Q.P. Code :21977

[3 Hours] **[Total Marks: 80]**

Please check whether you have got the right question paper.

N.B: **1. Attempt any four questions out of six questions.**
2. Write with legible handwriting.
3. Draw neat and clean diagrams wherever necessary.

1. a) Define disaster, explain with examples the difference between hazard and vulnerability. **(5)**
b) What are the long term and short term effects of disaster? **(5)**
c) How is Global warming different from Green House Effect? **(5)**
d) What is Volcano? Comment on Volcanic Explosivity Index. **(5)**

2. a) What is earthquake? Explain its Driving force, Impact and Mitigation Management. **(10)**
b) What are the various types of Disaster and Explain in detail with the help of a neat diagram the various Phases in Disaster Management. **(10)**

3. a) How do floods takes place? What are the possible risk reduction measures? Comment about the flood management in India. **(10)**
b) Explain the physics of cyclone, state various types, How cyclones are tracked. **(10)**

4. a) State disaster management act. **(5)**
b) Write in detail on mass casualty management. **(7)**
c) Discuss role and scope of National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NDIM). **(8)**

5. a) How do GIS and GPS applications bring effective help in disaster management? **(10)**
b) Explain role of NGO's in post disaster scenario and during rehabilitation. **(10)**

6. a) Explain the Do's and Dont's during various Disasters. **(6)**
b) How is Financing done during disaster? **(5)**
c) Explain the Mitigation Measures taken for Tsunami. **(5)**
d) What are various international relief and aid agencies playing important role in disaster management? **(4)**

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(3 Hours) **(Total Marks : 80)**

N.B.: 1) **Q.1** is **compulsory**.

2) Attempt any **three** from remaining **five** questions.

3) **All** questions carry **equal marks**.

Q1. a) Give classification of cybercrime. [05]

b) What is objective of computer based social engineering. [05]

c) Explain LDAP & RSA Securities for mobile devices. [05]

d) Discuss the concept of mishing & vishing. [05]

Q2. a) Explain in detail how cyber criminals plan the attacks. [10]

b) Explain in detail DOS and DDOS attacks [10]

Q3. a) Explain Cybercrime and Criminal Justice in Indian IT Act 2000. [10]

b) What is buffer overflow problem? How to minimize buffer overflow attack. [10]

Q4. a) Explain Cyber defamation with example. [10]

b) Explain information security standard : HIPPA and GLBA [10]

Q5. a) Explain risks associated with cloud computing . [10]

b) Explain some precaution measures that should be taken by end user at cyber cafe [10]

Q6. Write short notes on **(Any two)**

a) Laws related to Electronic Banking [20]

b) Key Logger

c) Cyberstalking

d) Types of Phishing

(3 Hours) **[Total Marks: 80]**

N.B. 1) Attempt any 4 questions.
2) Draw neat and labeled diagrams wherever required.
3) Figures to the right indicate full marks.

1. (a) Define PLM and explain its different phases. How its study can be used by manufacturing department in a company? (10)
   (b) Write note on "Design for X". Explain "Design for Serviceability" in detail with an example. (10)

2. (a) What are the principles of change management? How can it be carried out smoothly in an organization ? (10)
   (b) Write a note on PLM Vision and Strategy. Explain strategy structure and strategy elements. (10)

3. (a) Write note on 3D CAD systems. Explain the role of digital mock-up in Product Design. (10)
   (b) Write a detailed note on 'Concurrent Engineering. (10)

4. (a)What elements does product data comprise of? Explain how PDM system helps product development process to proceed smoothly. (10)
   (b) What is Product Configuration and Variant Management? Explain in details with suitable examples. (10)

5. (a)Explain phases of Life Cycle Assessment in ISO Standards. (10)
   (b)Explain the role of modeling and simulation in product design with some example or a case study. (10)

6. Write short notes (any four) (20)
   (a) PLM feasibility study during its implementation
   (b) Mission flow diagram
   (c) Relevance Trees
   (d) Morphological Matrix Technique
   (e) Design for Environment

(3 Hours) Marks: 80

N.B. : (1) Answer any four questions.
(2) Figures to the right indicate full marks.

1.

