company was well on track to meet its earlier announcement to increase the head count by 1500-2000 professionals in the current year to reach the 9000 mark by this year. We look at the acquisition of small boutique consulting companies that are focused on banking, financial services and insurance space. This will strengthen customer capability.
 - i) Identify the function of management performed by Polaris and also its features. (5)
 - ii) Outline the advantages and disadvantages of above function. (5)
- b) Explain the various team decision making methods. (10)

SASTRA DEEMED UNIVERSITY

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End Semester Examinations

December 2022

Course Code: MGT133

Course: BUSINESS STRATEGY

QP No. :U073R

Duration: 3 hours

Max. Marks:100

PART – A

Answer all the questions

10 x 2 = 20 Marks

1. Define profitability and why ROIC is the most superior
2. What is mission statements and state its components?
3. List the key characteristics of well-constructed goal
4. Difference between core competency and competitive advantage
5. Difference between functional level and business level strategy
6. What do you understand by mobility barriers, that exist between strategic groups?
7. State what is transnational strategy perused by firm
8. When do we call a company as diversified?
9. When do firms peruse a liquidation strategy?
10. What is organization control system and state the different types?

PART- B

Answer any four questions

4 x 15 = 60 Marks

11. What are the strengths and weaknesses of formal strategic planning? Are formal strategic planning systems relevant or irrelevant for firms competing in high-technology industries and Why?
12. "A framework to evaluate and monitor a business environment is PESTEL" explain with reasons why this analysis is most preferred?
13. Describe the generic competitive strategy and state why does each generic competitive strategy require a different set of product/market/distinctive competence choices? Give example of pair of companies in (a) the auto industry that pursue different competitive strategies.
14. How to understand industry profitability with Porter's five forces?
15. When is a company likely to choose related diversification, and when is it likely to choose unrelated diversification? Discuss your answers with reference to an electronics manufacturer.
16. Give an analysis of various entry modes to foreign markets? Under what circumstances might it be best to enter a new business area by acquisition?

PART- C

Answer the following

1 x 20 = 20 Marks

17. Oracle Corporation, was the world's largest maker of database software in the world. The Corporate applications was a fast growing and highly profitable market then and in Germany it was the market leader., Its goal was to quickly build the distinctive competences it needs to expand the range of products that it can offer to its customers and to attract new customers to compete with SAP. Oracle's CEO,

Larry Ellison, spent \$19 billion to acquire fourteen leading suppliers of corporate software, including two of the top five companies: PeopleSoft, a leading human resource management (HRM) software supplier, which it bought for \$10 billion, and Siebel Systems, a leader in customer relationship management (CRM) software, which cost Oracle \$5.8 billion. Oracle expected several competitive advantages to result from its use of acquisitions to pursue the corporate strategy of horizontal integration. Oracle's own corporate and database software programs to create a new integrated suite of software that will allow corporations to manage all their functional activities, such as accounting, marketing, sales, HRM, CRM, and supply chain management. Second, through these acquisitions Oracle obtained access to thousands of new customers—all the companies that currently use the software of the companies it acquired. These companies now become potential new customer for all of Oracle's other database and corporate software offerings. Oracle's acquisitions consolidated the corporate software industry. By taking over some of its largest rivals, Oracle become the second largest supplier of corporate software, and so it is better positioned to compete with leader SAP. Achieving the advantages of its new strategy was not be easy, however. CEO Ellison, who expects a lot from his top executives, has been quick to fire executives who don't perform well. Oracle has obtained from each of the companies it acquired to build its new suite of state-of-the-art corporate software applications. He also has to persuade customers not to switch software vendors—for example, jump ship to SAP.

Wookey the senior vice president was well placed to implement Oracle's new strategy: He also regularly visits major customers, especially those that came with its acquisitions, to gain their input into how and what kind of software package. One of Wookey's notable achievements was retaining the top-rate software engineers Oracle obtained quired rivals. These people could have easily found high paying jobs elsewhere, but most of the top engineers Oracle wanted stayed to help it achieve its new goals.

Nevertheless, after 3 years of acquisitions Oracle's new strategy was not working well. SAP popular software was fast becoming the industry standard, Moreover, SAP is still the leader in more advanced applications incorporating the latest technologies, and its proprietary

technology is inhouse and did not face the huge implementation issue of bringing together the applications from many different acquisitions. Analysts also say that Oracle runs the risk of stretching itself too thin if it continues to purchase too many companies too quickly, because high-tech acquisitions are the most difficult for execution. In 2008, Oracle announced yet another major acquisition—software supplier BEA Systems. Will it be able to continue its track record of success?

