

TYBSc IT Sem II (ATKT)

NOV-2024

(2½ Hours)

[Total Marks: 75]

N. B.: (1) **All** questions are **compulsory**.

(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.

(3) Answers to the **same question** must be **written together**.

(4) Numbers to the **right** indicate **marks**.

(5) Draw **neat labeled diagrams** wherever **necessary**.

(6) Use of **Non-programmable** calculators is **allowed**.

1. **Attempt any three of the following:**

15

- a. Explain .Net Framework architecture with neat diagram.
- b. Explain static constructor and copy constructor with example.
- c. What is an Array? Explain with example various types of an array.
- d. Define Inheritance. Explain multiple inheritances with example.
- e. What are operators? Explain Comparison and ternary operators with example.
- f. Write a short note on Delegates.

2. **Attempt any three of the following:**

15

- a. Explain any five properties of list-box and drop-down list controls.
- b. Explain the ASP.Net page Life Cycle in short.
- c. Explain validator controls used in ASP.NET.
- d. Write a short note on Sitemap and TreeView control.
- e. Write a short note on AdRotator and Calendar controls.
- f. Explain the basic functionality of checkbox, radio button, button, and textbox web controls.

3. **Attempt any three of the following:**

15

- a. Explain try-catch block mechanism in short.
- b. Explain the predefined classes related to System Exception.
- c. Explain various State Management techniques used in ASP.Net.
- d. What are Master Pages? Explain how they are different from other web pages.
- e. What is CSS? Explain various types of Selectors used in CSS.
- f. Explain with examples how themes are used in ASP.Net.

4. **Attempt any three of the following:**

15

- a. Explain the Data provider model used in ADO.Net.
- b. State difference between DetailsView and FormView control.
- c. Explain ADO.NET Architecture in short.
- d. What is Data Binding? Explain its types.
- e. Explain Connected and disconnected Data Access.
- f. Explain what is paging and sorting in GridView with example.

5. Attempt any three of the following:

15

- a. What is XML? Explain with example XMLTextReader and XMLTextWriter class.
  - b. Explain in short style sheet used in XML.
  - c. Write a short note of Authentication and Authorization.
  - d. What do you mean by Impersonation in ASP.Net?
  - e. What is AJAX? What are its advantages and disadvantages?
  - f. Explain the working of update panel and update progress controls in ASP.NET.
-

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- Analyze the statement, "Any sufficiently advanced technology is indistinguishable from magic."
- How do calm and ambient technologies work? Illustrate your answer with the example of Live Wire.
- Explain the following concepts with respect to IoT:
  - First Class Citizens on the Internet
  - Affordances
- Explain the differences between TCP and UDP.
- Provide a brief overview of the Domain Name System (DNS).
- Define the term protocol and explain any five application layer protocols.

**2. Attempt any three of the following:****15**

- What challenges arise when transitioning from a prototype to large-scale production? Explain
- How can open-source software provide a competitive advantage for businesses?
- Using an example, explain the process of scaling up electronic devices from prototype to larger production.
- Explain any five factors that influence the choice of platform for an Internet of Things device.
- Write short note on Raspberry Pi.
- Explain the following IOT devices built with Arduino.
  - The Good Night Lamp
  - Botanicals
  - Baker Treat

**3. Attempt any three of the following:****15**

- Describe the process of sketching, iterating, and exploring in the context of prototyping.
- Explain the different methods used for 3D printing.
- Discuss how repurposing and recycling can be applied in the prototyping of IoT devices.
- Explain HTML5 web socket.
- Explain the following protocols suited to Internet of Things applications:
  - Message Queueing telemetry transport (MQTT)
  - Constrained Application Protocol (CoAP)
- Discuss the different standards that must be considered while implementing APIs.

4. Attempt any three of the following:

15

- a. How can you maximize the utilization of available memory in embedded systems, especially when dealing with limited RAM?
- b. What are the concerns regarding performance and battery life while writing code for embedded systems?
- c. Explain different types of libraries for embedded systems which works with limited memory.
- d. Discuss the business model canvas for Internet of Things.
- e. Explain the following business models:
  - i. Make thing, Sell thing
  - ii. Customization
  - iii. Be a Key Resource
- f. What is venture capital? How can one exit?