(a) A research laboratory has two melts of A and B of copper Nickel and Zinc alloy to make a new alloy. The composition of metal is as follows: 10

Melt	Composition		
	Copper	Nickel	Zink
A	3	2	1
B	3	2	1

To make a new alloy, at least 15 Kg. of Copper, 10 Kg of Nickel and 6 Kg of Zinc is needed. Melt A costs Rs. 45 per Kg and Melt B costs Rs. 50 per Kg.
Formulate the problem as linear programming model for the quantities of each melt to be used to minimize the cost.

(b) Trains arrive at the yard every 12 minutes and the service time is 35 minutes. If the capacity of the yard is limited to 4 trains; find: 10
i. Probability that yard is empty
ii. The average number of trains in the system
iii. The average number of trains in the queue

2. (a) Find the graphical solution of the problem 10
Maximize $Z = 3x + 2y$
Subject to $x \leq 3$
$4x + 5y \geq 20$
$X, y \geq 0$
Give your comment on the solution.

(b) Discuss the advantages, limitations and uses of simulation 10

3. (a) Solve the following problem by simplex method 10
Maximize $z = 10x_1 + 5x_2$
Subject to
$4x_1 + 5x_2 \leq 100$
$5x_1 + 2x_2 \leq 80$
$x_1, x_2 \geq 0$

(b) Consider the following payoff matrix for two firms. Find the best strategy for both. Find the value for the game. 10

		Firm II		
		No Advertisement	Medium Advertisement	Large Advertisement
Firm I	No Advertisement	60	50	40
	Medium Advertisement	70	70	50
	Large Advertisement	80	60	75

4. (a) Solve the following transportation problem, by Vogel's Approximation method and find the optimum solution by uv method. 10

		To			Available
		P	Q	R	
From	A	2	7	4	5
	B	3	3	1	8
	C	5	4	7	7
	D	1	6	2	14
Required		7	9	18	

(b) The annual demand for a product is 64,000 units. The buying cost per order is Rs. 10 and the estimated cost of carrying one unit in stock for a year is 20%. The normal price of the product is Rs.10 per unit. However the supplier offers a quantity discount of 2% on an order of at least 1,000 units at a time and a discount of 5% of the order is for at least 5,000 units. Suggest the most economic purchase quantity per order. 10

5. (a) Three buildings are to be added to the college campus. Bids are submitted by five contractors. The bid figures are given in millions of rupees and are shown in the table below: 10

Building ➡	A	B	C
Contractor ⬇			
1	2.90	1.62	-
2	3.10	1.75	2.81
3	3.05	1.80	2.90
4	2.85	1.55	2.75
5	-	1.70	3.00

Find the assignment of buildings to contractors that will result in a minimum total cost for the building programme.

(b) The profit for three markets as a function of sales efforts extended is given in the table below. How will you distribute a given number of salesmen by dynamic programming so as to achieve maximum profit? 10

No. of Salesmen	Market		
	I	II	III
0	40	50	50
1	42	60	60
2	50	65	70
3	60	75	80
4	66	85	88
5	75	95	105
6	82	110	115
7	90	120	130

6. (a) Solve the following problem by integer programming 10

Maximize $z = 8x_1 + 5x_2$

Subject to

$$x_1 + 2x_2 \leq 10$$
$$5x_1 + 2x_2 \leq 20$$
$$x_1, x_2 \geq 0 \text{ and to be integers}$$

(b) Find the dual of

Maximize $z = 5x_1 - 6x_2 + 4x_3$

Subject to

$$3x_1 + 4x_2 + 6x_3 \geq 9$$
$$x_1 + 3x_2 + 2x_3 \geq 5$$
$$-7x_1 + 2x_2 + x_3 \geq -10$$
$$x_1 - 2x_2 + 4x_3 \geq 4$$
$$x_1, x_2, x_3 \geq 0$$

(3 Hours) **[Total Marks : 80]**

N.B. 1) Attempt **ANY FOUR** questions
2) Assume additional data if necessary and state the same
3) Use of Statistical Tables and Certified Data Sheets is permitted
4) Figures to the right indicate full marks

1. a) Estimate the probability of at least 4 candidates passing an examination in a group of 6 candidates, if the overall percentage of failures is 40. Use binomial distribution. **[10]**

b) A life test on electric bulbs was conducted by a company. The results of the test are tabulated below : **[10]**

No. of bulbs	3	10	20	30	15	10	10	2
Time in hrs for failure	1000	1200	1500	2000	2200	2500	2700	3000

Estimate :
(i) No. of survivors, failure density and failure rate at each interval
(ii) Mean Time to Failure
(iii) Reliability of the bulbs for 1500 hrs and 2500hrs of operation. Assuming constant rate of failure.