- a) In what ways is Oracle was seeking to create value from its acquisitions?
- b) Based upon the ways it is seeking to increase the value it creates, what is its corporate-level strategy?

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End Semester Examinations

Dec 2023

Course Code: MGT133

Course: BUSINESS STRATEGY

QP No. :UD078-5

Duration: 3 hours

Max. Marks:100

PART-A

Answer all the questions

10 x 2 = 20 Marks

1. Why Vision and Mission statements are significant to a firm?
2. What is strategic intent?
3. What constitutes a firm's internal environment?
4. Why is SWOT analysis essential to a firm?
5. List the primary activities in Porter's Value Chain.
6. Cite two examples for 'Functional Strategies'.
7. What makes an industry attractive?
8. How will you define 'Strategic Groups'?
9. When should a firm go for diversification?
10. What are the types of international strategy?

PART-B

Answer any FOUR questions

4 x 15 = 60 Marks

11. Describe the Strategic Management Process and highlight the importance of each step.
- ✓12. What do you mean by PESTLE Analysis? Explain how it is used to evaluate the external environment.
- ✓13. Choose an industry and assess the forces of industry attractiveness using Porter's Five Force model.
- ✓14. Explain the concept of Planned, Deliberate, Emergent and Realized Strategies.
- ✓15. Discuss BCG Matrix and explain its significance to business portfolio analysis.
16. Discuss the importance of McKinsey's 7 S Framework in evaluating a firm's organisational design.

PART-C

Answer the following

1 x 20 = 20 Marks

17. Building on its commitment towards sustainable motoring, Maruti Suzuki India Limited showcased the Concept Electric SUV eVX at Auto Expo 2023. With this, the company has reinforced its vision of developing sustainable powertrain systems through continuous technological development and innovation. The 'Emotional Versatile Cruiser,' - Concept eVX is a mid-size electric SUV concept designed and developed by Suzuki Motor Corporation, Japan offering futuristic SUV design elements with an upright posture and commanding high-seating. The Concept Electric SUV eVX will be powered by a 60kWh battery pack offering up to 550km of driving range.

Commenting on the global premiere of Concept Electric SUV eVX, Mr. Toshihiro Suzuki, Representative Director and President, Suzuki Motor Corporation, said, "Today, I have an exciting announcement. I am delighted to unveil the Concept eVX, our first global strategic EV. We plan to bring it to market by 2025. At the Suzuki Group, addressing global warming is a priority. We are promoting a range of global measures to reduce greenhouse gas emissions generated from our business. One key measure is reducing CO2 emitted by using our products. Here in India, as announced in March last year, we will invest 100 billion rupees in the production of BEVs and their batteries."

Adding to this, Mr. Hisashi Takeuchi, Managing Director & CEO, Maruti Suzuki India Limited, said, "For over 4 decades, Maruti Suzuki has been spreading the Joy of Mobility in India and fulfilling the aspirations of millions of Indian families. Along with our parent company Suzuki Motor Corporation, we remain highly optimistic and committed to the long-term growth story of India. With specific emphasis on Atma Nirbhar Bharat, we have committed ourselves to bring new products, technologies, investments and set up new facilities in India. We believe in exploring a full spectrum of technologies like hybrids, CNG, bio-CNG, ethanol and electric to support Government of India's twin objective of reducing oil-import bill and Carbon Net Zero by 2070. Our approach towards electric vehicles is holistic with scale and localization. The Concept eVX is Suzuki's first global strategic Electric Vehicle, and I am excited that it debuts here in India. It brings exciting urban SUV styling through its sharp design language and as a Battery Electric Vehicle it purposefully reinforces our commitment to environment friendliness and sustainability."

(Article Source : <https://www.marutisuzuki.com>)

Questions:

- a) Which are the environmental forces that would impact the electric vehicle market in India? Explain. (10)
- b) With other major players in Indian automobile industry launching their electric cars well ahead of Maruti, will it be appropriate for Maruti to be a *late mover* in this market? Why? (10)

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SASTRA DEEMED UNIVERSITY

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End Semester Examinations

December 2022

Course Code: CSE320

Course: **COMPILER DESIGN**

QP No. :U099R

Duration: 3 hours

Max. Marks:100

PART - A

Answer all the questions

10 x 2 = 20 Marks

1. What is the role of compiler in a computer programming?
2. Differentiate Deterministic and Non-Deterministic finite automata.
3. List out the applications of compiler technology.
4. Why should we remove left factoring in grammar?
5. Write a context free grammar for language
$$L(G) = \{ww^R : w \in \{a, b\}^*\}.$$
6. Differentiate top down and bottom up parsing.
7. Mention the applications of syntax directed translation.
8. Define static single assignment form.
9. What is register allocation and assignment?