5. Attempt any three of the following:

15

- a. Discuss the phase of Testing in manufacturing of Internet of Things device.
  - b. What is the importance of Certification for IoT devices? Explain.
  - c. Explain the steps for manufacturing PCBs.
  - d. Discuss the issues in scaling up the software for large scale IOT devices.
  - e. Explain the five critical requirements for sensor commons project.
  - f. What do you mean by disrupting control?
-

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1. Attempt **any three** of the following:

15

- What is project? Explain the various phases of project management life cycle.
- Define and calculate Net Profit, Payback Period and Returns on Investment terms for the following Projects cash flow forecast of a project.

Year	Project 1 Cash-flow	Project 2 Cash-flow
0	-100,000	-100,000
1	20,000	50,000
2	30,000	50,000
3	20,000	20,000
4	30,000	30,000
5	60,000	60,000

- What is risk evaluation? What are the activities involved in risk management process?
- Explain the Step Wise approach to planning software projects briefly with the help of suitable diagram.
- Write short note on Project Charter.
- Explain the business case with its content of business case document.

2. Attempt **any three** of the following:

15

- Explain waterfall model with the help of suitable diagram.
- State and explain Capers Jones estimating rules of thumb.
- What is Atern /Dynamic Systems Development Method? What are the eight core principles of it?
- Explain the Scrum as a fast delivery approach of a project in detail.
- Describe the COCOMO II and discuss the stages of it.
- Discuss the problems generally faced during effort estimation in project management.

3. Attempt **any three** of the following:

15

- Explain Bohem's top software project risks and different strategies for reducing it.
- Using the data in the following table, answer the questions given below :

Activity	Duration	Predecessors
A	6	-
B	8	-
C	3	A
D	5	B
E	4	C,D

(i) Create a precedence activity network.

(ii) What is the total project duration?

- (iii) Calculate earliest start date, latest start date and float of all the events.
- (iv) Identify the critical path.
- c. Suppose four risks namely R1, R2, R3 and R4 have been identified and assigned the probabilities of occurrence of 0.1, 0.2, 0.3 and 0.4 respectively. The likely damages due to the four risks are Rs. 50,000; Rs. 1,00,000; Rs. 70,000; Rs. 50,000 respectively. Calculate the risk exposure of all the risks.
- d. Describe the reasons for necessity of activity planning in detail.
- e. Write short note on Monte Carlo simulations.
- f. Distinguish between PERT (Program Evaluation Review Techniques) and CPM (Critical Path Method).

**4. Attempt any three of the following:**

**15**

- a. Explain the following terms under the concept of visualizing progress.  
i) Gantt chart ii) Slip chart
- b. Explain RAG reporting (Traffic light method)
- c. What is contract? Explain fixed price per unit delivered contracts? List the advantages and disadvantages of this approach.
- d. What is Stress? Explain stress management
- e. What is the Expectancy Theory of Motivation (Vroom)? Explain.
- f. The Earned Value for a project is 10,000 more than the planned value. The Planned value is 60,000/-. Actual Cost is 5,000/- less than the planned value  
EV = ?, AC = ?, PV = ?  
CPI = ?  
SPI = ?  
And write conclusion.

**5. Attempt any three of the following:**

**15**

- a. What are the five basic stages of Team Development?
- b. What is Leadership? What are its types?
- c. Differentiate between Verification and Validation.
- d. What are the different ISO 9126 software qualities? What are the sub-characteristics of Functionality and Reliability?
- e. Describe Capability maturity model (CMM). What are the various levels of CMM?
- f. Explain premature project termination (project closure)? What are its reasons?

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- Differentiate between Thinking Rationally and Thinking Humanly.
- Enlist and explain the foundations of Artificial Intelligence.
- Explain the working of Vacuum Clean agent
- Write a note on types of environment faced by an Artificial Intelligent agent.
- Brief on the working of Goal Based Agent.
- Write PEAS of Robotic Assembly.

2. Attempt any three of the following:

15

- Explain different states of n-queen problem.
- Write difference between Breadth First Search and Depth First Search
- Show the working of Bidirectional Search.
- Demonstrate A star search with an example.
- Explain the landscape of Hill Climbing Search
- Explain the algorithm for Online Search.

3. Attempt any three of the following:

15

- Demonstrate the working of Wumpus World Agent.
- Using an example demonstrate alpha beta pruning.
- Write atomic sentences and complex sentences in Propositional Logic
- Show the working of MINMAX algorithm
- Explain the generic knowledge based agent algorithm.
- Summarize on WALKSAT algorithm.

