

[3 hours]

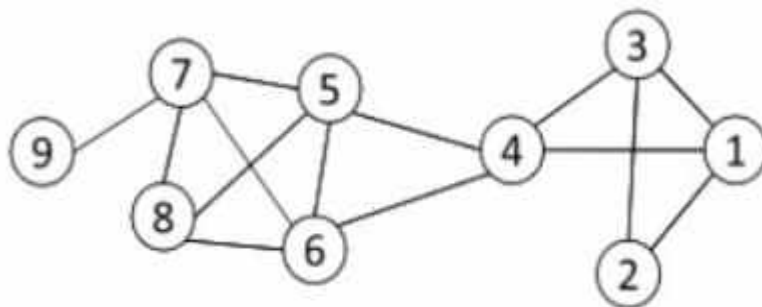
[80 Mks]

- NB : 1) **Question 1** is compulsory.
 2) Attempt any **three** questions from the **remaining** questions.
 3) **Assume** suitable **data** wherever applicable.

- 1 (a) Write three important characteristics of big data and explain any one with real life example. 5
 (b) Explain Hadoop ecosystem components - Hive and Pig. 5
 (c) Explain MapReduce programming model in detail. 5
 (d) Differentiate between SQL and NoSQL system. 5
- 2 (a) Discuss I-step Matrix-Matrix Multiplication MapReduce algorithm and apply to the following problem 10

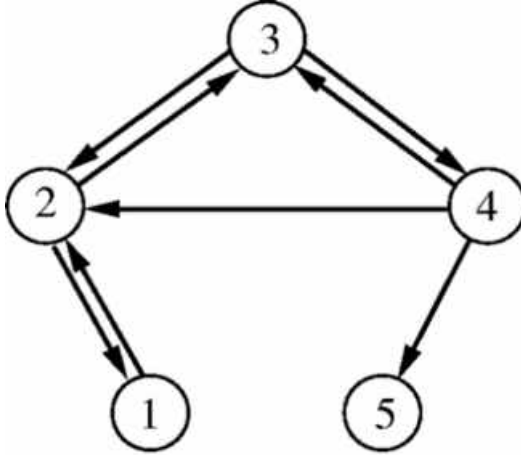
$$\begin{matrix} 2 & 3 & & 3 & 4 \\ 4 & 2 & * & 0 & 2 \end{matrix}$$

 (b) Explain DGIM algorithm for counting ones in a stream with example. 10
- 3 (a) Find the frequent itemset using PCY algorithm with minimum support 3 and $h(i,j)=i*j \bmod 8$
 T1 -- 1,2,3,5
 T2 -- 1,2,5
 T3 -- 1,3,5
 T4 -- 1,2,4
 (b) Recall all NoSQL design patterns with example. Justify CAP property. 10
- 4 (a) Investigate to find all communities in the graph given below using CPM method. 10



- (b) Comment on usefulness of different types of Recommendation System in real life with example. 10

5 (a) Find PAGERANK of each page in the following figure after 3rd iteration. 10



(b) Illustrate different Relational Algebra operations using MapReduce. 10

- 6 (a) Hadoop advantages and limitations 5
- (b) FM algorithm 5
- (c) KNN Algorithm 5
- (d) CURE algorithm for clustering 5

Duration: 3hrs

Marks:80

N.B:(1) Question No 1 is Compulsory.

(2) Attempt any three questions out of the remaining five.

(3) All questions carry equal marks.

(4) Assume suitable data, if required and state it clearly.

- Q1. Attempt any four
- a. Explain the Proof of Stake and Proof-of-Work consensus algorithms 5
 - b. Discuss Truffle and the various truffle commands used during the development of Smart Contracts. 5
 - c. Enumerate the interoperability and scalability issues in Hyperledger Fabric. 5
 - d. What is forking in blockchain? Explain hard and soft forks with suitable examples. 5
 - e. Differentiate between Fungible and Non-fungible tokens. 5
- Q2. a. What is a private blockchain? Explain the distinct features and drawbacks of a private blockchain. Discuss any two examples of private blockchain. 10
- b. Discuss the different consensus algorithms applied in Hyperledger blockchain. 10
- Q3. a. Explain the role of certificate authority and Chain code in Hyperledger blockchain. 10
- b. How are ERC20 tokens helpful in blockchain applications? Explain the steps to create an ERC20 token. 10
- Q4 a. What is a genesis block? Explain the components of a block and block header of bitcoin in detail? 10
- b. Discuss the benefits and challenges of Blockchain technology to develop applications in the finance domain. 10
- Q5 a. Explain transactions and UTXO in bitcoin. How are fees calculated for a Bitcoin transaction. 10
- b. Explain different components of Ethereum in detail. 10
- Q6 Write short note on (any 2) 20
- a. Byzantine Generals' Problem.
 - b. ICO Launching Mechanism
 - c. Hyperledger umbrella projects
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Duration: 3hrs