10. Describe live variable analysis in compiler design.

PART - B

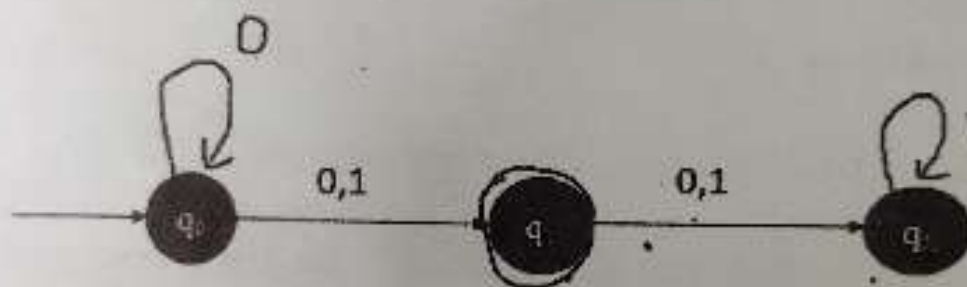
Answer all the questions

4 x 15 = 60 Marks

11. Demonstrate the working of various components of compiler like Lexical Analyzer, Syntax Analyzer, Semantic Analyzer, Intermediate Code Generator, Optimizer and Code Generator with a proper example.

(OR)

12. Write down the procedure for converting an NFA to DFA. Convert the given NFA into an equivalent deterministic machine.



13. Construct LL(1) parsing table for the following grammar.

$E \rightarrow E + T$

$E \rightarrow T$

$T \rightarrow T \times F$

$T \rightarrow F$

$F \rightarrow (E)$

$F \rightarrow id$

Also validate the given input: $id + id \times id$

(OR)

14. Construct LR (1) parsing table for the following grammar.

$S \rightarrow CC$

$C \rightarrow aC$

$C \rightarrow d$

Also parse the given input: "aadd"

15. Discuss the evaluation orders for syntax directed definition with an appropriate example.

(OR)

16. Illustrate linear intermediate representation with a suitable example.
17. Explain in detail about the issues in the design of a code generator in compiler.

(OR)

18. Demonstrate the various semantic preserving transformation schemes in optimization with suitable example.

PART - C

Answer the following

1 x 20 = 20 Marks

19. a) Explain in detail the role of symbol table in compiler design. (10)
- b) Describe about activation trees and activation records in stack allocation of space with proper example. (10)

SASTRA DEEMED UNIVERSITY

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End Semester Examinations

Dec 2023

Course Code: CSE320

Course: COMPILER DESIGN

QP No. :UD099-5

Duration: 3 hours

Max. Marks:100

PART – A

Answer all questions

10 x 2 = 20 Marks

1. List out the applications of compiler technology.
2. Differentiate NFA and DFA.
3. Write a regular expression to recognize C language identifiers.
4. Mention the uses of symbol table.
5. Show that the following grammar is ambiguous.
S \rightarrow AB / aaB
A \rightarrow a / Aa
B \rightarrow b
6. Describe the advantage of LALR parser over SLR (1) & LR (1).
7. Construct DAG for expression: $a + a \times (b-c) + (b-c) \times d$.
8. Define static single-assignment form.
9. List out the various semantics preserving schemes in compiler optimization process.

10. What is the use of live variable analysis?

PART- B

Answer any Four questions

4 x 15 = 60 Marks

11. Develop a LEX and YACC program for function definition of c programming language.

12. Construct LL (1) parsing table for the given grammar. Also parse the given input "(num-num) / num \$".

$E \rightarrow E-T$

$E \rightarrow T$

$T \rightarrow T/F$

$T \rightarrow F$

$F \rightarrow P^F$

$F \rightarrow P$

$P \rightarrow (E)$

$P \rightarrow \text{num}$

13. Construct a Deterministic Finite Automata for the given Regular Expression $(a | b)^* abb$ using McNaughton & Yamada algorithm.

14. Explain in detail about Syntax Directed Translation Schemes with a suitable example.

15. Discuss about Heap Memory Management in Compiler Design.

16. Discuss in detail about Register Allocation and Assignment process in compiler design.

PART - C

Answer the following

1 x 20 = 20 Marks

17. a) Construct LR (1) parsing table for the given grammar. (10)

$S \rightarrow Aa / bAc / Bc / bBa$

$A \rightarrow d$

B->d

- b) Explain about the issues in the design of a code generator in compiler. (10)