4. Attempt any three of the following:

15

- Simulate the working of Backward chaining with example.
- Explain the concept of Resolution.
- Demonstrate the working of unification and lifting.
- Brief on the universal and existential quantifier.
- Using examples explain First order logic and Propositional logic.
- Explain the concept of forward inference.

5. Attempt any three of the following:

- a. Illustrate the classical planning algorithm.
  - b. Explain the working of STRIPS with example
  - c. Show the hierarchical task network with example.
  - d. Explain the default logic reasoning circumscription concept.
  - e. What is multi agent planning ?
  - f. Write the knowledge base Internet Shopping World agent.
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T4BSCT sem II (ATKT)

NOV. 2024

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1. **Attempt any three of the following:** 15
  - a. Explain the duty of system administrator.
  - b. Write a short note on piping and redirection.
  - c. Explain the scheduling job using cron command.
  - d. Explain symbolic link and Hard link.
  - e. Write a note on RPM and YUM
  - f. Explain the Bash Shell in detail.
  
2. **Attempt any three of the following:** 15
  - a. What are different kinds of partitions available in Linux
  - b. Explain the different File system available on RHEL
  - c. Write a short note on run levels and services in Linux
  - d. What is use of fstab? Explain the contents of fstab
  - e. Explain the chmod command with example.
  - f. List and explain the advance file permission in detail.
  
3. **Attempt any three of the following:** 15
  - a. Write short note on IP Masquerading
  - b. Explain the NFS and write down advantages and disadvantages of NFS.
  - c. What is File Transfer Protocol (FTP) ? How to enable the anonymous FTP server.
  - d. Give the steps to configure Samba server.
  - e. Explain the Secure Socket Layer(SSL).
  - f. What is NAT? Give steps to configure NAT
  
4. **Attempt any three of the following:** 15
  - a. Explain the POP and IMAP4 Protocol.
  - b. Write a short note on DNS and its hierarchy
  - c. Write short note on DHCP (Dynamic Host Configuration Protocol).
  - d. Write down the steps setting up the cache-only name server.
  - e. Explain the option statement named.conf with at least five parameter.
  - f. Explain the MTA and MDA in detail.

5. Attempt any three of the following:

15

- a. What are different elements of shell script
  - b. Write a short note on kickstart file.
  - c. Write down Steps for setting up TFTP server for PXE Boot.
  - d. How will you setup bonding ?
  - e. What is boot loader? Explain content of grub.conf file
  - f. Explain the fencing in detail
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TYBScIT Sem V (ATKT)

Nov. 2024

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5. Attempt any three of the following:
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  - a. What is Java Enterprise Application? Explain the architecture of Java Enterprise Application.
  - b. Write a note on Multi Tire architecture.
  - c. Write a short note on CGI. Explain alternatives to CGI.
  - d. Explain the life cycle of servlet.
  - e. What are steps to create Web Application using NetBeans?
  - f. Write short note on JDBC Driver. Explain its types.
  
2. **Attempt any three of the following:** 15
  - a. Write a program for implementing a ReadListener.
  - b. What is RequestDispatcher interface? Explain its methods.
  - c. How to create cookies using Servlet?
  - d. What is Session Tracking? Explain its methods.
  - e. Write a short note on Uploading file with Java Servlet.
  - f. Explain Non-Blocking I/O. How it works?
  
3. **Attempt any three of the following:** 15
  - a. Explain the Life Cycle of A JSP Page.
  - b. Explain page directive with its attributes.
  - c. How to Forward and Pass parameter to other action in JSP?
  - d. Explain methods of request implicit objects of JSP.
  - e. Write a short note on operators of EL.
  - f. What is wrong in using JSP scriptlet tag? How JSTL fixes JSP scriptlet shortcomings?
  
4. **Attempt any three of the following:** 15
  - a. Explain Enterprise Bean Containers in brief.
  - b. What is EJB? Explain its Architecture.
  - c. Write a note on different types of session beans.
  - d. Explain life cycle of a message driven Bean using suitable diagram.
  - e. Explain the concept of naming service & Directory Interface. Explain basic lookup in JNDI.
  - f. What is an interceptor? How an interceptor is defined and how aroundInvoke () is added to it?

5. Attempt any three of the following:

15

- a. Explain the persistent standards available in java.
  - b. Explain Java Persistence API with their specification.
  - c. How JPA Works?
  - d. Write Short note on-
    - a. JOIN Condition using ON      b. Entity Listeners using CDI
  - e. Draw and explain the architecture of hibernate.
  - f. Explain the Structure of hibernate.cfg.xml
-