[Max Marks:80]

- N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]
- a How does user research contribute to the process of designing user interactions?
 - b What is the difference between user interface design and user interaction design?
 - c Explain good error messages with example.
 - d How does accessibility factor into user interaction design?
 - e Give Examples of Quantitative Data Analysis Methods
- 2 a Can you discuss the characteristics of good design and bad design, using a specific example to illustrate the concept. [10]
- b Explain any five design principles and aid thinking when designing for product development with good UX. [10]
- 3 a What is the role of prototyping in user interaction design? What do you mean by low-fidelity and high-fidelity prototyping? [10]
- b List various usability inspection methods and summarize cognitive walkthrough techniques. [10]
- 4 a What methods are available for gathering data during the requirements phase, and how do these techniques help in understanding user needs and project requirements? [10]
- b Explain Shneiderman's "Eight Golden Rules of Interface Design" [10]
- 5 a How do controlled settings, natural settings, and evaluations in any setting differ when assessing user experiences? [10]
- b Design the interface for Education Content management system. [10]
- 6 a What is DECIDE framework? Explain in detail [10]
- b Summarize the key issues in Data Gathering process. [10]

(3 Hours)

[Total Marks:80]

N.B. 1) Question No. 1 is compulsory.

- 2) Attempt any three questions from the remaining questions.
- 3) Figures to right indicates full marks.
- 4) Assume suitable data, if necessary.

Q1. Write short notes on the following (Any Four) **20**

- i. Triple constraints in Project Management
- ii. Project charter and Project sponsor
- iii. Project Management Information system
- iv. Goldratt's critical chain methods
- v. Project audits

Q.2 (a) Explain stages of team development and growth. What are the advantages of effective team and barriers to team effectiveness? **10**

(b) A project is composed of 8 activities, the time estimate for which are given below. **10**

Activity	Predecessor	Duration		
		t_o	t_m	t_p
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B, C	9	9	9
G	D	3	3.5	7
H	E, F, G	5	5	5

Z	Probability (P)
0	0.5
0.5	0.6950
1	0.843

- (i) Draw the network diagram.
- (ii) Find the critical path and expected projected duration.
- (iii) Calculate the standard deviation and variance of the project.
- (iv) What is the probability of completing the project on 30-week deadline?

Q.3 (a) Explain work breakdown structure and Gantt chart with example. **10**

(b) A project requires an initial investment of Rs. 200000 and it is expected to generate a cash flow of Rs. 10000 for 3 years. The target rate of return of the project is 12% per annum. Calculate the net present value of the project. **05**

(c) Explain non numeric project selection models. **05**

- Q.4** (a) Explain top down and bottom-up budgeting. **05**
(b) What is the difference between resource loading and resource leveling? **05**
(c) Describe probability and impact matrix. Explain risk response strategies for positive and negative risks. **10**
- Q.5** (a) A project in its 20th week has an actual cost of Rs. 250,000. It was scheduled to have spent Rs. 241,000. For the work performed to date, the budgeted value is Rs. 252,000. What are the cost and schedule variances for the project? What are the SPI and CPI? **05**
(b) Describe Earned value management technique in Project Management. **05**
(c) Explain Project Procurement Management. What is the difference between contracting and outsourcing? **10**
- Q.6** (a) Explain multicultural and virtual projects. **05**
(b) Why is ethics important in Project management? **05**
(c) What is project termination? Explain different types of project terminations. **10**

(Time: 3 Hours)

(Total Marks: 80)

Note:

1. Question No.1 is compulsory
2. Attempt any **three** out of the remaining **Five** questions.
3. Assume suitable data if necessary.

- Q. 1.** Answer **any FOUR** of the following: (20)
- (a) Define Environmental Objective as per ISO 14001
 - (b) What are the challenges in implementation of ISO 14000 standards?
 - (c) Unawareness or ignorance of environmental protection will lead to detrimental consequence comment. Justify the statement.
 - (d) Write short note on Global Warming as a Global Environmental Concern.
 - (e) Discuss on Applications of Environmental Management System..
 - (f) Discuss the key success factors for applied to almost all the operation for EMS implementation.
- Q. 2.** (a) What is Water (P & CP) Act? Give its objectives. (10)
- (b) Discuss in short about Environment Protection Act. (10)
- Q. 3.** (a) Discuss roles of Government as regulatory agency for Environmental Management. Enlist 3 points. (10)
- (b) Explain limiting factors and carrying capacity as related to Ecosystems. (10)
- Q. 4.** (a) What is Total Quality Environment Management Concept? (10)
- (b) How is CSR related to Environmental Management? Explain with an example. (10)
- Q. 5.** (a) Elaborate the ISO 14001 EMS Model for Municipalities. (10)
- (b) Discuss in short about EMS certification. (10)
- Q. 6.** Answer the following (20)
- (a) Discuss on Wildlife protection Act.
 - (b) What are the guidelines to conduct and Environmental audit?