2. a) The quantity of engine oil in the engine have a normal distribution with mean of 500ml and SD of 5ml. What percentage of engine will have engine oil fall : **[10]**
a) Below 498ml
b) Above 504ml
c) Below 498ml and above 504ml
d) Between 498ml and 504ml

b) The time to repair a power generator is best described by its probability density function $m(t)= \frac{t2}{333}$, $1 \le t \le 10$ hours: **[10]**
(a) Find the probability that a repair will be completed in 6 hours.
(b) What is the MTTR
(c) Find the repair rate

3. a) Identify the two missing class frequencies from the frequency distribution table below. **[12]**

Class Interval	100-110	110-120	120-130	130-140	140-150
Frequency	4	7	15	?	40
Class Interval	150-160	160-170	170-180	180-190	190-200
Frequency	?	16	10	6	3

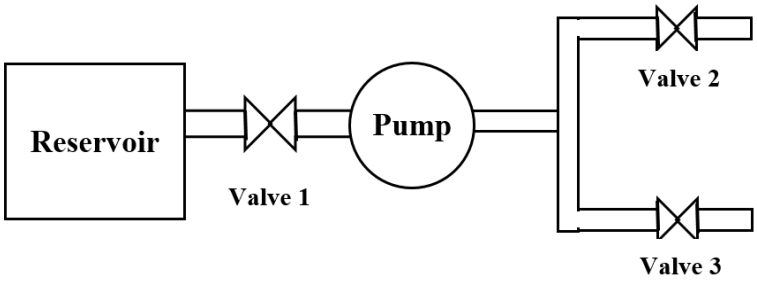
The total number of frequencies are 150 and the median is 146.25.

b) Illustrate any one method for Reliability Improvement **[04]**

c) Describe with neat sketch the Bath tub curve in Reliability Engineering **[04]**

P.T.O.

4. a) Figure shows a typical reactor coolant system that is required to pump coolant from a reservoir in the case of 'Loss of Coolant Accident' (LOCA). The coolant from the reservoir is controlled by valve 1 and is pumped through two parallel segments via the valves 2 and 3. Considering LOCA as the initial event, develop the FAULT TREE of the system. **[10]**



b) Domestic hot water boilers make use of thermal switches to control the temperature of the water. In order to provide protection against malfunctioning of the thermal switches, either blow-out valves or vent pipes can be provided. Assume a situation where a boiler is provided with a thermal switch and a blow-out valve. The beating elements inside the boiler may or may not be working. Construct a suitable EVENT TREE model considering top event as 'Failure of Boiler'. **[10]**

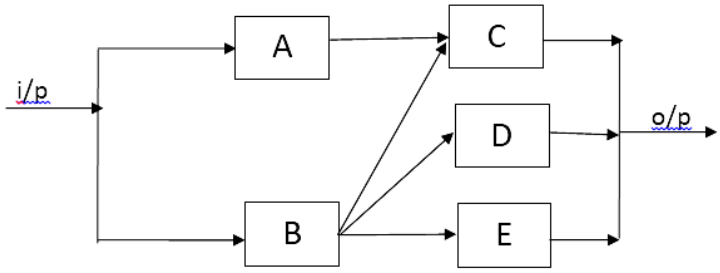
5. a) Two fuel pumps each having Weibull failure distribution with $\beta = ½$ and $\theta = 1000$hrs are configured to provide a redundant system. Find the system reliability for a 100hr mission and the system MTTF. **[10]**

b) Distinguish between Repair and Replacement **[05]**

c) With neat sketch explain the five basic symbols in Fault Tree Analysis. **[05]**

6. a) Determine the reliability of the system as shown in the figure by the following methods: **[14]**

a. Cut-Set Method
b. Decomposition
c. Enumeration Method



$R_A = R_B = 0.9$
$R_C = R_D = R_E = 0.8$

b) Describe the procedure for Failure Mode Effect and Criticality Analysis (FMECA). **[06]**